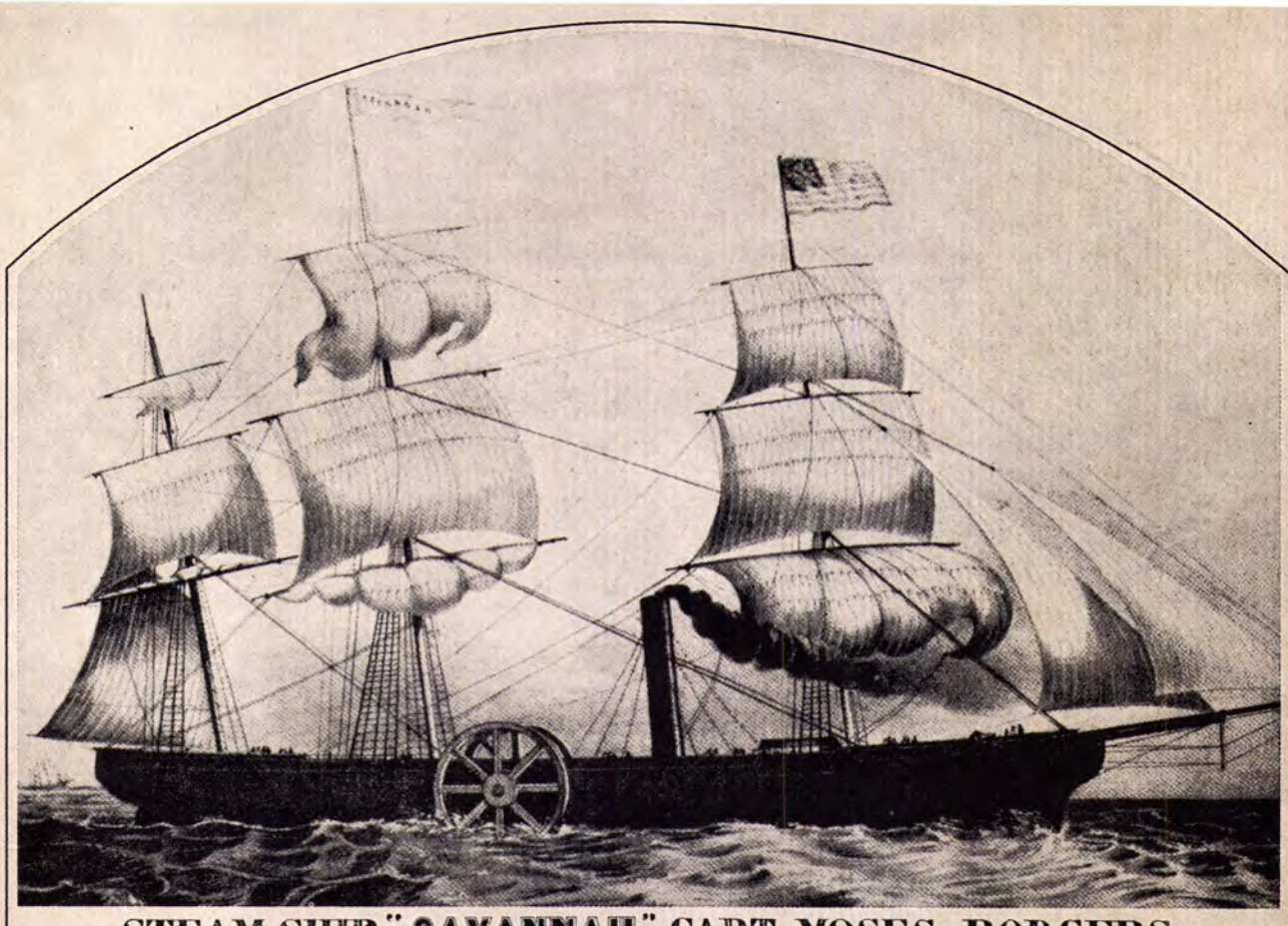
MARITIME REPORTER
AND
ENGINEERING NEWS

Gotaverken Arendal Yard Delivers First In New Series Of 32 Tankers

(SEE PAGE 6)

SEPTEMBER 1, 1974



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Atlantic Richfield Announces Test Flow From Well In Timor Sea

Atlantic Richfield Company, Los Angeles, Calif., has confirmed that an exploratory well in the Timor Sea, 160 miles offshore northern Australia, flowed oil at a rate of 4,272 barrels per day during a drill stem test through a half-inch choke.

The well, Puffin No. 2, located approximately 430 miles west of Darwin, flowed 48-degree API gravity crude from a thin sand through perforations at the 6,600-foot-depth level, a spokesman said.

ARCO Australia Limited, an Atlantic Richfield subsidiary with a 50 percent interest, is operator for the venture. Other participants are Australian Aquitaine Petroleum, Pty., Limited, 37.5 percent; and Esso Exploration and Production, Australia, Inc., 12.5 percent.

This find cannot be declared commercial without further study of test results and possible additional drilling, the spokesman added.

Welding Brochure Shows Award-Winning Ideas

The Lincoln Arc Welding Foundation Review is a new eight-page illustrated brochure containing brief abstracts of award entries in the Lincoln Arc Welding Foundation's recent Award Program. This annual program offers awards for ideas that have conserved material, reduced costs, and improved machinery or manufactured products through arc welded design, engineering, and fabrication.

The current issue of the Review contains abstracts of entries describing design and fabrication of turbine runner hubs, farm machinery, truck frames, machine tools, fixtures and compressor frames. The projects involve the redesign of weldments, the efficient use of materials, replacement of castings and welded design for energy conservation. Featured are weight savings by eliminating over-designing and other inefficient uses of material.

The Lincoln Arc Welding Foundation Review is available free from the James F. Lincoln Arc Welding Foundation, Box 3035, Cleveland, Ohio 44117. Ask for Bulletin JFLF-713.

MARITIME REPORTER AND ENGINEERING NEWS

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The end results of a Decca autopilot's near perfect steering are faster runs and reduced propulsion losses with proven fuel savings of 4% or more. With bunker fuel figured at $70 per ton, the savings are considerable. For example, an 8,890 ton cargo liner with 5,600 shaft horsepower consumes about $280,000 worth of fuel annually. A 4% fuel savings comes to $11,200—or twice the cost of our DP 550 Autopilot.

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Side Trawler Diesel 1,200 Shaft H.P.	1,650 tons $115,500	$4,620	DP.450 (G) $3,600
280 ft. Freezer 4,000 Shaft H.P.	3,300 tons $231,000	$9,240	DP.550 (G) $5,390
8,890 ton Cargo Liner 5,600 Shaft H.P.	4,000 tons $280,000	$11,200	DP.550 (G) $5,390
26,000 ton Bulk Carrier 11,600 Shaft H.P.	7,000 tons $490,000	$19,600	DP.550 (G) $5,390
90,000 tdw Tanker 25,300 Shaft H.P.	33,700 tons $2,350,960	$94,038	DP.550 (G) $5,390
250,000 ton V.L.C.C. 30,000 Shaft H.P.	50,000 tons $3,500,000	$140,000	DP.550 (G) $5,390

Use our "phantom rudder" autopilot or lose big money. It's that simple.

The Sydhav, shown on trials, is the first ship to be built by Gotaverken using the shipyard's new facilities.

Gotaverken Arendal Yard Delivers First In New Series Of 32 Tankers

The first vessel in a series of 32 tankers of 140,000 to 154,000 dwt, the Sydhav, which are on order with Gotaverken Arendal, Gothenburg, Sweden, was delivered recently. The Sydhav also is the first ship to be equipped with a Burmeister & Wain K90 engine, built by Gotaverken under the license agreement of 1972.

Including the Sydhav, Gotaverken has built no less than 200 tankers in Gothenburg. The first one was the motor tanker Hamlet, 7,210 dwt, which was delivered in 1916 and at that time attracted attention for its speed, size and design. On this ship Gotaverken introduced the system of two longitudinal bulkheads which then became standard in tankers.

The Sydhav has been built to the highest class of Det norske Veritas and bears the class EO (unmanned machinery room) and the special notation "Inert." It is 885 feet 10 inches in length overall and 883 feet 0¼ inches between perpendiculars. The beam is 142 feet 0¾ inches and has a depth of 73 feet 7⅞ inches and a summer freeboard draft of 56 feet. The deadweight is 140,800 tons and the registered gross tonnage is 74,100.

The total cargo-oil capacity at 98 percent full is 6,005,740 cubic feet, in the four center tanks and 12 side tanks. Clean-water ballast can be carried in the fore and aft peak tanks and in two side tanks. The total clean-water ballast capacity is 573,505 cubic feet.

The hull design has many features common to tankers but also a number of less orthodox structural arrangements. The web spacing in the cargo tanks is 201 inches, in the after peak and counter 23.6 inches, in the engine and pump room 35.5 inches, and in the forepeak area 33.5 inches. High tensile steel was used almost exclusively for the longitudinal hull plating and profiles and also in parts of the transverse bulkheads and deep web frames. Forty-five percent of the total hull steel consists of such high-tensile steel, almost all of which was produced in Swedish mills.

Primary structural stiffness of the longitudinal panels is afforded by the transverse bulkheads and by the deep transverse web frames. This has made possible the omission of the centerline deck girder. The centerline bottom girder has a height much lower than the bottom transverse and serves as a docking girder only. The transverse bulkheads have horizontal stiffeners and deep, vertical web frames.

All crew staterooms are on the second deck or higher. Only storerooms are located on the upper deck. Messrooms, dayrooms, galley, etc. are on the first poop deck. "Floating floors," consisting of a wooden board resting on mineral wool with no battens to the steel deck give good soundproofing and vibration reducing effect. All bulkheads and ceilings are of incombustible material.

The ship has single-berth cabins with showers and water closets for officers and single-berth cabins with semi-private shower and water closet for the crew. The accommodations, including the wheelhouse, are fully air conditioned by a high-pressure single-pipe system and cabin ventilators with individual electric preheating facilities.

The main engine is an eight cylinder, two-stroke, crosshead, large-bore diesel engine. This engine retains some of Burmeister & Wain's traditional design features, such as single-stage impulse turbo-charging, uniflow scavenging with top-mounted central exhaust valve, oil-cooled pistons, etc. Another feature is the completely new design of the frame. This is a very stiff construction, consisting of a few, horizontally joined elements instead of the previous vertically subdivided cylinder units. The exhaust valves are hydraulically operated. The cylinder covers are of solid steel plate with radial cooling-water bores in the upper part and tangential in the lower part. Hydraulically tightened nuts are used extensively.

The machinery is normally controlled from a sound-insulated, air conditioned control room. Arrangements are made for at least 24-hours operation in the unmanned condition.

The three auxiliary diesel engines are 12-cylinder, V-type units made by Bergens Mek. Verksted, each coupled to one 1,100-kw Nebb air-cooled alternator. Two of the alternators can be disconnected from the engine by a pneumatically operated clutch. By means of this clutch, the diesel can be engaged to a bevel gear driving a cargo pump through a vertical shaft system. When driving the pumps the cargo-pump speed can be controlled from the pump room, from which also the coupling can be disengaged.

During normal operation at sea, the steam for all heaters in the engine room, bunker heating and domestic heating is produced in a Gotaverken/Sunrod exhaust-gas boiler.

Steam for cargo heating, the two turbine-driven cargo pumps and the deck machinery is produced in two oil-fired Gotaverken/Sunrod boilers, each with a capacity of 20 tons of saturated steam per hour.

Because of the system with two diesel-driven and two turbine-driven cargo pumps, an optimized and simple steam plant has been possible and an ample supply of inert gas is available at the same time.

Sludge oil produced by the machinery is burnt in a Saxlund incinerator which also can handle garbage. A Neptumatic sewage plant also is installed.

Several new investments at the shipyard have been utilized to their fullest in building the Sydhav and in this respect this ship marks the beginning of a new era at Gotaverken Arendal.

The Family Cabin on the Sydhav has a unique arrangement combining the sleeping and lounge areas in one space.

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Gulf+Western Awarded $5.2-Million Nuclear Sub Components Contract

The Gulf+Western Manufacturing Company, Oak Brook, Ill., has reported that its Energy Products Group has received contracts valued at $5.2 million for piping components for nuclear submarines from the Electric Boat Division of General Dynamics Corporation. G+W Manufacturing is a unit of Gulf+Western Industries, Inc.

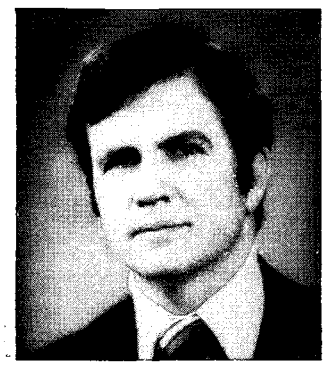
The contract includes piping components used on SSN-688-class nuclear attack submarines. The components, which will be produced at the Memphis plant of the Energy Products Group's Taylor Forge Division, will be provided over the next four years.

The new contract brings to nearly $12 million the value of piping systems components provided by the Energy Products Group for use on SSN-688-class submarines. Previously, the Energy Products unit supplied components for nuclear submarines built by Electric Boat and Newport News Shipbuilding and Dry Dock Company, a division of Tenneco Corporation.

Taylor Forge has been a supplier of nuclear submarine components since the United States' first nuclear submarine, the Nautilus, was commissioned in 1954.

Energy Products Group is a newly formed unit of Gulf+Western Manufacturing Company. The Group consists of 39 production operations in eight countries. It is a major integrated producer of forged and fabricated piping systems and components serving nuclear and energy producing industries on a global basis. Energy Products has a current sales base of $200 million, assets of $100 million and employs 5,000 persons.

Oceans International Appoints Pereira VP



Melvin C. Pereira Jr.

Burnell Russell, president of Oceans International Corporation, has announced the appointment of **Melvin C. Pereira Jr.** as vice president and general manager.

A 15-year maritime veteran, Mr. **Pereira** will be involved with all of Oceans International's offices, including Houston headquarters, Galveston, New Orleans, and New York City.

Prior to joining Oceans International, Mr. **Pereira** was with Bay-Houston Towing Company in Houston, and Waterman Steamship Corporation in Galveston.

Oceans International represents American Offshore, Inc.; Cook Transportation Systems, Inc.; Maritime Service, Inc.; Transamerican Ocean Contractors, and Transamerican Steamship Corporation.

The firm also services offshore petroleum industry vessels, including preparation of customs and other Government required forms, both domestic and foreign; ordering of fuel and supplies; making port arrangements, and providing owner representation for foreign-flag vessels.

Tidal Company Names Swanton Executive VP

Gerald F. Swanton has been named executive vice president of Tidal Co., Inc., New York-based steamship and stevedore agents, the company announced.

Mr. **Swanton,** a vice president of Southeastern Maritime Co., was formerly a vice president of operations for Netumar International, and vice president and director of Moore-McCormack Lines.

M & S (Marine) Appoints U.K. And European Agent

F.J. Emond

Murray & Stewart (Marine), the South African ship repair firm with headquarters in Table Bay Harbour, has taken a further step toward the consolidation of its U.K. and European network of agents and representatives. The company has appointed a 37-year-old South African, **F.J. Emond,** as their U.K. and European representative. Mr. **Emond** will be working from the London offices of M & S (Marine)'s U.K. agent, **John Bailey**.

Mr. **Emond** is a chartered engineer and fellow of the Institute of Marine Engineers. He was previously a chief engineer and then, for six years, a superintendent engineer with Safmarine, for whom he has altogether worked for 16 years. Mr. **Emond** has extensive experience in both the technical and cost side of vessel repairs, as well as a thorough training in the costs and problems of routine maintenance. He will be primarily responsible for establishing a closer liaison with over 200 U.K. and European clients and potential clients, and will at the same time maintain the closest possible contact between them and the ship repair teams in South Africa whenever a European client's vessel is in M & S (Marine)'s hands.

ETA Announces British Subsidiary

Engineering Technology Analysts, Inc. (ETA), an engineering design and consulting firm based in Houston, Texas, has recently formed a wholly owned British subsidiary in Edinburgh, Scotland. Engineering Technology Analysts, Ltd. was established to better serve ETA's U.K. clients involved in the rapidly growing North Sea activities. Directors for the firm, which is registered in Scotland, are **Peter Lovie** (managing), and **Edwin L. Lowery** (secretary).

ETA specializes in the complete design and analysis of mobile and fixed offshore structures, marine pipelaying, and piping system analysis and design. Now in its fifth year of business, ETA has expanded its engineering services on an international scale, and has also established representative offices in Oslo, Norway and Rio de Janeiro, Brazil.

M-G Transport Asks Aid For 75 Hopper Barges To Be Built By Jeffboat

M-G Transport Services Inc. of Cincinnati, Ohio, has applied to the Maritime Administration for construction loan and mortgage insurance to build 75 barges costing $9,224,675. The new barges will add to the carrier's existing fleet on the Ohio and Mississippi Rivers.

The application states that 45 of the barges will be the semi-integrated hopper rake type, and the remainder semi-integrated open hoppers.

The barges, which will have from 70,000 to 79,000-cubic-feet bale and grain capacity each, will be built by Jeffboat, Inc. of Jeffersonville, Ind.

M-G pointed out that it already operates a fleet of 15 towboats and 214 barges on the two rivers.

Sedco, Inc. Receives $40-Million Contract From British Petroleum

British Petroleum Company Ltd., has awarded a two-year drilling contract, valued at approximately $40 million, to Sedco, Inc., for a dynamically stationed drillship to be known as the Sedco 471.

The vessel will be built at Halifax, Nova Scotia, and will be delivered in March 1977.

Todd Galveston Yard Construction Backlog Increases to $50 Million

The Galveston Division of Todd Shipyards Corporation has in recent months booked a substantial volume of diversified marine construction work—all scheduled for completion by the middle of 1975. The total volume of this work is approximately $50 million.

A long-term contract with Alamo Barge Lines calls for construction of two twin-screw 135-foot river pushboats and 12 liquid cargo barges. This contract is now well past the halfway mark. The first set of four barges, intended for use in integrated 1,055-foot tows of four barges each, has already been delivered, as have two of the second set of barges. The balance of the work, in varying stages, is well along toward completion. This schedule originally called for all of the units to be delivered before the middle of 1974. However, difficulties encountered in obtaining the necessary steel precluded such deliveries, and the contract is now scheduled for completion later this year.

Todd has also been awarded, and will shortly sign, contracts covering the construction of four 96-foot tugboats for various companies, with deliveries set for 1975.

Already nearing completion—well ahead of schedule—is Phase I of a contract with Santa Fe International Corporation. This phase calls for the construction of a 220-foot by 74-foot drilling barge to be used by Santa Fe for oil exploration in the swamps of Africa. The owner was able to furnish the bulk of the steel required for this project. Work on Phase II of this contract is expected to be started shortly. This work calls for the fabrication and erection of a two-story working structure and installation of diesel engines and all related drilling equipment, as well as air-conditioned living facilities.

Todd has also been awarded a contract by James Griffiths & Sons, Inc. to construct a 302-foot by 72-foot barge to be used for hauling logs in Alaskan coastwise service. Here again, the owner was able to furnish the bulk of the steel, which is presently en route from Japan.

In addition to the above construction work, Todd will convert three vessels into drillships. Two of these vessels have already been delivered to the shipyard. They are presently 335-foot-long cargoships and will have 40-foot midbody sections fabricated and installed by Todd. The completed drillships will be operating in the icy Arctic waters of the Beaufort Sea off the northern coast of Canada, and so the entire hulls of the vessels will be widened and strengthened for this service. Considerable other work will be carried out on these vessels, including installation of Whirley cranes capable of lifting in excess of 100 tons. The completed drillships will be 375 feet long and 70 feet wide when redelivered to Dome Petroleum Limited of Calgary, Alberta, Canada. Steel for this project is being furnished by owners and is presently en route to the shipyard.

The third vessel scheduled for conversion, a 440-foot-long lumber carrier, presently in Japan, will arrive at the Galveston shipyard in the early part of October. A 42-foot midbody section is to be fabricated and installed in the existing vessel, quarters completely renovated and drilling equipment installed, after which the converted vessel will operate as a self-propelled oceangoing drilling vessel. The steel required for this contract will also be supplied by the owner.

Accelerated hiring and a continuing "in-plant" training program is a significant part of Todd's activities.

General Dynamics Wins $285.4-Million Contract For Trident Submarine

The Naval Sea Systems Command has awarded a $285.4-million contract to General Dynamics Corporation to begin construction of the first missile-launching Trident submarine.

Precise power is the Moran difference.

A new 225,000 dwt tanker being transported to its berth by Moran tugs. It's an awesome sight, and the amount of skill required is equally staggering.

Moran tugs have been handling the big assignments for well over a century. With the most powerful equipment, capable of moving the largest ships and the heaviest tows, Moran has the experience to do the job efficiently and safely.

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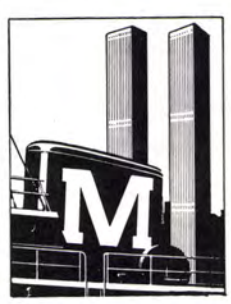
The economical way to go.



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Corps Of Engineers Asks Bids For Twin-Screw Towboat

The Corps of Engineers, P.O. Box 867, Little Rock Ark. 72203, will open bids on September 17, 1974 for the construction of a twin-screw diesel-powered towboat. The vessel's propulsion system will consist of two 975-horsepower diesel engines, and the towboat will measure 96 feet by 34 feet, with the cost ranging from $1 million to $5 million. Bid sets may be obtained from the Corps of Engineers at a price of one dollar.

Executive Promotions At Dravo Corporation

Robert Dickey III, president and chief executive officer of Dravo Corporation, Pittsburgh, Pa. 15222, was elected to the additional post of chairman of the board in action taken by the company directors.

Mr. **Dickey** reported that the board also elevated four other senior executives to new posts in moves which realign and expand management responsibilities at a time when Dravo is experiencing steady growth and developing new long-term opportunities in its domestic and international operations. The other promotions are:

H.E. Lore, to vice chairman and chief administrative officer, will assume responsibility for staff functions, including international, industrial relations, purchasing and traffic, legal, public relations and advertising.

J.K. Beidler, as vice chairman, commercial, will expand his responsibilities for the company's worldwide commercial activities, with particular emphasis on coordinating the marketing of multidivisional products and services.

P.J. Berg moves up to senior vice president, operations, in charge of Dravo's four operating groups and its Australian subsidiary, Dravo Proprietary, Ltd.

R.S. Gould, as senior vice president, corporate development, will be responsible for research and development, acquisitions, market development and planning and land development.

Completing the new executive alignment at the diversified engineering, manufacturing and construction firm is **T.F. Faught,** who earlier this month was elected senior vice president, finance to replace **E.T. Fitch** who retired last year.

In commenting on the changes, Mr. **Dickey** said that the board's actions are a response to the company's recent growth and recognition of expanding executive responsibilities as Dravo positions itself in new and enlarging areas of activity worldwide. "The steps announced today," Mr. **Dickey** said, "are the first in a series of operational, personnel, marketing and other changes that will take place in an evolutionary manner to meet the company's long-range objectives."

Earlier, Dravo announced that earnings for the first six months of 1974 were 50 percent above those of the corresponding period last year. Backlog to be reported as revenue at June 30, 1974 was $951 million, compared with $812 million a year ago and $677 million on the same date two years ago. Mr. **Dickey** commented that Dravo's earnings for the full year 1974 are expected to exceed 1973's record $3.72 per common share by a sizable margin, and will represent the fourth consecutive year of profit improvement. He added that revenue for the full year is expected to reach the half-billion-dollar mark for the first time in the company's history.

Lee Turner To Manage Ship Chartering For Evans International

Lee Turner has been named manager of the ship charter department of Evans International Trading Co., Portland, Ore. He was previously a director of A.A. Whitehead Shipping Ltd., London.

Robert L. Hague Post To Honor Todd President

The Robert L. Hague Post American Legion has announced that the 34th Annual Guard of Honor Ball will be held on November 2 at the Waldorf-Astoria Hotel in New York City.

Past Commander **Walter L. Vaughan,** general chairman of the affair, announced at a committee meeting that **John T. Gilbride,** president of Todd Shipyards Inc., will be this year's recipient of the Robert L. Hague Post's Citation and Distinguished Service Medal.

Sponsors this year will be: **Francis J. Barry,** president, Circle Line, Inc.; Capt. **Leo V. Berger,** president, Avon Steamship Co., Inc.; **Harry A. Berke,** vice president, Maryland Shipbuilding & Drydock Co.; **George H. Blohm,** president, International Ocean Transport Corp.; **Francis B. Bushey,** president, Ira S. Bushey & Sons, Inc.; **James A. Farrell Jr.,** chairman of the board, Farrell Lines, Inc.; **Morris Feder,** vice president, Maritime Overseas Corp.; **Harrison R. Glennon Jr.,** president, Zapata Bulk Transport, Inc.; **Edward J. Heine, Jr.,** president, United States Lines, Inc.;

John T. Gilbride

Edwin M. Hood, president, Shipbuilders Council of America; **William H. Jory,** president, Norfolk Shipbuilding & Drydock Corp.; **Francis J. Joyce,** vice president, Marine Division, National Bulk Carriers, Inc.; **Charles Kurz,** chairman of the board, Keystone Shipping Co.; **Henry J. Luck Jr.,** vice president, Mobil South Inc.; Dr. **John J. McMullen,** chairman of the board, John J. McMullen Associates, Inc.; **O.R. Menton,** general manager, Marine Division, Exxon Co. U.S.A.; Capt. **Claude D. Phillips,** vice president, Amoco Shipping Co.; **James J. Reynolds,** president, American Institute of Merchant Shipping; **Ward K. Savage Jr.,** vice president, Marine Department, Texaco Inc.; **Spyros S. Skouras,** chief executive officer, Prudential-Grace Lines, Inc.; **T.T. Wilkinson,** vice president and general manager, Trinidad Corp.; **Walter F. Williams,** vice president, Bethlehem Steel Corp.; **Robert T. Young,** chairman of the board, American Bureau of Shipping, and **Eugene A. Yourch,** vice president, Marine Transport Lines, Inc.

Ball Committee members are as follows: **Walter L. Vaughan,** general chairman; **T.T. Wilkinson,** honorary chairman, and **Christian A. Bendixen,** vice chairman.

Journal and Ball Committees: **Anthony J. McAllister,** chairman; **James A. McQuilling,** vice chairman, and **Robert Bassett,** vice chairman.

ABS Subsidiary ABSTECH Names Two

ABSTECH appointments of **John Snowdon** as regional representative for the United Kingdom and **John H. MacDonald** as representative for Spain were announced by vice president in charge of operations **Walter D. Vandegrift.**

Mr. **Snowdon** will direct ABSTECH activities from the London office at Winchester House, 77 London Wall, London, EC2N 1 BU.

Mr. **MacDonald** will direct ABSTECH activities from Madrid, where the office is located at La Torre de Madrid 90-9, Calle Princesa 1, Apartado 50380, Madrid, Spain.

ABSTECH, a wholly owned subsidiary of the American Bureau of Shipping, provides inspection services of land-based structures to insure compliance with contract plans and agreed upon standards.

Numerical Control's Impact On Shipyard Management

Thomas Lamb*

The searching for better ways to accomplish specific items of work should be a never-ending task of engineers and management. Although it is applied in shipbuilding, the determination and implementation of new ways is generally slow compared to other industries. This is usually stated to be because shipbuilding is a custom-building heavy industry, building one of a kind products in a fiercely competitive world where any significant change usually involves large capital expenditure.

One of the important changes in shipbuilding methods and one which allows others to be possible is the use of numerical-control (N/C) production machines. The N/C production machines for shipyards are limited presently to marking and burning machines and frame-bending machines, although commitments have been made for other shipyard N/C machines and N/C controlled processing lines and plate-forming machines have been proposed.

The use of N/C in the shipyard has had a significant effect on most methods and departmental organization.

Although it takes a relatively short period of time to learn the basic coding of a specific computer-assisted programming system for the preparation of N/C data, it requires considerable experience in the full use and management and control of such N/C software systems to be able to set up an effective and efficient N/C programming group and to integrate it within the existing shipyard organization. Even when the programming instructions are fully understood, the success of the system is not guaranteed. This part is less than 25 percent of the total effort required to ensure an effective N/C data-processing group. It appears that it is more difficut to set up the organization and its operating procedures than it is to obtain working knowledge of the programming methods.

N/C or Not N/C?

The application of N/C to shipyard processes has been discussed and the benefits of the use of the system covered in previous papers and articles. However, is it the panacea for all shipyards, or are there certain conditions that must exist before it becomes beneficial? Does it depend on ship type and size, or shipyard size, and are there other alternatives today which provide meaningful competition to N/C production machines?

As may be obvious, there are no easy and clear-cut answers to these questions, as they involve many factors which are not even constant from one shipyard to another. However, from the experience of shipyards using at least some aspect of N/C, it can generally be stated that N/C applications always have improved the process and resulted in economic savings, regardless of these factors.

Guidelines for the use of N/C in other industries can be studied as a decision aid for a shipyard. It is claimed that a company is ready for N/C when:

1. The number of identical job runs is relatively small.

2. The average part has a fair degree of complexity.

3. The parts are subject to frequent design change.

4. Inspection procedures are lengthy, difficult and, therefore, costly.

In order to determine the size of the N/C data-processing section, an estimate of the total manhours per year is necessary. A rough estimate of the total manhours required, utilizing a second generation computer-aided lofting (CAL) system, can be obtained from Figure 1. Table 1 can be used to analyze the manpower requirements for the N/C data-processing section. The example given in the table is the basis for the manning shown in Figure 2. It can be seen from the example that two ships, each of new and different design, are forecasted for each year and that the work for one will be completed before the other is commenced. This is obviously an idealized case and difficult to obtain in real life.

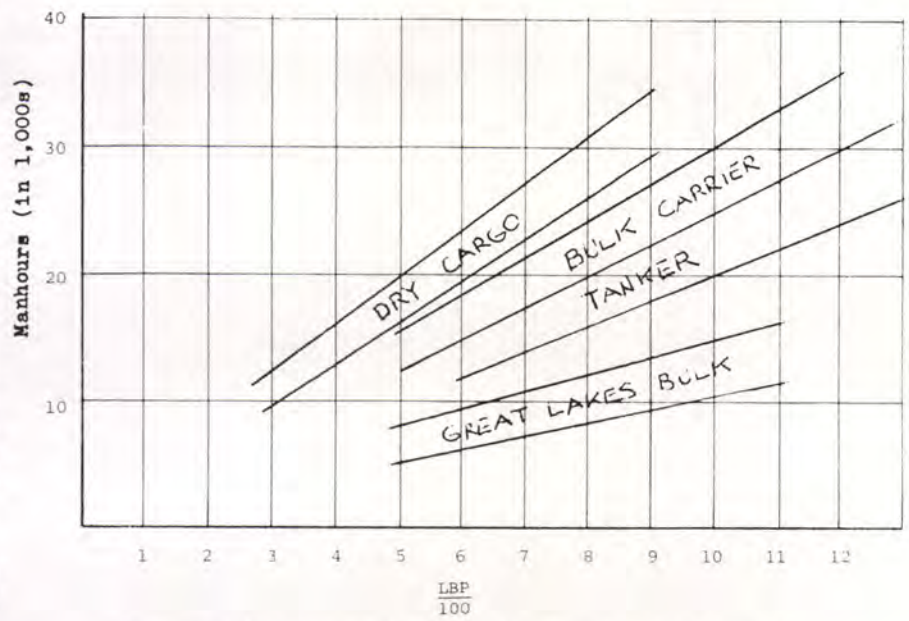


Figure 1—Total computer-aided lofting section manhours, including all necessary manual lofting for four classes of ships.

Methods and Organization

The introduction of N/C production machines along with computer-aided lofting systems have had noticeable effect on both shipyard methods and organization. While it is true that the use of a computer-aided lofting system could be set up so that it simply replaced a manual system with no changes to the existing organization, it soon becomes obvious to the users that changes should be made in order to gain the full benefit of the system. In fact, some shipyards using computer-aided lofting systems have made significant changes to their organization, either at the time of implementation of the system or very soon thereafter. These changes usually result in improvements far in excess of those directly related to N/C but, of course, are brought about by the use of N/C. In other words, the application of N/C has a snowballing effect; the extent of which is only limited by the attitude and capabilities of the individual shipyard staff and management.

A possible setup, using a computer-aided lofting system, is shown in Figure 3. The requirements of modern shipbuilding structural fabrication and assembly methods suggest that a different approach to structural engineering is required, and the use of a second-generation computer-aided lofting system provides the means whereby this can be accomplished.

It is suggested that the usual practice of preparing a very detailed structural drawing for each subassembly is no longer necessary, nor is it the best method. An engineering information procedure should be established that avoids duplication and ensures that adequate information is provided to the production department. It should also be set up so that changes can be effectively managed and controlled. The use of computers for this control is a natural continuation to computer-aided lofting. A possible approach utilizes the usual structural-design drawings required by the classification society, the shipyard's structural-standard detail booklet, an erection and welding sequence booklet, and assembly and welding booklets for each type of sub-

(continued on page 19)

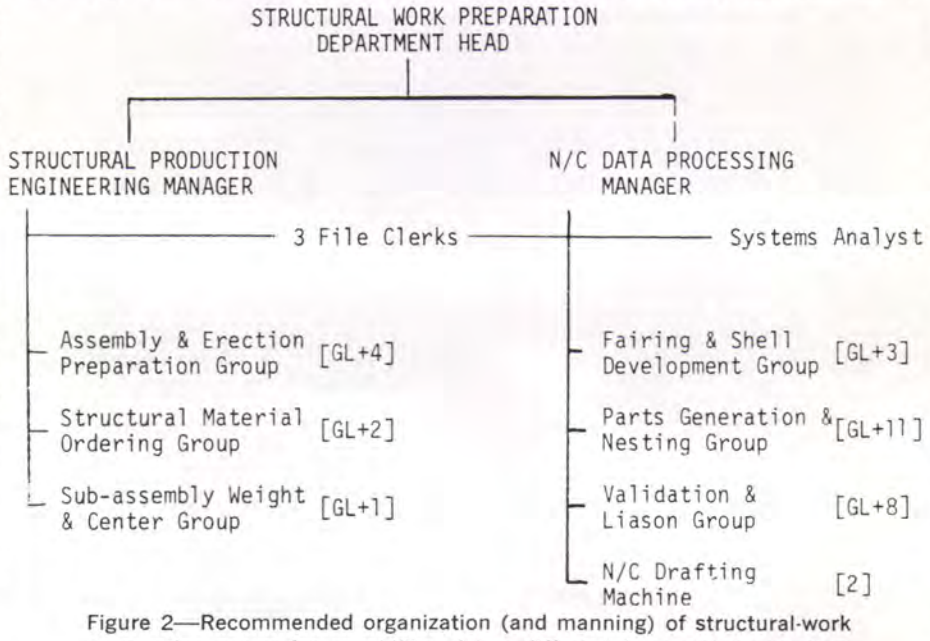


Figure 2—Recommended organization (and manning) of structural-work preparation group for capability of two different large ships per year.

*Mr. **Lamb,** manager of the Marine Division, Value Engineering Company, presented the paper condensed here before a meeting of the Hampton Roads Section of The Society of Naval Architects and Marine Engineers.

assembly containing a series of sequential isometric sketches showing welding details. These booklets can list what parts are to be coded for N/C tapes or 1:10 scale and 1:1 templates or simply laid off in the fabrication shop.

Breaking down the subassembly into sequential steps also assists the planning department to determine the work content and each craft can easily retrieve the information they require. Every operation presently utilizing detailed structural drawings can be significantly clarified and simplified with significant savings resulting from such an approach and the time required to complete all the details, information, and booklets reduced to at least half of what is normally required. This, in turn, will allow the planning department to complete its detailed analysis earlier in the production cycle.

Unfortunately, all this time saving is not necessarily available as a total building-time savings due to the fact that as the time to complete the structural part of engineering and planning is reduced, other engineering aspects or the procurement of material become the critical item. However, the use of computer-aided programming systems usually allows a better engineering job to be done.

Programming Group

The main function of a N/C programming group is to provide all required N/C tapes, N/C drawings, 1:10 templates and related information to the production department for processing all the structural material required to build a ship.

The responsibilities of the N/C programming group will obviously depend on the individual shipyard organization requirements. However, it is considered essential for the greatest success of the system that the existing steel drawing office and the N/C programming group be integrated into one structural-work preparation department. Such a department could be completely responsible for the preparation of all information that the production department requires to build the structural part of a ship.

They also would be responsible for structural-material lists and the preparation of N/C drawings for other departments. If the department is given such responsibility, it must obviously be given the authority necessary to accept the responsibility.

The proposed structural-work-preparation department could be organized as shown in Figure 2. It is split into two sections, but their operations are very closely intertwined and, therefore, are under the control of a department head who reports directly to the vice president-technical.

Table 1—Manning Requirements for N/C Data-Processing Section

A. Annual forecast of ship type and size

No.	Type	LBP	Manhours	Preparation Period (Weeks)
1	Tanker	1,000	24,000	25
2	Bulk Carrier	800	24,000	25
	Total		48,000	50

Required total number of staff = 24

B. Manpower Disposition

		Manhours	Number of Personnel
Fairing	1½%	720	
Sight-edge fairing	½%	240	
Longitudinal fairing	¾%	320	
Shell development	2½%	1,200	
Assembly jig tables	1¾%	800	
Norm writing	2%	960	
Frame & long'l bending	2¼%	1,080	
Scientific calculation	1¾%	800	
Sub-Total		6,120	3
Part generation	25%	12,000	
Nesting	20%	3,600	
Sub-Total		21,720	11
Validation & liaison	30%	14,400	7
Supervision	12%	6,000	3
Grand Total	100%	42,120	24

Skills and Training

Most existing computer-aided lofting systems are production-oriented and basically replace a function which was previously all manual by a combined computer-manual operation. From this point of view, the skills required by personnel who will use the computer-aided lofting system are almost the same as for the pure manual system. The only significant difference being that drafting or layout lose their importance. Obviously, the users must be able to work with numerical data and have a good knowledge of at least elementary trigonometry.

In this country, many of the early users of computer-aided ship lofting systems were recruited from the aircraft and industrial N/C fields, but their effectiveness was restricted due to their lack of shipbuilding experience. The average shipyard draftsman or loftsman can learn the basics of coding in three to four weeks and become quite proficient in the use of the system in less than a year, whereas it takes many years to learn the many facits of shipbuilding that the shipyard draftsmen or loftsmen require to do their job.

Assuming a staff of three systems analysts and 12 users, the training requires an investment of over 100 manweeks or approximately $50,000. Add to this the cost of the instructors and computer usage, the investment can be $100,000.

Future Developments

It is obvious to anyone working with N/C that the present state-of-the-art is just scratching the surface of the potential use of the computer in all phases of ship production. Therefore, the basic need for the future is to continue the effort to expand the application of N/C to shipyard methods and to better integrate the processes involved from design through production.

The present state of capabilities allows access to the following types of information for the hull structure: area of parts, perimeter of parts, thickness and weight of parts, position of parts in ship coordinates, and position of parts on nested formats.

The immediate future should see the following type of programs implemented in connection with N/C:

1. Interference program for distributed systems and compartment equipment.
2. Automated bill of material for: hull structure, piping systems, and ventilation systems.
3. Pipe design and sketching, and N/C pipe bending and finishing systems.
4. Increased use of computer graphics for input of required information.

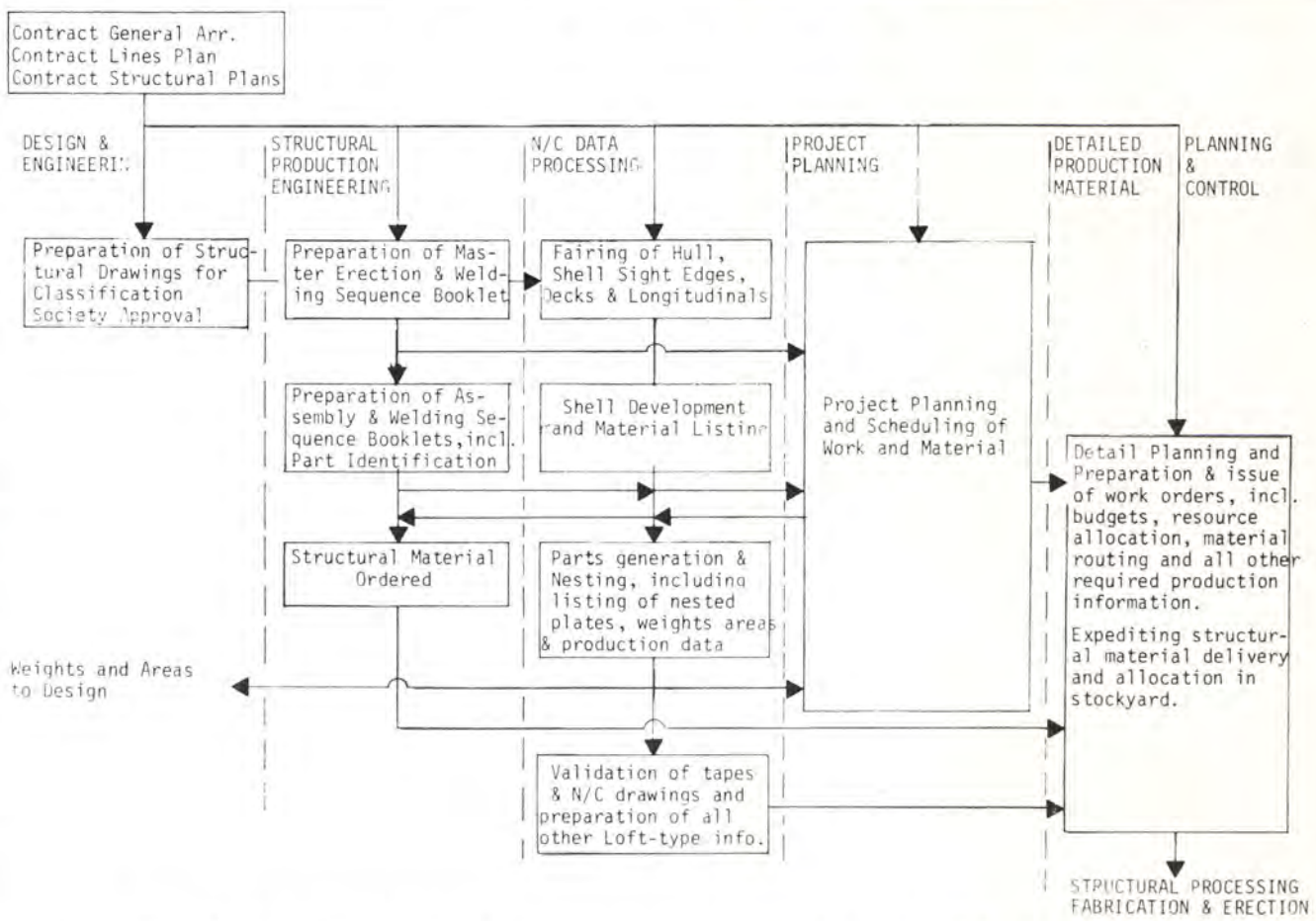
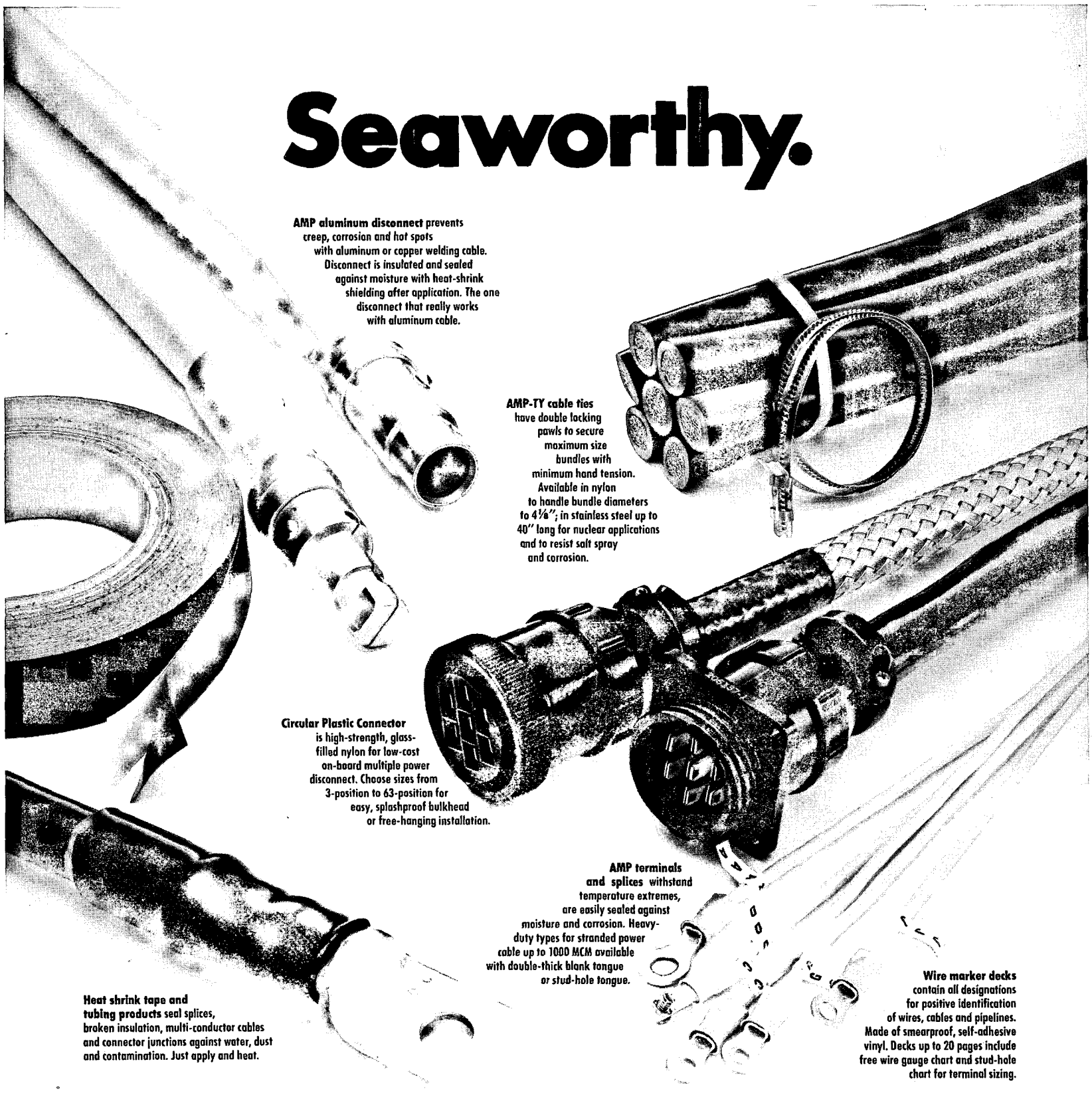


Figure 3—Possible structural-production process utilizing a second-generation N/C software system.

Seaworthy.



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AMP-TY cable ties have double locking pawls to secure maximum size bundles with minimum hand tension. Available in nylon to handle bundle diameters to 4⅛"; in stainless steel up to 40" long for nuclear applications and to resist salt spray and corrosion.

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Santa Fe Drilling Names Aldo Zanier Manager In Nigeria

Aldo M. Zanier

Aldo M. Zanier has been promoted to manager of Santa Fe Drilling Co. in Nigeria.

Mr. **Zanier** joined the company in 1972 as a staff drilling engineer in Orange, Calif., and transferred to Nigeria in April of this year as assistant zone manager.

He is an engineering graduate of Instituto Minerario in Italy, and has a master's degree in petroleum engineering from the University of Houston.

Santa Fe has four rigs currently operating in Nigeria, and is building a new swamp barge which will start work there early next year.

Manchester Orders Two Additional Containerships From Smith's Dock Co.

Smith's Dock Company Limited (a member of the Swan Hunter Group), South Bank, Teesside, England, has received an order from Manchester Liners Limited for two more container vessels for delivery in the first half of 1977.

The new vessels are designed to accommodate over eight hundred 20-foot containers and are fitted with sliding container divisions for easy conversion to accommodate 40-foot containers. Provision has also been made for fitting up to thirty-five 40-foot refrigerated containers.

The vessels are powered by 7RND90 Sulzer machinery driving a fixed bladed propeller at a loaded trial speed in excess of 20 knots.

Principal particulars of the vessels are: length between perpendiculars, 525 feet; breadth, molded, 82 feet 6 inches; depth, 51 feet 6 inches, and 17,500 deadweight tons at 30-foot draft.

These two latest ships will be the 12th and 13th in a series ordered from Smith's Dock for Manchester Liners over the past few years. The previous tonnage consisted of four general cargo vessels; one general cargo vessel, which was converted to a containership shortly after completion; and six fully containerized vessels, the last of which, the Manchester Reward, is due for completion in the near future.

GHH Sterkrade To Build Floating Dock For Brazil

GHH Sterkrade (Gutehoffnungshutte Sterkrade Aktiengesellschaft) has been commissioned by the Brazilian company Comercio, Industria e Participacoes S.A., Rio de Janeiro, to build a floating dock of 20,000 tons lifting capacity. The approximate measurements would be 705 feet length overall, a width of 115 feet, and an immersion depth measured above top of keel blocks of 31 feet.

The dock, which is to be launched in May of next year, can dock ships of up to 60,000 dwt. The 36,000-ton dock Mar Joe, launched from GHH Sterkrade's dockyard in Nordenham-Blexen on the lower Weser at the beginning of May of this year, was delivered to Maryland Shipbuilding & Drydock Company in Baltimore after a successful trial docking on the 20th of July.

Libya Orders Tankers From Swedish Shipyard

Libya has signed a 73-million-dinar contract with a Swedish shipbuilding firm for three 124,-000-ton tankers.

The tankers are scheduled for delivery in 1976 to the Libyan Shipping Corp. The corporation has sent students to Britain, Greece and Egypt for training in engineering, electronics and navigation so they can run the tankers.

'Repairing And Drydocking Large Carriers'—H.P. Drewry

The growth in world international seaborne trade during the last decade, particularly in bulk commodities, has been accompanied by an equally rapid growth in the size of the world bulk fleet, and especially in the number of vessels of 50,000 dwt and over. By the end of 1977 it is estimated that there will be approaching 3,000 vessels in this category, of which over 700 will be very large carriers of 225,000 dwt and above (including 170 of 300,000 dwt and over). "Repairing and Drydocking Large Carriers," the latest in a series of shipping studies from H.P. Drewry (Shipping Consultants) Limited, is primarily concerned with the supply of, and demand for, suitable repair docks capable of accommodating this increasingly important sector of the world merchant fleet.

The growth and development of the large carrier fleet over the last decade is analyzed by vessel type and size, as well as typical vessel dimensions, in each of these categories. Future scheduled deliveries are similarly analyzed and reveal the trend towards beamier vessels. A comprehensive list of standarized specifications of tankers developed by the world's major shipyards is given in the Appendix. The study also examines those vessels, such as containerships and gas carriers, which because of their extreme length, also use large carrier repair docks.

The 65-page study then proceeds to analyze current and future drydocking demand and categorizes demand by scheduled and unscheduled. Techniques and technologies to reduce scheduled drydocking are discussed, and although afloat surveys which reduce the frequency of drydocking are beginning to be widely accepted by the classification societies, there are other factors, such as performance guarantees in charter commitments, which are tending to work against drydocking minimization. Also discussed is the increasing demand for large repair docks for highly lucrative conversion work.

The supply of suitable drydocks is identified, and the study reveals that there are about 80 drydocks in the world which are considered to meet the requirements of accommodating vessels of 50,000 dwt and above. Of these, 14 are suitable for accommodating VLCCs. The size and location of these facilities are listed in the Appendix, as is the number of drydocks currently under construction. By 1977, it is estimated that there will be 100 such docks to service the large carrier fleet (i.e. vessels of 50,000 dwt and over), of which 25 will have dimensions exceeding 340 meters (about 1,116 feet) in length, and 60 meters (about 197 feet) in breadth, and may therefore be considered suitable for VLCCs. The trend away from traditional ship repairing areas is highlighted, and also discussed are the large number of expansion plans which are currently under consideration. There are estimated to be 30 such schemes, and these too are listed in the Appendix. In the opinion of H.P. Drewry, it is concluded that fewer than half will actually materialize because of a variety of financial and political considerations. Also, those that do become a reality may well be somewhat different from current ideas.

The report concludes by examining repair and maintenance costs for different vessel types and sizes. Costs are calculated on a $ per dwt p.a. basis, and reveal the economies of scale associated with size. Also revealed are repair and maintenance differentials between tankers and bulk carriers of similar size. Besides these direct costs to shipowners, the indirect costs of loss of revenue while the vessel is out of service are also estimated. These costs, in a given freight market situation, often exceed the direct cost of drydocking and maintaining a vessel; this is particularly true of large vessels, and illustrates why shipowners will not always drydock their vessels in the cheapest market—they are more concerned about the length of the docking than about the cost. This is why apparent high cost facilities are in constant demand. The report concludes by examining recent escalation in repair and maintenance costs in different parts of the world.

"Repairing and Drydocking Large Carriers," No. 23 in a series of shipping reports prepared by the Research Division of H.P. Drewry (Shipping Consultants) Limited, Palladium House, 1-4 Argyll Street, London, W1V 1AD, England, is available on a subscription basis (£60 per ten consecutive reports) or at a single copy rate of £20.

Philadelphia Maritime Exchange Publishes New Port Directory

The 1974-75 edition of The Philadelphia Maritime Exchange Port Directory is on sale, according to **H. Willis Jackson**, Maritime Exchange president. Copies of the comprehensive guide to Ports of Philadelphia services and facilities can be obtained at $3 each by writing to The Philadelphia Maritime Exchange, 620 Lafayette Building, Philadelphia, Pa. 19106.

Continental Oil Discovers Oil And Gas In China Sea

The Continental Oil Company recently reported that a subsidiary, and Pertamina, the Indonesian State Oil Company, discovered gas and oil in an offshore exploratory well in the China Sea about 130 miles west of Natuna Island. The company said further testing is needed to determine commercial significance. Other partners in the group are units of the Getty Oil Company and the Standard Oil Company (Indiana).

Brochure On Towboat Power Produced By Electro-Motive

The Electro-Motive Division of General Motors Corporation, La Grange, Ill., has produced a new four-color brochure on towboat power. Describing a number of vessels included in the 3,000,000 shp that Electro-Motive has placed in marine service since 1965, the booklet also contains the addresses of EMD Parts Centers.

Electro-Motive has a series of propulsion units available ranging in size from 850 to 3,500 shp continuous for single-screw boats and multiples thereof for twin- and triple-screw vessels—the latest towboat being a triple-screw vessel at 10,500 shp. These EMD units are of standard design to simplify installation and maintenance.

For copies of the brochure, write to **S.B. Dowell**, Manager, Marine Sales Department, Electro-Motive Division, GMC, La Grange, Ill. 60525.

...technical service for ships of ... The personnel in the new com- ... had a turnover in 1973 of approxi- ...mately 150 million U.S. dollars.

Ten-Month Operating Season Provides

New Economic Life For Great Lakes

A Successful Ten-Month Sailing Season Has Been Attained And Even Greater Extensions Are Technically And Economically Feasible In The Near Future.

William R. Ransom*

Ten years ago, if someone had predicted a positive 10-month sailing season on the Great Lakes, he would have been labeled a cockeyed optimist. Well, vessels have now in fact operated in the Great Lakes ore trade over a 10-month season. I can see a year-around operation coming in the near future.

It is my opinion that the economics clearly indicate that the investments required to attain a year-around operation can be justified because of the sizeable benefits that will be attained.

The extended season, as it relates to the pellet trade, will render many economic and social benefits. The first will be a reduction in Lake-transportation costs. As more tons are handled in the efficient vessels during the extended season, several of the smaller, older vessels in each fleet can be retired or operated in a shorter season.

The fleet and terminal fixed costs will be allocated over a longer time period than the current 8-month season, rendering a lower unit-transportation cost. Ultimately, when a 12-month season is obtained, there will be no annual start-up and shut-down costs on the vessels or docks.

Secondly, the extended season will help us keep the cost of steel down. The extension of the season is effectively a cost-control program because it will help to limit the rise in transportation cost of domestic raw materials to the mills.

It will reduce inventory-carrying costs associated with maintaining large stockpiles of raw materials at the mills. Large inventories were needed at the mills so they could continue operation during the winter months when vessel deliveries were not scheduled. By reducing the inventory requirement, the need for working capital is also reduced which ultimately is a cost savings to the producer. Continued vessel deliveries during the winter will reduce the material-handling costs also at the Head-of-the-Lakes where pellets are produced year around but must be stockpiled during the winter and reclaimed in the spring.

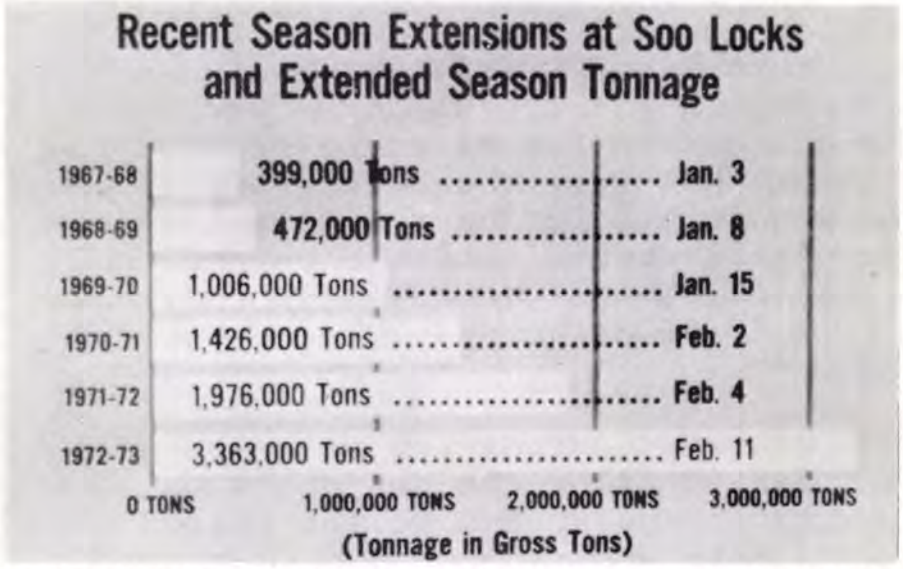

Figure 1—Tonnages and termination dates of recent Great Lakes' season extensions.

Thirdly, the extended season will help keep our domestic raw materials competitive with foreign sources. This will accrue from the lower transportation costs, the reduced inventory-carrying costs, and the availability of a steady flow of domestic raw materials throughout the year.

A fourth benefit will be an increase in income and employment for the operating vessel and dock crews. A year-around season will allow steady, uninterrupted employment. Also, the longer season will make it possible to set up scheduled vacation programs for the crewmen on board the vessels. We will be making better utilization of our limited supply of skilled merchant-marine officers and seamen.

A fifth benefit will accrue from conservation of natural fuel resources due to the newer, larger vessels which will operate longer [illegible] gallon can be compared with an efficiency of our new super carriers of approximately 625 to 675 ton-miles per gallon.

Furthermore, the extended season will eliminate much of the all-rail shipments which are occasionally necessary when the vessels are inactive. In view of the fact that even the older, small Lake vessels can move 148 percent more ton-miles of cargo per gallon of fuel consumed than railroads, a reduction in total fuels consumed in transportation will be gained.

Finally, a sixth benefit of the extended season will be revitalization of the Great Lakes merchant marine fleet. As a vessel operator, I know how difficult it is to attract investment funds for a new vessel if her utilization is not maximized.

The combination of the funding available through the Merchant Marine Act of 1970 and the greater potential utilization of lakers on a year-around basis should stimulate investments in new vessel construction on the Great Lakes.

These are just a few of the [illegible]

A Joint Effort

After the introduction of pelletized products which can be handled during the winter season, the shipping industry, the Coast Guard and the Army Corps of Engineers had an opportunity to solve the sub-optimum utilization of the Great Lakes Waterways System.

We started off by attaining a rather meager extension of the season in 1967. After some knowledge and experience was gained, we introduced several modifications to the vessels, the lock operations, the ice-breaking and escorting system and we achieved another small extension in 1968.

Accordingly, in each subsequent year we managed to extend the season by longer and longer periods. Figure 1 demonstrates quite an improvement over the pre-extended season era when nothing moved on Lake Superior after the middle of December.

It has taken a sincere determination on the part of the Government to prove that man can break through the ice barriers on the Great Lakes. Congress acted favorably in passing Public Law 91611-Section 107 which provided funding for the Extended Season Demonstration Program, and the Government has enthusiastically supported attainment of the objective to extend the season.

The Corps of Engineers has kept the locks open at the Soo during the daylight hours of the extended season. We are hopeful that they will provide 24-hour service in the future.

The Coast Guard has changed its ice-breaking and escorting policy. The new active escorting policy includes preventive breaking or continuous ice breaking of the channels. Two large ice breakers and several smaller tugs and buoy tenders have been assigned to the extended-season project.

The Coast Guard has experimented with several different types of buoys in an effort to find a floating aid to navigation which will be functional during the extended season. This agency also has been active in improving other aids to navigation.

The Maritime Administration has been developing a laser and radar navigation system, which looks quite promising. It will have

(Continued on page 25)

Round the world

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Together we could make the 1980's a much brighter time.

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Coatings Materials

Ten-Month Operating Season Provides

New Economic Life For Great Lakes

A Successful Ten-Month Sailing Season Has Been Attained And Even Greater Extensions Are Technically And Economically Feasible In The Near Future.

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Ten years ago, if someone had predicted a positive 10-month sailing season on the Great Lakes, he would have been labeled a cockeyed optimist. Well, vessels have now in fact operated in the Great Lakes ore trade over a 10-month season. I can see a year-around operation coming in the near future.

It is my opinion that the economics clearly indicate that the investments required to attain a year-around operation can be justified because of the sizeable benefits that will be attained.

The extended season, as it relates to the pellet trade, will render many economic and social benefits. The first will be a reduction in Lake-transportation costs. As more tons are handled in the efficient vessels during the extended season, several of the smaller, older vessels in each fleet can be retired or operated in a shorter season.

The fleet and terminal fixed costs will be allocated over a longer time period than the current 8-month season, rendering a lower unit-transportation cost. Ultimately, when a 12-month season is obtained, there will be no annual start-up and shut-down costs on the vessels or docks.

Secondly, the extended season will help us keep the cost of steel down. The extension of the season is effectively a cost-control program because it will help to limit the rise in transportation cost of domestic raw materials to the mills.

It will reduce inventory-carrying costs associated with maintaining large stockpiles of raw materials at the mills. Large inventories were needed at the mills so they could continue operation during the winter months when vessel deliveries were not scheduled. By reducing the inventory requirement, the need for working capital is also reduced which ultimately is a cost savings to the producer. Continued vessel deliveries during the winter will reduce the material-handling costs also at the Head-of-the-Lakes where pellets are produced year around but must be stockpiled during the winter and reclaimed in the spring.

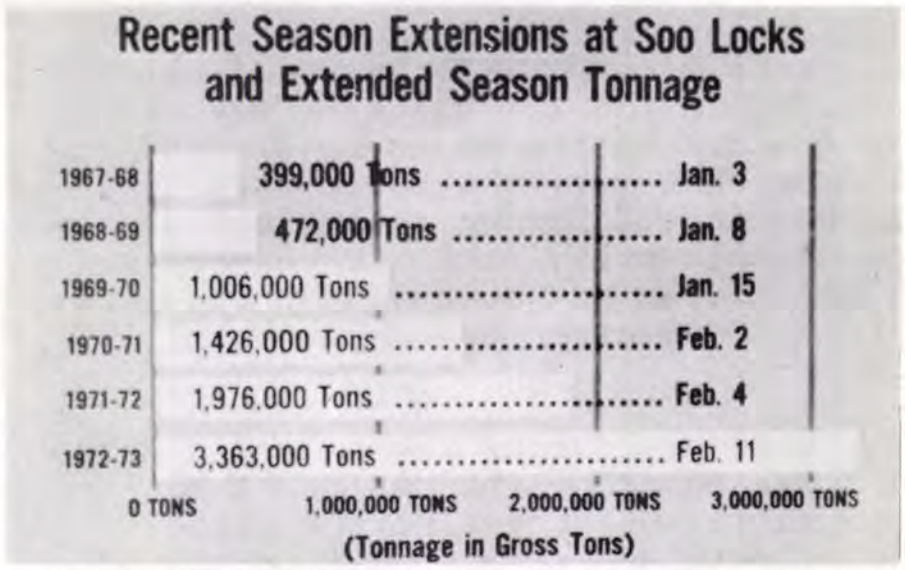

Figure 1—Tonnages and termination dates of recent Great Lakes' season extensions.

Thirdly, the extended season will help keep our domestic raw materials competitive with foreign sources. This will accrue from the lower transportation costs, the reduced inventory-carrying costs, and the availability of a steady flow of domestic raw materials throughout the year.

A fourth benefit will be an increase in income and employment for the operating vessel and dock crews. A year-around season will allow steady, uninterrupted employment. Also, the longer season will make it possible to set up scheduled vacation programs for the crewmen on board the vessels. We will be making better utilization of our limited supply of skilled merchant-marine officers and seamen.

A fifth benefit will accrue from conservation of natural fuel resources due to the newer, larger vessels which will operate longer and are more efficient fuel consumers per ton of delivered cargo than the old, small vessels they will displace. A fuel efficiency on the smaller vessels of approximately 450 to 500 ton-miles per gallon can be compared with an efficiency of our new super carriers of approximately 625 to 675 ton-miles per gallon.

Furthermore, the extended season will eliminate much of the all-rail shipments which are occasionally necessary when the vessels are inactive. In view of the fact that even the older, small Lake vessels can move 148 percent more ton-miles of cargo per gallon of fuel consumed than railroads, a reduction in total fuels consumed in transportation will be gained.

Finally, a sixth benefit of the extended season will be revitalization of the Great Lakes merchant marine fleet. As a vessel operator, I know how difficult it is to attract investment funds for a new vessel if her utilization is not maximized.

The combination of the funding available through the Merchant Marine Act of 1970 and the greater potential utilization of lakers on a year-around basis should stimulate investments in new vessel construction on the Great Lakes.

These are just a few of the benefits that can be associated with the extension of pellet haulage on the Lakes. Equally impressive benefits will accrue from extension of the St. Lawrence Seaway season.

A Joint Effort

After the introduction of pelletized products which can be handled during the winter season, the shipping industry, the Coast Guard and the Army Corps of Engineers had an opportunity to solve the sub-optimum utilization of the Great Lakes Waterways System.

We started off by attaining a rather meager extension of the season in 1967. After some knowledge and experience was gained, we introduced several modifications to the vessels, the lock operations, the ice-breaking and escorting system and we achieved another small extension in 1968.

Accordingly, in each subsequent year we managed to extend the season by longer and longer periods. Figure 1 demonstrates quite an improvement over the pre-extended season era when nothing moved on Lake Superior after the middle of December.

It has taken a sincere determination on the part of the Government to prove that man can break through the ice barriers on the Great Lakes. Congress acted favorably in passing Public Law 91611-Section 107 which provided funding for the Extended Season Demonstration Program, and the Government has enthusiastically supported attainment of the objective to extend the season.

The Corps of Engineers has kept the locks open at the Soo during the daylight hours of the extended season. We are hopeful that they will provide 24-hour service in the future.

The Coast Guard has changed its ice-breaking and escorting policy. The new active escorting policy includes preventive breaking or continuous ice breaking of the channels. Two large ice breakers and several smaller tugs and buoy tenders have been assigned to the extended-season project.

The Coast Guard has experimented with several different types of buoys in an effort to find a floating aid to navigation which will be functional during the extended season. This agency also has been active in improving other aids to navigation.

The Maritime Administration has been developing a laser and radar navigation system, which looks quite promising. It will have

(Continued on page 25)

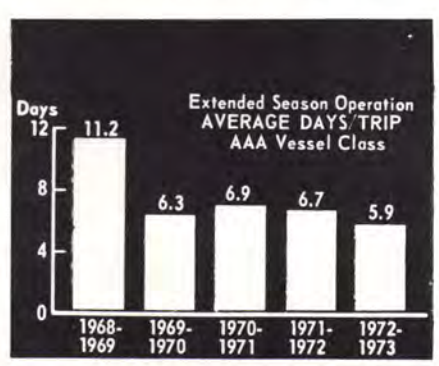

Figure 2—Comparison of average round-trip vessel times in the extended season.

*Mr. Ransom, United States Steel Corporation, presented the paper abstracted here before the recent Spring Meeting of The Society of Naval Architects and Marine Engineers.

New Economic Life For Great Lakes—

application during the normal season as well as the extended season and could reduce the number of buoys necessary.

Congress has provided funding for the establishment of Ice Central. At the Coast Guard's Ice Central Headquarters in Cleveland, input is received from the many vessels plying the Lakes, the Weather Bureau at many remote stations and from the Coast Guard's own ice-reconnaissance aircraft. The ice and weather information is compiled, analyzed and disseminated back to the vessels by radiotelephone and facsimile to help them maneuver as efficiently and safely as possible.

The season extension has also taken a high degree of determination on the part of private industry. Vessel hulls have been ice-strengthened in the bow areas. Heated pilothouse windows were installed. Additional insulation and heaters were added to the accommodations for crew comfort. Under a Maritime Administration contract a hull bubbler system was installed on one vessel.

The extended season has been a success. During the normal season, our AAA class of vessel's average round-trip time from Two Harbors, Minn., to Gary, Ind., is approximately five and one-half days. As you can see by Figure 2, except for the first year, their average extended season trip time is only slightly higher.

Phoenix Container Liners Names Kerr Vice President

H.R.Q. Hubble, managing director of the Hong Kong-based Phoenix Container Liners, Ltd., has announced that **A. Keith F. Kerr** has been named vice president and North American representative of the company.

Mr. **Kerr,** who was former director of European trade development for the Port of Los Angeles, replaces **James A. Blackmore,** who has joined Kerr Steamship Co.

Pioneer Industries Issues New 35-Page Manual On Joiner Doors And Frames

Pioneer Industries' 35-page comprehensive manual details the use of the stainless steel and aluminum joiner doors and frames, marine hardware, metal trim and moulding and sheet metal specialties required for a complete joiner installation. The publication includes typical elevations, details, suggested use of material and suggested hardware requirements for all types of openings.

Further information can be obtained by contacting Pioneer Industries, 401 Washington Avenue, Carlstadt, N.J. 07072.

MacGregor Forms New Scandinavian Company

MacGregor International has announced the opening of a new organization in Scandinavia to further strengthen their sales and technical service for ships of all nations.

The new organization will have offices in Goteborg, and offices in Oslo, Helsinki and Copenhagen.

The rapid technical development of the technology involved in every aspect of cargo access equipment has made it essential for MacGregor to be able to provide good service facilities and technical assistance in every maritime country.

The personnel in the new company has considerable experience with MacGregor equipment: the managing director, **K. Eriksen,** and the technical manager, **P. Isacsson,** worked previously for 'Bromstrom,' the Swedish shipowners, and the sales manager, Capt. **F.J. Ruud,** is from Norsk MacGregor Oslo.

The International MacGregor Organisation, which was founded by **Henri Kummerman** in 1946, had a turnover in 1973 of approximately 150 million U.S. dollars. Today, in the region of 15,000 ships are fitted with either MacGregor hatch covers or access equipment.

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Simmonds Precision Names H.P. Rowell VP

Howard P. Rowell has been named a vice president of Simmonds Precision Products, Inc. (NYSE), Tarrytown, N. Y., it was announced by **Geoffrey R. Simmonds,** president.

Mr. **Rowell** is president and general manager of the company's Engine Systems Division, Norwich, N.Y., formerly General Laboratory Associates, Inc. (GLA).

A graduate of Northeastern University, Mr. **Rowell** joined GLA as a project engineer in 1950. He served successively as assistant chief engineer, engineering manager, chief engineer and vice president-engineering before being elected divisional vice president and general manager in 1970. In 1971, he became president of the division.

The Simmonds Precision Engine Systems Division designs and produces exciters, igniters, alternators and related equipment for gas turbine engines used in the aerospace, industrial and marine fields.

ODECO Reports Record Earnings For Half

Ocean Drilling & Exploration Company, New Orleans, La., has reported record earnings of $13,043,000, equal to $1.15 per common share, for the six months ending June 30, 1974, a 71 percent increase over the first half of 1973 when the company reported income of $7,603,000, equal to 67 cents per common share.

Total revenues for the six months were $58,523,000, compared with $39,418,000 a year earlier. Contract drilling revenues increased from $30,422,000 to $41,759,000.

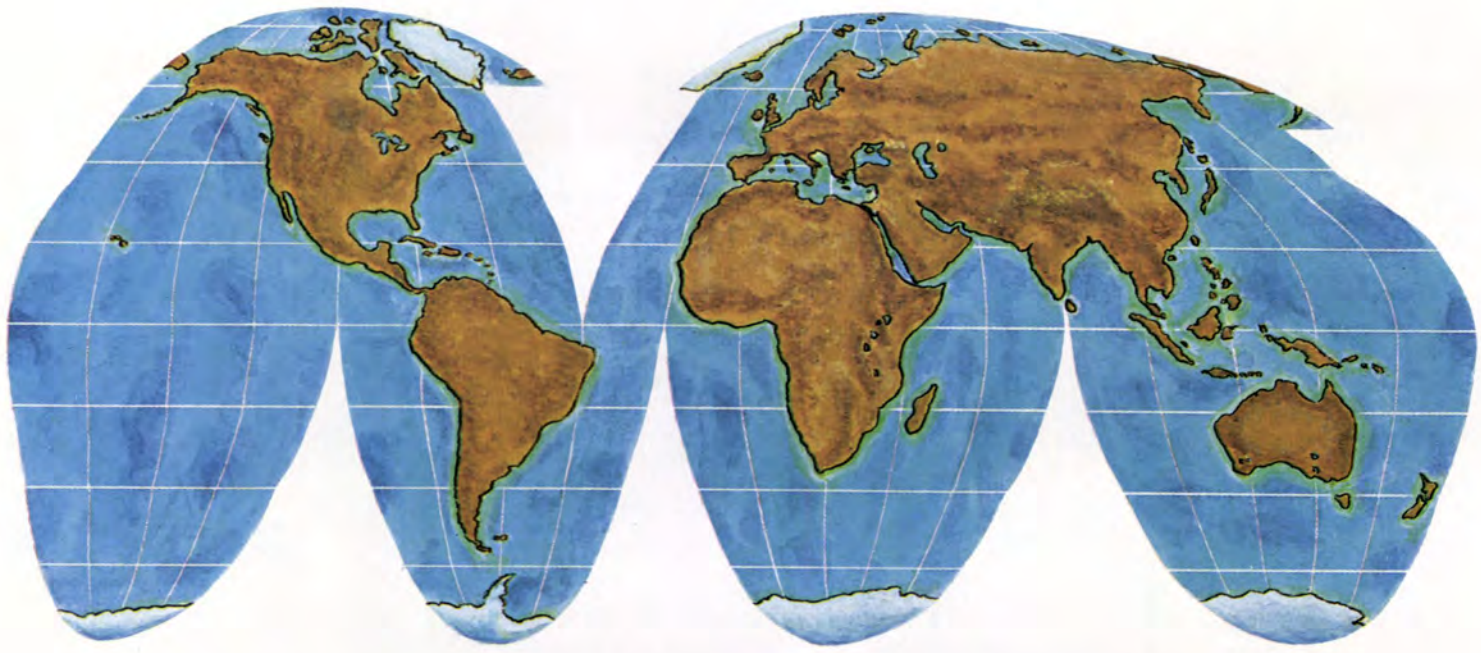
Oil and gas sales improved from $6,281,000 to $10,521,000. Production of crude oil and gas liquids averaged 7,432 barrels a day, compared with 7,979 barrels a day a year earlier. Natural gas production averaged 37,047,000 cubic feet a day, compared with 22,059,000 cubic feet a day in the first half of 1973.

Interest, design fee and other income rose from $1,499,000 to $2,785,000. The company's equity in the net income of unconsolidated subsidiaries and 50 percent-owned companies was $2,079,000, compared with $804,000 for a year earlier. Diving revenues for the six months were $1,379,000, and exceeded 1973 revenues of $412,000.

In the second quarter, ODECO earned $7,035,000, equal to 62 cents per common share, also a company record. In the like period of 1973, earnings were $3,633,000 or 32 cents per common share. Second quarter revenues totaled $31,011,000, compared with $20,291,000 a year earlier. Contract drilling revenues increased to $22,448,000 from $15,615,000 a year earlier, and oil and gas sales were $5,243,000, compared with $3,269,000. For the respective three-month periods, interest, design fee and other income were $1,283,000 and $832,000, equity in net income of unconsolidated subsidiaries and 50 percent-owned companies was $1,130,000 and $383,000, and diving revenues were $907,000 and $192,000.

At the May Federal lease sale offshore Texas, the company, together with its 51 percent-owned subsidiary, Ocean Oil & Gas Company, acquired varying interests in eight leases containing approximately 41,793 acres (13,514 net acres) at a cost of $5,590,000.

In commenting on the results, **Alden J. Laborde,** president, said: "The record performances for both the quarter and six-month periods are attributed to increased activity worldwide in the offshore drilling business which resulted in full utilization and improved rates for contract drilling services, as well as new drilling units joining the fleet, improved prices for oil and gas production, and good demand for services of the company's diving subsidiary, Sub Sea International." Mr. **Laborde** also observed that the outlook for the remainder of the year appears favorable.



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FMC Fluid Control Equipment

New Gamlen Marine Sales Manager Named

William F. O'Brien Jr.

The appointment of **William F. O'Brien Jr.** to marine sales manager in charge of Gamlen Chemical Company's key North American Zone Operations, based in Saddle Brook, N.J., has been announced by **R.A. Gamlen,** president.

Mr. **O'Brien,** with 30 years of experience in chemical specialty sales, is a registered professional engineer (chemical), and belongs to The Society of Naval Architects and Marine Engineers.

Pointing out recent changes in modern maritime transportation, Gamlen continues to revitalize its technical-sales organization to better serve this growing international market, according to the firm's president.

A division of Sybron Corporation, Gamlen is a major supplier of marine chemical products and technology, including tank cleaning systems, in all major ports and cities around the world.

American Bureau Enters Reciprocal Agreement With Germanischer Lloyd

The American Bureau of Shipping and Germanischer Lloyd recently signed a memorandum of agreement for mutual assistance in the performance of surveys. This agreement shall apply to assistance from one society to the other rendered by making available upon request the services of its exclusive surveyors to carry out surveys independently or in company with the surveyors of the other society. It is intended that this agreement may be invoked on a worldwide basis.

Further information is available at the head offices of the two societies.

National Cargo Bureau Announces Appointments

The National Cargo Bureau, Suite 2757, One World Trade Center, New York, N.Y. 10048, has announced the following personnel changes:

Capt. **James B. Mason** has been appointed technical assistant in its New York office effective August 5, 1974. Captain **Mason** is a graduate of the New York State Maritime Academy, Fort Schuyler. He has been employed with the Bureau since 1969. His first assignment was in San Francisco and later at Galveston, Texas, where he has been serving as senior surveyor for the last four years.

Capt. **Benjamin P. Nieves** has been promoted to senior surveyor in their Galveston office effective August 5, 1974. Captain **Nieves** is a graduate of the U.S. Merchant Marine Academy, Kings Point, N.Y., and has been employed by the Bureau since 1965. He has had assignments at several Bureau ports, the most recent of which has been at Houston, Texas.

Captain **Robert R. Mundell** has been promoted to senior surveyor at the Portland, Ore., office succeeding Capt. **Alden B. Johnson** who retired August 1, 1974. Captain **Mundell** is a graduate of the U.S. Merchant Marine Academy at Kings Point, and has served at the Portland office of the Bureau since 1968.

The National Cargo Bureau is a nationwide nonprofit membership organization dedicated to the safe stowage, securing and unloading of cargo on all vessels for the purpose of claims prevention. It formulates recommendations to the Government on safe stowage of dangerous goods and other cargoes, and offers low-cost cargo loading inspection service (breakbulk and containers), and inspection of cargo handling gear.


1078

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Today, more than 700 C-E V2M-8 marine boilers propel fighting ships and merchantmen over the seas.

For the future, C-E is preparing new improved designs to power the advanced ships now on the Navy's drawing boards.

For additional information, contact Marine Sales, C-E Power Systems, Combustion Engineering, Inc., Windsor, Conn. 06095. Telephone: 203-688-1911.

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USS Joseph Hewes (DE-1078), built at Avondale Shipyards, Inc.
Official U.S. Navy photograph.

Hoffert-Lowe Represents Tank S.A.P.P. In USA

Paul E. Hoffert

Paul E. Hoffert, president of Hoffert-Lowe, Inc., has announced that his company will represent the Tank S.A.P.P. inert gas system in the United States, while Ringstead Engineering Ltd., a subsidiary of Tank S.A.P.P., will be the representative of Skinner Turbines in the European market. Tank S.A.P.P. stands for Tanker Safety and Pollution Prevention.

Hoffert-Lowe, Inc., with headquarters in Jacksonville, Fla., and offices in the ports of New York and Norfolk, deal in deck and engine equipment for merchant marine and Naval vessels. Hoffert-Lowe are also worldwide representatives for Skinner Engine Company, Erie, Pa., a leader in the manufacture of marine engines for more than a century.

Attending the recent signing of the contract agreements at Ringstead House, Croydon, England, were Mr. **Hoffert, William Glennon** of Hoffert-Lowe's New Jersey-New York office, **Alfred E. Stanford,** managing director, Tank S.A.P.P., and **Kenneth Watson,** a director of the British firm.

As a result of the agreement, Skinner turbines will be making their first major appearance in the overseas market.

Mr. **Hoffert** was enthusiastic about the recently signed contract and the entrance of the Skinner products in Europe.

"Our prices are very competitive with those in Europe. Furthermore, we do not have the long delivery delays found in Europe," he said.

Mr. **Hoffert** added, "I believe that American manufacturers can now begin to compete very satisfactorily on the world market."

The Hoffert-Lowe president declared that he was happy to be affiliated with the British-based firm. Mr. **Hoffert** said: "We feel that the Tank S.A.P.P. inert gas system which we will market in the United States is the latest and finest-designed engineering system that will help prevent explosions on tankers. We feel it is the best program, since it is designed as a package system with the company able to provide service anywhere in the world."

In order to achieve safety in tankers, the company offers a comprehensive design and engineering service covering the installation of inert gas atmosphere control systems in new and existing vessels. These services include the complete survey of a system; choice of the most suitable equipment; supervision of installation work; training of operators; regular servicing and worldwide maintenance facilities and guidance on other material and equipment to increase tanker safety.

Mr. **Hoffert** pointed out that one of the major difficulties facing designers and operators of tankers is the risk of explosion. "This is rapid and uncontrolled combustion. To support this," he declared, "three elements must be present—fuel, ignition and oxygen. Remove any one of these and explosion will not occur."

To support combustion, a hydrocarbon/air mixture must have a content of at least 12 percent of oxygen by volume. Atmospheric air contains 21 percent, which makes it highly dangerous in tankers. But if the air is replaced by an inert gas containing less than the critical 12 percent of oxygen, there can be no combustion.

One system employed by Tank S.A.P.P. takes the waste flue gas from the ship's boiler plant to replace air in the cargo spaces. Processed waste gas from a boiler plant operating at normal efficiency does not contain more than 5 percent of oxygen by volume. Alternatively oil-fired inert gas generators are available where the boiler exhaust gas is insufficient. Included in the system is a control panel to monitor and regulate the operation of the system.

Mr. **Stanford** of Tank S.A.P.P. stated: "Up to 1967, the incident rate of explosions in tankers at sea was about 1 percent. However, from 1968 onward, coincident with the increases in tanker sizes from 90,000 to 300,000 tons, the incident rate rose sharply."

As part of the Tank S.A.P.P. plan, after the inert gas system is installed, the systems technicians will sail in the ship, supervise the operation of the plant under all conditions and instruct the crew members in order to achieve full efficiency of the system.

The Hoffert-Lowe president added that Tank S.A.P.P. is also interested in dealing in problems arising in spillage of oil from tankers. He declared, "Tank S.A.P.P. is interested in counteracting pollution, aiding prevention and dealing with all problems arising from spillage of oil from tankers."

Mr. **Hoffert,** a native of Baltimore, Md., and an alumnus of Baltimore Polytechnic Institute, became a resident of Jacksonville following the termination of U.S. Navy duty at nearby Green Cove Springs in 1955. He then joined Gibbs Corporation Shipyard and attended Jones College, where he majored in business administration. In 1968, with **Charles Lowe,** he established Hoffert-Lowe in Jacksonville. The Hoffert-Lowe Building is at 1700 East Church Street.

Nippon Kokan (NKK) Names Takeo Arakawa New York Gen. Manager

Takeo Arakawa

Takeo Arakawa has been appointed Nippon Kokan (NKK) New York general manager, succeeding **Yoshikazu Asano,** who has been named general manager, Heavy Industries Division, Tokyo.

NKK is Japan's number two steel producer and only integrated steelmaker - fabricator / constructor-shipbuilder. The company's fiscal 1973 sales (April 1, 1973 to March 31, 1974) were $3,219,411,000.

Mr. **Arakawa** was formerly general manager, export department, Iron and Steel Division, NKK Tokyo.

Joining the company in July 1964, he served as general manager, Corporate Planning Division, Tokyo until June 1966, when he was appointed general manager of the overseas project department. In April 1968, he was named general manager of the Iron and Steel Division export department.

Prior to joining NKK, Mr. **Arakawa** served in the Treasury Ministry of Japan. During his Ministry career, he occupied many overseas posts. A graduate of Tokyo University, Mr. **Arakawa** also attended St. Paul School in London.

ODECO To Build $46-Million Offshore Rig Of New Class

Ocean Drilling & Exploration Company and Japanese Industrial Land Development Company have announced that they have signed a letter of intent with Mitsubishi Heavy Industries, Ltd., Hiroshima, Japan, to construct the first unit of a new class of self-propelled semisubmersible drilling rigs at an overall cost of $46 million.

According to **Hugh J. Kelly,** president and chief operating officer of ODECO, the new unit —ODECO's 29th—will be named the Ocean Bounty and will have increased capacity over previously built rigs of its type.

"Mitsubishi has previously built two other rigs for ODECO and its Japanese partner, and we are looking forward to a completion date in about May 1976 for this newest unit", **Mr. Kelly** said.

The major changes in the Ocean Bounty over other similar units are the topside load capacity, which will be increased from 2,000 to 2,500 short tons, and the mooring capability, up to 3,000-feet water depth. The hulls will be lengthened somewhat, and the column diameters will also be increased in order to accomplish these improved capabilities.

Designed to operate in any drilling environment in waters anywhere in the world, the Ocean Bounty will have a lower hull length of 340 feet, a width of 262 feet and quarters for 83 men. Its combination chain-wire rope spread mooring system will enable it to drill from a floating position in water depths up to 1,500 feet, and with minor additions, to 3,000 feet for a drilling depth of 25,000 feet.

Hills-McCanna To Supply Valves For LNG Ships

Hills-McCanna Company, Carpentersville, Ill. 60010, has received a contract totaling more than $\$1/2$ million for ball valves to be used on the first giant U.S. carriers of liquefied natural gas (LNG).

The contract was awarded to Hills-McCanna by the Quincy Shipbuilding Division of General Dynamics Corporation. Initially, a total of seven General Dynamics LNG supertankers will be equipped with Hills-McCanna ball valves.

In announcing the contract, Hills-McCanna president **Harry W. Wilcox Jr.** noted that "U.S. demand for natural gas is increasing at approximately twice the rate of domestic supplies. To help relieve this shortage, American shipyards are expected to build more than 100 cryogenic supertankers to transport liquid natural gas from ports throughout the world. Selection of Hills-McCanna ball valves for the nation's first LNG supertankers is significant recognition of our products and our people who make them. In essence, Hills-McCanna ball valves are being selected for this critical application because they have been proven reliable in the extreme environments involved with cryogenic service."

Hills-McCanna valves called for in the General Dynamics contract will be employed in elaborate cryogenic flow control systems aboard the new supertankers. Natural gas "liquefies" at minus 260 degrees Fahrenheit, and is kept colder than this temperature throughout all phases of cargo handling and containment. Hills-McCanna ball valves and other flow control components used on the giant ships will be specially built to manage the frigid LNG cargo.

General Dynamics' first supertanker, now under construction at Quincy, Mass., will transport LNG from Algeria to East Coast ports of the United States. Scheduled for completion in December 1975, it will carry 125,000 cubic meters of LNG—enough natural gas to heat a city of over one million population for a month.

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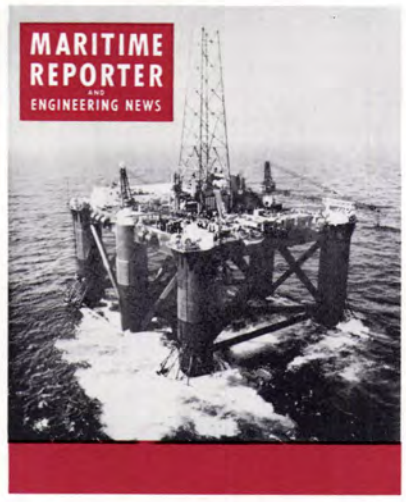

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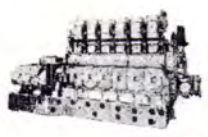
250 KW DIESEL GENERATOR SET



ENGINE: Enterprise 12 x 15 DSG-6 — 6 cyl. — 450 RPM crank No. 50J. GENERATOR: Westinghouse 250 KW—120/240 DC—1040 amps—450 RPM. Typical serial No. 3S-10P-913. Complete with switch gear.

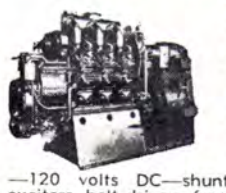
3

EMERGENCY GENERATOR SUPERIOR 75KW 120/240 VOLT D.C DIESEL GENERATOR SET

With switchgear. ENGINE: Radiator cooled Superior GBD-8—6-cylinder—1200 RPM. GENERATOR: Electric Machinery Co.—120/240 volts DC—316 amps—1200 RPM—stab. shunt.

4

415 KW 250 VOLT DC GM 6-278 DIESEL GENERATOR SETS



ENGINE: GM Model 6-278—6-cylinder—8½ x 10½—2-cycle—800 RPM—complete with heat exchanger. GENERATOR: Allis-Chalmers—415 KW—250 volts DC—800 RPM—1660 amps—shunt wound. Top mounted exciter—800/1600 RPM—208 amps—type EB5-123. Pilot exciter 2½KW—120 volts DC—shunt wound—20.8 amps. Both exciters belt-driven from main generator shaft.

5

ELECTRIC PROPULSION MOTOR

1 Available. 515 HP—230 volts DC—shunt wound—1040/1400 RPM—1660 amps—120 volts DC exciter.

6

ALSO SUITABLE FOR COMPANIES OPERATING AN NET TENDERS

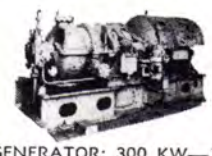
TURBO GENERATOR SETS

7

400 KW WESTINGHOUSE TURBO GEN SETS FOR BETH. SPARROWS PT. HULLS 400 TO 4500; QUINCY HULLS 1600

400 KW (500 KVA)—80% PF—1200 RPM—450/3/60. TURBINE: 585 lbs—840°TT—28½" vacuum—9018 RPM—serial 10A4462-3 & 10A4462-4. GEAR: 9018/1200 RPM. A.C. GENERATOR: 500 KVA—400 KW—450 volts—641 amps—80%PF—3 phase 60 cycle—1200 RPM—CR 40°—excitation amps 41—excitation voltage 120. Instruction book 5442. Switchgear available.

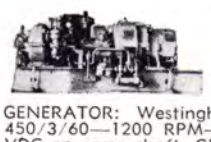
8



LOW-PRESSURE UNUSED 300 KW G.E. 120/240 VOLT DC TURBO-GENERATOR SET

GENERATOR: 300 KW—120/240 VDC—1250 amps—1200 RPM. REDUCTION GEAR: 8.344:1 — 10012/1200 RPM—type S-182. TURBINE: DOR418N—449 H.P.—10012 RPM—working pressure 180/220 PSIG.

9



WESTINGHOUSE 440/3/60 200 KW UNIT

GENERATOR: Westinghouse 200 KW—250 KVA—450/3/60—1200 RPM—80% PF—with 40 KW—120 VDC on same shaft. GEAR: 9989/1200 RPM—double helical. TURBINE: Westinghouse — 540 PSI — superheat 322°F. Test 930 PSI 800°TT. Also operate 615 PSI—850°TT.

10

AP2 VICTORY WORTHINGTON-MOORE CROCKER-WHEELER 300 KW UNIT

TURBINE: 440 PSI—740°TT—28½" vacuum—type S4 — 5-stage — 6097 RPM — serial 7547 & 7548. GEAR: 6097/1200. GENERATOR: 300 KW—120/240 volts DC—1250 amps—compound wound—973643—999759. Armature flange 8½"; B.C. 7"—12 holes. ALSO NEW ARMATURES IN STOCK & 300 KW SHUNT ARMATURES.

11

TWO 538 KW WESTINGHOUSE T-2 AUX. GENERATORS (COMPLETE)

TURBINE: 538 KW @ 5010 RPM—438 PSIG—750°TT—28½" vacuum. GEAR: 5010/1200 RPM. A.C. GENERATOR: 400 KW 450/3/60/1200—0.8 PF. DC EXCITER: 32.5 KW—120 volts (variable voltage)—shunt—4-pole—DC excitation 5 KW. ALWAYS WELL MAINTAINED BY MAJOR OIL CO.

TURBINES & ROTORS

MAIN PROPULSION

12

BETH. CLASS—13,600 H.P.

Sparrows Point & Quincy 1600 hulls. H.P. turbine casing only.

T-2 TURBINES & ROTORS

13

UNUSED GENERAL ELECTRIC 750 KW TURBINE ROTORS

2 Available

General Electric Instruction Book 16846 for type FN3-FN24—seven stage 10033 RPM. TURBINE: 525 lbs. per sq. inch—825°TT. Originally built for CL68-122-CUL 48 class cruisers and now used on many merchant, tankers and cargo ships. G.E. drawing No. 6665729AA-1—FSN2825-373-0489.

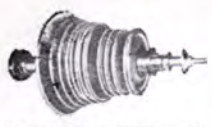
14

1250 KW WESTINGHOUSE 8050 RPM

2 Available

One Curtis Stage and 8 Rateau Stages—mfg drawing 25T-556—BuShip Plan No. BB61-561-061. Rebuilt and rebladed by Westinghouse. Factory boxed. LIKE NEW.

15



T2-SE-A1 MAIN PROPULSION ROTOR—G.E.

Large Schenectady — serial 77418 — reconditioned Bethlehem Steel 1970—all stages magnafluxed.

T-2 TANKER

AUX. G.E. TURBO GEN. ROTORS

16

DORV — 325M — 5645 RPM — for 525 KW G.E.

PUMPS

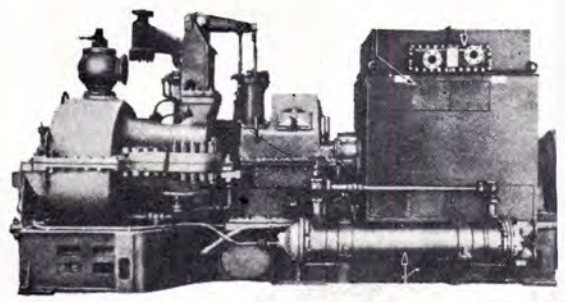
17

UNUSED DELAVAL IMO ROTARY PUMP

175 GPM—35 PSIG—10 HP—120 volts DC—1750 RPM—serial E-8619—frame 324 VY—76 amps—mfg. by Electro Dynamics. With magnetic control. Excellent condition.

A

TURBO GEN



TURBINE: 11 Stage type FN4— 8145 RPM—3½" stea absolute back pressure—complete steam with seal regulat

GEAR: Type S-195A—reduction 8145 RPM to 1200 RP

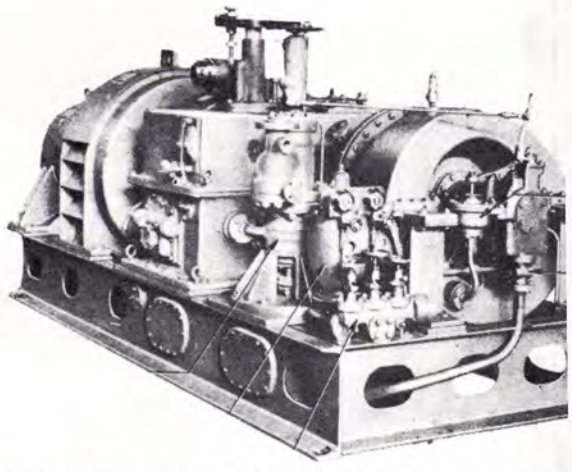
GENERATOR: 1500 KW —450 volts—2405 amps—12 enclosed. Insulation: Class B stator and rotor. Temperatu thermometer. Mfg type AT1—form HL. Oil lubricated b sump in turbo generator set base. Generator cooling: —120 volts —110 amps—40°C rise—frame 654—mf

GENERAL INFORMATION: Overload rating 2 hours—1 weight 36,000 lbs. Guaranteed steam flows & conditio flange. The set will carry 1500 KW with steam conditic flange. The set will withstand 644 PSI and 850°F. Gu at exhaust flange:

50% Load	—	750 KW	—	D.
75% Load	—	1125 KW	—	D.
100% Load	—	1500 KW	—	D

Exhaust flange size: 18" x 38" rectangular.

B



GENERATOR: 400 KW 450 volts 3-phase 1200 RPM 0 sulation—natural self-ventilated cooling. Exciter: 50 K

GEAR: Single helix—single reduction—10059/1200 RP

TURBINE: Six stage—10059 RPM—525 PSI—825°F n tors. **OVERLOAD CONDITIONS AT NORMAL STEAM 52** overload for 2 hours at normal conditions; overload cap turbine generator will deliver full load output 400 KW capable of withstanding 634 lbs PSIG 850°TT.

STEAM FLOWS

100% Load	—	400 KW AC	—
75% Load	—	300 KW AC	—
50% Load	—	200 KW AC	—

When operating at 575 PSIG & 0° Superheat and 1 lb,

125% Load	—	500 KW AC	—
100% Load	—	400 KW AC	—
75% Load	—	300 KW AC	—

UNIT DESIGNED FOR NAVY FOR DD692 CLASS DES HOUSE 8316.

Since Westinghouse and G.E. built them for the same cl able.

DIMENSIONS: OAL 10' 10⅛"—OAW 4'10½"—OAH 5

TOTAL WEIGHT: 14,855 lbs.

2" steam inlet—17" Round exhaust—20½" bolt circle

UNIT DIMENSIONS OAL 16' 3⅜"—OAW 6'6"—OA

...N METALS CO.

...ST. • BALTIMORE, MD. 21202

...9-1900 Marine Dept.: (301) 355-5050

...RATOR SETS

4 G.E. 1500 KW AC SHIPS SERVICE SETS

G.E.I. BOOK 19320

...nlet. Normal steam conditions 525 PSI 825°TT—1 lb

...RPM—P.F. 0.8—60 cycles—3-phase—6-pole—totally ...ise normal—stator 60°C by thermometer—rotor 70°C by ...sitive displacement pump for gears and bearings from ...stream and circulating water. Amplidyne Exciter: 13.2 KW ...pe 5AM654A1.

... load; Overload rating 5 minutes—150% load. Total ...normal 525 PSIG—825°TT and 1 PSI absolute at exhaust ...420 PSIG and 825°TT and 1 PSI absolute at exhaust ...nteed steam flows—525°F & 825°TT at 1 PSI absolute

...xciter 5.9	—	Steam Flow 8190 lbs/hr
...Exciter 8.0	—	Steam Flow 11385 lbs/hr
...Exciter 10	—	Steam Flow 14790 lbs/hr

400 KW WESTINGHOUSE/GE DESIGN

MFG. BY WESTINGHOUSE

...PF 641 amps alternating current generator—class B in- ...—120 VDC—1200 RPM.

...nal. Type G.E. 618N—equipped with synchronizing mo- **...LBS/825°TT:** Sets 500 KW AC and 62.5 KW DC— ...city 50%—600 KW & 75 KW DC for five minutes. The ...C & 50 KW DC at 420 lbs and 825°TT. The turbine is

		STEAM RATE
50	KW DC	5100 lbs/hour
37½	KW DC	3999 lbs/hour
25	KW DC	2885 lbs/hour

...quare inch absolute back pressure at flange:

62½ KW DC	—	8720 lbs/hour
50 KW DC	—	6980 lbs/hour
37½ KW DC	—	5450 lbs/hour

...ROYER—G.E. INSTRUCTION BOOK 17716—WESTING-

...ss destroyer, G.E. and Westinghouse parts are interchange-

...5¼".

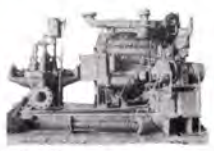
...7'5¼" over steam strainer.

18

LUBE OIL SERVICE PUMP

Qunimby-Rotex — size 6D — — 500 GPM @ 70 lbs — 6" x 6" flange — 720 RPM. MOTOR: Allis-Chalmers — 40 HP — 230 VDC — type EBV-147S — stab. shunt — 148 amps. Complete with starter and rheostat — designed originally for C-1MAV-1 vessels.

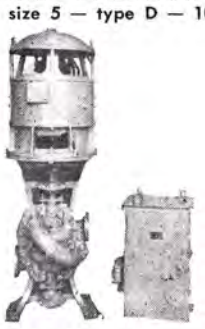
19



1000 GPM GARDNER-DENVER BRONZE DIESEL DRIVEN FIRE PUMP

1000 GPM — with priming pump assembly. ENGINE: Buda 6LD-468 — 4¼ x 5½ — 6 cylinder — 1850 RPM. PUMP: Gardner-Denver — bronze — 6 x 5 — size 5 — type D — 1000 GPM @ 281' head.

20



DAYTON-DAWD 2-STAGE FIRE AND BILGE PUMP

Vertical 2-stage type TDV-10—20 HP—200 GPM @ 184'—3" discharge—4" suction—1775 RPM—Maumee Sun. Motor: 120 volts DC—20 HP—1775 RPM.

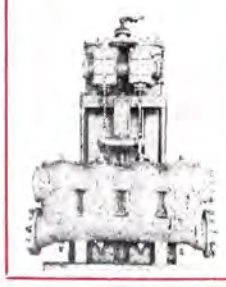
21

CARGO STRIPPING PUMPS

BRONZE T2 TANKER STRIPPING PUMPS

14x14x12—700 GPM at 100 lbs. Same pump available in steel for fuel oil transfer, etc.

22



WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP

1400 GPM @ 110 PSI—suction lift 11.5 ft.—steam back pressure 15 lbs. Suction 14" — discharge 10"—steam 2½" — exhaust 4". Overall width 6'8"—overall height 9'11½" — depth 3'9½"—wt. approx. 10,000 lbs.

23

C-25 CARGO PUMP TURBINE SPARE GEARS

One set of gears available for Westinghouse C-25 Cargo Pump Turbine.

24

T-2 TANKER BILGE, BALLAST AND FIRE PUMP

Bronze — 10 x 7 x 10 — vertical duplex. Steam pressure 150 lbs gauge — exhaust pressure 10# gauge — discharge pressure 100# gauge — 300 GPM.

25

NEW TURBINE DRIVEN FIRE AND GENERAL SERVICE PUMP

Allis-Chalmers 6 x 5 pump, type SKH—1200 GPM—125 PSI—3500 RPM. Coppos turbine type TF-22-2½ — 3500 RPM. 273:... 50° superheat.

MISCELLANEOUS

DOUBLE REDUCTION GEARS for Diesel Drive

26

3200 HP DOUBLE INPUT SINGLE OUTPUT DIESEL REDUCTION GEARS 20 DEGREE OFFSET

Farrell-Birmingham — 3200 SHP. REDUCTION GEAR: 1.81:1—handles two 1600 HP diesels @ 720 RPM. With hydraulic couplings & Fawick clutch. Port and starboard. Gear output 400 RPM. Suitable for dredge pumps. Non-reversing. OK for 38D8-⅛ engine.

27

2:67:1 RATIO DOUBLE IN-LINE GEARS

Farrell-Birmingham 3200 HP non-reversing — from seaplane tenders. Ratio 1.867:1. Complete with hydraulic couplings, etc. Will handle two 38D8-⅛ FM diesels. Has Fawick clutch.

28

2100 HP DOUBLE INPUT SINGLE OUTPUT GEARS—3:435:1 RATIO

Farrell-Birmingham — heavy duty — originally built for 2 heavy-duty direct-reversing engines —300 RPM—1050 HP each. Ratio 3.435:1.

29

SINGLE ENGINE REDUCTION GEAR

Farrell-Birmingham — non-reversing—1600 HP at 2.4909:1. With hydraulic couplings.

30

DOUBLE INPUT SINGLE OUTPUT GEAR—7.9:1 RATIO

Final output 175 RPM. Mfg by Farrell-Birmingham —for use with two 515 HP—230 volts DC shunt wound motors—1040/1400 RPM.

31

ANCHOR WINDLASS FOR BETHLEHEM-SPARROWS POINT 1954 CLASS TANKER

Hyde 2-11/16" — 12x14 — 100 PSI — steam — 54,100 lbs.

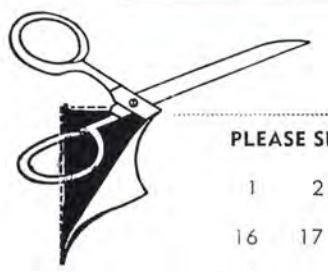
32

UNUSED 70 HP McKIERNAN-TERRY WINDLASSES

Chain and two 10640 lb anchor & 30 fathoms chain @ 30 FPM. 70 HP—230 volts —shunt DC motors—233 amps 550 RPM—55°C rise. Wildcat centers 47½". Base 9'5" wide x 11' long. Weight 36,000 lbs.

INQUIRE FOR ALL OTHER ITEMS

Forced draft blowers, reduction gear parts, bilge and ballast pumps, main circulators, general service pumps, F.O. transfer pumps, lube oil service, standby feed pumps, condensate pumps, aux. circulating pumps, feed water heaters, wash water pumps, etc.



PLEASE SEND INFORMATION ON THE FOLLOWING: (Please circle items) 9/1/74

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

31 32 A B

NAME..... COMPANY.....

ADDRESS..... POSITION..... PHONE.....

CITY..... ZONE..... STATE.....

Proposals To Build Navy Destroyer Tenders Requested From 4 Yards

Four U.S. yards—Bath Iron Works, Bath, Maine 04530; Lockheed Shipbuilding & Construction Co., Seattle, Wash. 98134; Newport News Shipbuilding & Dry Dock Co., Newport News, Va. 23607; Sun Shipbuilding & Dry Dock Co., Chester, Pa. 19013—have been asked for proposals by the Naval Sea Systems Command, Washington, D.C. 20360, in connection with the building of either one or two Class AD-40 destroyer tenders. RFP N00024-75-R-2019(S) will be issued to the four shipyards.

Exxon Signs Intent For Drilling Vessel

Exxon USA, Houston, Texas 77002, has signed a letter of intent with Mitsubishi Heavy Industries Ltd. to enter into contract negotiations for the construction of an Exxon-owned semisubmersible drilling vessel.

The vessel, intended for use off the U.S. West Coast and in the Gulf of Alaska, will be of a Friede & Goldman, Inc. design. It is anticipated that the unit will be in service by early 1977.

The unit will be capable of operating in waters up to 1,500 feet deep and drilling to depths of 25,000 feet.

J.F. Homer, former drilling manager of Exxon's New Orleans, La., offshore drilling organization, has been transferred to the company's headquarters drilling organization in Houston as marine equipment manager to coordinate the construction of Exxon's semisubmersible drilling vessel.

APL-Everett Names James Wager President

The appointment of **James E. Wager** as president of APL-Everett Agencies, S.A., San Francisco, Calif., was announced by **Norman Scott,** president and chief executive officer of American President Lines and former president of APL-Everett Agencies, S.A.

Mr. **Wager,** who will continue as a vice president for American President Lines, will assume his new duties as president of APL-Everett Agencies, S.A. immediately. According to Mr. **Scott,** Mr. **Wager** will be based in San Francisco although his duties will involve extensive travel to maintain proper liaison between the offices in the Far East and San Francisco.

APL-Everett Agencies, S.A. is principally owned by American President Lines and is operated as a subsidiary company. Everett Steamship Corporation of Yokohama holds a substantial minority interest. APL-Everett Agencies, S.A. is a comprehensive service organization for customers of American President Lines in the Far East, responsible for husbanding APL vessels, traffic documentation, customer service and sales. Offices are located in Tokyo, Yokohama, Osaka, Kobe, Hong Kong and Singapore.

Mr. **Wager** joined American Mail Line, which now operates as a division of American President Lines, in 1955. Last September, he was transferred to the San Francisco headquarters of American President Lines as vice president-administration, and was involved in the reorganization following the merger of the two companies. He holds a B.S. degree from the U.S. Merchant Marine Academy and has served in various seagoing positions in the merchant marine, and as an officer in the U.S. Navy.

Subsidy Board Approves Sale Of The Independence

The sale of the passenger ship Independence to C.Y. Tung's Atlantic Far East Lines, Monrovia, Liberia, has been approved by the Maritime Subsidy Board. The vessel, for which $2.9 million was paid, will operate under the Panamanian flag and will be used as either a passenger or cruise ship.

Iotron Announces New Sales Office

Iotron Corporation of Bedford, Mass., manufacturer of the DIGIPLOT® collision avoidance system, has announced the establishment of a sales office in the New York-Philadelphia area. The office, located in Howell, N.J., will be the headquarters of Iotron's sales manager, **Victor H. Prushan.**

According to **John C. Herther,** Iotron's president, the move better enables the company to serve the marine community by having one of its key marketing people located close to the major concentration of shipowners in the United States.

The mailing address for the new office is Iotron Corporation, P.O. Box 593, Howell, N.J. 07731. Telephone (201) 367-6160.

Since joining Iotron in 1973, Mr. **Prushan** has concentrated his efforts on DIGIPLOT sales to commercial ship operators in the United States and Europe, either directly or through supervision of established distributors and sales agents. This activity will continue from the New Jersey office.

Overall marketing and field service management, under the direction of **James S. Coolbaugh,** vice president, will be retained at the company's headquarters, 5 Alfred Circle, Bedford, Mass. 01730.

DIGIPLOT, the world's only fully automatic radar plotter, has been in production since November 1971. More than 80 units are now installed and operating on ships of all types throughout the world.

ALL-OCEAN TUG, MISTER RICHARD, equipped with two ALCO, V-12, 251s rated at 2650 BHP each has 13 knots free-running speed.

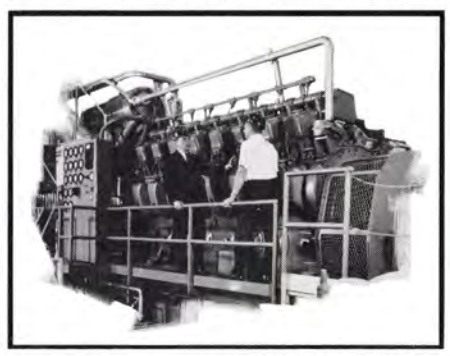
NEW GREAT LAKES ORE CARRIER, M/V WILLIAM R. ROESCH is Power Bossed by two ALCO, V-16, 251 diesels rated at 2800 BHP each.

DRILL SHIP DISCOVERER III obtains main propulsion from three, 12-cylinder, ALCO 251s.

LASH VESSEL, THOMAS E. CUFFE's ship service is provided by ALCO 16-cylinder diesel rated at 2,000 KW at 900 RPM.

WHITE MOTOR CORPORATION

Genuine ALCO parts are continually improved to provide top engine efficiency.



We offer a complete staff of expert service specialists.

ALCO®

SteelShip Corporation Appoints Raymond Dyson

Raymond N. Dyson

Edward D. Fry, president of AlumaShip/SteelShip Corporations with shipyards in Jeanerette, La., and Pine Bluff, Ark., announced that **Raymond N. Dyson** has been hired as personnel/training director for SteelShip Corporation.

Mr. **Dyson** received his B.S. degree in art education in 1968 from Southern University in Baton Rouge, La. In his new position with SteelShip, he brings two years of experience as a shipyard supervisor, and several years of experience in the educational field.

Mr. **Dyson** is responsible for interviewing and testing all job applicants and hiring all new production employees. He has complete responsibility for setting up and operating all formal and on-the-job training programs. SteelShip's new training program includes safety, shipfitting, blueprint reading, and vertical, flat, and overhead welding.

SteelShip Corporation of Pine Bluff, Ark., specializes in river pushboats, with stock models under construction in 50-foot, 60-foot and 80-foot sizes. AlumaShip Corporation of Jeanerette, La., builds aluminum passenger vessels and workboats up to 125 feet in length. They have stock model design crewboats in the 65-foot, 90-foot and 100-foot sizes, and build catamaran vessels in 65-foot, 80-foot and 100-foot sizes. Both corporations also build custom vessels to owners' specifications, or designed by "in house" engineering staffs.

Inquiries concerning any of AlumaShip/SteelShip Corporations' products or services should be directed to **Douglas L. Oehrlein,** Marketing Director, Route 4, Box 167, Pine Bluff, Ark. 71601, telephone (501) 536-0362.

Paul A. Doorley Named Permali Ltd. Director

Paul A. Doorley

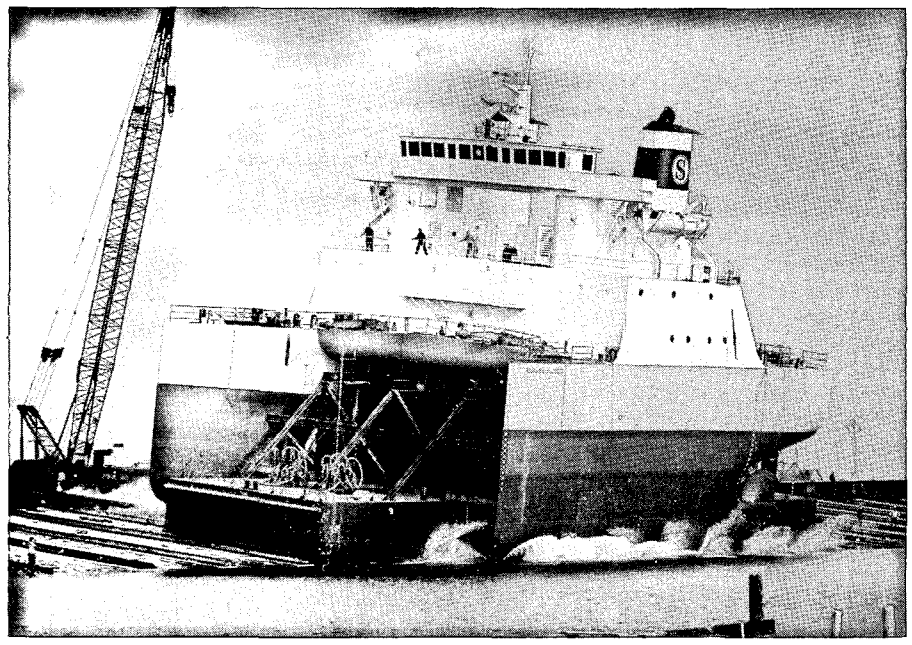
A.A. Heath, chairman of Permali Limited, parent company of an international group of technical plastics manufacturers with headquarters in Gloucester, England, has announced that **Paul A. Doorley** has been named a director of the publicly held company listed on the London Stock Exchange.

Mr. Doorley has been the president of Permali, Incorporated, Mount Pleasant, Pa., since 1963, with responsibility for all North American operations, including manufacturing facilities in Mount Pleasant; Kirkland, Wash., and Ontario, Canada.

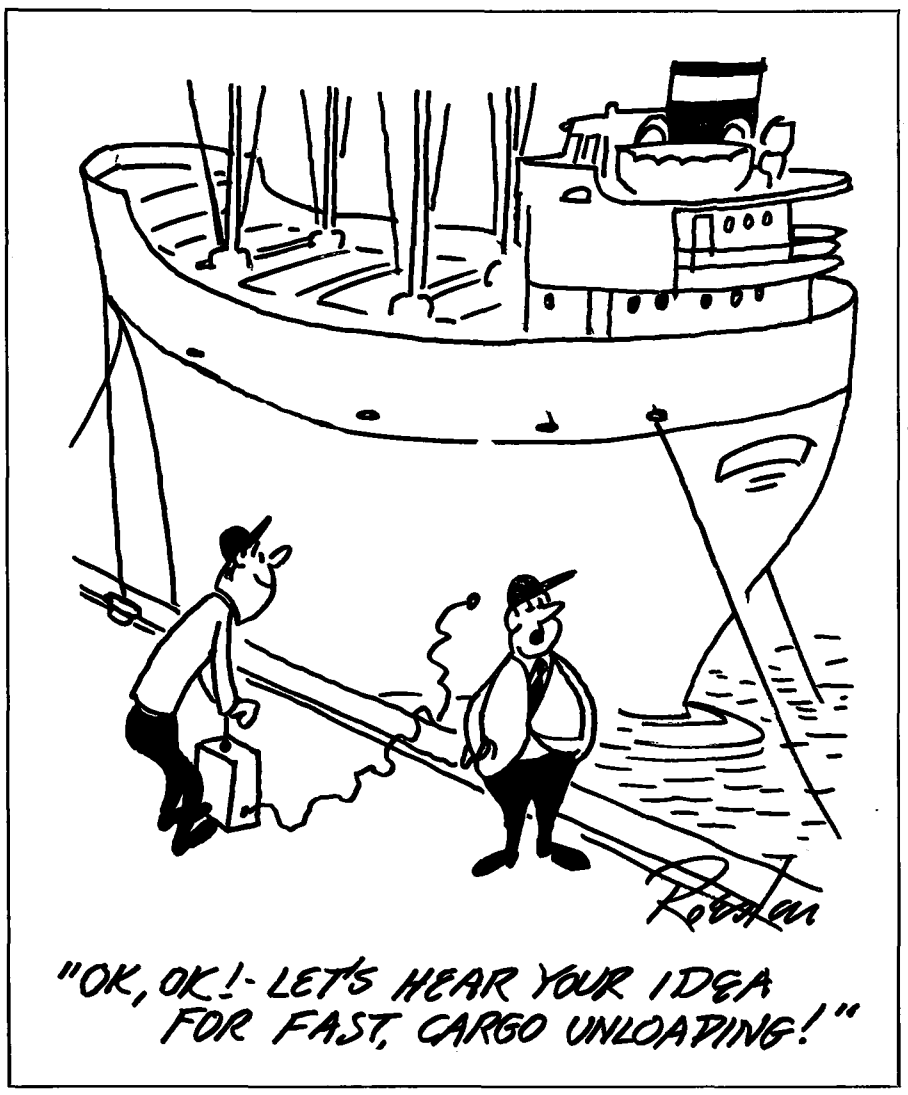
Commenting, **Mr. Heath** said: "This appointment acknowledges the importance and growing contribution of our North American interests in Permali Group's affairs."

The Permali International Group consists of closely related corporations with manufacturing plants in major trading countries of the free world. In addition to the United Kingdom and North American companies, the affiliated firms include S.A. Permali, Nancy, France; Permali-Wallace, Bhopal, India, and Permali Torrance (Pty) Ltd., Johannesburg, South Africa.

The Group companies manufacture a broad range of technical plastic components with applications in high-voltage electrical equipment, electrical distribution and transmission, nuclear generating and petrochemical plants, commercial aircraft, ships, and many industrial and recreational industries.



GIANT TUG LAUNCHED: The push-tug portion of a $13.5-million tug-barge combination being constructed for Seabulk Tankers, Ltd., general partner of Port Everglades Towing Co., both of Fort Lauderdale, Fla., is shown coming down the ways from Kelso Shipyard in Galveston, Texas. This tug makes a rigid connection with the 588-foot tank barge already launched. In combination, the unit will be about 629 feet in length overall and have a beam of 95 feet, making it perhaps the world's largest such unit. The oceangoing integrated tug and barge features a cargo capacity of about 320,000 barrels and will be able to move at about 14.6 knots. The CATUG system is a new concept in marine transportation and seeks performance equal to a ship of comparable size and power, with lower capital investment and reduced operating costs. The tug unit has the capability to disengage itself from the cargo section, which allows it to leave the tank barge for loading or unloading. The tug can then lock onto an identical barge and again be under way without having to wait for the loading or unloading process. The first of three CATUG integrated tug-barge units is being built by the Galveston yard. It will be operated under the American flag for the transportation of petroleum products in U.S. coastal trade.



Delmar Towing Associates Applies For Title XI To Build 6 Offshore Tugs

The Maritime Administration has received a request for construction loan and mortgage insurance to build six offshore tugboats. The application was filed by Delmar Towing Associates, 1001 Kinhook Road, Lafayette, La. The vessels will be built by Delmar Systems, Inc., La Rose, La., and operated by Gulf Overseas Marine Company, another Delmar affiliate. The 3,600-bhp tugs will have a length of 110 feet, a beam of 32 feet, and 14½ feet in depth.

PFEL Requests Title XI For 66 LASH Lighters To Be Built By Equitable

A Title XI request to build 66 LASH lighters has been received by the Maritime Administration from Pacific Far East Line, Inc. Equitable Equipment Co., New Orleans, La., is slated to construct the steel lighters. The construction cost is estimated at $4 million.

Kerr Steamship Names Holmes And Cameron To San Francisco Posts

The appointment of **Carl L. Holmes** as Pacific regional sales manager has been announced by Kerr Steamship Co., Inc. **Mr. Holmes** has been in the marketing and sales management field for 15 years.

It was also announced that **Ladner N. Cameron** has been named national equipment manager. **Mr. Cameron** will administer corporate maintenance and repair policies in support of the equipment inventory of Kerr principals.

The new appointees will be based in San Francisco, Calif.

Capt. G.H. Davis, USN Heads Naval Science At Kings Point Academy

The U.S. Merchant Marine Academy, Kings Point, N.Y., has announced the appointment of Capt. **George H. Davis,** USN, as head of its department of naval science.

No stranger to Kings Point, Captain **Davis** is a graduate of the class of 1948. He will head the department at the Academy, which prepares midshipmen for commissions as ensign in the U.S. Naval Reserve upon graduation. Midshipmen also receive U.S. Coast Guard licenses as either third mates or third assistant engineers, and Bachelor of Science degrees.

Captain **Davis** accepted a commission in the U.S. Navy in 1952, and served at sea on numerous types of vessels, including cruisers, aircraft carriers, minesweepers, destroyers and tenders. He also commanded the USS Laffey (DD-724) and the USS Everglades (AD-24).

Ashore, Captain **Davis** has been assigned as an instructor at the New York State Maritime College, Fort Schuyler, N.Y., at the Bureau of Naval Personnel in Washington, D.C., and at the Naval War College at Newport, R.I.

A native of Pulaski, N.Y. Captain **Davis** has also served with the Joint Military Advisory Group, Thailand, and has been assigned to the Staff of the Commander of the Seventh Fleet in the Western Pacific. His most recent tour was as Deputy Commander, Logistics Support Directorate, Naval Ordnance Systems Command, Washington, D.C.

Norton, Lilly & Co. Appoints Haggerty VP

Norton, Lilly & Co., has named **John J. Haggerty** as vice president of the firm, according to a recent announcement.

Mr. Haggerty, formerly a vice president of Seatrain Lines, will be responsible for the weekly Baltatlantic Line services between the North Atlantic, Northern Europe, and the Soviet Union.

Lykes Names Martinez To SEABEE Division

R.T. Martinez of New Orleans has been appointed director of tonnage control for the SEABEE Division of Lykes Bros. Steamship Co., Inc., it was announced by **Stewart A. LeBlanc Jr.,** vice president of the SEABEE Division.

Mr. **Martinez,** a 17-year veteran of Lykes, recently returned from Europe where his assignment included posts in London and Antwerp, covering a span of 11 years. He is a graduate of Tulane University, New Orleans.

Mr. **Martinez** has been indentified with the Lykes SEABEE System ever since its inauguration between U.S. Gulf ports and United Kingdom and Continental Europe in 1972. The unique SEABEEs are huge intermodal barge and container transports, and Lykes has the only SEABEEs in the world.

The Lykes SEABEE System combines inland waterway barges, containers and ocean carriers and is maintained with three 875-foot vessels, each capable of transporting as many as 38 fully loaded barges, or a combination of barges and containers. The barges can carry cargo in any form — bulk, breakbulk, unitized or containerized — and containers may also be stacked atop the barges or on container adapters on the main deck of each of the ships.

SEABEE barges are increasingly penetrating the inland waterways systems of both the United States and Europe, said Mr. **LeBlanc.** Each SEABEE transport can load two barges simultaneously with its 2,000-ton submersible stern elevator.

Fruehauf Reports Earnings Increase For Six-Month Period

Robert D. Rowan, president and chief executive officer of Fruehauf Corporation, has announced that for the six months ended June 30, net earnings reached $21,989,870, up from $16,633,053 for the corresponding period last year, while sales increased to $657,707,510 from $322,261,950 in the first half of 1973. Earnings per common share were slightly reduced at $1.85 per common share, compared to $1.89 in the first six months last year.

Second quarter net earnings increased to $11,514,651, from $8,615,736 in the second quarter of 1973 on sales of $337,078,732, up from $164,758,442. Earnings per common share were $0.97 compared to $0.98 last year because of additional shares outstanding.

"Our trailer order backlog now extends into the first quarter of 1975," Mr. **Rowan** indicated. "All of our operations showed volume increases over the same period of the previous year while our profits were adversely affected by parts shortages, material price increases, and higher interest rates. Even with these problems, earnings per common share were comparable to those in the second quarter and first six months of 1973."

Fruehauf's Maryland Shipbuilding and Drydock Division took delivery on June 15 of the largest floating drydock on the East and Gulf Coasts. The drydock was commissioned on July 20, and represents a significant factor in the continued expansion of Fruehauf's maritime business.

Mr. **Rowan** said: "We anticipate a continuation of the problems which affected our first six months' figures. Results for the remainder of the year will be contingent upon the availability of materials and the outcome of negotiations on several major labor contracts."

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(714) 232-4011

Owned by Kaiser Industries Corporation and Morrison-Knudsen Company Incorporated

ODECO Announces Major Personnel Changes

At the bimonthly meeting of the board of directors on July 23, 1974, Ocean Drilling & Exploration Company, New Orleans, La. 70160, announced major personnel changes in its corporate organization.

Alden J. Laborde, founder and president of ODECO, has been named chairman of the board and chief executive officer.

Hugh J. Kelly, formerly senior vice president, has been named president and chief operating officer.

James L. Kilpatrick, also a former senior vice president, has been named president and chief executive officer of ODECO, Inc., the newly formed contract drilling subsidiary.

George H. Troxell Jr., likewise an ODECO senior vice president, has been named president and chief executive officer of Ocean Production Company, ODECO's new exploration and production subsidiary.

Terry Petty Jr., formerly manager of ODECO's new rig construction division, has been named president and chief operating officer of ODECO Engineers, Inc., the company's new design and engineering subsidiary.

Messrs. **Kelly, Kilpatrick** and **Troxell** have also been named to ODECO's board of directors.

Other officers of the new subsidiaries will be announced later.

Kerr Steamship Names James A. Blackmore To Northwest Operations

James A. Blackmore

The managing directors of Kerr Steamship Company, Inc., have announced the appointment of **James A. Blackmore** as assistant vice president in charge of Kerr's Pacific Northwest Division. He will be headquartered in Seattle, Wash., where **O.J. Abello** has been promoted to the newly created position of vice president.

The largest shipping agency in North America, Kerr has offices in 24 cities. The divisional office in Seattle directs operations in Washington, Oregon and British Columbia.

A native of Foamlake, Saskatchewan, Canada, Mr. **Blackmore** completed his education in Seattle and worked there for General Steamship Corporation before joining Kerr in 1964. In 1968, he opened Kerr's first office in western Canada, at Vancouver, British Columbia. For the past 1½ years, Mr. **Blackmore** has served as vice president for Phoenix Container Liners, Ltd., San Francisco, Calif.

Kerr's Western activities are under the direction of **G.S. Jones,** San Francisco. Other managing directors of the nationwide company are **J.S. McDermott,** Houston, in charge of the Gulf Coast Region, and **S.M. Dillon,** New York, East Coast and Atlantic services.

Merrin Publishes Brochure On Fans For Marine Use

Merrin Electric Corp. has issued a new brochure covering their AC and DC fans. These include exhaust, diffuser and ventilating types for marine use. Complete specifications are shown, as well as outline and mounting dimensions.

Other products manufactured or distributed by Merrin include blowers and accessories, electrical equipment such as brakes, convertors, cable and wire, generating sets, heaters (electrical and steam), switchgear, transformers and winch controls; also turbines, valves, welding machines, instruments motors and parts, panels and switchboards, controllers and starters, rheostats and resistors.

For copies of the brochure, contact Merrin Electric Corp., 1120 Clinton Street, Hoboken, N.J. 07030.

Marine Industries Gets $20-Million Tanker Order From Gulf Oil Canada

A $20-million order for two ice-strengthened oil tankers has been received by Marine Industries, Ltd., Sorel, Quebec, Canada, from Gulf Oil Canada Ltd., which is 69-percent owned by Gulf Oil Corp., Pittsburgh, Pa. The 68,000-barrel tankers—scheduled for delivery in late 1976—will be used to supply petroleum products to the lower St. Lawrence River, the Maritime Provinces, and Newfoundland. The price of the order includes a $3-million Canadian Government construction subsidy.

Hyde Appoints Four As Product Group Managers

In line with Hyde Products' rapid growth as a designer and producer of marine machinery, plus pollution control equipment and chemicals for a wide range of industrial and marine applications, the company has appointed four product group managers to direct and implement these functions. The announcement was made by **Thomas P. Mackey Jr.**, Hyde president.

Parker L. Hay was appointed group manager in charge of the extensive Hyde line of marine machinery, including steering gears, anchor windlasses, mooring winches, chocks, and cargo winches for both lake and ocean vessels. The line includes virtually all mechanical systems except main propulsion gear. In addition, **Mr. Hay** has assumed the duties of chief engineer for Hyde Products.

Mr. Hay, who attended Union University and Southern Baptist College, joined Hyde in 1969 as a project engineer. Prior to that, he was a field engineer with J.J. Henry Co., Inc., and a mechanical designer for General Dynamics Corporation's Electric Boat Division. He is a member of The Society of Naval Architects and Marine Engineers.

Edward L. Heidenreich has been named group manager responsible for all activities relating to Hyde's marine and industrial pollution control equipment. These products include oil-water separators, waste treatment systems, and water quality monitors.

Mr. Heidenreich, who received his education at Purdue University, came to Hyde in 1971. Before that, he was a piping systems designer at Adache Associates and a design engineer at Comprehensive Design, Inc. At one time, he was also a designer of marine piping and ventilation for American Shipbuilding Company.

Thomas Braid has been appointed group manager in charge of Hyde's growing line of specialty marine chemicals, as well as the company's popular Zimmite Mud Remover for shipboard ballast tanks and similar marine applications. **Mr. Braid's** new responsibilities will also include coordinating customer service activities for all Hyde's marine products, as well as the application of marine chemicals to the company's marine pollution control systems.

Mr. Braid joined Hyde in 1973 as manager of marine products. Formerly, he was assistant marine superintendent at the Kinsman Marine Transit Company. A native of Scotland, **Mr. Braid** was educated at Glasgow Technical College.

Paul J. Blonski was appointed group manager responsible for the maintenance, stocking and furnishing of repair parts for Hyde's entire line of marine machinery, including deck machinery as well as marine sewage disposal systems, oil-water separators, and pumping systems and accessories. His responsibilities will also include all activities involving the Hyde Stream-Stay®, a unique grooved headstay which is being distributed nationally, and other Hyde yacht equipment.

Mr. Blonski, who attended Kent State University, came to Hyde Products from Midland Ross Corporation, where he was a tool and die maker. Before that, he was in the steel production department of Republic Steel Corporation.

New Shipboard Decking Now Available From Selby

Flexi-Flor® MT (marine type), a specially compounded decking for Naval and merchant vessels, is now available from Selby, Battersby & Co. Flexi-Flor MT is a homogeneous rubber without backing or fabric insert. It was developed by the R.C.A. Rubber Company, an Ohio Corporation of Akron, and features high dielectric strength—minimum of 40,000 volts—which makes it ideal for use in shipboard electrical equipment areas.

The resilient decking is approved by the U.S. Navy for use when specifications MIL-M-1556-2C (Navy) and Federal Specification L-F-00450 (COM. NBS) must be met. It provides a firm, nonslip footing which acts as a cushion and helps reduce leg fatigue. Flexi-Flor MT is durable, easy to maintain, and crack and crevice free for fast, easy cleanup.

The decorative surface is available in four marbleized colors—blue, brown, off-white and red. Selby reports that Flexi-Flor is readily available for prompt shipment from the plant and distributors' stocks.

For further information, write requesting Flexi-Flor MT Bulletin, Selby, Battersby & Co., 5220 Whitby Avenue, Philadelphia, Pa. 19143.

Mooremack Asks Title XI To Rebuild Three Ships

The Maritime Administration has received a Title XI mortgage and loan insurance request from Moore-McCormack Lines, Inc., to assist in rebuilding and reconditioning three Constellation-class vessels. New cranes will be placed on the ships, which will be reconstructed to carry 20-foot or 40-foot containers in the holds and three-high on the deck. An option for work on a fourth combination cargo vessel has been included in the application. No builder has been named for this project.

Skaarup Shipping Group Opens London Office

Glan Moseley

Skaarup Shipping Corporation, Greenwich, Conn., has announced the opening of a London office, Skaarup Shipping (U.K.) Limited. **Glan Moseley** will be managing director, and the firm's location is 52, Lincoln's Inn Fields, London WC2, England.

Skaarup Shipping (U.K.) Limited will be primarily concerned with expanding coverage of the European shipping markets, working closely with Skaarup Schiffahrts GmbH, Hamburg, Germany. The new London office will also be responsible for maintenance of close relationships with Skaarup's European clients involved in special projects and long-term contracts.

Mr. **Moseley** joined the Skaarup Group in March, after leaving Oil Companies' International Marine Forum, where he had been secunded by Mobil Oil Corporation. He has had broad experience in many aspects of the shipping industry in worldwide trade, including UNRAA in Italy, Standard Vacuum in London, Japan and New York, and Mobil Oil in London and New York.

Dimitri Negroponte, a director of Skaarup Chartering Corpora-

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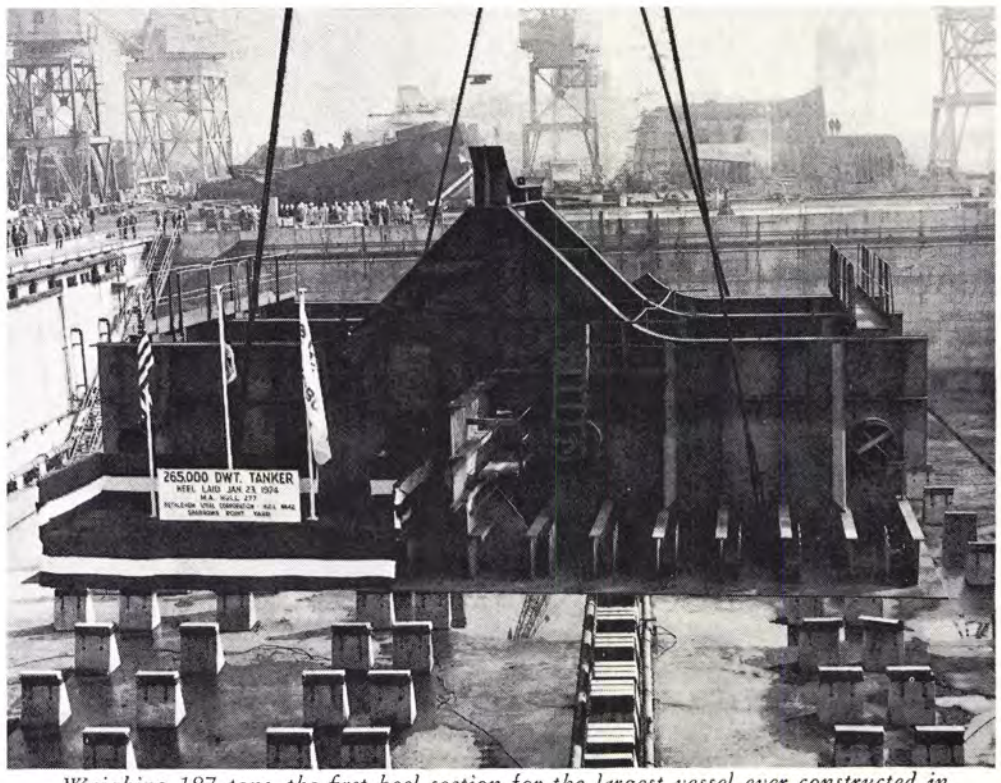
Dimitri Negroponte, a director of Skaarup Chartering Corporation in the United States, will act as special advisor and consultant to Skaarup Shipping (U.K.) Limited, having had long experience as a shipowner based largely in London. Mr. **Negroponte** will continue to represent Skaarup Chartering in London.

Sparrows Point Yard Lays Keel for Largest American-Built Tanker

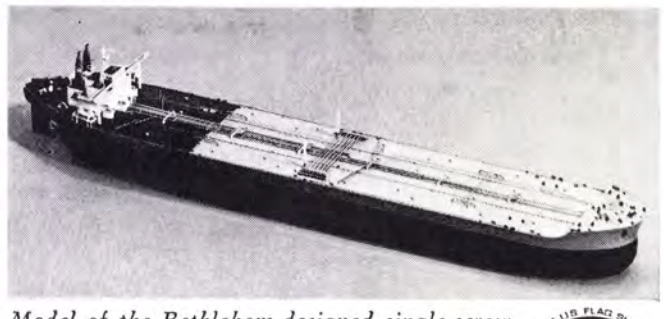


Weighing 187 tons, the first keel section for the largest vessel ever constructed in an American yard—a 265,000-dwt VLCC—is swung into place in the giant building basin of Bethlehem Steel's Sparrows Point shipyard.

SPARROWS POINT, MD. On January 23, the initial keel section for a 265,000-dwt tanker was laid in the big building basin at Bethlehem's shipyard here. The vessel, the first of a series of five similar VLCC tankers under contract at the yard, will be the largest ship ever built in the United States. Scheduled for delivery in 1975, she will have an overall length of 1,100 ft, a breadth of 178 ft, a summertime freeboard draft of 67 ft, one in., and will be capable of carrying 2,035,000 barrels of oil in her 21 tanks (two of which carry clean ballast). Cruising radius will be 20,000 miles at the design speed of 15¼ knots.

Nation's Largest Basin

The basin itself is the largest and most modern shipbuilding facility in the U.S. Measuring 1,200 ft long by 200-ft wide, it is served by four 100-ton-capacity tower cranes which together can handle lifts of more than 400 tons. It is also served by two new support facilities: a large, fully mechanized panel shop which turns out ship subassemblies weighing as much as 200 tons; and a 231-ft-long blast and paint building within which completed structural units are abrasive cleaned and painted in a controlled environment.



Model of the Bethlehem-designed single-screw, 265,000-dwt tanker shows its single deck with forecastle, cylindrical bow, and transom stern.

Room for One Hull, Plus

Two 70,000-dwt, and three 120,000-dwt tankers have already been built in this basin, and the hull for a fourth 120,000-tonner is nearing completion. The great size of this building facility allows work to proceed on one full hull simultaneously with the work on the stern section of another. As one hull is completed, it is floated out of the basin to an outfitting pier, the second hull's stern section is floated to the vacated outboard end of the basin for further, bow-section work, and construction is begun on a following hull by the laying of a stern keel in the basin's shore end. When the final 120,000-dwt vessel is floated out in mid-year, basin work will be given over exclusively to the 265,000-dwt tanker series now under contract.

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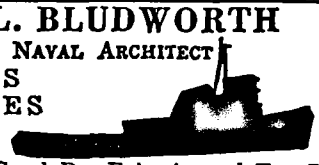
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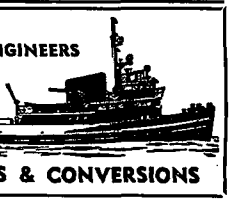
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SNAME Issues Call For Papers For 1975 Annual Meeting in N.Y.

The Society of Naval Architects and Marine Engineers has issued a call for papers for its 1975 Annual Meeting to be held in New York City on November 13-15, 1975.

Papers on the following subjects are particularly desired; however, submittal of abstracts on other topics of interest to the marine industry is also encouraged.

Ro/Ro ships—state of the art, operational experience, design.

New barge-carrying ships—operational experience, design.

LNG ships—operational experience.

Assessment of subsidy under the Merchant Marine Act of 1970

Tanker explosions—history and developments.

Industrial gas turbines for marine propulsion

High-performance vessels and related subjects—hydrofoils, surface effect ships, structures and materials, propellers, submersibles, planing craft, new displacement types.

Offshore terminals

Tanker structural problems

Maintainability/reliability

Offshore drill rigs

Pollution abatement

Analysis and trends in naval ship design

Mooring of large ships

High-powered commercial nuclear ships

Deep ocean resources—exploitation.

Supersize ships

Economic aspects of design, construction, operation

Welding technology

Foundation stiffness

Fifteen copies of a 400-500 word abstract should be sent in by October 31, 1974. The author's name, title, organization, and address should be included on the abstract.

A tentative selection of papers will be made in December 1974. Prospective authors will be requested to submit a finished manuscript by April 15, 1975. Final acceptance of the paper is dependent upon favorable review by the Committee on Papers. It is the author's responsibility to obtain appropriate clearance from Government or industry, as required.

The abstract deadline is October 31, 1974. Fifteen copies should be sent to **Robert G. Mende,** Secretary, The Society of Naval Architects and Marine Engineers, 74 Trinity Place, New York, N.Y. 10006.

MarAd Satellite Contract To Marine Management Systems

The potentials of satellite communications between ocean-traveling cargo vessels and land-based offices for management information and control purposes will be explored over the next two years under a contract just awarded by the U.S. Government to Marine Management Systems, Inc. (MMS).

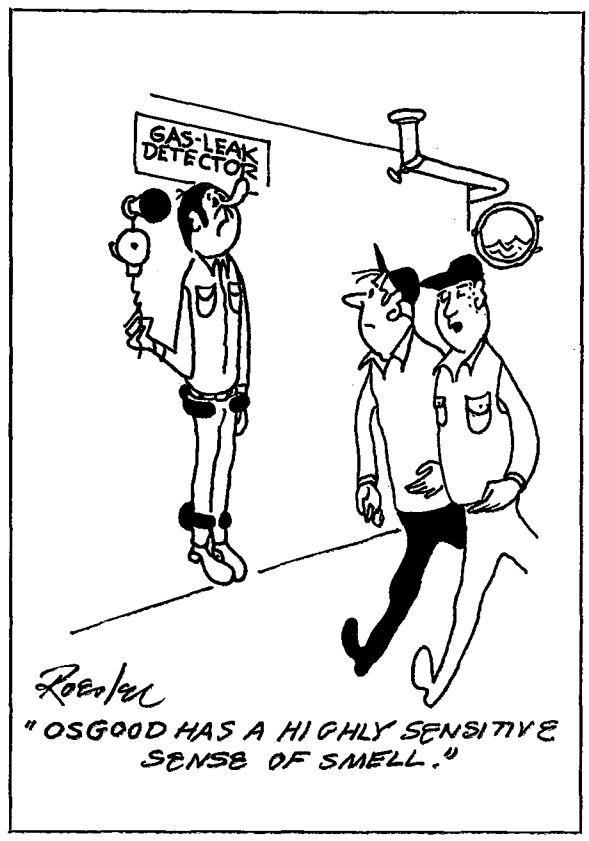
The announcement was made by **Eugene D. Story,** company president, who said that the contract was signed with the U.S. Maritime Administration. MMS, headquartered in Stamford, Conn., designs and implements computer-based management systems for the international marine transportation industry.

In recent years, Mr. **Story** said, MarAd's Office of Commercial Development has been sponsoring advanced technological programs in satellite communications as part of an overall effort to improve the competitive position of American-flag shipping companies. A satellite communication facility, established at the National Maritime Research Center, Kings Point, N.Y., is used for conducting tests to improve the management tools available to operators of the U.S. merchant fleet.

He said that the contract calls for development of fleet management techniques, in cooperation with participating shipping companies, and the operation of a Maritime Coordination Center at Kings Point.

Under the terms of the contract, he explained, MMS will conduct tests initially involving satellite terminals aboard two vessels on two North Atlantic routes using the NASA ATS-6 and ATS-5 satellites. Later, the tests will be extended to include 10 or more U.S. ships in the Atlantic and Pacific Oceans using the MARISAT commercial system being developed by ComSat General, RCA Globcom, ITT, and Western Union International.

MMS-developed computer/communication systems are presently in operation internationally. They incorporate—on an interactive basis—minicomputers, an international network time-sharing system, and commercial communication satellites.



Mitsui Delivers Third Hovercraft To Sanzo

The Angel No. 3 has a maximum speed of about 62 mph.

Mitsui Shipbuilding & Engineering Co., Ltd. recently delivered at the Hovercraft factory of its Chiba Works, the MV-PP5-type hovercraft Angel No. 3, last of the three identical vessels ordered by Sanzo Co., Ltd., an affiliate of Mitsui.

This hovercraft can accommodate 52 passengers, and will be operated by Airport Hovercraft Co., Ltd. of Kyushu, to be placed on the coastal service route in the Bay of Kagoshima in Kyushu (Southern part of Japan), where the company already has two identical ones in service since 1972.

This route covers the distance of about 37 miles between the city of Kajiki near the new Kagoshima airport, and Ibusuki, near the southern tip of the island of Kyushu. The new addition to the fleet was mainly prompted by the fact that the Ibusuki area has recently become a popular year-round tourist spot, and an additional vessel became necessary to cope with the growing number of tourists. And Sanzo Co. has plans to further enlarge this fleet, should circumstances so demand in the future.

There are at present a total of nine Mitsui hovercraft, including the Angel No. 3, serving various domestic routes.

Cooper-Bessemer Awarded $18 Million To Supply Gas Turbines For Pipeline

Cooper-Bessemer, a division of Cooper Industries, Inc., Houston, Texas 77002, received a letter of intent from Alyeska Pipeline Service Company for the purchase of 14 Coberra gas turbines for installation on the Trans-Alaska oil pipeline.

In announcing the award, Cooper Industries' president **Robert Cizik** estimated the contract at between $15 million and $18 million, depending on the final configuration of the equipment.

According to Mr. **Cizik,** the 14 units of this order, combined with 10 turbines previously purchased from Cooper-Bessemer, represent 324,000 horsepower and will provide delivery capacity of 1.2-million barrels of oil per day.

Alyeska nominally rates these units at 13,500 horsepower. There will initially be eight pump stations along the route of the 800-mile 48-inch-diameter pipeline from Prudhoe Bay to the port city of Valdez. Three turbines will be located at each station. These stations are spaced from 40 to 210 miles apart.

The first of the 14 turbines is scheduled to be shipped in November 1975, with the final unit to be delivered in December 1976.

Western Co. Of North America Receives $4-Million Increase In Title XI For Drilling Rig

Western Company of North America has received approval from the Maritime Administration for an increase of $4 million in Title XI mortgage insurance covering construction of a semisubmersible drilling rig. Instead of the original plan to operate at 600 feet in the North Sea, the new plan is to drill in 1,200 feet of water in the Gulf of Mexico. The increase was needed to cover additional drilling equipment necessary to do this. The new guarantee is $28.7 million.

Farrell Lines Asks Subsidy For Jumboizing Four Ships

The Maritime Administration has received an application from Farrell Lines Incorporated of New York, N.Y., for construction subsidy to aid in rebuilding its newest containerships—the Austral Envoy, Austral Ensign, Austral Endurance and Austral Entente. The four ships would be enlarged by inserting a new 144-foot midbody that would provide three additional holds for refrigerated containers, and fitting new container-securing devices that would permit higher stacking on deck.

Farrell Lines estimates the cost of the expansion at $12.8 million per ship. No shipyard was named in the application.

Kockums, Supertanker Shipyard, To Build New Rescue Mini-Sub

Kockums, Malmo, Sweden, Europe's largest shipyard and supertanker builder, will build a mini-sub to serve as a rescue vessel for the crews of standard-size submarines disabled undersea.

The newly designed $2,700,000 underwater rescue vessel (URV), ordered by the Swedish Defense Material Administration, will be ready for delivery in 1977.

For Kockums, which for years has been producing submarines for the Royal Swedish Navy, the mini-sub will be its first. Kockums, with an eye to the future, considers the mini-sub as a step into civilian underwater technology. Planners at Kockums, now turning out a series of 360,000-deadweight-ton tankers, believe that its experience with the rescue vessel can lead the innovative shipyard into the growing field—demand—for small submarines for inspection of offshore oil field, underwater pipelines, etc.

The URV, with a displacement of some 49 tons, will carry a crew of five—two pilots, two divers, and one engineer—and will contain rescue capacity for 25 more men.

Measuring 44 feet long, 14 feet at beam, and 13 feet high, the mini-sub will have a diving depth of 1,510 feet, which is the maximum depth of the Baltic Sea. The URV will have a maximum speed of 3 knots. Utilizing the air cleaning system, the URV can stay submerged for 40 hours. At 2 knots' speed, the endurance time will be 10 hours.

The rescue submarine was designed by Kockums in cooperation with Comex, the French diving company, which will also produce several of the components for the URV. The URV will replace the Swedish Navy's present system involving rescue bells.

The rescue submersible will be stationed and operated from the new Royal Swedish Navy Center to be constructed just south of Stockholm, and to serve as a diver training center. Comex will deliver a decompression chamber for the Center, and Kockums will set up other installations.

Experts at Kockums are to develop new welding techniques for the hull of URV, which will require high tensile steel of a type not used in Sweden up to now. The URV will also provide several construction innovations.

Once towed to the approximate area of the disabled sub, the URV will home toward the distressed vessel guided by acoustic signals. URV divers would carry out the undersea connection of the two vessels.

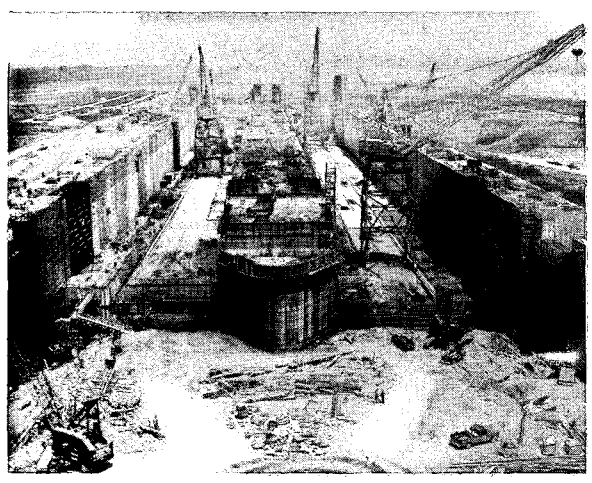
John J. McMullen Associates Name Schmidt To Managerial Post

John J. McMullen Associates, Inc., the internationally known firm of naval architects, marine engineers and transportation consultants, has announced the appointment of **John W. Schmidt** as manager of commercial marketing.

Mr. Schmidt will assist the corporate management in the development of commercial business for the firm. He reports directly to **George R. Knight**, vice president for naval architecture, and to **Norman K. Basile**, vice president for engineering.

Mr. Schmidt has a B.S. degree in naval architecture and an M.S. degree in mechanical engineering from M.I.T., and an M.B.A. degree from Fordham University. He has had extensive design and program development experience in the marine industry and was formerly associated with the Bird-Johnson Company as U.S. representative for Karlstads Mekaniska Werkstad, manufacturers of KaMeWa controllable pitch propellers.

The McMullen firm has its headquarters at One World Trade Center in New York City, and maintains offices in Washington, D.C., Hyattsville, Md., Pascagoula, Miss., and Boston, Mass., as well as offices in London and Madrid.



ONE-MILLIONTH YARD OF CONCRETE was poured at Smithland Locks on the Ohio River near Paducah, Ky. The locks are being built under a $90-million contract from the U.S. Army Corps of Engineers by a joint venture sponsored by Dravo Corporation, Pittsburgh, Pa. Other participants are S.J. Groves & Sons Company, and Gust K. Newburg Construction Company. Smithland Locks will be the first Ohio River navigation facility with two 1,200-foot-long chambers, which will help alleviate the congestion of increasing traffic on the river. The project, begun in July 1971, is scheduled for completion in late 1975.

Freighters Inc. Asks MarAd Approval To Purchase Consolidated's PFEL Stock

Subject to Maritime Administration approval, Freighters, Inc., headed by **John Alioto,** son of San Francisco's Mayor **Joseph Alioto,** has agreed to purchase the 49.9 percent share of Pacific Far East Line, Inc., now held by Consolidated Freightways, Inc. In 1969, controlling interest in PFEL was acquired by Consolidated Freightways at a price of $24 million, and in September 1973 Consolidated wrote down its PFEL stock to $3 million, at which time it was offered for sale.

Mr. **Alioto's** firm presently owns only one ship—the 24,345-dwt bulk carrier American Wheat. Freighters, Inc. would get Consolidated's shares of PFEL stock at a price of $10 per share, for a total of $4,622,660. If the necessary MarAd approval is obtained, Mr. **Alioto** said applications will then be submitted for subsidized operation of PFEL on two new routes, from West Coast ports to Indonesia and mainland China. The line presently operates on two routes to the South Pacific and the Far East.

Matson Navigation Names Walter Leong Port Engineer

Walter Leong has been appointed port engineer for Matson Navigation Company in the Port of Los Angeles. He succeeds **Richmond Barker,** who is retiring.

Mr. **Leong,** who was born in Honolulu, has sailed on Matson vessels for more than 30 years. He was chief engineer on the roll-on/roll-off trailership Matsonia before the assignment to the shoreside post.

Litton Industries Offers Erie, Pa. Shipyard For Sale

Litton Industries has announced that it has terminated its Erie Marine operations and will seek to sell the Erie, Pa. shipyard.

"We came to this decision very reluctantly, after an all-out effort to make this new yard a strong and viable enterprise," a Litton spokesman said. "We are grateful for the fine support of the people of Erie and of the Commonwealth of Pennsylvania."

The Erie yard has been on standby, with a small nucleus of employees, for the past several months while the company was engaged in negotiations for a major shipbuilding contract. When these negotiations proved unproductive and were terminated recently, Litton decided to sell the facility.

A company spokesman said there have been earlier expressions of a strong interest from prospective buyers of the shipyard. Litton declined to identify the prospective buyers or to estimate when the yard might be sold.

The Erie Marine yard, a 200,000-square-foot facility for modular construction of very large Great Lakes carriers, was completed in January 1969, at a cost of approximately $20 million. This includes a $10-million expenditure by Litton, plus approximately $10 million of Commonwealth of Pennsylvania funding, through a 25-year loan in September 1967 to Litton through EIDCO (Erie Industrial Development Corporation). Approximately $8 million of this loan remains outstanding and will be repaid, Litton said.

Erie Marine produced the first of 1,000-foot-long Great Lakes ore carriers, the Stewart J. Cort, for Bethlehem Steel Corporation, and a 1,000-foot-long tug-barge, the Presque Isle, now operated by Litton under a long-term transport contract with U.S. Steel Corporation. The Cort began its service on the Lakes in April 1972, and carried more than 2-million tons of iron ore pellets in its first two seasons. The Presque Isle, which also carries more than 50,000 tons of ore cargo per trip, made its maiden voyage in December 1973, and returned to service early this season, in April.

At its peak, Erie Marine employed more than 300. Eight employees will now be retained in Erie for administration of Litton Great Lakes Corp. and for routine maintenance of the yard. The company will assist its terminated employees in seeking new jobs with other area employers.

Delaval Publishes Bulletin On IMO 3-Screw Pumps

IMO Pump Division of Delaval Turbine Inc. has published a six-page illustrated bulletin on IMO 3-screw pumps for use in fuel transfer, boost and burner service. Performance data (discharge pressure vs. capacity) are given in separate plots for single-end and double-end IMO pumps. Typical consoles and installations are illustrated.

The bulletin is available gratis from IMO Pump Division, Delaval Turbine Inc., P.O. Box 321, Trenton, N.J. 08602.

Prudential Lines Names Wilburt Reich VP

Prudential Lines, operators of American-flag cruise ships and cargo vessels from the West Coast, has announced the appointment of **Wilburt H. Reich** as vice president, marine operations of its Pacific Division.

Mr. **Reich** has been with the steamship line 28 years, having entered the engineering department in San Francisco, Calif., where the West Coast operations are headquartered. In 1956, he was transferred to the company's New York office, where he managed marine operations for vessels operating out of the East Coast. Returning to San Francisco in 1967, he filled a similar position with expanded responsibilities for Prudential's fleet serving Canada, Mexico, Central America and South America.

Active in maritime affairs for many years, Mr. **Reich** began his career as a chief engineer in the American merchant marine. Currently, he is president of The Propeller Club of the United States, Port of the Golden Gate; a member of The Society of Naval Architects and Marine Engineers; past president of the Marine Square Club; port captain of the Islam Shrine Yacht Club, and a member of the Corinthian Yacht Club, and the Marine Exchange. Mr. **Reich** also served as general chairman of Maritime Week 1974.

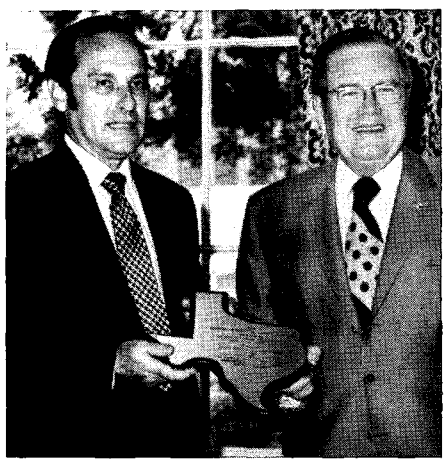
Royal Netherlands SS Appoints Jack Kruiten

Maarten L. de Ruiter, general manager of Royal Netherlands Steamship Co. (Antilles) N.V., has announced the appointment of **Jack C. Kruiten** as assistant general manager in charge of operations.

Mr. **Kruiten** has been with Royal Netherlands since 1957, and has served as assistant superintendent and marine superintendent. In his new capacity, he will be responsible for ships' operations, terminals and stevedoring contracts.

Port Of St. Louis Propeller Club Elects

The board of governors of The Propeller Club, Port of St. Louis, Mo., held their annual meeting last month at the Missouri Athletic Club, and the following officers for 1974-75 were elected: president — **Albert M. Dudley,** manager, marine repairs of St. Louis Ship Division of Pott Industries Inc.; vice president — **James A. Peterson,** Acting Chief, Operations Division, St. Louis Army Corps of Engineers, and secretary-treasurer — **Ronald A. Bennett,** assistant chief engineer, St. Louis Ship Division of Pott Industries Inc.



BETHLEHEM BEAUMONT AWARD: Governor **Dolph Briscoe** of Texas, right, presents a Governor's Industrial Expansion Award to **William T. Faucett,** representing Bethlehem Steel Corporation's Beaumont, Texas, shipyard. Mr. **Faucett** accepted the award to **Ralph A. Leaf,** general manager of the yard, in recent ceremonies in Austin. The yard received one of five such awards made this year. Winners are selected on the basis of economic contribution to their community and Texas. Nominations are submitted to the Texas Industrial Commission from all parts of the state. The shipyard was nominated by the Beaumont Chamber of Commerce.

Freighters Inc. Asks MarAd Approval To Purchase Consolidated's PFEL Stock

Subject to Maritime Administration approval, Freighters, Inc., headed by **John Alioto,** son of San Francisco's Mayor **Joseph Alioto,** has agreed to purchase the 49.9 percent share of Pacific Far East Line, Inc., now held by Consolidated Freightways, Inc. In 1969, controlling interest in PFEL was acquired by Consolidated Freightways at a price of $24 million, and in September 1973 Consolidated wrote down its PFEL stock to $3 million, at which time it was offered for sale.

Mr. **Alioto's** firm presently owns only one ship—the 24,345-dwt bulk carrier American Wheat. Freighters, Inc. would get Consolidated's shares of PFEL stock at a price of $10 per share, for a total of $4,622,660. If the necessary MarAd approval is obtained, Mr. **Alioto** said applications will then be submitted for subsidized operation of PFEL on two new routes, from West Coast ports to Indonesia and mainland China. The line presently operates on two routes to the South Pacific and the Far East.

Matson Navigation Names Walter Leong Port Engineer

Walter Leong has been appointed port engineer for Matson Navigation Company in the Port of Los Angeles. He succeeds **Richmond Barker,** who is retiring.

Mr. **Leong,** who was born in Honolulu, has sailed on Matson vessels for more than 30 years. He was chief engineer on the roll-on/roll-off trailership Matsonia before the assignment to the shoreside post.

Litton Industries Offers Erie, Pa. Shipyard For Sale

Litton Industries has announced that it has terminated its Erie Marine operations and will seek to sell the Erie, Pa. shipyard.

"We came to this decision very reluctantly, after an all-out effort to make this new yard a strong and viable enterprise," a Litton spokesman said. "We are grateful for the fine support of the people of Erie and of the Commonwealth of Pennsylvania."

The Erie yard has been on standby, with a small nucleus of employees, for the past several months while the company was engaged in negotiations for a major shipbuilding contract. When these negotiations proved unproductive and were terminated recently, Litton decided to sell the facility.

A company spokesman said there have been earlier expressions of a strong interest from prospective buyers of the shipyard. Litton declined to identify the prospective buyers or to estimate when the yard might be sold.

The Erie Marine yard, a 200,000-square-foot facility for modular construction of very large Great Lakes carriers, was completed in January 1969, at a cost of approximately $20 million. This includes a $10-million expenditure by Litton, plus approximately $10 million of Commonwealth of Pennsylvania funding, through a 25-year loan in September 1967 to Litton through EIDCO (Erie Industrial Development Corporation). Approximately $8 million of this loan remains outstanding and will be repaid, Litton said.

Erie Marine produced the first of 1,000-foot-long Great Lakes ore carriers, the Stewart J. Cort, for Bethlehem Steel Corporation, and a 1,000-foot-long tug-barge, the Presque Isle, now operated by Litton under a long-term transport contract with U.S. Steel Corporation. The Cort began its service on the Lakes in April 1972, and carried more than 2-million tons of iron ore pellets in its first two seasons. The Presque Isle, which also carries more than 50,000 tons of ore cargo per trip, made its maiden voyage in December 1973, and returned to service early this season, in April.

At its peak, Erie Marine employed more than 300. Eight employees will now be retained in Erie for administration of Litton Great Lakes Corp. and for routine maintenance of the yard. The company will assist its terminated employees in seeking new jobs with other area employers.

Delaval Publishes Bulletin On IMO 3-Screw Pumps

IMO Pump Division of Delaval Turbine Inc. has published a six-page illustrated bulletin on IMO 3-screw pumps for use in fuel transfer, boost and burner service. Performance data (discharge pressure vs. capacity) are given in separate plots for single-end and double-end IMO pumps. Typical consoles and installations are illustrated.

The bulletin is available gratis from IMO Pump Division, Delaval Turbine Inc., P.O. Box 321, Trenton, N.J. 08602.

Prudential Lines Names Wilburt Reich VP

Prudential Lines, operators of American-flag cruise ships and cargo vessels from the West Coast, has announced the appointment of **Wilburt H. Reich** as vice president, marine operations of its Pacific Division.

Mr. **Reich** has been with the steamship line 28 years, having entered the engineering department in San Francisco, Calif., where the West Coast operations are headquartered. In 1956, he was transferred to the company's New York office, where he managed marine operations for vessels operating out of the East Coast. Returning to San Francisco in 1967, he filled a similar position with expanded responsibilities for Prudential's fleet serving Canada, Mexico, Central America and South America.

Active in maritime affairs for many years, Mr. **Reich** began his career as a chief engineer in the American merchant marine. Currently, he is president of The Propeller Club of the United States, Port of the Golden Gate; a member of The Society of Naval Architects and Marine Engineers; past president of the Marine Square Club; port captain of the Islam Shrine Yacht Club, and a member of the Corinthian Yacht Club, and the Marine Exchange. Mr. **Reich** also served as general chairman of Maritime Week 1974.

Royal Netherlands SS Appoints Jack Kruiten

Maarten L. de Ruiter, general manager of Royal Netherlands Steamship Co. (Antilles) N.V., has announced the appointment of **Jack C. Kruiten** as assistant general manager in charge of operations.

Mr. **Kruiten** has been with Royal Netherlands since 1957, and has served as assistant superintendent and marine superintendent. In his new capacity, he will be responsible for ships' operations, terminals and stevedoring contracts.

Port Of St. Louis Propeller Club Elects

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VLCC DELIVERED TO BRAZIL: IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.), Japan, recently delivered the 282,750-dwt tanker (shown above) to her owners, Petroleo Brasileiro S.A. of Brazil. The delivery took place at IHI's Kure Shipyard. The VLCC, christened the Cairu, is the second of two vessels of the same type ordered in June 1972 from IHI by the shipowner, the first vessel being the Vidal de Negreiros. The Cairu is classified to ABS and has the following approximate measurements: overall length, 1,106 feet; length bp, 1,050 feet, molded breadth, 179 feet; molded depth, 91 feet, and a draft of 71 feet in fully loaded condition. Equipped with a 40,000-shp IHI marine turbine, she cruises at a service speed of 15.9 knots. She recorded 16.82 knots on a trial run. Construction was started in November last year, and she was launched in March 1974.

New Brochure Describes Engelhard PTX Purifiers

Engelhard Industries has published a new brochure, "Engelhard PTX Purifiers To Control Diesel Engine Exhaust Fumes." It describes different units, dimension and model specifications, details on their operation and safety benefits, and includes photographs.

For copies, write Engelhard Industries, Technical Service Department, 430 Mountain Avenue, Murray Hill, N.J. 07974.

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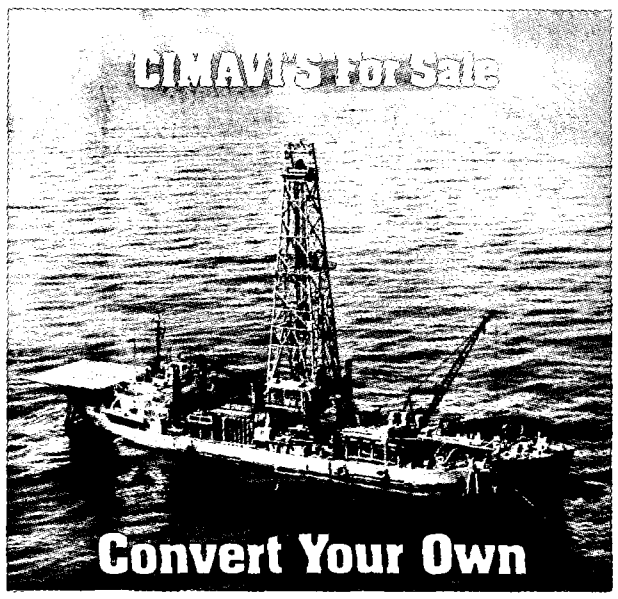

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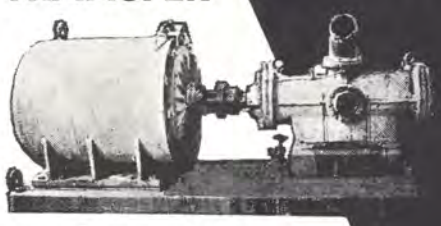

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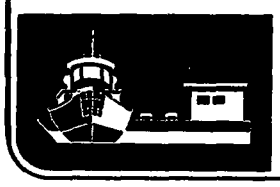

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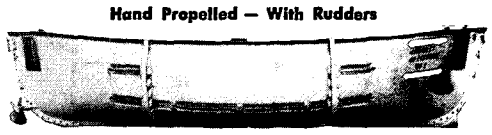

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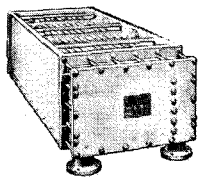

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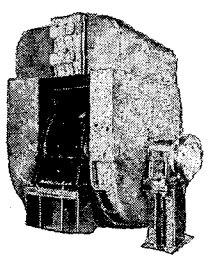

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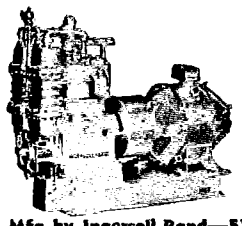
DIESEL STARTING & DIVING COMPRESSOR



30 CFM ACTUAL CAPACITY
44 CFM PISTON DISPLACEMENT AT 400 PSI

Mfg by Ingersoll-Rand—5¼x2½x4—type 20—875 RPM. Relief valve inter cooler setting 85 lbs. Just removed from Net Tender YN-24. 15 HP Westinghouse motor—115 volts—112 amps DC—875 RPM—with magnetic starter. Temp. rise 40°C. Motor frame SK-93—100% load—24 hours—40° rise. The unit is 2-stage water cooled single acting—fitted with inter cooler and after cooler. Weight 2758 lbs. OAL 4′2″—OAW 23″—OAH 4′.

THE BOSTON METALS COMPANY
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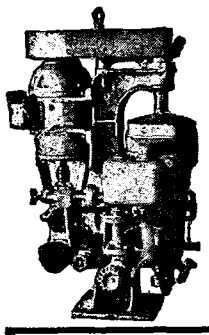
SHARPLES OIL PURIFIERS
Complete with motor, starter and pump
FOR FUEL OR LUBE OIL



DIESEL LUBE OIL: 225 GPM —viscosity 180-220 SSU @ 130°F. DIESEL OIL: 225 GPM —viscosity 45 SSU @ 100°F. MODELS: Lube Oil M-85-34-5-23BM-44; Fuel Oil M-85-35-5-8CA-13. SPECIFICATIONS: Bowl speed 17,000 RPM—1″ oil inlet & outlet. 2 HP verticle GE motor—440/3/60/3400 — complete with starter. Plans available.

$1850

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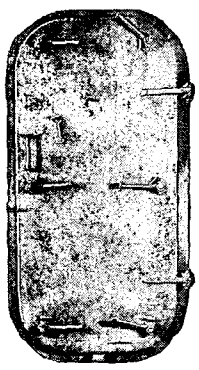
NEW WATERTIGHT DOORS



6-Dog right and left hand hinged steel doors—with frames. Built and tested to A.B.S. spe-specifications.

SIZE	NET WT.
26″x48″	250 lbs.
26″x60″	300 lbs.
26″x66″	320 lbs.

EACH DOOR

IMMEDIATE DELIVERY

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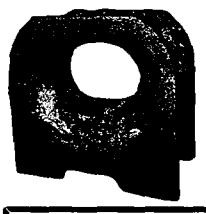
BARGES
SALE or CHARTER

COEN MARINE EQUIPMENT, INC.
1571 RICHMOND TERRACE, S. I., N. Y. 10310
(212) 448-0900

D.C. MAGNETIC STARTERS:

10 HP/Clark 115 Volt DC Bul #5370
Marine Surplus $300.00 each
4½/5 HP/Clark 230 Volt/DC/Bul 5370
Marine Surplus $125.00 each

Wurth Electric Motor Company, Inc.
75-20 Jamaica Ave., P.O. Box 1131
Woodhaven, New York 11421 — Tel. 212-296-2000-1-2



NEW 7″ RADIUS PANAMA CHOCKS
(MEET PANAMA REGULATIONS)
With extended legs for welding to deck. IMMEDIATE DELIVERY FROM STOCK.

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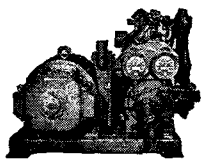
AIR COMPRESSORS



DIESEL STARTING
Two stage—water cooled—single acting verticle type—10 CFM—600 lbs. Type 30—Class T. Ingersoll-Rand Compressor—4x1½ x3½ @ 630 RPM. Motor 7½ HP—440/3/60 — 1750 RPM — complete with starter—intercoolers and aftercoolers.

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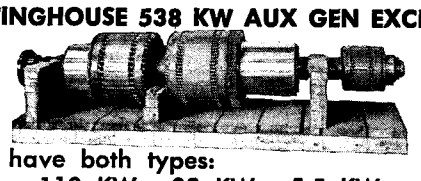
WESTINGHOUSE 538 KW AUX GEN EXCITERS



We have both types:
110 KW — 32 KW — 5.5 KW
110 KW — 28 KW — 5.5 KW

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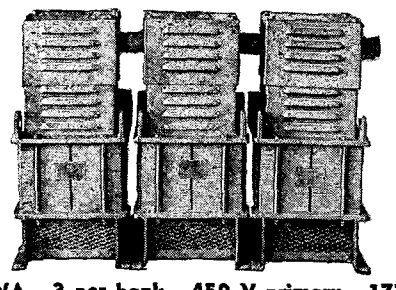
TRANSFORMERS



15 KVA—3 per bank—450 V primary—177 volt secondary. **$295.00 PER BANK**
Also inquire about other sizes: 10 KVA/20 KVA/25 KVA/37 KVA

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SHIPBOARD EQUIPMENT

From

ZIDELL EXPLORATIONS INC.

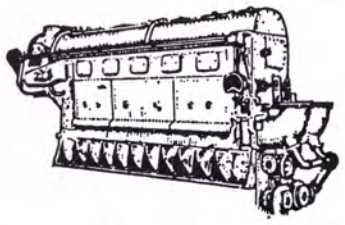
Contact: Ralph E. Ingram
3121 S.W. Moody Ave., Portland, Ore. 97201
Telex: 36-0503 • Cable "ZIDELL"
PHONE: A/C 503 • 228-8691

A partial listing of our stock from EX-NAVY and MARITIME VESSELS

Certifications to A.B.S. or Lloyd's a routine

SEE OUR 2-PAGE SPREAD IN ALTERNATE ISSUES OF M.R.

MARINE DIESEL ENGINES

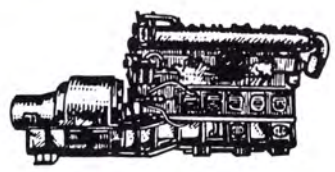


MATCHED PAIR . . . FAIRBANKS-MORSE Model 38D8-⅛ — 1 Port; 1 Starboard. Used condition, 1800 HP, 800 RPM, 2 cycle, 8½" bore, 10" stroke, Air Start.. Complete with Westinghouse Reduction Gears, 2.216:1 ratio —with Hydraulic Coupling.

MARINE DIESEL GENERATORS

4—COOPER - BESSEMER, Marine . . . Model FSN 6, 6 cylinders, 375 HP, 900 RPM with General Electric generators, 250 KW 440/3/60.

2—SUPERIOR Diesel Engines . . . Model GBD8 Marine, 150 HP, 1200 RPM, 8 cylinder, with Delco Generators, 100 KW, 120/240 DC.



4—GENERAL MOTORS, Model 3-268A, marine, 150 BHP, 1200 RPM, 3 cylinders, with 100 KW Generators, 450/3/60.

3—GENERAL MOTORS, Model 3-268A, Marine, 150 HP, 1200 RPM, 3 cylinders, with Allis-Chalmers Generators, 100 KW, 120/240 DC.

Many other units in stock

TURBINE GENERATORS—AC and DC Voltage

A.C.

2—1500 KW, GENERAL ELECTRIC Turbines: Type FN4-FN30, Steam 525 PSIG. 8145 RPM, with G.E. Generators, 1500 KW, 450/3/60.

4—1250 KW, GENERAL ELECTRIC Turbines: Type FSN, 525 PSI, 7938 RPM. Generators: 1250 KW, 450/3/60, 3600 RPM, Type ABT2.

7—750 KW, GENERAL ELECTRIC Turbines: Type FN3-FN24, 525 PSI, 10,033 RPM. Generators: 750 KW, 450/3/60, 1200 RPM, Type ATI.

2—500 KW, GENERAL ELECTRIC Turbines: Type FN3-FN20, steam 375/425 PSI, 6 Stage, 9987 RPM. Generators: 500 KW, 450/3/60, 1200 RPM, Type ATI.

D.C.

1—WORTHINGTON, 225 PSI, 397°F, 6510 RPM, with Westinghouse Generator, 150 KW, 120 DC, 1250 Amperes.

1—GENERAL ELECTRIC, with G.E. Generator, 350 KW, 440/3/60.

4—ALLIS-CHALMERS, 440 PSI, 740°F, with Allis-Chalmers Generators 300 KW, 240/240 DC.

1—GENERAL ELECTRIC, 525 PSI, with G.E. Generator, 250 KW, 440/3/60.

ALLIS-CHALMERS, 440 PSI, 740°F, 300 KW, 120/240/DC.

6—WESTINGHOUSE, 200 PSI, with Westinghouse Generators, 60 KW, 120 D.C.

JOSHUA HENDY, 300 PSI, 550°F, with Westinghouse Generator, 300 KW, 120/240 DC.

WORTHINGTON, Form S4, 440 PSI, 740°F to a Westinghouse Generator, 250 KW, 440/3/60, and to a 90 KW, 120 DC.

DELAVAL, 450 PSI, 750°F, 300 KW, 120/240 DC.

FAST REPLIES ON YOUR INQUIRIES!

Rebuilt and Guaranteed

AXIAL FLOW FANS

LaDel, Sturtevant, etc.

In 440 AC, in 115 DC, and in 230 DC, and in sizes 1 HP through 20 HP. Completely reconditioned.

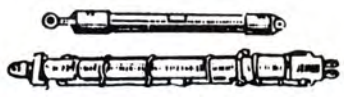
EXAMPLE LISTING:

Size A¼	Size A3	Size A8
Size A½	Size A4	Size A10
Size A1	Size A5	Size A12
Size A2	Size A6	Size A16

Electro-Mechanical STEERING GEAR

1—SPERRY No. 2, 5 HP, 230 Volts DC, complete with Steering Winch, Controller Panel, Ballast Resistor, Electro-Mechanical Steering Stand—with Steering Wheel (with Pull-out Knob).

HYDRAULIC CYLINDERS



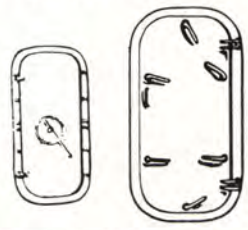
Bore	Overall Stroke	Rod Diameter	Retracted Length	Action
10"	12"	3.75"	45½"	double
10"	26"	3.75"	58½"	double
2"	8"	1½"	20"	double
2.5"	15"	1.12"	25½"	double
3"	8"	1.37"	15½"	double
6"	8Ft.	4"	144"	double

CARGO HOISTER BLOCKS

5 ton rated, steel, as removed from surplus ships. Manufactured by: Young, Draper, etc., 12" & 14" sizes.

$44.50 ea. **$49.50 each with pull test certificates**

STEEL WATERTIGHT DOORS

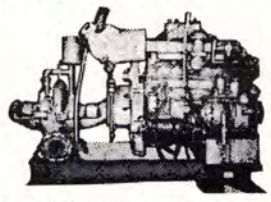


Used, Good Condition, Trimmed Frames.

Many sizes available, priced reasonable Some Typical Prices shown below. Please Inquire for other sizes.

26"x48"-4 Dogs—**$60.00 ea.**
26"x57"-6 Dogs—**$80.00 ea.**
26"x60"-4 Dogs, 6 Dogs—**$86.00 ea.**
26"x66"-6 Dogs, 8 Dogs—**$100.00 ea.**
26"x66"-Q.A. Type—**$175.00 ea.**

FIRE PUMPS



2—BUDA, Model 6-LD-468, Diesel Engines 6 cylinders, 100 BHP, Marine, Gardner Denver, centrifugal Pumps, Bronze, horizontally split case, 1000 GPM, 280' head, 6" suction and 5" discharge.

AIR COMPRESSORS

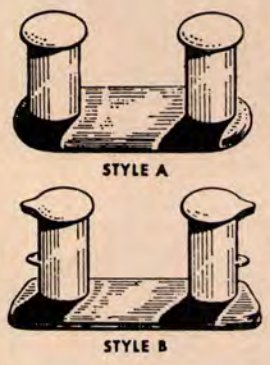
1—GARDNER-DENVER, 150 CFM, 125 PSI, Class WB, Size 7x5¾x5, with Diehl Motors, 45 HP, 230 Volts DC, 870 RPM, 167 Amperes.

3—INGERSOLL - RAND, Size 5x5x4x4, 50 CFM, 150 PSI, with G.E. Motor, 20 HP, 440/3/60.

1—INGERSOLL - RAND, Model 40B, 155 CFM, 110 PSI, 870 RPM, with 40 HP Motor, 230 DC.

2—WORTHINGTON, 20 CFH, 3000 PSI, 4 stage, 585 RPM, with Worthington Steam Turbine, 47 HP, 5502 RPM.

DOUBLE BITS



STYLE A

STYLE B

Used, clean, good suitable for reuse Predominantly 12 and 14" sizes, styles, Many other sizes in stock ranging from 6" t 18".

Specify quantity size and style required for fas quotation.

ANCHOR CHAINS

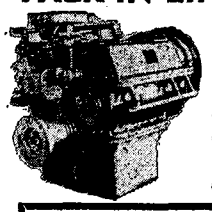
USED - GOOD

1⅛" Size	2¼" Size
1⅜" Size	2⅝" Size
1½" Size	3⅜" Size
2 1/16" Size	

FOR MARINE VALVES AND FITTINGS: A/C 503, 228-8691, ASK FOR "VALVE DIVISION."

FOR ELECTRICAL EQUIPMENT: A/C 503, 228-8691, ASK FOR "ELECTRICAL DIVISION."

FALK IN-LINE MARINE REVERSE REDUCTION GEAR



SUITABLE TO 1600 HP WITH MODIFICATIONS

700 HP @ 750/246 RPM—30" clutch drum—ratio 3.05:1—equal to new. Can be used with up to 1600 HP by modifying with larger clutch drums & tires.

THE BOSTON METALS COMPANY

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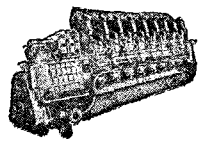
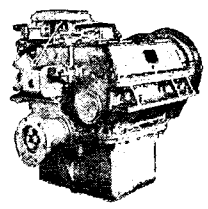
ATTENTION! TUG OWNERS
GM 1700 HP Geared Diesel Sets

2 Sets Available





ENGINE: GM 16-278A—Vee type 8¾"x10½"—air starting—heat exchanger cooled and complete with filters, strainers, engine-operating-panel-board and all accessories. GEAR: Falk—3.05:1 ratio—vertically offset in line.

Will sell engines & gears separately

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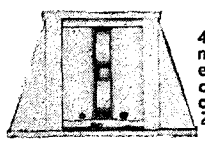
NEW UNUSED NAVY SURPLUS
UNIVERSAL FAIRLEADS



SHIPBOARD TYPE

4 Rollers — 8"x18" — 2 horizontal mount—2 vertical mount. Clear opening 3". Center to center on vertical & horiz. rollers 11". Fairlead 36" overall width—24" high—24" deep. 28 available.

$695 Each

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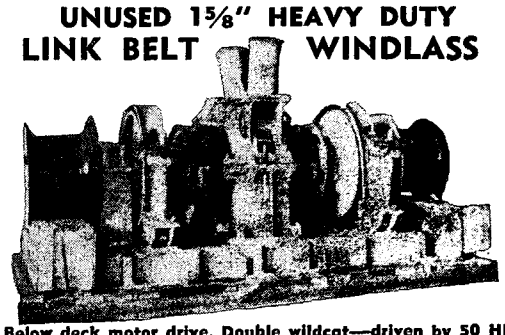
UNUSED 1⅝" HEAVY DUTY LINK BELT WINDLASS



Below deck motor drive. Double wildcat—driven by 50 HP 230 VDC motor with vertical shaft and worm drive. Single speed—handles 7000 lb anchors and 60 fathoms of 1⅝" chain at 7 fathoms per minute. Wildcat centers 56". Complete with all controls and warping features. Total weight 27,500 lbs. With spares.

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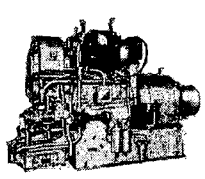
G.M. 3-268A 100 KW A.C. Diesel GENERATOR SET



Like new, ENGINE: G.M. 3-268A—3 cylinder—6½"x7" bore & stroke. GENERATOR: Century—100 KW—440 volts—3-phase—60 cycle. Switchgear available.

AIR STARTING **$2450** ELECTRIC STARTING **$2775**

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MARINE PUMPS
115 Volts D.C.
Very Little Use

FIRE & BILGE

350 GPM—100 lb. head—1750/3500 RPM—40 H.P. Furnished with Nash Hytor Pump MO-571 & float switch, for self-priming. All controls. Pump & primer weight 900 lbs.

BILGE & FLUSHING

15 GPM—20 lb. head—1750/3500 RPM—¾ HP motor. Furnished with Nash Hytor MD-2 vacuum pump. Approx. weight 250 lbs.

SANITARY SERVICE

35 GPM—40 lb. head—3500 RPM—1 H.P. Pump weight 40 lbs.

DIESEL FUEL OIL TRANSFER

Positive displacement—gear head—15 GPM—20 lb. head—350 RPM—1 HP—pump weight 260 lbs.

LUBE OIL SERVICE

Positive displacement—gear head—30 GPM—35 lb. head—273 RPM—2 HP motor—weight of pump 350 lbs.

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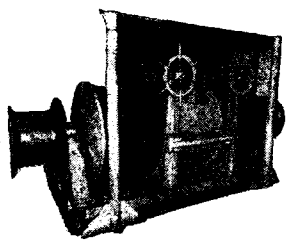

2 LIDGERWOOD DOUBLE DRUM

TOWING WINCHES

CAPACITY: Each drum stows 1800' of 1¼" wire. Each drum independently 30,000 lbs. on 2nd layer at from 10 to 50 feet per minute. Both drums simultaneously 15,000 lbs. each. Drums equipped with clutch shift levers. 24" Winch heads for 8" circumference manila rope. Static load 52,000 lbs. applied at mid-length. Base 10' 6" wide with 2 outboard winch heads 20¼" each. Drum diameter 22½"—flange 50"—28" between flanges. Equipped with level wind spooling devices and compressor hand brake. MOTOR: 75 HP—under deck with horizontal drive through worm gear. Drip-proof—fully protected. Mfg by Allis-Chalmers—type EB-127-DC—compound wound—125/250 volts—254 amps—reversible—575/1150 RPM. CONTROLLER: Allis-Chalmers drum type—with 1 off position and 5 heave in positions and five payout conditions in opposite directions. Control cabinet also located below deck. Worm gear reduction 62T at 1½ CP worm wheel 31:1 reduction. Drum shaft beveled bull gear 61T. Drive shaft beveled pinion gear 14T—ratio 4.857:1.

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REVOLVING FIELDS

WESTINGHOUSE

For T2SE—A-1 tankers—with A.B.S.—ex-Caltex J.H. MacGaregill.

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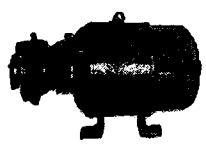
UNUSED ALLIS-CHALMERS FIRE & GENERAL SERVICE PUMPS



200 GPM — 180' head — 2½"x2"—bronze—flange connections. MOTOR: 20 HP—115 volts DC—2400 RPM—153 amps.

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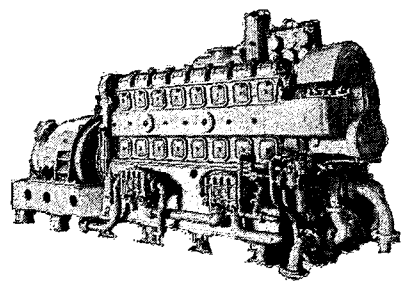
G.M. 8-268A 200 KW A.C. DIESEL GENERATOR SETS



ENGINE: 8-268A—6½" bore x 7" stroke—1200 RPM—driving 200 KW Westinghouse generator—440 volts—3-phase—60 cycle—321 amps—80% power factor at 1200 RPM. Switchgear available.

$3750

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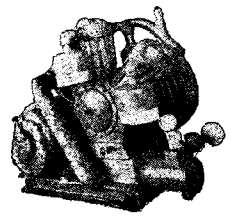
2-STAGE 5x4x4 50 CFM @ 150 LBS INGERSOLL RAND AIR COMPRESSOR



Class R—type 30—5x4x4—750 RPM 3-cylinder air cooled 2-stage compressor with air intake filter. 20 HP Vee-belt drive motor—440 volts—3-phase—60 cycle—27 amps—1800 RPM continuous duty—class A insulation—ball bearing dripproof squirrel cage—low starting current. Motor weight 500 lbs. Complete with GE magnetic starter size 2—27.2 amps—weight 75 lbs. Copper finned intercooler between stages. Total weight motor, compressor and base 1505 lbs. OAL: 4' 1⅜"; OAW: 2' 6½"; OAH 3' 2½".

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60 KW GM 6-71 DELCO DIESEL SET

GM 6-71 engine with Delco 120 volt DC 500 amp generator with stab. shunt.

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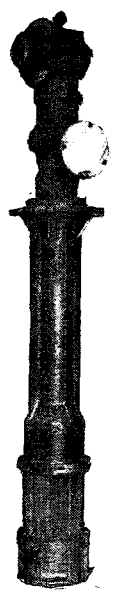

NEW — UNUSED ROTARY DISPLACEMENT DELAVAL IMO 8" DEEP WELL PUMPS for oil 840 GPM at 50 PSI DIS. PRESS.

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Patterson-Sargent, P.O. Box 494, New Brunswick, N.J.
Transocean Marine Paint Association, P.O. Box 456, Delftseplain 37, Rotterdam, Holland
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Vancouver Shipyards Co., Ltd., 50 Pemberton Ave., North Vancouver, B. C., Canada

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SHIP MODELS
Yankee Shipwrights, P.O. Box 35251, Minneapolis, Minn. 55435

SHIP STABILIZERS
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Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202
Henry Gillen's Sons Lighterage, West End Ave., Oyster Bay, N.Y. 11771
James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048
Puerto Rico Lighterage Co., P.O. Box 1072, San Juan, P.R. 00902
Suderman & Young Towing Co., 329 World Trade Center, Houston, Texas 77002
Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305

VALVES AND FITTINGS—Hydraulic—Safety Flanges
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Fabri-Valve Co., 2100 N. Albina Ave., Portland, Oregon 97208
Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn, N.Y. 11231
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Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027

WATER POLLUTION CONTROL
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Keene Corporation, Fluid Handling Div., Cookeville, Tenn. 38501
Koehler-Dayton, Inc., P.O. Box 309, New Britain, Conn. 06050

WEATHER ROUTING
Weather Routing Inc., 1415 Boston Post Road, Larchmont, N.Y. 10583

WELDING EQUIPMENT—Flame Cutting
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Unitor Ships Service, Sorligaten 8, P.O. Box 2814 K, Oslo 5, Norway

WIRE ROPE
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Bethlehem Steel Corp., Bethlehem, Pa. 18016

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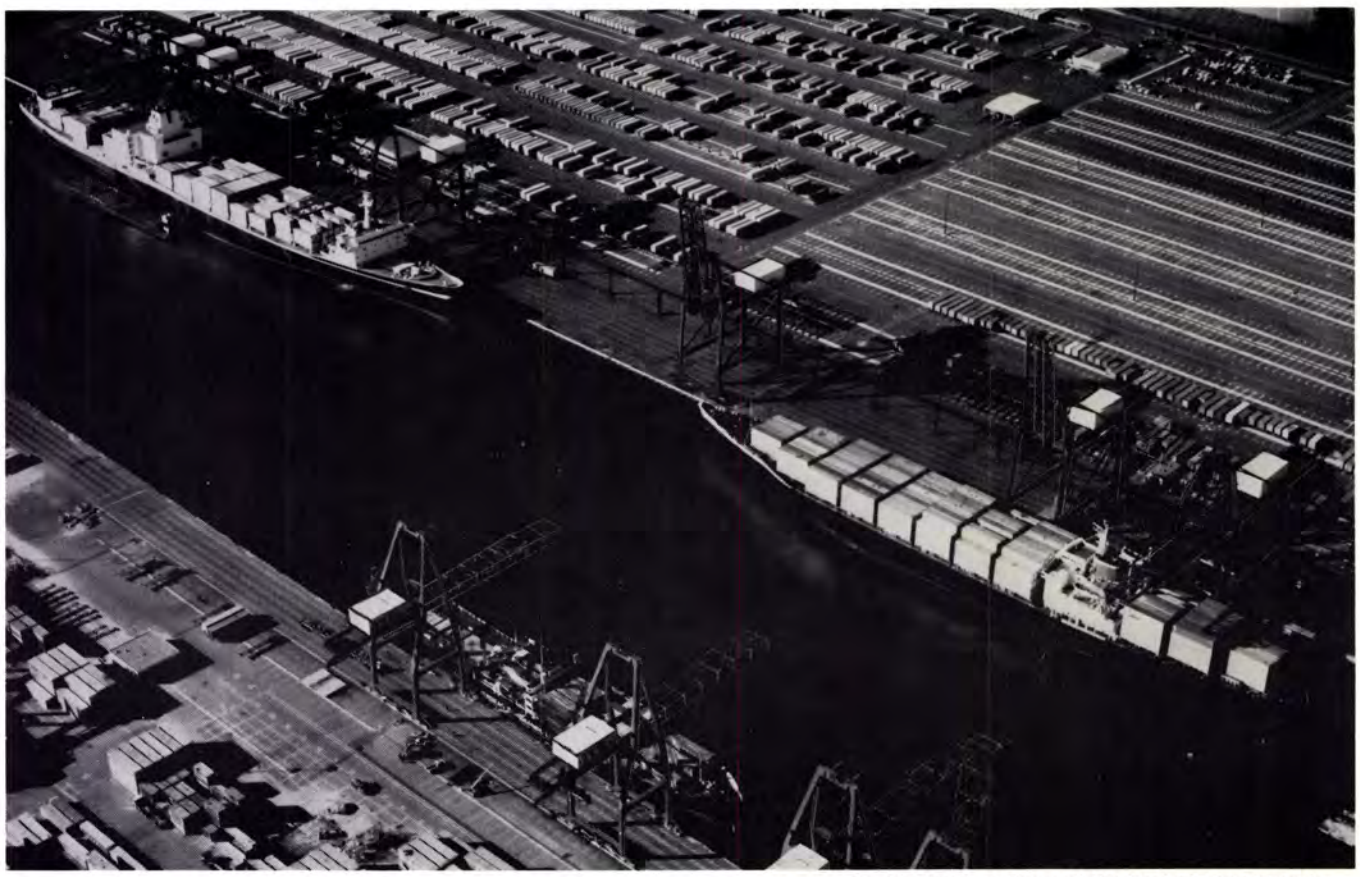

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