

MARITIME DAY

**MARITIME  
REPORTER**  
AND  
**ENGINEERING NEWS**



**Thousands Attend Ceremony  
Honoring American Seamen  
—Model Of Monument Unveiled**

(SEE PAGE 11)

**LNG-5-Dusseldorf  
Conference Program**

(BEGINS PAGE 12)

**JUNE 15, 1977**

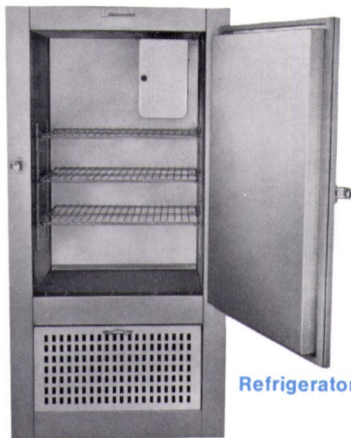
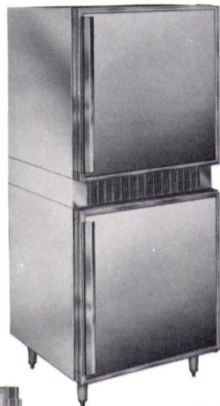


# COOL IT... with **BAILEY** "refreshers"

■ All of the following Bailey products are designed, engineered and manufactured especially for marine use to meet specifications of U.S. Public Health Service. We stock units and repair parts at all our warehouses.

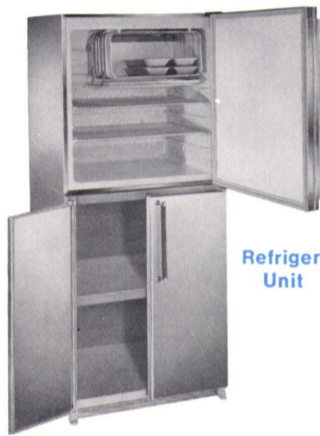
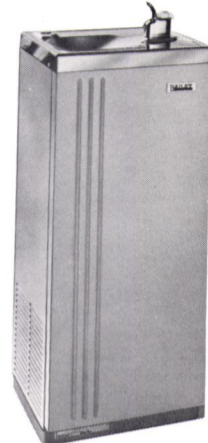


Refrigerator/Freezer  
Combination



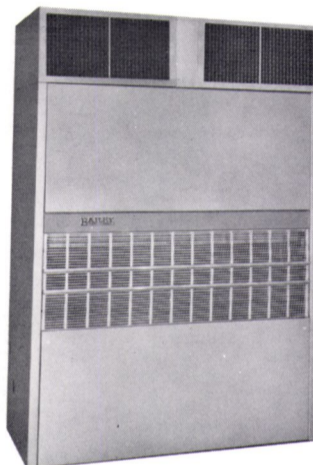
Refrigerator

Water Cooler



Refrigerator/Storage  
Unit

Air Conditioners



Ice Cuber

## ICE CUBERS

Bailey Kold-Draft\* units range in capacity from 110 to 1,200 lbs. daily using ice storage bins, the largest occupying only 7½ sq. ft. of floor space. Add-A-Unit feature permits increasing capacity without using more floor space. Designed to compensate for a 15° roll or pitch. Special salt water condenser and water regulating valve for sea water cooling.

\*Reg. TM Uniflow Mfg. Co.

## WATER COOLERS

Deep basin of stainless steel prevents spilling when cooler is inclined up to 15°. Deck mounting brackets provided; wall models available.

## REFRIGERATORS

Standard, portable and under-counter models, ranging from 4 to 102 cu. ft., in AC or DC, for efficient operation at high ambient temperatures, Stainless steel cabinets with easy-to-clean interiors. AC units with blower-type evaporators are self-defrosting.

## AIR CONDITIONERS

Water cooled, self-contained units in 3, 5, 7½ and 10 ton models in AC or DC. Four smaller AC models, measuring only 24" x 24" x 36" high, with cooling capacities ranging from 9,400 to 27,100 Btu/hr, are water cooled with 90/10 Cupro-Nickel sea water condensers.

## REFRIGERATOR/FREEZER/STORAGE COMBINATION UNITS

In less than 5 sq. ft. of floor space, you can now combine a 6 cu. ft. refrigerator or freezer with an 11 cu. ft. dry storage unit; or a refrigerator with a freezer. If you want 12 cu. ft. of refrigerator or freezer space, simply stack two similar units together with our optional stacking kit.

FOR YOUR  
PROTECTION

When you purchase any kind of automatic equipment, be certain that your supplier can furnish proper service when needed. BAILEY maintains qualified mechanics to install units and service them properly, as well as a team of engineers to cope with any problems that may arise.



## BAILEY DISTRIBUTORS, INC.

74 SULLIVAN STREET • BROOKLYN, N.Y. 11231 • 212/855-3958

### Offices and Warehouses

AVENEL, N.J. 07001 • 2323 Randolph Avenue • 201/382-1225  
NEW ORLEANS, LA. 70117 • 632 Alvar Street • 504/943-2461  
NORTH MIAMI, FLA. 33179 • 524 N.E. 190th St. • 305/651-4160  
WASHINGTON, D.C. 20006 • 1629 K St., N.W. • 202/296-2358

### Affiliated Companies

BAILEY REFRIGERATION CO., INC.  
BAILEY CARPENTER & INSULATION CO., INC.  
BAILEY JOINER CO., INC.



# VERSATILITY



Photographic simulation of pilot house being elevated 28' height of eye to 45'.



Tug Marjorie B. McAllister in notch of 18,000 ton/125,000 barrel barge.  
Pilot house elevated to 45' height of eye.



Tug Marjorie B. McAllister with barge on hawser,  
pilot house lowered to a conventional 28' height of eye.

McAllister Brothers, Inc. Towing and  
transportation. 17 Battery Place,  
New York, N.Y. 10004. (212) 269-3200.  
Serving the ports of New York,  
Norfolk, Philadelphia, and San Juan.

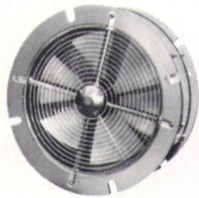
**McAllister** 



**IT'S A DEGASSER!**  
Gas frees — Ventilates — Cools  
and it's portable!



- CP-20 high volume ventilator—11,200 cfm
- Fits standard 20" manways.
- Steam or compressed air turbine drive.
- Speeds up "turn-arounds"
- Flip-flop design for supply or exhaust applications.



Fast degassing, ventilating and cooling large process vessels, fractionators, stills, reactors, storage tanks. Gets maintenance men on the job sooner — reduces turn-around time, reduces costs.

Ideal for painting, lining and construction contractors during welding, chipping, sandblasting, painting.

IN-STOCK

Immediate shipment from stock locations world-wide.



Specialists in  
Portable Ventilation

**COPPUS**

ENGINEERING CORPORATION

Main Office: 344 Park Ave., Worcester, Mass. 01610 U.S.A.  
Europe, Middle East, Africa: Seefeldstrasse 14, 8008 Zurich, Switzerland

**GENERAL METALS  
IS DISMANTLING**

**11, V-4 TUGS**

Engine room parts, valves, etc. Deck equipment also available including Almon Johnson series 225 towing winches. Tugs are complete except for wheel house equipment. Electrical parts run on 230V D.C.

**CI-M-AVI  
CONVERTED TO  
MISSILE TRACKER**

**COASTAL CRUSADER**

This is a modern updated vessel complete with Nordberg T.S.M., main engine, 2 - D343 Cat w/Kato 230/460 A.C. and 200 K.W. Generators, 2 Waukesha V-12 model L5790 DSU w/500 K.W. G.E. D.C. generators, deck equipment, modern crew living quarters and office furniture.

We also stock fans, generators, pumps, and motors for victory ships, destroyers and destroyer escorts.

For information contact:  
Lane Whitmore or Marty Brashem at (206) 572-4000



1902 Marine View Drive  
Tacoma, Wa 98122  
(206) 572-4000

Telex: 327435 TAC • Cable: GENMETEX

**Barker Elected Chairman  
Of 1977 AOTOS Committee**

James R. Barker, chairman, president and chief executive officer of Moore McCormack Resources, Inc., Stamford, Conn., has been elected chairman of the 1977 Admiral of the Ocean Sea Award (AOTOS) committee, succeeding **Thomas J. Smith**, the president of Farrell Lines.

The award, a silver statue of Christopher Columbus, represents that granted to Columbus by Queen Isabella of Spain in 1493. This year's recipient is **James A. Farrell Jr.**, the chairman of Farrell Lines.

**Sixth LNG/LPG Meeting  
Gastech 78 To Be Held  
Nov. 7-10 In Monte Carlo**

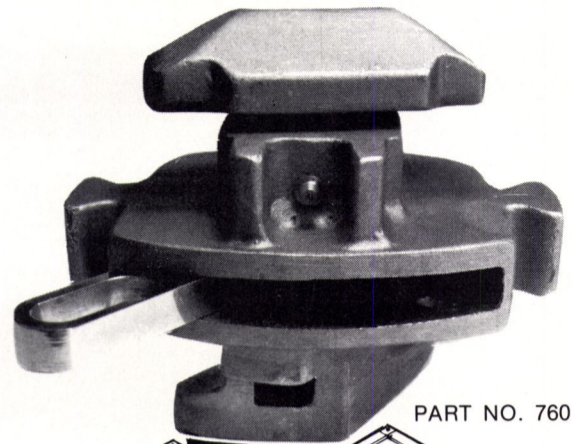
Gastech 78, the sixth LNG/LPG meeting in the series, will be held from November 7-10, 1978, in the new Spelugues Conference Centre in Monte Carlo, Monaco. The meeting thus returns to Europe, following the outstandingly successful Gastech 76 conference and exhibition in New York last year at which more than 1,000 participants were registered.

The Gastech 78 meeting will bring together leading specialists from the world's liquid natural gas and liquid petroleum gas industries for the presentation of a comprehensive and varied program of conference papers and for working discussions in a relaxed, informal atmosphere. As with previous Gastech meetings, there will be a program of technical tours. These will be to centers of advanced French technology in the liquid gas industries, including shipbuilding, storage and gas terminals.

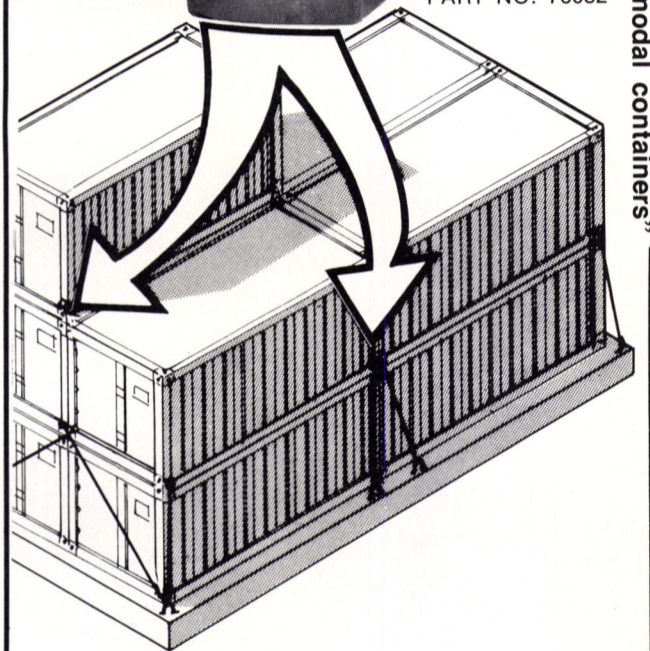
An associated exhibition of LNG/LPG equipment and services will be held in conjunction with the 1978 conference. A number of companies have already reserved stands and as the total space available in the Monte Carlo venue is relatively restricted, the organizers anticipate that all stands will soon be booked.

The Gastech 78 Papers Committee will shortly be meeting to consider the format of the conference program: intending speakers are invited to write to the Gastech Secretariat, 2 Station Road, Rickmansworth, Herts WD3 1QP, England, for fuller particulars.

**THE NEW  
"FASTLOC"  
FROM LINE FAST**



PART NO. 76032



"Specialists in handling and securing intermodal containers"

Line Fast's new Fastloc® has many timesaving features, such as the anti-jamming device for free lever operation which eliminates one of the major problems encountered in leverlock securing.

Another time and money saving feature is the "Dog Bone", which enables side-by-side bridging of stacked containers.

The Fastloc® can be installed safely and speedily to the bottom of a container before it is lifted aboard the ship. This bottom lock feature, together with a pole-activated handle, eliminates the need to have men climbing atop the containers.

We promised for years to be ahead of our competition and we kept our promise again.

For more information, write or call...

Request a catalog of container fittings from:



805 Grundy Ave. Holbrook, New York 11741 U.S.A.  
516-981-8666 TELEX 12-6512

L.F. has Reprs. in every container port in the U.S. and Canada.

**MARITIME  
REPORTER  
AND  
ENGINEERING NEWS**

107 EAST 31st STREET  
NEW YORK, N. Y. 10016

Murray Hill 9-3266, 3267,  
3268, 3269

ESTABLISHED 1939

Maritime Reporter/Engineering News is published the 1st and 15th of each month by Maritime Activity Reports, Inc. Controlled Circulation postage paid at Waterbury, Connecticut 06701.

Postmaster send notification (Form 3579) regarding undeliverable magazines to Maritime Reporter/Engineering News, 107 East 31st Street, New York, N.Y. 10016.

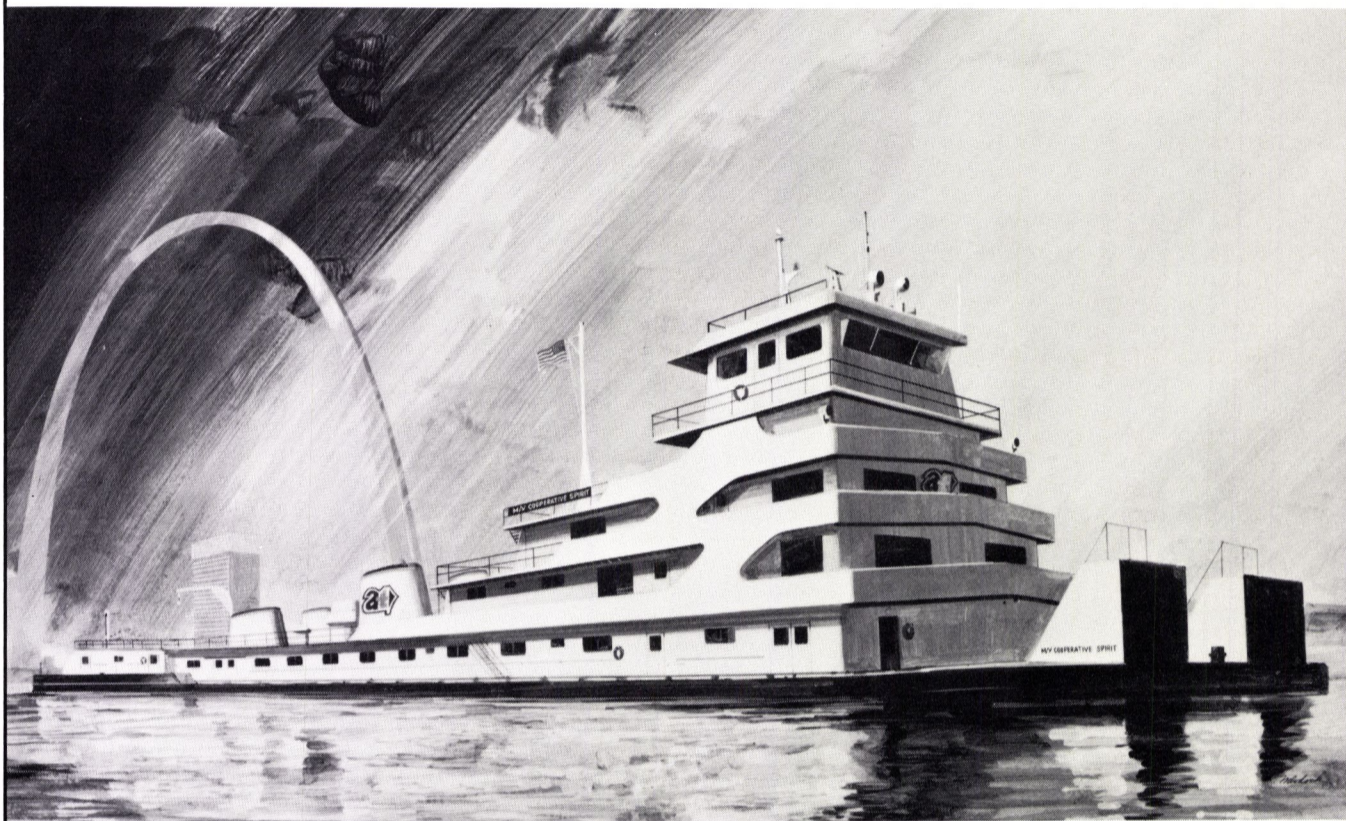
Member



Business Publications  
Audit of Circulation, Inc.



# THE FARMERS' **MR. BIG**



**The M/V Cooperative Spirit, purchased by Agri-Trans Corporation.**

Among river transportation companies, Agri-Trans Corporation is unique. It is the only barge line owned and operated by farmer cooperatives. The new M/V Cooperative Spirit is also unique. At launching, it became the largest commercial towboat operating on the Mississippi River system. This 10,500 hp, triple screw **HYDRODYNE** measures 200 by 54 by 12 feet. The Hydrodyne name identifies St. Louis Ship's exclusive combination of hull lines, nozzle and propeller design, rudder configuration and steering system. All are designed to produce greater performance in pushing and backing, with special emphasis on improved, maneuvering and steering ability. The Hydrodyne's increased efficiency results in more PUSH with less fuel. Whether you need a "MR. BIG," like Agri-Trans, or a much smaller towboat, St. Louis Ship will design a Hydrodyne of any size. It will increase your profits, too. Telephone (314) 638-4000.



**ST. LOUIS SHIP**

DIVISION OF POTT INDUSTRIES INC.  
611 EAST MARCEAU STREET, ST. LOUIS, MO. 63111

New York, Chicago, Kansas City, New Orleans, Memphis, Minneapolis, Houston and Mobile.



## Nichols/Pittman/Choate Purchase Cox Interest In Mississippi Marine

John Nichols, president of Mississippi Marine Towboat Corporation, Greenville, Miss., announced recently that he and partners T.R. Pittman and Mrs. Lillie M. (Skeeter) Choate of Greenville, have purchased the John H. Cox family interest in

Mississippi Marine for an undisclosed amount.

John H. Cox, founder, established the firm in the mid-1960s under the name Mississippi Marine Corp. The late Walter L. Choate, and T.R. Pittman joined him later as partners. In 1972, Mr. Nichols joined the firm as president and the company name was changed.

Mississippi Marine, one of the largest shipbuilding operations in

Greenville, is located on Lake Ferguson, and specializes in all phases of marine construction and repair.

Messrs. Nichols and Pittman and Mrs. Choate plan to extend Mississippi Marine Towboat Corporation specialties to the construction of offshore supply boats and tugs. An additional 2,500-ton drydock and expansion of the present repair facility is also planned. Mr. Nichols will remain

president, while Mr. Pittman takes the secretary-treasurer position formerly held by Mr. Cox.

Mr. Pittman, a custom agricultural machine operator and planter, has extensive agricultural operations south of the city, as well as being active in speculative petroleum prospecting. He is also owner of Pitcox Barge Corp. and co-owner (with Mrs. Choate) of Cox Towing Corp.

Mrs. Choate, in addition to her share in Mississippi Marine and Cox Towing Corp., also owns Chocox Barge Corp. and Choate Furniture Mart.

Mr. Nichols is co-owner of Nichols Propeller Company.

## Japanese Shipbuilders Association Elects Dr. Shinto President



Dr. Hisashi Shinto

The Shipbuilders' Association of Japan recently elected new managing directors.

Dr. Hisashi Shinto, president of IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.), became president of the Association, while Gakuji Moriya, president of Mitsubishi Heavy Industries, Ltd., Tsunesaburo Nishimura, president of Sumitomo Heavy Industries, Ltd., and Kageki Minami, president of Osaka Shipbuilding Co., Ltd., were elected to the posts of vice president.

Dr. Shinto is one of the leading authorities of Japan's shipbuilding industry. He took his doctorate in engineering in 1958 with a thesis entitled "A Study of Production Control of New Shipbuilding." Representative among his writings is "Japanese Shipbuilding Industry after World War II" (written on May 15, 1967).

Dr. Shinto graduated from Kyushu Imperial University (naval architecture), and also received his D. Eng. degree from Kyushu.

In November 1970, Dr. Shinto was awarded a Blue Ribbon Medal from the Japanese Government. In May 1973, he became a Meritorious member of The Society of Naval Architects of Japan. In November 1975, he was commended by the Minister of Transport of Japan in recognition of his services in the development of modern shipbuilding techniques, and in May 1977 he was awarded the "Legion d'Honneur" by the French Government.



# Some Men Read For Pleasure...

# Some Men Read For Profit.

Smart shipowners and operators know that one of the best ways to save money is to specify proven coatings systems formulated specifically for the job at hand.

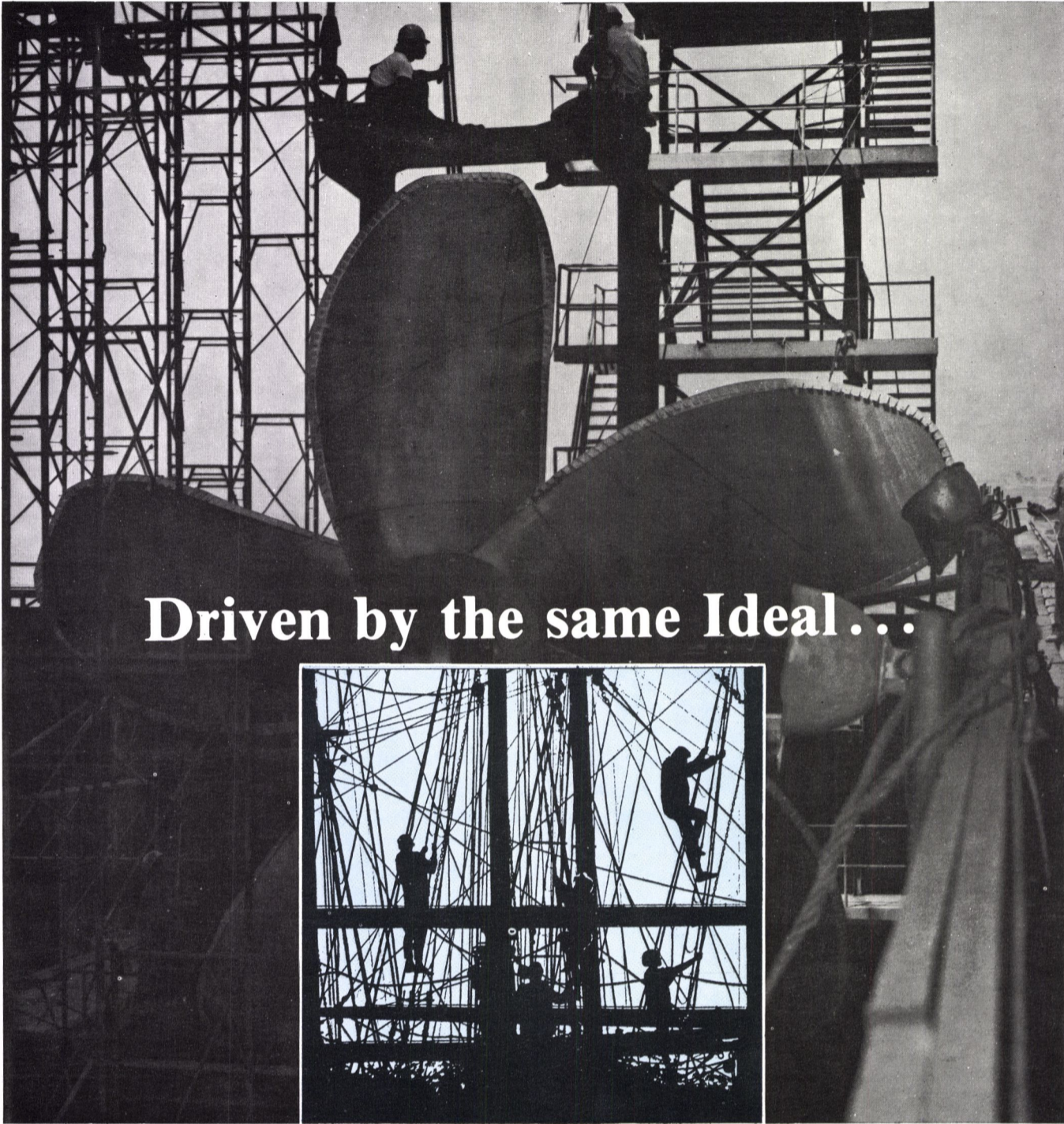
Experience is the best teacher. And the experience at International spans almost 100 years of normal protective coatings maintenance. Most of the information is contained in our Marine Painting Specifications & Product Data manual. What isn't there is in our lab, expertise and personal knowledge based on experience. We'd like to share it with you. Just give us a call.



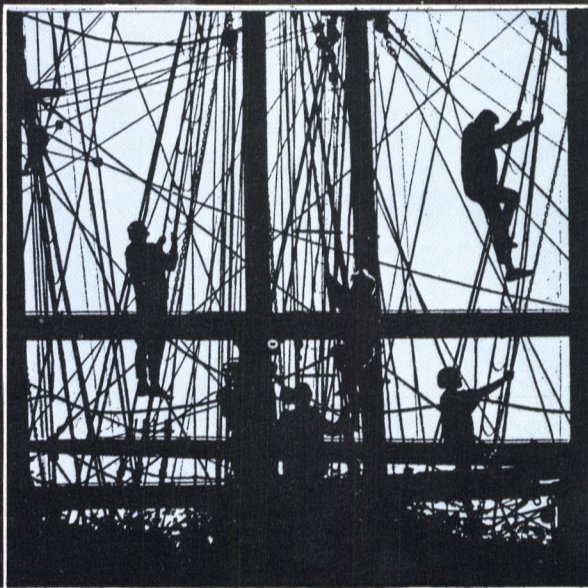
## International Marine Coatings

Corporate Headquarters: 17 Battery Place North, New York, NY 10004  
3915 Louisa Street, P.O. Box 26067, New Orleans, LA 70186  
220 South Linden Avenue, South San Francisco, CA 94080





**Driven by the same Ideal...**



## **PERFECTION**

. . . utilizing the best tools, materials and talents available  
to provide a product of ultimate excellence.  
Now, as then, a proud tradition . . . the driving spirit  
of one of America's great shipyards.

# **NASSCO**

## **NATIONAL STEEL AND SHIPBUILDING COMPANY**

*Owned by Kaiser Industries Corporation and Morrison-Knudsen Company, Inc.  
San Diego, California 92138 Phone (714) 232-4011*



## Bethlehem To Reconstruct Four PFEL Ships At Cost Of \$5 Million Each

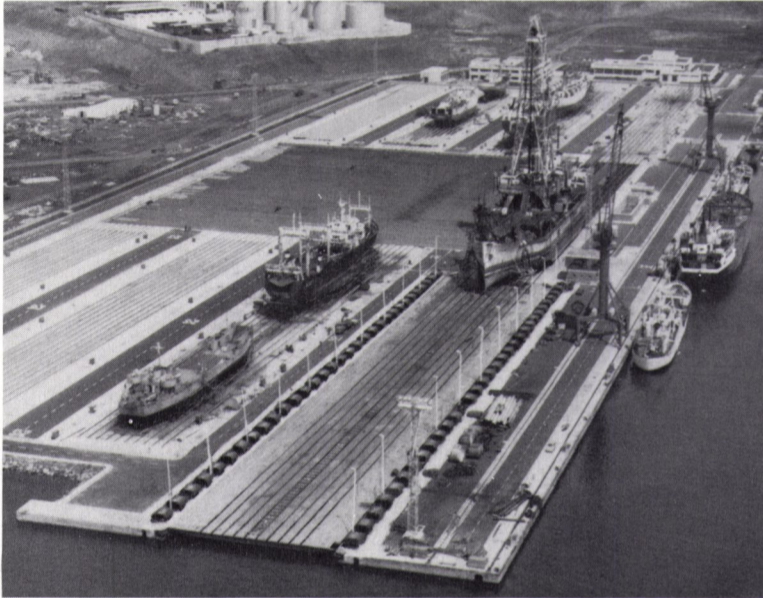
The Maritime Subsidy Board has approved the application of Pacific Far East Line, Inc. (PFEL), One Embarcadero Center, San Francisco, Calif., for construction-differential subsidy (CDS) for the reconstruction of

four LASH barge carriers into full containerships at Bethlehem Steel's San Francisco shipyard.

The four ships are the Thomas E. Cuffe, Golden Bear, Japan Bear, and the Pacific Bear, all built in 1971 and 1972 at Avondale Shipyards, Inc., New Orleans, La. Each 820-foot vessel is presently rated at 29,820 dwt and is capable of accommodating 49 barges and 344 twenty-foot

containers or 69 barges only. Reconstruction will consist of removing LASH-handling equipment and installing container cells, new hatch covers, supporting structures, guides, deck reinforcements, and other modifications. After reconstruction, each ship will accommodate 1,740 twenty-foot equivalent units (TEUs) and operate with 37 crewmen.

PFEL and Bethlehem Steel Corporation have entered into a fixed-price contract of \$5.1 million per vessel. The Maritime Administration will pay CDS of \$2.2 million each, a CDS rate of 42.64 percent. In a related action, the Assistant Secretary also approved in principle the Title XI application which PFEL submitted for the reconstruction. After the work is completed, the ships will operate on subsidized service between California and the Far East (Trade Route 29).



LAS PALMAS, CANARY ISLANDS  
Platform: 171.6 meters by 30 meters, lifts vessels up to 25,000 d.w.t.

## SYNCROLIFT

### 20 years of shiplifting experience.

- 117 installations in 53 countries.
- used by 22 national navies.
- more than 150,000 individual dockings and transfers completed.

### Most economical shiplift system.

- lower cost of installation, maintenance and operation than any comparable system.
- ONLY shiplift system with continuous lifting.
- faster docking speed than any other system.

### 3 Year warranty on all components.

### 1 Year free field service after completion.

### Proposals, quotations, and visits by engineers at no cost or obligation.

### Designed to classifications standards of:

- Lloyd's Register of Shipping.
- American Bureau of Shipping.
- Germanischer Lloyd.

## Pearlson Engineering Co.

P.O. Box 560008 • 8970 S.W. 87th Court  
Miami, Florida 33156 U.S.A. • Phone: 305/271-5721  
Telex: 051-9340 • Cable: SYNCROLIFT

LONDON: 17 Devonshire St., London W1N 1FS, U.K.  
Telephone: 323-2855 • Telex: 23717

World's most experienced  
builder of shiplift systems.

## Federal Barge Lines

Names David Ruffner

Manager Eastern Region



David B. Ruffner

David B. Ruffner has been appointed manager-Eastern region for Federal Barge Lines, Inc., it was announced by Thomas F. Maloney, vice president-marketing of the St. Louis, Mo.-based common carrier. Mr. Ruffner will establish new regional offices for Federal in Pittsburgh, Pa. 15222. His address will be 886 Kossman Building, located at Stanwix Street and Forbes Avenue.

In his new position, Mr. Ruffner will be responsible for all marketing, as well as operational aspects of Federal Barge Lines' service in his region. Federal's Eastern region territory extends from the Indiana-Ohio state line east to the Atlantic Coast, and includes the Ohio River Valley area. From his Pittsburgh base, Mr. Ruffner will frequently visit Cleveland, Youngstown, and Cincinnati, Ohio, Louisville, Ky., New York City, Philadelphia, Pa., and other leading cities. Federal Barge Lines, Inc. is a division of Pott Industries Inc. It is one of the five largest barge lines in the United States.

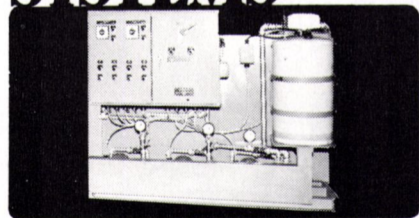
Prior to his joining the management staff at Federal Barge Lines, Mr. Ruffner served with another major barge line for nearly 11 years.

Mr. Ruffner is a 1963 graduate of Hartwick College, Oneonta, N.Y., with a major in business administration. He has done graduate studies at Washington University, St. Louis, and the University of Houston. He is currently a member of the board, Calumet Traffic Club; vice president, Illinois River Carrier Association; a member of the South Suburban Traffic Club, and a member of the Japan American Society.

## USCG CERTIFIED SHIPBOARD SEWAGE SYSTEMS

Following is  
a partial list  
of current users:

American Export Lines  
American Oil Company  
Costa Lines  
Global Marine  
Hendy International  
Martran  
Mobil Oil Corporation  
Nippon Kokan  
Seatrain Shipbuilding  
Sumitoma  
Sun Oil Co.



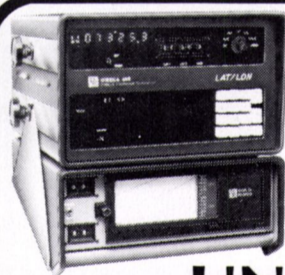
Flow-through treatment in all sizes, proven by years of shipboard use. Automatic operation, low maintenance, and installation costs. Certified for immediate installation on all restricted waters.

MSS-PT High Volume Treatment System  
MTT-3 Compact Treatment System  
MTT-4 Holding Tank Conversion System  
MTS Sewage Transfer System

## MARLAND

Environmental Systems, Inc.  
A member of the LaMere Family  
LaMere • Clear Water, • Marland  
127C Main St., Walworth, WI 53284  
414/275-2171

Marine Sanitation Devices to meet the unique needs of the commercial marine industry, by the people who are specialists in marine pollution equipment



## HERE'S AN OMEGA YOU CAN UNDERSTAND!

### DYNELL'S AUTOMATIC OMEGA 400 FEATURES:

- Direct latitude/longitude readout
- Easy to operate, no need for special charts and tables
- Highly accurate GMT and date display
- Dynell Omega 300's can be easily converted to latitude/longitude at low cost

THE GLOBAL NAVIGATION SYSTEM YOU NEED,  
AT A PRICE YOU CAN AFFORD...



FOR INFORMATION CONTACT  
WALTER PERLOWSKI

## DYNELL ELECTRONICS CORP

536 Broadhollow Road, Melville, N.Y. 11746  
(516) 694-8910 TWX 510-224-6533



## McAllister Adds 4,290-HP Tug To Hampton Roads Fleet



The new 123-foot Eileen McAllister, powered by two EMD 16-645 E6A diesel engines, is the largest of eight McAllister tugs operating in the Hampton Roads area.

Newest addition to the tugboat fleet of McAllister Brothers is the Eileen McAllister, a 4,290-hp vessel just put into operation at Norfolk, Va., for service in the growing Hampton Roads Harbor area.

The vessel was named for, and christened at the Norfolk International Terminal by Mrs. Eileen McAllister Donovan, a great-granddaughter of Capt. James McAllister, who founded the marine transportation company in New York in 1864.

Present at the christening ceremonies were 200 distinguished guests and their spouses from the Norfolk Hampton Roads area.

Bruce McAllister, president of the marine towing company, stated in remarks during the christening ceremony: "The addition of the Eileen to our Hampton Roads fleet gives the port much needed additional service to handle its expanding marine traffic, and also makes available a modern seagoing vessel for ocean tows and offshore rescue work."

The Eileen McAllister, which was designed by Donald C. Hankin of McAllister Brothers and constructed this year at Main Iron Works, Houma, La., joins a fleet of seven other company tugs in the area and will be the most

powerful of them all. She is 123 feet overall, with a beam of 34 feet, depth of hold of 18 feet 6 inches, has a working draft of 16 feet 6 inches, and a speed of 14½ knots. Crew space for 10 men and storage fuel capacity and refrigeration for 25 days for ocean tows have been provided. She is powered by two EMD 16-645 E6A diesel engines.



Mrs. Eileen McAllister Donovan, assisted by her daughter Eileen, breaks the bottle on the bow of her namesake tug in Norfolk Harbor. In this close-up, Neill McAllister, vice president of McAllister Brothers, serves as instructor. Over 200 guests attended from the Hampton Roads area.

ers. PLI, headquartered in Suite 3601, One World Trade Center, New York, N.Y., operates U.S.-flag vessels in the foreign trade, including regular cargo-passenger service from the West Coast of the United States to ports on the East and West Coasts of South America.

The proposed consulting contract would include, but not be limited to, advice and assistance related to the operation maintenance, and repair of the river vessels and matters involving the furnishing of so-called "hotel services" (food and lodging) on the vessels, and the marketing of the river passenger service. The consulting agreement would be terminated on December 31, 1980, unless sooner ended, on six months' notice, by either party.

## Prudential Lines Plans Entry Into Inland River Steamboat Operations

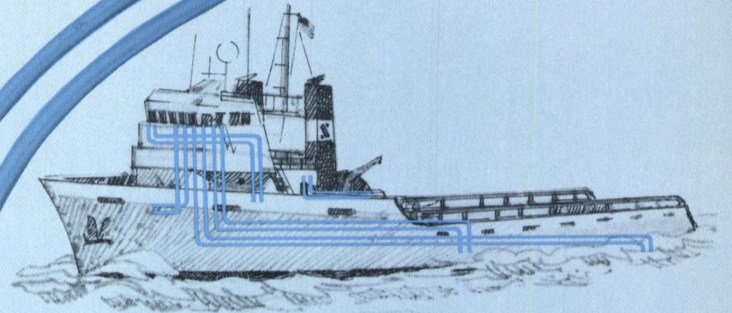
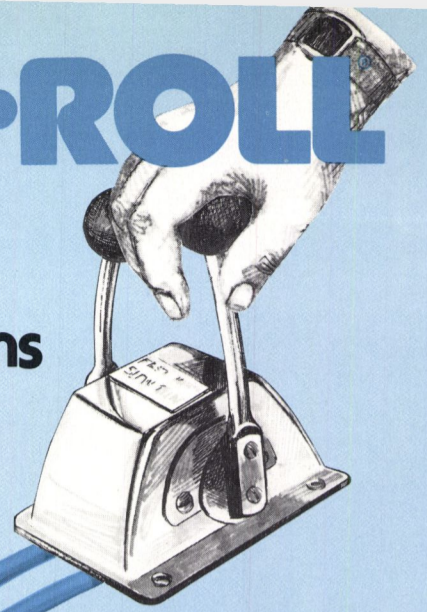
The Assistant Secretary, U.S. Department of Commerce, Maritime Administration, has authorized publication in the Federal Register of notice that Prudential Lines, Inc. (PLI) has applied for MarAd approval of a consulting agreement under which PLI would provide advice and assistance to Delta Queen Steamboat Co., with an option, conditionally, to purchase 40 percent of the steamboat firm's equity.

Delta Queen Steamboat Co. of 511 Main Street, Cincinnati, Ohio, operates the passenger vessels Delta Queen and Mississippi Queen on the Mississippi and Ohio Riv-

June 15, 1977

# ACCU-ROLL

The first  
push/pull  
control systems  
featuring  
captive  
ball-bearing  
cages



## applications in service

- Throttle/shift control systems
- Remote valving systems
- Steering control systems
- Ventilation control systems

## system performance

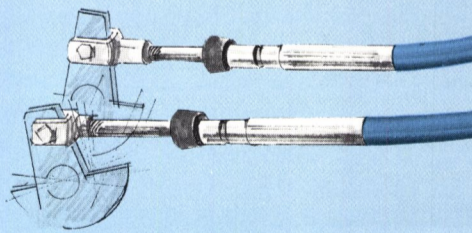
- 90% efficient transmission over any length or configuration
- Ultimate system efficiency in both tension and compression
- Reliable stainless steel components
- Captive ball-bearing cages provide greater system reliability and longer life

## reduced system costs

A single Accu-Roll cable can eliminate rod and crank, long chain and sprocket or cable/pulley systems. At the same time, it provides effective system cost reductions through elimination of unneeded accessories and/or components and reduced installation and maintenance costs.

**Teleflex** Incorporated  
(U.S.A.)

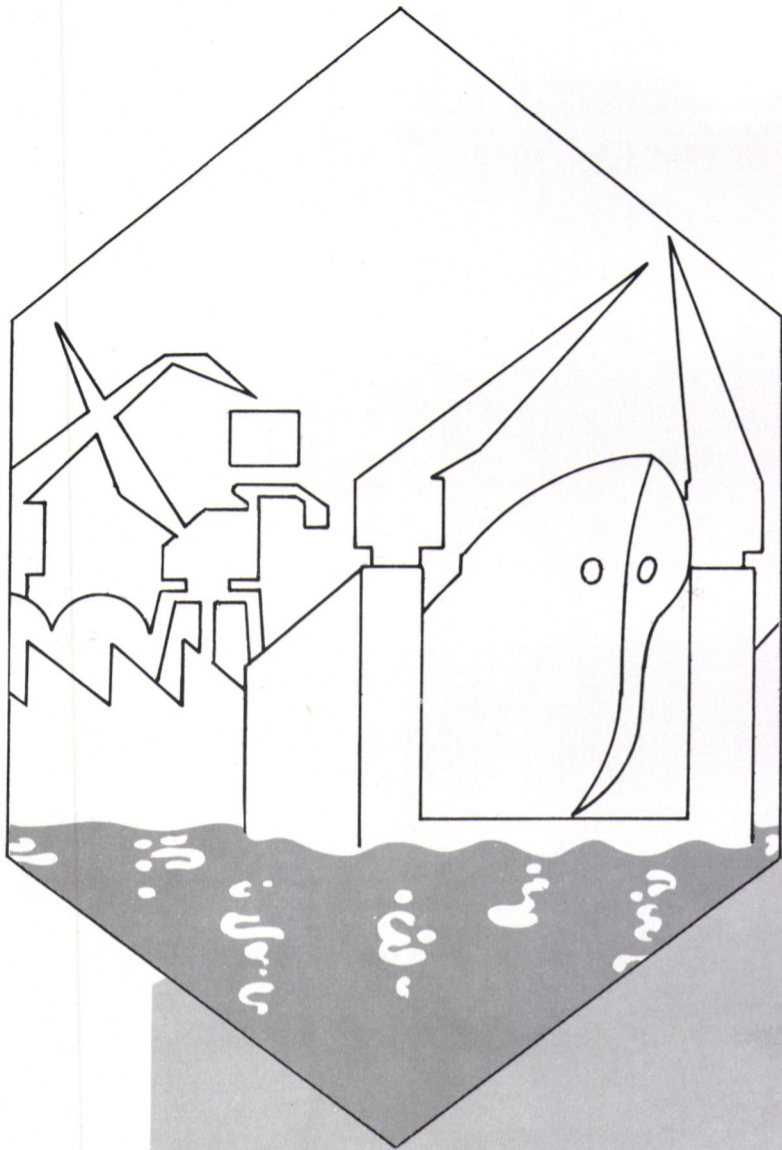
P. O. Box 218, North Wales, Pennsylvania 19454  
215/699-4861 • Telex 84-6446 • TWX 510-661-8231



TELEFLEX INCORPORATED  
P.O. Box 218 North Wales, Pa. 19454  
Attn: Richard T. Lampitoc  
I would like to know more about ACCU-ROLL

Name/Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_





**SPECIALIZED SHIPBUILDING  
AND SHIP REPAIR SERVICES  
IN EUROPE**

*Floating docks up to 80,000 ton lift capacity,  
lengthening and repair conversions,  
of all types of vessels.*

- Known the world over for excellence in ship repair and new construction of specialty vessels.
- Used commercial and fishing vessels.
- All types of repairs to ships, hulls, electronic equipment, damage repairs to engine rooms and ship installations.
- Special tonnage of various types—fishing vessels, passenger/cargo vessels and a variety of craft for inland and coastal navigation.
- Yachts, sports and pleasure craft, diesel engines and small vessels for fishing fleets.

Call or write for brochure:

**NAVIMOR U.S.A.**

One World Trade Center—suite 3557  
New York, N.Y. 10048

Phone: 212 432 5058  
Telex: RCA 232447



## Model Of National Monument Honoring American Seamen Unveiled On Maritime Day



At the unveiling of a miniature of the monument, which will be 25 feet high, are left to right: (Front Row) **George McCartney**, vice president of Seafarers International Union; **Mel Barisic**, secretary-treasurer, National Maritime Union of America; Adm. **William F. Rea III**, USCG, Commander Atlantic Area, Third USCG District, and Adm. **John M. Will**, USN (ret.), president of Arthur Tickle Engineering Works. (Back Row): Dr. **William J. Ronan**, chairman of the Port Authority of New York and New Jersey and chairman of World Trade Week Committee 1977; Capt. **Thomas A. King**, Director, Eastern Region, U.S. Department of Commerce and president of The Propeller Club, Port of New York; the Honorable **John M. Murphy**, Chairman of the House Merchant Marine and Fisheries Committee; **James P. McAllister**, chairman of the board, McAllister Bros., Inc. and honorary chairman maritime industry, World Trade Week Committee, and Capt. **Robert E. Hart**, president, Marine Index Bureau, Inc., and general chairman, National Maritime Day 1977.

America's merchant marine industry, after 200 years, will build a national monument on the New York waterfront to the thousands of merchant seamen who died at sea in the service of their country in war and peace.

Announcement of the Merchant Mariner's Memorial was made, appropriately, on National Maritime Day by Congressman **John M. Murphy**, Chairman of the House Merchant Marine and Fisheries Committee. The Congressman was a special guest of honor at the New York observance.

Port Authority chairman **William J. Ronan** and Congressman **Murphy** unveiled a model of the Memorial at public ceremonies on the plaza of the World Trade Center, also marking the start of World Trade Week.

Dr. **Ronan**, who spoke in his role as chairman of the World Trade Week Committee for the New York-New Jersey Port area, told several hundred invited guests and several thousand Trade Center employees and members of the general public that foreign trade was the keystone of the area's economy. "Nearly half a million people earn their livelihood from the Port," he said, "and foreign commerce valued at \$43.5 billion moved through the New York-New Jersey area last year."

It was a day long to be remembered in the annals of the World Trade Center, which will mark its seventh anniversary of operation in December. It was the first time that the five-acre plaza—the largest such public space in New York City—was opened to the public.

Maritime Day ceremonies on the plaza were the occasion for a stirring review by cadets from

the U.S. Merchant Marine Academy at Kings Point, N.Y., which included the Regimental Band and Color Guards under the direction of Comdr. **Kenneth R. Force**. The review featured marching and exercises by the Precision Rifle Squad, including 100 parading color bearers carrying 50 state flags and an equal number of American flags.

Not to be outdone, Director **William Reynolds** and the Color Guard and Glee Club of the State University of New York Maritime College at Fort Schuyler presented their own review. They presented three sea chanteys, to bring a proper nautical touch to the observance of National Maritime Day in the nation's leading port.

It was a solemn day too.

Invited guests from the maritime industry earlier in the morning had begun Maritime Day with an ecumenical service at the Seamen's Church Institute on nearby State Street. There, they observed a moment of silence for those merchant seamen who lost their lives at sea in the last year.

At the plaza, representatives of labor, management and government from the maritime industry laid the traditional memorial wreath, normally cast into the waters of the harbor, instead at the base of the model of the New York waterfront monument, to merchant seamen lost at sea.

Then the model was unveiled by Congressman **Murphy**, assisted by Dr. **Ronan**. Also participating were **James P. McAllister**, honorary chairman of World Trade Week for the maritime industry, and Capt. **Robert E. Hart**, USN (ret.), general chairman of the

Maritime Day program. Representations of four white ships' bows, pointing to each direction of the compass, surrounded a gleaming golden flag pole in the center of the model.

In actuality, each ship's bow will be of white steel, 25 feet high. The bows will come from a shipyard in each of the nation's four coastal regions, it is hoped by the nonprofit group from the maritime industry sponsoring the Memorial.

Captain **Hart**, president of the Marine Index Bureau, Inc., who directed the committee which put the program together, presided over the hour-long ceremony.

The plaza will remain open as a landscaped haven for thousands of office workers in the Trade Center and surrounding areas. The park-like area will also attract many thousands of visitors.

Many will go in clear weather to the rooftop observation deck of the South Tower Building, Two World Trade Center. There, 1,377 feet above the plaza—more than a quarter of a mile high—they will look out into the bistate harbor. They will see the stately procession of ships manned by our own merchant marine and the merchant seamen of America's trading partners, steaming in and out of port.

## Research Contracts To Combustion Engineering And Mortada International

The Maritime Administration has awarded two research and development contracts concerning marine fuels. The first is a \$172,000, nine-month contract to Combustion Engineering, Incorporated, Windsor, Conn., to develop and test a device to measure the effectiveness of various marine burners in atomizing residual fuel oils. When completed, the device will be installed in Combustion Engineering's Fuel Burning Test Facility and used to evaluate atomization improvements on marine burners.

The second contract, for \$102,000 and one year, was awarded to Mortada International, Dallas, Texas, to study the pricing of marine bunker fuels. The study will analyze elements that determine the cost of marine bunkers, such as production, refining, transportation, tariffs, duties, and taxes, and the impact of various domestic, social, environmental, and industrial factors on No. 6 bunker "C" fuel and marine diesel fuel.

The firm will also evaluate the influence which fuel prices have on freight rates and the effects of capital cost improvements in reducing fuel costs. Ultimately, a mathematical model will be developed to permit shipowners and operators to evaluate available options for reducing fuel costs while maintaining a reasonable degree of service.

## New GE MST-21 9,000-19,000 SHP Steam Turbine Available

The new General Electric MST-21 low-horsepower, geared marine steam turbine ship-propulsion power plant, designed specifically for the 9,000-19,000 shp range, is now available.

The MST-21 was developed by GE to meet the propulsion requirements of low-horsepower ships, such as coastal tankers and container feed ships.

Featuring a base plant all-purpose fuel rate of below 0.50 lbs/shp-hr at 9,000 shp, the MST-21 brings traditional steam-plant reliability and economy to the lower horsepower ranges. To further improve savings, the MST-21 offers special options, which can improve fuel rate by as much as 19 percent.

Manufactured by the General Electric Medium Steam Turbine Department in Lynn, Mass., the MST-21 meets the requirements of shipowners and shipyards for a propulsion plant that operates on inexpensive, low-grade fuels while keeping maintenance costs low. The MST-21 is modularized in construction for simple operation, and does not require specialized crew capabilities.

The base plant is a bridge-controlled, geared, cross-compound marine steam turbine with steam conditions of 850 psig at 950F non reheat, at 1.5" Hga, with power ranges from 9,000-19,000 shp. The MST-21 has four stages of feedwater heating, dual economizers and steam air heater, and cascaded extractions for improved part-load performance. Although designed for single-screw applications, with two boilers standard, the MST-21 offers great flexibility in individual design.

Various options available for the MST-21 can improve the fuel rate by as much as 19 percent. The options include attached generator and boiler feed pump, reduced condenser pressure, regenerative gas air heater, initial steam pressure 900 psig, reheat, Therma-Coupled™ turbines, for twin-screw ships, and low propeller speed. Other MST-21 options include a choice of axial or downward exhaust turbines, boiler-and-a-half arrangements and a c-p propeller.

Available now, the new MST-21 fills the requirements of shipowners and operators for economy, reliability, and flexibility in low-horsepower ship propulsion power plants. For a complete description of the MST-21, write to **F.G. Folsom Jr.**, General Electric Company, Medium Steam Turbine Dept., 1100 Western Avenue, Lynn, Mass. 01910.





Dusseldorf boasts the most modern trade fairgrounds in Europe, with 1,357,663 square feet of exhibition area at ground floor level, fully air-conditioned; 10,764 square feet of moving walkways and pedestrian bridges, and 409,032 square feet of open air exhibition area.

## LNG-5 ... Dusseldorf

Authors from 13 countries will present more than 40 technical papers to some 2,000 delegates expected to attend the Fifth International Conference and Exhibition on Liquefied Natural Gas (LNG-5) scheduled August 29-September 1, 1977, in Dusseldorf, West Germany.

**Aman R. Khan**, a vice chairman of the conference and executive advisor on international programs for the Institute of Gas Technology, said presentations are divided into four session topics on: "The Role of LNG in World Energy Supply," "LNG Technology and its Economic Implications," "Financing, Legal and Policy Aspects on LNG Trade," and "Transportation of LNG."

The Institute of Gas Technology, an energy research and education center, Chicago, Ill., is co-sponsoring the conference at Dusseldorf Congress Center with the International Gas Union, London, England, and the Interna-

tional Institute of Refrigeration, Paris, France.

The exhibition at the Dusseldorf Fair Grounds adjacent to the Congress Center will display advances in LNG technology since 1974, when more than 1,500 delegates attended the LNG-4 conference in Algiers. A preliminary list of exhibitors includes more than 90 companies and organizations from 12 countries who have contracted to display equipment and exhibits on: liquefaction at cryogenic temperatures; treatment of gases prior to liquefaction; separation of gases for component recovery; pipelines, valves and pumps for transporting liquefied cryogenic gases; cryogenic storage of liquefied gases; transporting and unloading cryogenic gases; LNG terminals; vehicles for transporting cryogenic gases; gasifying liquefied cryogenic gases; treatment of LNG; and accessories.

In addition to the formal pres-

entations, workshop sessions are scheduled on five topics related to the conference papers: "The Future Role of LNG in Energy Supply," "The Future of LNG Transport," "Offshore LNG Projects," "LNG Operating and Reliability Experiences," and "Safety, Legal and Financial Aspects of LNG."

Post-conference tours to LNG-related plants in Belgium, France, Germany and the Netherlands may be arranged September 2 or 3. In addition, a six-day motor coach and steamer tour of Germany may be scheduled for a minimum of 40 people, following the conference.

Held under the patronage of Herr **Walter Scheel**, President of the Federal Republic of Germany, the conference and exhibit is being organized by the Deutscher Verein von Gas- und Wasserfachmannern (DVGW), the West German Gas Association. The exhibition portion is being managed

by Dusseldorfer Messegesellschaft mbH (NOWEA).

The co-chairmen of the conference are **James Kerr**, chairman and chief executive officer of TransCanada PipeLines, Canada, who serves as president of the International Gas Union, and Dr. **Christoph Brecht**, a member of the executive board of Ruhrgas AG, Essen, West Germany. Serving as a vice chairman with Mr. Khan is Prof. **Geoffrey Haselden** of the University of Leeds, Yorkshire, England, representing the International Institute of Refrigeration.

For conference information, address: Deutscher Verein von Gas- und Wasserfachmannern e.V. (DVGW), Frankfurter Allee 27, D-6236 Eschborn, Federal Republic of Germany.

For exhibitor information, address: Dusseldorfer Messegesellschaft mbH -NOWEA-, Zentralbereich 1, Postfach 32 02 03,

(continued on page 13)



D-4000 Düsseldorf 30, Federal Republic of Germany; or its U.S. representative, German American Chamber of Commerce, **Nikolaus Gentzen**, 666 Fifth Avenue, New York, N.Y. 10019, or **Louis L. Phannenstiel**, LNG-5 Exhibition Committee, Air Products & Chemicals, Inc., P.O. Box 538, Allentown, Pa. 18105.

#### Technical Program for LNG-5 Monday, August 29, 1977

**Session I: The Role of LNG in World Energy Supply.** Session chairmen: **Chr. Brecht**, Federal Republic of Germany; **G.D. Carameros**, U.S.A.; **A. Kazi-Tani**, Algeria, and **A. Centeno**, Spain.

1. "The Prospects of LNG Export and its Limitations," by **T. Mossadeghi**, National Iranian Gas Co., Teheran, Iran.

The large-scale export of LNG is specifically dependent on its economic viability. This holds above all for the costs of liquefying and transport. The prospects of reducing these costs are negligible, although minimal improvements in liquefying plant and carrier vessels appear possible.

2. "The Future Market for LNG in the United States," by **C.G. Gams**, Ford, Bacon & Davis Inc., New York, U.S.A.

The future LNG market in the U.S. will develop within the framework of a balance of manifold influences, namely, politics, the economy, problems of trade balance, the assurance of supplies and other factors. The artificial market that has developed as a result of prices that were too low and which, among other things, has led to an unwarrantably high demand for natural gas, might be expected to disappear if the prices for natural gas become adjusted to the general level of overall energy prices. In the coming 10 to 25 years, the U.S. will be in a position to accept further quantities of LNG if they are offered at economically viable terms.

3. "LNG Situation in Europe," by **M.G. Bonfiglioli**, SNAM, Italy; **M.G. Centeno**, ENAGAS, Spain; **M. Pilloy**, Gaz de France, and **P. Soille**, Distrigaz, Belgium.

In 1964, supplies of LNG from Algeria to Europe began on a commercial scale. Today, Britain, France, Italy and Spain receive 8.4 thousand million cubic meters of natural gas annually in the form of LNG from Algeria and Libya. As a result of new agreements between Algeria, Belgium and France, this quantity will rise to 21.5 thousand million cubic meters annually by 1980. The structures of supply and consumption of LNG are discussed.

4. "A Review of Current LNG Ship Technology — and an Attempt to Rationalise," by **R.C. Ffooks**, Conch Methane, London, England.

There are now close on 25 different conceptions for LNG ships.

In some cases operational experience is available, in other cases not. After making an effort to achieve an objective comparison of all the systems, pointers which would lead to greater rationalization are sought.

5. "Energy Policy in Japan and the Role of LNG," by **Dr. Seiichi Hirakawa**, Professor at Tokyo University, and **Shigero Kusano**, Tokyo Gas Corporation Ltd.

As a consequence of the 1973 oil crisis, which led to a big disruption within the Japanese economy, a new energy policy with heavy emphasis on nuclear energy and increased imports of LNG was adopted. In 1974, natural gas consumption including LNG imports did not even amount to 2 percent of total energy consumption. By 1985, LNG imports are expected to increase to 42 million tons. The background of this policy, the prospects for future LNG projects and the role of the Japanese LNG and gas industries are discussed.

6. "Alternatives to LNG," by **B. Hunsaker**, El Paso LNG Co., Houston, U.S.A.

Although there are alternatives to LNG supplies, none of them would appear to be satisfactory in the immediate future in terms of price, quantities, temporal availability and environmental compatibility. Increased coal consumption is environmentally a bad thing; the use of coal for substitute gas production has been delayed; electricity as a substitute source of energy from coal is, against this, too costly. There are also many obstacles standing in the way of the development of nuclear energy, geothermal energy, oil shale production and solar energy.

7. "World LNG Trade: Present Status and Long Term Prospects," by **M.W.H. Peebles**, Shell International Gas Ltd., London, U.K.

The present status of LNG trade and the long-term prospects are discussed against the background of earlier LNG conferences. To these belong economic and other influencing factors which have a bearing on the development of LNG trade, and which even serve to hinder and delay. The future development of prices and the availability of LNG vessels in relation to the tonnage needed are also examined.

#### Tuesday, August 30, 1977

**Session II: LNG Technology and its Economic Implications.** Session chairmen: **A.W. Mellen**, U.S.A.; **M. Grenier**, France; **G.G. Haselden**, Great Britain, and **W. Forg**, Federal Republic of Germany.

1. "The Brunei Liquefied Natural Gas Plant," by **A.J.W. Ploum**, Brunei LNG Ltd., Brunei.

In 1968, Shell took over the management of the Brunei Japanese project. The project was completed in time. The first tankers were loaded in November 1972.

Construction and operation costs remain within the bounds envisaged. The planning and the organization during construction are described and improvements noted.

2. "The First Years of Operation of Skikda LNG Plant with a Discussion of Mercury Corrosion of Aluminium Cryogenic Exchangers," by **B. Khenat** and **T. Hasni**, Sonatrach, Algeria.

The plant is entering its fifth year of operation. This serves as an occasion for reporting on the most important operational failures and contractual problems between owner and builder and also on the staff employment. The main operational disruptions dealt with concern the cryogenic exchangers and damage caused by mercury. The efficiency of the plant as a whole, as well as its most vital parts, such as compressors, cryogenic exchangers and LNG storage reservoirs, are discussed.

3. "Operational Flexibility of LNG Plants using the Propane Precooled Multicomponent Refrigerant, MCR Process," by **N. Chatterjee**, **L.S. Gaumer** and **J.M. Geist**, Air Products, U.S.A.

For various reasons, plants do not work in practice in the conditions their designers intended. A well-conceived layout of the plant, both in whole and in part, becomes evidenced when a flexible mode of operation shows itself to be capable of ironing out discrepancies. The MRC process enables the cryogenic exchanger to operate through a wide range of conditions, and at the same time maintain a high degree of efficiency in the plant as a whole. The important variables which permit this flexibility are the composition of the refrigerant, its pressure upstream and downstream, the compressor, its flow rate and the propane pressures. On a basis of thermodynamic considerations, efficiency is compared to that of conventional systems.

4. "LNG Peak Shaving Plant, Maasvlakte," by **P.H. Bijl** and **P.N. Vet**, Nederlandse Gasunie, Groningen, NL.

This plant is unique inasmuch as it processes two liquid products from Groningen natural gas, LNG and nitrogen. In designing the preliminary scrubbing plant, the mercury problem received special attention. Eighty-five percent of energy requirements are provided by an expansion turbine in which the natural gas is expanded before being used in a powerplant. Additional details, such as storage reservoirs, evaporators and their capacity are dealt with.

5. "LNG Plants on Floating Structures—Intermediate Report on an Extensive Test Programme," by **E. Berger**, Linde AG, Munich, West Germany.

The results of an extended test program with floating processing plant are reported on. This in-

cludes experimental investigations into the behavior of rectifying columns when influenced by movement from simulated waves, model tests on structures in seawater tanks and experiments with insulated LNG pipelines consisting of inner and outer corrugated tubes. Semisubmerged bearer-platforms are very suitable. They have very good floating stability, due to the fact that their buoyancy cells are not subjected to the forces of the waves.

6. "Denitrogenation Plant at Clenze," by **F. Schlemm** and **H. Kaast**, B.E.B. Betriebsführungs-ges. mbH, Hanover, West Germany.

In a newly opened-up area east of Hanover, natural gas with a nitrogen content of 60 percent and industrially extractable helium content has been discovered. Since this gas could not be made use of as it is, a denitrogenation plant started its trial operation in August 1976. Separation is by way of a cryogenic process. For economic reasons, the originally planned extraction of helium was scrapped. Special precautions were called for in order to remove undesirable substances such as carbon dioxide, water, mercury and higher hydrocarbons. The plant is very largely automated. Experience up to now leads to hopes that the plant will operate smoothly in the future.

7. "Development and Operational Experience of LNG Underground Storage Tanks," by **Y. Ishimasa**, **J. Umemura**, **A. Fujita** and others, Osaka Gas Co., Osaka, Japan.

In designing a large underground LNG storage tank, the problems normally concern the effects of low temperatures on the surrounding soil conditions. To solve these, laboratory investigations and model tests are made. However, in the case of large reservoirs the latter fail to provide adequate information, for which reason a program of data measurement and recording was evolved for an LNG reservoir begun in 1972 and completed in 1975. The report covers measurement data, for example soil pressure, the behavior of iron and concrete, water pressure and temperatures. Seismic and boil-off gas measurements are also dealt with.

8. "Studies of the Storage of LNG in Salt Cavities," by **H.G. Haddenhorst** and **K. Schwier**, West Germany.

The differences in the geological prerequisites for the storage of LNG in salt cavities and other subterranean reservoirs are examined. Of importance to the viability of this type of reservoir is the behavior of the ground when subjected to changes in pressure and temperature. The resulting mechanical stresses lead to fissures that influence the boil-off rate. The first in situ experi-

(continued on page 14)



## LNG-5

(continued from page 13)

ence was gathered in a small experimental cavity in 1974. The results of the investigation justify the further prosecution of the work.

9. "Tests at the Fos Terminal on the LNG Behaviour in the Big Tanks," by **F. Bellus, M.Y. Revellard, M.C. Bonnaure, and M.L. Chevalier**, Gaz de France, France.

After the Fos Terminal had been in operation for a number of years, it was seen that its storage capacity of 70,000 cubic meters was inadequate as a buffer for the irregular arrival of vessels. In 1975, the decision was taken to extend this capacity by the addition of a further 80,000-cubic-meter reservoir. This consists of an outer shell of 90 cm prestressed concrete and an inner 9 percent Ni-steel tank with a suspended cover. Submerged pumps are being installed. This type of reservoir, until now not seen in France and therefore unique, will be environmentally extremely compatible and safe.

10. "Ultra Low Temperature LNG Compressors," by **D. Kato**, Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan.

In 1969, the first compressor for handling natural gas at  $-160^{\circ}\text{C}$  went on stream. As a result of further improvements, these machines serve for the direct compression of boil-off gas from storage reservoirs or ships' tanks without the need to warm it beforehand. Thanks to this process, the reliquefaction of boil-off gas can be accomplished with a minimum of outlay and space requirements.

11. "Electricity Generation by Utilisation of LNG Cold," by **M. Streich, A. Pocrna, D. Weber and G. Krey**, Linde AG, Munich.

In the past, major interest was centered on the utilization of cold produced by LNG for refrigeration or cryogenic processes. The main difficulties involved in this direct application of cold lie in the combining of various process plant and in the excessive amount of cold available. Two new suggestions for the conversion of LNG cold into electric power push these disadvantages into the background. One process merely utilizes heat from the surroundings. The other is a closed gas turbine circuit with the unique feature that more than 1 kWh electrical energy can be generated from 1 kWh of cold energy.

12. "Nitrogen Gas Turbines for LNG Regasification," by **H. Haselbacher**, BBC, Baden, Switzerland.

Regasification by way of a closed gas turbine process is particularly economical and ecologically compatible. The development of a nitrogen gas turbine with a capacity of 200 tons/h LNG is described. The turbine's electrical output is 44 Mw, and the attend-

ant thermal efficiency is in excess of 44 percent. Particularly remarkable is the low entry temperature of the gas ( $-129^{\circ}\text{C}$ ) into the compressor.

**Workshop Sessions.** "The Future Role of LNG in Energy Supply." "The Future of LNG Transport."

**Wednesday, August 31, 1977**

**Session III: Financing, Legal and Policy Aspects of LNG Trade.** Session chairmen: **W.E. Matthews**, U.S.A.; **H. Tahmassebi**, Iran; **W.J. Walters**, Great Britain, and **R. Francoeur**, Canada.

1. "The Legal Problems of Long Term LNG Contracts," by **J.M. Soesan**, Great Britain.

Due to the vast financial involvement demanded by an LNG project, the contracts that have to be entered into in order to see such projects through to the end involve duration periods generally in the order of 15 to 20 years. In this context, the contributor of this paper examines, among other things, the matter of "unpredictability," framed in the legal systems of several countries.

2. "On Some Legal Aspects of an LNG Terminal Establishment and Operation in France," by **F. Marle**, Gaz de France, Paris.

The legal problems associated with the acquisition of the site, the design, the operational plan and the cooperation between contractors and operators with the responsible authorities under French law are explained. A further chapter deals with legal problems during operation, as for example the regulations for traffic with LNG tankers, in addition to other matters.

3. "Ownership Transfer of LNG Plants," by **N.N.**, Sonatrach, Algeria.

Two major aspects are concerned in the transfer of ownership of LNG Plants, one being juristic and the other technical. While the latter is essentially concerned with factual problems, the former involves matters of legal concepts and philosophies.

In many of the isolated problems that emerge, the classic conception of property transfer becomes subject to query. One factor involved is that an extremely complicated plant is concerned, with appropriately complex operational conditions. This is important, since it is often a matter of transferring plant which was designed and constructed in a highly developed industrial country into the hands of a country with a limited technical potential. The real meaning of the term "ownership transfer" under such circumstances, and the way in which the attendant contractual terms need to be adapted to such conditions, is discussed on a basis of Algerian experience.

4. "Hazard Assessment of LNG Supply and Storage," by **G. Snelink**, TNO, Netherlands.

This study deals with the risks concerned with the supply and storage of LNG under the conditions prevailing in the region of the Maas estuary on the Dutch coast. The consequences of a shipping collision involving an LNG tanker of 125,000 cubic meter capacity, the consequences of such a vessel running aground, the consequences of a major accident during unloading and the consequences of the destruction of a storage reservoir are all gone into. At the same time, the probability that such a calamity might occur is assessed. The study is intended to give the authorities guidelines concerning the problems involved in the introduction of this new form of energy.

5. "Controlling the Hazards of LNG Ground Spillages — LNG Firefighting Methods — Application to the Gaz de France LNG Terminals," by **F. Bellus, H. Conchard, J. Mauger and R. Vincent**, Gaz de France, France.

The fundamental precautionary measures required in the construction and design of LNG plant are set forth on a basis of the mathematical model developed by Gaz de France for the calculation of the diffusion of LNG clouds caused by LNG ground spillages. Furthermore, a method has been developed for assessing the amount of water required to be sprayed on LNG reservoir walls to protect them from radiant heat from nearby fires. The results of extinguishing LNG fires with high expansion foam are reported on.

6. "Safety and Reliability of Floating LNG Production Facilities," by **H.R. Hansen, K.R. Authen** and others, Norske Veritas, Norway.

Norske Veritas has worked out guidelines covering the safety aspects of planned offshore floating LNG production and storage facilities. As a result, a set of binding rules for the approval of such installations has emerged. In these, safety measures called for against calamities, for technical installations, staff and environment, are within acceptable limits and such plant will be adequately reliable in operation. The report covers recommendations and regulations for the design, construction, installation and operation of LNG plants.

7. "Financing Aspects of LNG Trade," by **A.R. Batkin**, Lehman Brothers Inc., New York, U.S.A.

The financing of LNG chain operations is bound up with grave difficulties because of the enormous investments needed, differing legalities, financing in various countries and the need to finance widely varying links in the chain. The report describes both the classical financing techniques and new possibilities for financing, such as leasing and advance payment models. The report also analyzes the various potential sources of money for direct fi-

ancing and borrowing (banks, insurance companies, pension funds, mortgage financing) and illustrates the alternative modes of financing under the aspects of taxation, trading and legal effects.

8. "The Contribution of the Export-Import Bank of Japan to Japanese LNG Projects," by **S. Hirakawa**, Tokyo University, and **T. Kurihara**, Export-Import Bank of Japan, Tokyo, Japan.

The Export-Import Bank of Japan is being a great help in the setting up of Japanese LNG projects. The authors discuss the aims of this newly founded bank, its business pursuits, and draw particular attention to the link between LNG projects and the bank's activities. In addition, the attitude of the bank in assessing the prospective gas reserves and production potential from the viewpoint of financing is made clear. To round off, the bank's future policy in terms of financing further LNG projects is discussed.

9. "Project Financing of LNG Trade," by **S.J. Lewand and G.L. Meyer**, Chase Manhattan Bank, New York, U.S.A.

The inherent technical and economic structure of the extremely costly LNG projects makes an accurate calculation of the risks involved by those providing capital and the investors necessary. In the report, financing at exceptionally high levels is discussed. Such financing not only has a powerful influence on the international finance market, but also on the economic resources of both producer and consumer countries.

10. "Financing of LNG Production Facilities and Tankers," by **N.N.**, Sonatrach, Algeria.

After summarizing the individual links of which an LNG chain is composed, the means of financing and the type of financing called for in each single link in the chain is investigated. From this emerge possibilities for filling gaps in the Euro-dollar market and the plant-producing countries. These questions are dealt with in respect of each of the processing steps in detail. Tanker construction financing can mostly be supported by state subsidies to the shipyards.

11. "Densities of LNG for Custody Transfer," **W.M. Haynes and R.D. McCarty**, National Bureau of Standards, Boulder, Colorado, U.S.A.

Precise knowledge of LNG density in relation to composition and temperature is necessary in order to calculate and invoice the quantities of LNG delivered. Experimental investigations at the National Bureau of Standards have resulted in systems with error quotients of less than 0.1 percent. The equipment needed, as well as the data collected and the experimental procedure are described. With these methods, the LNG

(continued on page 15)



density can be predicted to within less than 0.1 percent.

12. "World LNG Trade and the Competitiveness of Present and Projected Prices," by **J.G. Seay, P.J. Anderson** and **E. Daniels**, IGT, Chicago, U.S.A.

The report discusses the competition in the light of present prices on the energy market and costs of LNG on the major world markets, the U.S., Japan and Western Europe, and anticipated events up to 1990. The competitiveness of LNG is measured against oil, conventional natural gas, electricity, synthetically produced substitute gases (SNG) from solid or liquid raw materials, solar energy and geothermal energy, with which one may have to reckon as realities after 1985. In the production of electric power, comparisons are made both with the classic coal-fired power plant and with a modern nuclear plant; in SNG, the costs of producing gas in both the first and second families are invoked.

**Workshop Sessions.** "Offshore LNG Projects." "LNG Operating and Reliability Experiences."

**Thursday, September 1, 1977**

**Session IV: Transportation of LNG.** Session chairmen: **E.E. Bowyer**, Great Britain; **P. Asselineau**, France; **R. Kvamsdal**, Norway, and **K. Yamamoto**, Japan.

1. "Algerian Point of View on LNG Transport," by **A. Hasmin**, Sonatrach, Algeria.

The experience gained by CNAN as a result of the Algerian maritime transportation concept (50 percent buyer/50 percent seller) in the operation of the tanker Hassi R'Mel is reported on. The report deals with economic and technical aspects. Financial losses emerge as a result of delays in the acceptance of contractual deliveries, in which the problem of under-employment at the outset of the period of guarantee plays a particularly important part. On the technical side, only two cases of damage (turbine/boiler) have occurred. An instruction center for the training of personnel for operating the tankers has now been set up in Algeria. Finally, the report describes the extension work in the port of Skikda.

2. "Arctic Islands LNG," by **Walter Hindle**, Trans-Canada Pipelines, Canada.

This paper reports on investigations into the use of LNG tankers equipped for icebreaking in Canadian Arctic waters. Using such tankers it is hoped that the scattered deposits in the Canadian Arctic, for the exploitation of which it would not be worthwhile building pipelines, might be opened up. The report contains a survey of the particular aspects that need to be taken account of in the construction of a collecting system, in the design of LNG vessels and in the landing terminal and the regasification. It appears that three LNG vessels

would suffice to transport 11.3 million cubic meters per day to the U.S. and Canadian markets. On initial consideration, LNG tanker transportation appears to be as economical a proposition as pipeline transportation with a volume of between 85 and 113 million cubic meters daily.

3. "Risk Management in Marine Transport of LNG," by **T.C. Matheisen**, Norske Veritas, Oslo, Norway.

Marine transportation of LNG, as well as chemical products such as LPG, will increase in volume in the coming decades. It is well to pay due heed to the risks involved. The report deals with a model of the hazards associated with LNG transport and notes measures aimed at reducing or avoiding dangers. A risk control system is developed. In this matter, one important aspect is to make clear to the public that in all such proj-

ects, each and every aspect involved in achieving a maximum of safety is considered.

4. "LNG Transportation by Road Tank Trailers," by **A. Montet, M. Przydrozny** and others, Technique de l'Industrie du Gaz en France, Paris, France.

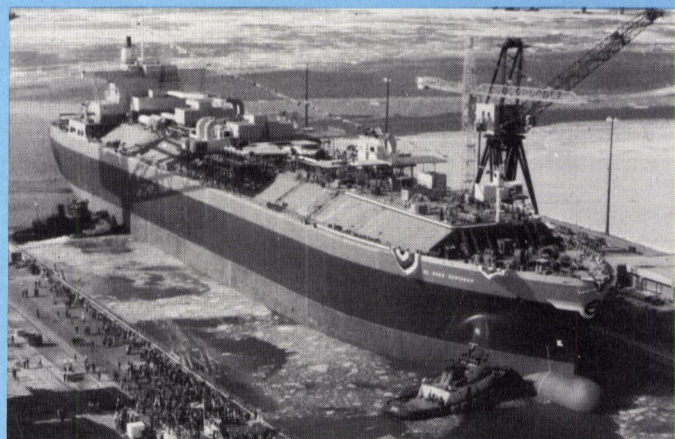
For several years now, Gaz de France has been concerned with the development of road transportation of LNG between the land-

(continued on page 16)

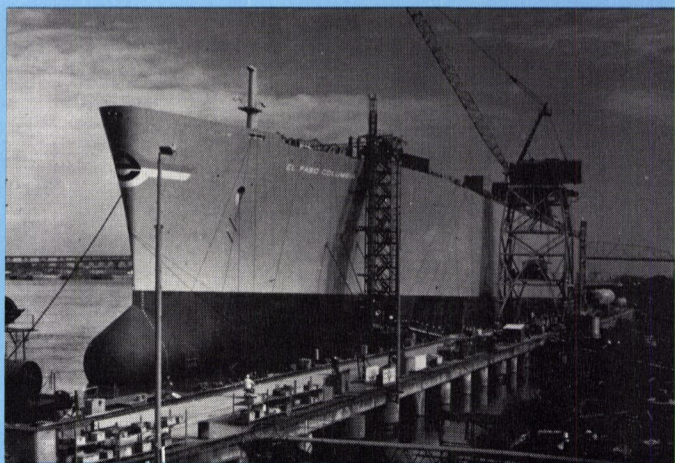
# LNG INSULATION

Supplied by  
**BALTEK/CSC**

Methane Pioneer  
Methane Princess  
Methane Progress  
Esso Brega  
Esso Portovenere  
Esso Liguria  
Laieta  
Descartes  
Gadnia  
Gadila  
Gari  
Charles Tellier  
Gastrana  
Benjamin Franklin  
Gouldia  
Mostafa Ben Boulaid  
El Paso Southern  
El Paso Arzew  
El Paso Howard Boyd  
El Paso Columbia  
El Paso Savannah  
El Paso Cove Point



Above: El Paso Southern, Newport News Shipbuilding, launched in 1977.  
Below: El Paso Columbia, Avondale Shipyards, launched in 1976.



**A BALTEK Corporation Subsidiary**  
10 Fairway Court • P.O. Box 195  
Northvale, New Jersey 07647  
(201) 767-1400

# CSC

**CRYOGENIC  
STRUCTURES  
CORPORATION**



## LNG-5

(continued from page 15)

ing terminals at Le Havre and Fos, and the LNG experimental station at Nantes. After extended tests with hired road tankers, Gaz de France has developed its own specifications and has ordered road transport vehicles in accord with them. The authors report on the work done on the development of such road transportation systems and deal with the factors which influence the reliability of such delivery units.

5. "Operational Experience with LNG Ships," by **A.E. Findlater**, Shell Tankers, U.K., Ltd. and **L.R. Prew**, Shell International Marine Ltd., U.K.

The paper reports on experience in the operation of the LNG ships plying between Brunei and Japan. All the steps in unloading, warming-up, rendering inert and ventilating the system as well as the optimum utilization of the boil-off during the voyage are dealt with. The safety aspects of LNG transportation are discussed with reference to the requirements of the authorities for terminal installations and the operational behavior of the ships. The report also describes the planning necessary to ensure the successful commissioning and trouble-free operation of a fleet of gas tankers.

6. "Experience of LNG Tankers—Operation and Commissioning"

—"Methane Princess and Methane Progress," by **J. McHugh**, British Gas Corporation, and **P.L. Vrancken**, Conch Methane, U.K.

—"Cryogenic Commissioning of New LNG Tankers," by **P.W.A. Eke**, and **G.H. Gibson**, BGC, U.K.

The two tankers Methane Princess and Methane Progress have concluded 12 years of service, representing around half of the expected life of the tankers. The experience gained during these years of service in the running and operating of the vessels is discussed, as well as certain difficulties and the conclusions to be drawn from these data for the future.

The English Canvey Island LNG terminal is being utilized increasingly for the commissioning of third-party LNG tankers as an LNG supply station for the initial trial and acceptance trips. The experience gained in this service is discussed, as well as the influence of the design of ships on technical details in commissioning.

7. "330,000 m<sup>3</sup> Verolme LNG Carrier," by **A.K. Winkler**, Naval Project Development Company, Rotterdam, Netherlands.

In the report, the 330,000-cubic-meter-capacity tanker belonging to the VLGC (very large gas carrier) class and developed for the transport of LNG over long distances is described. A multi-container system is used

for transportation. The latter is especially suited to such large vessels. The tank as such is composed of proven construction elements. The container system consists of a large number of horizontal aluminum tanks made on land and then installed in the ship. In designing this ship, a second generation of supertankers was being aimed at.

8. "Proto-Type Tank Test of Semi-Membrane LNG Tank," by **E. Watanabe**, Sasebo Heavy Industries Co., Ltd., Tokyo, and **K. Furuta**, Bridgestone Liquefied Gas Co., Ltd., Tokyo.

Using as a basis the preliminary work done by the Bridgestone Liquefied Gas Co., Sasebo Heavy Industries Co. pursued the technical development of an LNG tanker using the semi-membrane tank during the period 1973-76.

A computer program was used to investigate the stress distribution in the tank, the tank construction methods and the development of the second cold barrier. The investigations were carried out on a prototype tank 10 meters long, 10 meters wide, and 8 meters deep. The tank system has now been approved by the Japanese Ministry of Transport and the U.S. Coast Guard.

9. "Spherical LNG Tanks on Continuous Cylindrical Skirts," by **A. Tonnessen** and others, Moss Rosenberg Shipyard, Norway.

This design conception, developed in 1970, has now been proven in practice following the necessary design and construction phase. During the interim period, various construction materials were developed for the tank insulation as well as mechanical installations for ships of a wide range of sizes. A number of shipyards have acquired licenses for this technology. The experience of designers, shipbuilders and licensees are discussed and possible improvements based on this accumulated experience described.

10. "The GT/MDC Invar Membrane System," by **A. Gilles**, **P. Jean** and others, Gaz-Transport, France.

The construction technology for Invar membrane marine tanks developed by Gaz-Transport, is used in almost half of all LNG tankers either in use or under construction. The paper describes a new insulation technique using an insulation material developed by McDonnell Douglas for the Apollo Moon program.

At the same time, a new automatic resistance welding technique is described with which 95 percent of the seams required in the construction of the membrane tanks can be welded. This leads to a noticeable reduction in building costs. The welding equipment and the advantages of this process are discussed at length.

11. "LNG Offshore Handling," by **H.W. Backhaus**, LGA Gas & Marine Consult, West Germany.

Various systems for the construction of offshore LNG liquefaction plants have been developed by construction companies, including German ones, in concert with shipyards. In this conception, a critical point is the loading installation for the tanks, particularly under the bad weather conditions encountered in the North Sea.

In this report, the design of a new loading system is described. The latter was investigated on a basis of a 1:25 scale model which was tested under as near to practical conditions as possible in a water tank in 1976. The system consists of a newly developed, insulated, submerged flexible metal pipe connection, insulation under water and in the anchor buoy, to which the reservoir to be filled is connected. The difficulties in the design resulting from the low temperatures are described in particular. In addition to a discussion of the latter problems, the results of the model tests are reported.

**Workshop Sessions.** "Safety, Legal and Financial Aspects of LNG."

### Post-Conference Tours

Participants in the Congress and Exhibition are offered the opportunity of visiting on September 2 and 3, 1977, a number of plants directly related to LNG. During these visits, the Congress participants shall also be given the possibility of having talks with the operators of the plants.

The program of the post-conference tours has been arranged in such a way that the visitors will be able either to continue their journey home immediately after the visits or to take part in the subsequent touristic program.

1. **Thyssengas liquefied natural gas plant at Nievenheim near Neuss.** This plant features an LNG storage capacity of 22,500 cubic meters, a liquefying capacity of 2,400 cubic meters/hour and an output capacity of 100,000 cubic meters/hour gas. The plant started up in the summer of 1976. Visits are on September 2 and 3, 1977.

2. **Liquefied natural gas plant at the Technische Werke AG, Stuttgart.** This liquefied natural gas plant with a 30,000 cubic meter storage tank is protected by special safety precautions, since it is located in a populated area. The plant, which has been in operation since September 1971, features installations enabling road tankers and vehicles to be filled. Visit is on September 2, 1977.

3. **Liquefied natural gas peak-shaving plant in Zeebrugge, Belgium.** A plant for natural gas liquefaction, storage and re-evaporation similar to that of the Nederlandse Gasunie in Maasvlakte, where natural gas from Groningen is separated into a nitrogen and a methane fraction;

these two fractions are then liquefied and stored separately.

The plant is scheduled to start operations in the spring of 1978. Visits are on September 2 and 3, 1977.

4. **Liquefied natural gas peak-shaving plant in Maasvlakte, Netherlands.** This plant serves for the liquefaction, storage and re-evaporation of natural gas; it was for the first time that natural gas from Groningen has been separated here into a nitrogen and a methane fraction, the two fractions being liquefied and stored separately.

In case of need, the liquefied nitrogen and the liquefied natural gas are re-evaporated, mixed, and fed into the distribution system. Both the combustion characteristics and chemical properties of the raw gas are thus maintained in the re-evaporated product.

The plant was put into service early in 1977. Visit is on September 2, 1977.

5. **Liquefied natural gas peak-shaving plant at Geretsried and Schalchen Plant, Bavaria.** LNG satellite plant serving to secure gas distribution in the Geretsried/Wolfratshausen area on peak demand days.

The plant is located at the end of the distribution line, and consists of a 100,000-liter storage reservoir and air-heated evaporators.

LNG supply is by road tankers from the liquefied natural gas plant of Stuttgart.

The plant of Linde AG at Schalchen is concerned with the construction of reservoirs, columns, heat exchangers, cold boxes, and complete plants for low-temperature and process engineering.

A large number of high-alloy steels are processed, in addition to standard steel and aluminum.

The equipment manufactured per year has a total weight of some 15,000 tons. Departure: September 2, 1977.

6. **Chantiers de France-Dunkerque and Le Havre LNG Terminal, France.** Visit to the Chantiers de France-Dunkerque dockyards where the 130,000-cubic-meter LNG tanker Leopold L.D. is being built. The LNG terminal of the Gaz de France in Le Havre has been the harbor where the first shipments of liquefied natural gas from Algeria were unloaded and delivered to the French distribution systems. Departure: September 2, 1977.

7. **Desulphuration Plant Gro-Benkneten in Oldenburg.** Natural gas treater plant for the purification of sour natural gas produced in the natural gas fields of the neighboring area by Sulphinol and Purisol processes. The plant capacity will be increased in 1977 from 15 x 10<sup>6</sup> cubic meters/day to approximately 20 x 10<sup>6</sup> cubic meters/day. Visits will be on September 2 and 3, 1977.

(continued on page 19)



**SILTEMP<sup>®</sup>**  
**The thermal  
barrier material  
for hot work  
up to 3000° F**



Siltemp is Haveg's entry into the high-temperature insulation market. Typical applications are: stress-relief blankets, fire curtains, brazing separators, mold liners, welding curtains, furnace curtains, and electrical insulation.

Siltemp is *absolutely* fireproof, and resists molten steel spills and most corrosive liquids.

Siltemp is available in fabric, cordage, mat, and tape forms.

If you want a material to replace asbestos, Siltemp is your answer. What's more, Siltemp throws heat and fuel conservation into the bargain, too. For full information, call or write: Haveg Industries, Inc., 900 Greenbank Road, Wilmington, Delaware 19808, Tel: 302-995-3800.

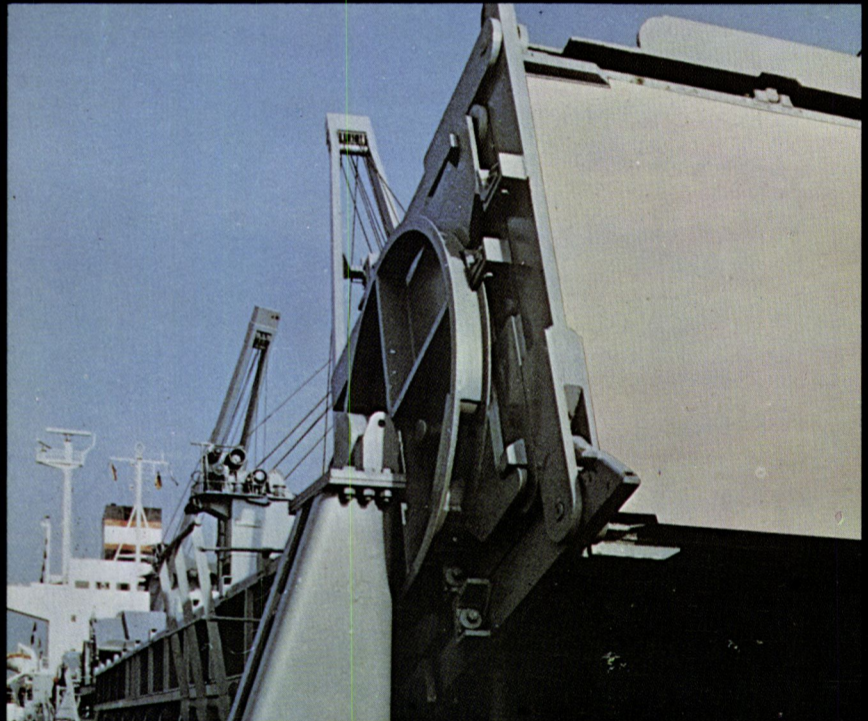
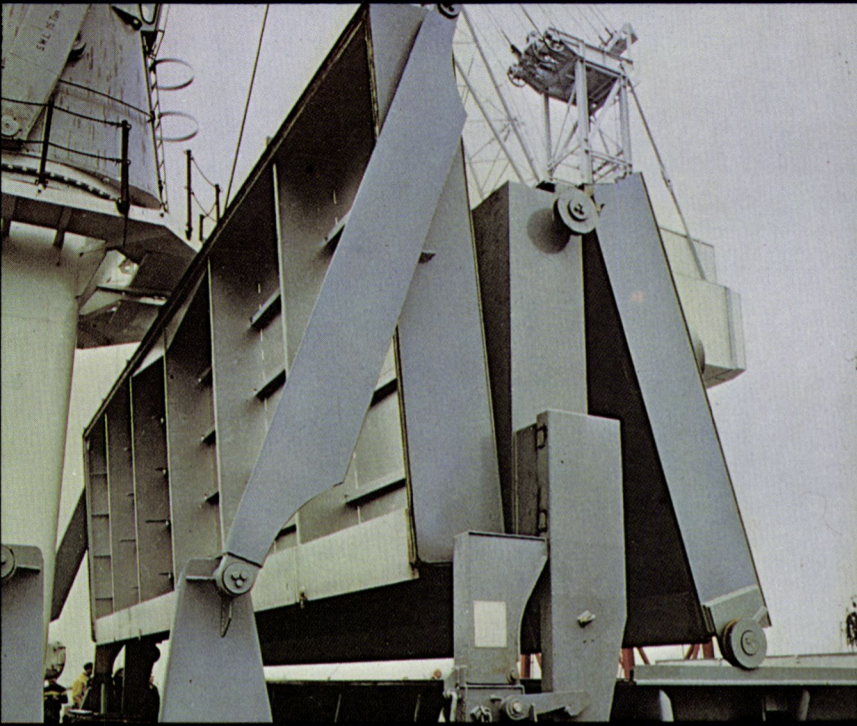


HS 77-1



MacGregor quarter, slewing and stern ramps together with a full range of access and transfer equipment for 'go-anywhere' Ro-Ro flexibility

Direct Pull is MacGregor's latest semi-automatic folding hatch cover for geared ships, offering substantial savings over hydraulically operated systems



After sales service on a global scale is recognised by MacGregor as essential. The organisation has some 60 service stations throughout the world each with comprehensive stores and highly-trained technical staff. MacGregor also offers full maintenance contracts

Rolltite - totally automatic one-man push button operation and continuous cross joint sealing makes this the world's most advanced hatch cover

## Who else but MacGregor?

The cargo handling demands of the world's most sophisticated vessels require a special brand of insight and expertise. To the shipping world MacGregor is synonymous with the answers to the needs of modern fleets. Today the International MacGregor Organisation spans 32 maritime countries and remains the undisputed world leader in the supply of cargo transfer and access equipment.

**MacGREGOR**

**Cargo transfer and access equipment**

The entire resources of the International MacGregor Organisation are available to the U.S. maritime industry through:  
MacGregor Comarain Inc, 135 Dermody Street, Cranford N.J. 07016

Tel: (201) 2728440 Telex: 138618



## LNG-5

(continued from page 16)

8. **Denitrogenation Plant Clenze/Niedersachsen.** A plant for the treatment of natural gas with high nitrogen content. Approximately 120,000 N cubic meters/hour natural gas with 50 to 70 per cent nitrogen are fed into a low-temperature separation plant under a pressure of 100 bar, where as much nitrogen is separated out as is necessary to yield a natural gas quality that can be marketed.

After a construction period of 22 months, the plant came on stream in September 1976. Departure: September 2, 1977.

9. **Control room of the Ruhrgas AG in Essen.** The Ruhrgas control room monitors and operates the 4,720-mile pipeline system throughout the Federal Republic

of Germany. Operating parameters such as flow, pressure and calorific value can be permanently monitored by highly sophisticated metering and regulating facilities installed at various points of the Ruhrgas grid. In case of deviation from present values, the control room is able to intervene immediately by taking adequate measures. The natural gas delivery stations, underground storages, compressor stations, maintenance stations and large customers are directly connected to the control room by the telecommunication system. In addition, a private telephone system and Ruhrgas-owned VHF-radio system are available to contact any station in the Ruhrgas grid. Visits are on September 2 and 3, 1977.

10. **Compressor Station Werne/Westfalen.** The Werne compressor station functions as a junction

point in the Ruhrgas grid (power installed 45,280 kw). In Werne, the natural gas produced from fields in North-West Germany and the Netherlands is compressed for transportation to the centers of consumption in the Federal Republic of Germany. The station is designed for automatic operation, and monitored and operated by the Ruhrgas control room in Essen. Visits are on September 2 and 3, 1977.

11. **Compressor Station Gernsheim/Hessen.** After the introduction of coke-oven gas, the Gernsheim compressor station (power installed 5,900 kw) was used for transmission and storage purposes. In connection with the importation of Russian and Iranian natural gas, the functions of the station will be expanded. The station is equipped with pressure reducing and measuring facilities and a flue gas and air treatment plant (adjustment of the calorific value of high-BTU natural gas to the calorific value of low-BTU natural gas). The station is used to pump gas to the Hahnlein underground storage (maximum storage capacity 200 million cubic meters) converted to natural gas operation. Visits are on September 2 and 3, 1977.

12. **North Sea Gas Terminal Emden and Cavern Storage of Natural Gas in Krummhorn/Niedersachsen.** The plants of the Emden Terminal in which the North Sea Gas is conditioned before it flows into the transport system have a throughput of  $56 \times 10^6$  cubic meters/day.

The Ruhrgas compressor station and cavern storage Krummhorn was constructed to receive natural gas from the Norwegian sector of the North Sea destined for consumption in the Federal Republic of Germany. The gas is transported via a marine pipeline of a total length of 273 miles to Emden, where it is first processed at the Emden Plant of the Phillips Petroleum Company before sendout to Krummhorn compressor station.

At the compressor station, the pressure of the natural gas is stepped up to 46 to 80 bar by two boosters (power installed  $2 \times 8,900$  kw). The compressor units used for storage operation are employed to further step up the pressure of part of the gas for injection into the cavern storage.

At present, there are three underground storage facilities at Krummhorn, although a total of 16 caverns can be installed in the salt dome. Each cavern can hold approximately a maximum 87 million cubic meters of natural gas, 38 million cubic meters of which remain in the storage as cushion gas. The maximum production rate of each cavern is in the order of 300,000 cubic meters/hour. Visits are on September 2 and 3, 1977.

## N.Y. Propeller Club Elects Hart President



Capt. Robert E. Hart

Capt. **Thomas A. King**, president of The Propeller Club, Port of New York, recently announced the results of the election held at the club's 54th annual membership meeting. The new officers are as follows: president, Capt. **Robert E. Hart**, Marine Index Bureau; first vice president, **James J. Dickman**, N.Y. Shipping Association; second vice president, Capt. **James L. Fleishell**, Captain of the Port, United States Coast Guard, N.Y., and secretary-treasurer, Col. **Fred A. Sikora**, maritime consultant.

The newly elected governors are: **Daniel J. Altilio**, Central Gulf Lines, Inc.; **Francis J. Barry**, Circle Lines, Inc.; **William H. Bevan**, Bethlehem Steel Corp.; **Philip A. Donahue**, Maritime Overseas Corp.; **Lloyd R. Graham**, Moran Towing & Transportation Co.; **Peter Hetzler**, Marsh & McLennan, Inc.; **James P. McAllister Sr.**, McAllister Brothers, Inc.; **George McCartney**, Seafarers International Union; **Robert W. Sammel**, Prudential Lines, Inc.; **Shannon J. Wall**, National Maritime Union, and **Richard S. Walsh**, Waterman Steamship Corp.

The Propeller Club is now commencing its 54th successful year as a broad maritime industry organization. Its principal objective is to promote, further and support an American merchant marine, and to aid the development of river, Great Lakes and harbor improvements. The club plans a number of activities for the coming year, featuring prominent speakers at regular luncheon meetings.

Captain **King** will continue to serve as president until June 30, 1977, at which time he will be succeeded by Captain **Hart**.

## Lockheed Shipbuilding Receives \$9,995,000 Contract From NSSC

Lockheed Shipbuilding & Construction Company, Seattle, Wash., has received a \$9,995,658 cost plus fixed fee contract for procurement of materials, advance shipyard planning, and limited prefabrication work leading to construction of an AS-39 class submarine tender. The Naval Sea Systems Command is the contracting activity. (N00024-77-C-2067)

### Preliminary List Of Exhibitors At LNG-5 Conference

#### WEST GERMANY

Auergesellschaft GmbH  
BEB Gewerkschaften Brigitta und Elwerath Betriebsfuehrungsgesellschaften mbH  
Bilfinger-Berger  
Braunschweiger Flammenfilter Leinemann & Co.  
BBC Brown, Boveri & Cie. AG  
Butting  
DEMAG Verdichtertechnik  
Deutsche Schachtbau-und Tiefbohr-gesellschaft mbH  
Deutscher Verein von Gas-und Wasser-fachmannern e.V.  
Dyckerhoff & Widmann AG  
Enraf-Nonius Vertriebsgesellschaft fur Mess-und Regelgerate mbH  
FLUOR GmbH  
GHH Gutehoffnungshutte Sterkrade AG  
Hoerbiger & Co.  
HOESCH Werke AG  
Howaldtswerke Deutsche Werft AG  
INTERSMAT GmbH  
Kaefer Isoliertechnik GmbH & Co.  
Kavernen Bau-und Betriebs GmbH  
KHD-Pritchard  
Kontron Technik GmbH  
LGA Gastechnik GmbH  
Linde AG  
Mannesmann AG  
Messer Griesheim GmbH  
Preussag AG  
Rheinhutte  
Ruhrgas AG  
Salzgitter AG  
Siemens AG  
Schmohl Messtechnik GmbH & Co.  
Strabag Bau AG  
Thyssengas GmbH  
VIA Gesellschaft fur Verfahrens-technik mbH  
Vulkan Verlag, Dr.W.Classen  
Wiese KG

#### BELGIUM

Boelwerf  
TRUFLO

#### FRANCE

Alstrom-Atlantique  
S.A. B.V.S.  
Bureau Veritas  
Chantiers de France-Dunkerque  
Constructions Metalliques de Provence  
FMC Europe SA  
Gaz de France  
Gaz Transport Engineering Naval  
Technigaz  
Technip

#### GREAT BRITAIN

American Bureau of Shipping  
Ocean Phoenix  
CPMBE  
Daniel Industries

Gastech  
Compoflex  
Marston Excelsior  
John Thurtley  
Triangle Valve Co.  
Tilling Construction  
Charles Winn (Valves)

#### ITALY

ENI Ente Nazionale Idrocarburi  
Snamprogetti

#### JAPAN

Chiyoda Chemical  
Engineering & Construction  
EBARA Manufacturing Co. Ltd.  
Ishikawajima-Harima Heavy Industries  
Kajima Corporation  
Mitsubishi Heavy Industries Ltd.  
Sumitomo Seimitsu Kogyo K.K.  
Tokyo Gas Engineering Co. Ltd.

#### CANADA

The Alberta Gas Trunk

#### THE NETHERLANDS

"Automatic" Sprinkler  
Dresser Europe S.A.  
INTEC Press  
Stevin Group

#### SWEDEN

Kockums Varv (Shipyard) AB  
Amerad Betong Vagforbattringar AB

#### SWITZERLAND

Cryostar  
SULZER AG  
BBC

#### SPAIN

Preload Sistemas  
ENAGAS

#### U.S.A.

Air Products and Chemicals  
Anderson Greenwood International  
J.C. Carter Company  
Chicago Bridge & Iron Company  
Cryogenic Structures Corporation  
Elliott Company  
Environmental and Energy Division of Frigitemp Corporation  
Eureka Chemical  
Gaz Transport McDonnell Douglas Corp.  
General Electric  
General Dynamics  
Newport News Shipbuilding  
Owens-Corning Fiberglas Corp.  
Preload Technology, Inc.  
Pittsburgh des Moines  
Pritchard and Company  
Pullman Kellogg  
Royal Industries  
Simmonds-Precision



**New Venture To Build  
42,000-DWT OBO  
Tug-Barge Unit**

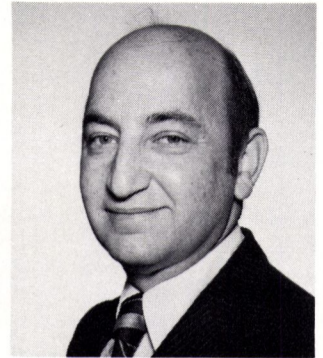
Arna Marine Company of Fort Lauderdale, Fla., has applied for construction-differential subsidy and a Title XI guarantee to aid in financing the construction of a 42,000-deadweight-ton oil-bulk-ore (OBO) integrated tug-barge vessel.

Arna is a New York corporation with offices in Ft. Lauderdale, Fla., and 410 Lakeville Road, Lake Success, N.Y. It is a partnership between **Leo Burger**, **Peter Constas**, and **Hvide Shipping, Inc.**, a Florida corporation. The vessel will be operated on a charter basis.

The company proposes to build a vessel similar to the **Seabulk Magnachem**, recently delivered by

**Kelso Marine, Inc.** and **Galveston Shipbuilding Corp.** The tug will be a catamaran unit 127 feet long, 90 feet abeam, with a 27-foot draft, a speed of 14.5 knots, and a crew of 24. It will have two engines of 7,000 bhp each. The barge unit will be 625 feet 4 inches long, 95 feet abeam, with a draft of 36 feet and rated at 40,468 dwt. Estimated actual cost is \$25.75 million. A shipyard has not been selected.

**Litton Systems (Canada)  
Names Victor Prushan**



**Victor H. Prushan**

**Herbert H. Halperin**, director of Automated Marine Systems Division, Litton Systems (Canada) Limited, has appointed **Victor H. Prushan** as marketing manager. Mr. Prushan is already on staff and is operating out of the company's offices at 21101 Oxnard Street, Woodland Hills, Calif.

Mr. Prushan earned his credentials in both the military and civil marine fields. A 1957 graduate of the U.S. Naval Academy, he was on active service in destroyers and submarines until 1963. In 1966, he was awarded a Master of Business Administration degree from Northeastern University in Boston.

After leaving the U.S. Navy, Mr. Prushan gained marine marketing experience with **Roland Marine Inc.**, and **Radiomarine Corporation**. For the four years immediately prior to joining the Litton Automated Marine Systems Division he served as sales manager of **Iotron Corporation**, handling that firm's line of collision avoidance and navigation systems.

At Litton Automated Marine Systems Mr. Prushan will be marketing the division's machinery control and condition monitoring systems, integrated navigation and steering control systems, and cargo load monitoring systems.

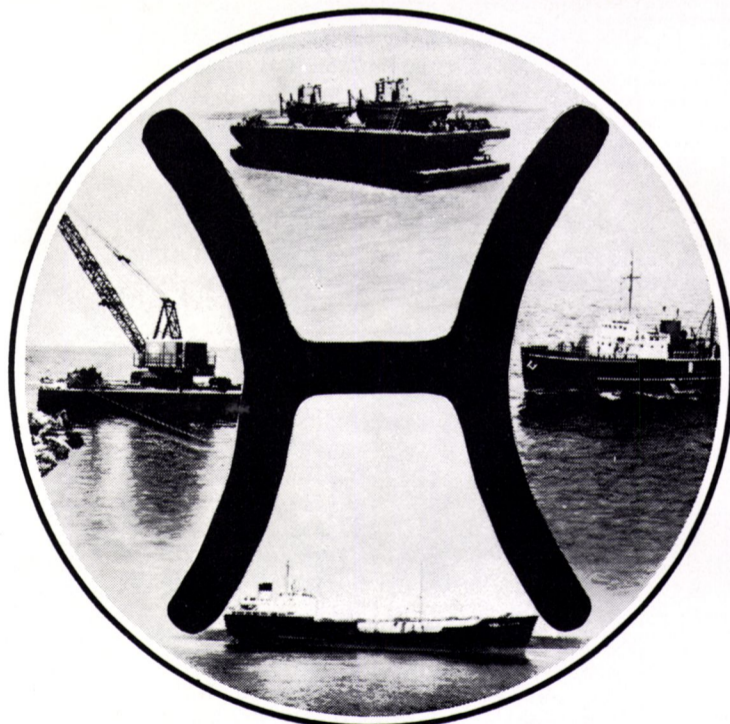
**Arthur Levy Applies For  
Title XI For 4 Vessels  
To Be Built By Halter**

**Arthur Levy Enterprises, Inc.**, 1028 One Shell Square, New Orleans, La., has applied for a Title XI guarantee to aid in financing the construction of four twin-screw tug/supply vessels. They are to be built by **Halter Marine Services, Inc.** of New Orleans, and are scheduled for delivery in December 1977 and January 1978.

The 3,000-bhp, 185-foot vessels are estimated to cost \$2.1 million each. The vessels will be operated by Levy to relocate movable offshore oil and gas drilling platforms, and to transport crews and supplies between drilling locations and the shore in both domestic and foreign waters. **Arthur Levy Enterprises** is affiliated with **Offshore Island Boats, Inc.**, which also owns ocean tug/supply vessels financed through Title XI.

# HUGHES BROKERAGE

**OFFERS MORE THAN  
THREE QUARTERS OF A CENTURY OF 'KNOW HOW'  
IN THE SALE, PURCHASE AND CHARTER  
OF ALL TYPES OF FLOATING EQUIPMENT**



**ALL TYPES AND SIZES OF TUGBOATS ■ BARGES ■ DREDGES ■ DERRICKS  
FERRIES ■ BOTTOM DUMPERS ■ WORK BOATS ■ SURPLUS GOVERNMENT VESSELS**

**HUGHES SALES DIVISION**

## HUGHES BROS., INC.

**17 BATTERY PLACE, NEW YORK, N.Y. 10004 ■ (212) 425-2350**

**CLEARING HOUSE FOR MARINE DIFFICULTIES SINCE 1894**



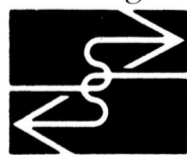
# The 105' patrol boat from Swiftships.



## It's making a world of difference.

All over the world, the all-aluminum 105' patrol boat from Swiftships is fast becoming the most demanded vessel for territorial water and shore patrol.

The construction quality is first class—performed under the most rigid quality control standards. With a 23 foot beam, mid-ship depth of 10 feet and a draft (appendage) of 7-1/2 feet, the 105' patrol boat is powered by a variety of turbo charged diesel engines including GM, MTU and Caterpillar.



A combination of these various types of propulsion plus the twin or triple screw configuration gives the craft a

top speed of 35 to 42 knots.

A full selection and location arrangement of ordnance suits is available. From the Emerlec 30mm, with complete fire control system, to 40mm, 20mm, 50 caliber, 30 caliber, 7.62mm and 81mm mortar. Of course, these armament selections can be customized to meet any specifications including missiles and torpedoes.

The 105' patrol boat from Swiftships. It's versatile. It's quality. It's powerful. And that's all the difference in the world.

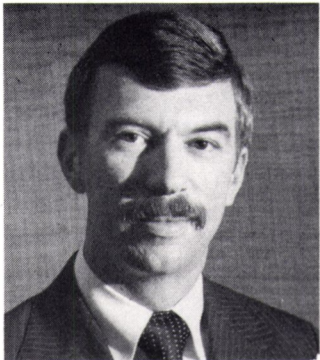
Call or write for details and our catalog.

**swiftships inc.**

P.O. Box 1908, Morgan City, Louisiana 70380 U.S.A.  
Telephone 504/384-1700, Telex 58-6453



**Moore-McCormack Lines  
Elect Hahn Treasurer**



Edward W. Hahn

Edward W. Hahn has been elected treasurer of Moore-McCormack Lines, Incorporated, it was announced by Robert E. O'Brien, president and chief operating officer. Moore-McCormack Lines is the ocean shipping subsidiary of Moore McCormack Resources, Inc. (listed NYSE, Pacific) of which Mr. O'Brien is also a director and vice president.

Mr. Hahn joined Moore-McCormack Lines in June 1971. He was appointed director of planning and budgeting in May 1973, and was elected assistant treasurer of Lines in June 1974.

After graduating from the United States Merchant Marine Academy at Kings Point, N.Y., in 1966, Mr. Hahn sailed as a deck officer for American Export Lines until August 1969. He then

entered the Harvard Business School, from which he received an MBA degree in June 1971.

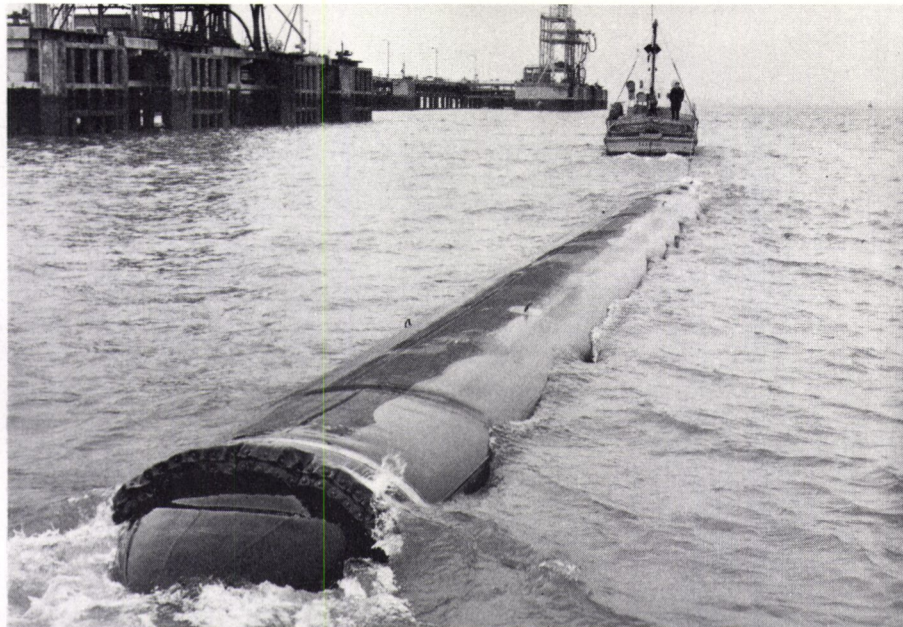
**Newport News To Convert  
Exxon Tug And Barge  
At Cost Of \$10 Million**

Exxon USA, Houston, Texas, has announced that it has signed a contract in excess of \$10 million with Newport News Shipbuilding, a Tenneco company, for the conversion of the seagoing tug Exxon Sunshine State and its companion barge Port Everglades into a 27,290 deadweight-ton tanker.

Scheduled for later 1977 delivery, the vessel will measure 552 feet 6 inches in length and 95 feet in breadth. Maximum cargo capacity will be approximately 194,000 barrels.

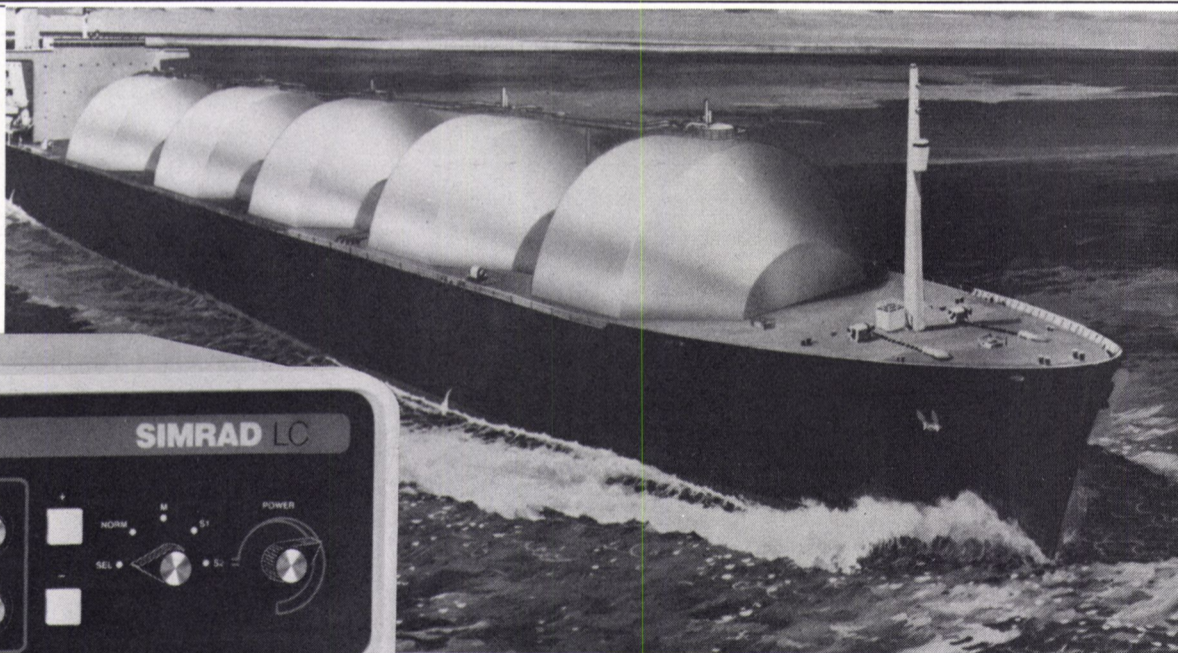
The conversion work generally involves cutting away part of the bow of the tug and installation of the propulsion plant into a notch in the stern of the barge. The converted unit will be powered by two existing diesel engines with approximately 6,000 combined horsepower.

Newport News Shipbuilding will also provide a new steel deckhouse for the tanker, which will contain a new navigation bridge and completely self-contained modules for all accommodation spaces.



**DUNLOP DRACONE BARGE** — An ideal solution to many oil-spill problems is provided by Dunlop Dracone Barges — towable, flexible containers that can be collapsed or rolled for ease of storage and transport. Manufactured by Dunlop GRG Division, they are available in a wide range of sizes (1,200 to 290,000 gallons), they can be moved quickly by air or sea to a disabled tanker or an oil-spill site; on arrival, they are instantly available as floating tanks for oil or oil-water mixtures. These barges are made of tough, petroleum-resistant synthetic rubber and nylon fabric. Their buoyancy and great strength enable them to be towed and maneuvered where conventional barges could not go. They ride well at sea-anchor, even in the roughest of seas. In addition to being utilized for oil spills, Dracones are ideally suited for transporting bulk liquids such as fresh water, refined petroleum products, and numerous other liquids. These barges have proved successful and economical by major international oil companies, oil-spill co-ops, and government agencies, etc., around the world. For complete information and engineering assistance, contact William Wood and Associates, P.O. Box 7886, Metairie (New Orleans), La. 70010.

**The Ship...  
LNG  
Aquarius**



**The Loran... Simrad LC204...**  
a solid choice for a ship that's going places

THE SUPPLIER... ELECTRO-NAV... a solid choice  
for all your marine electronic equipment.

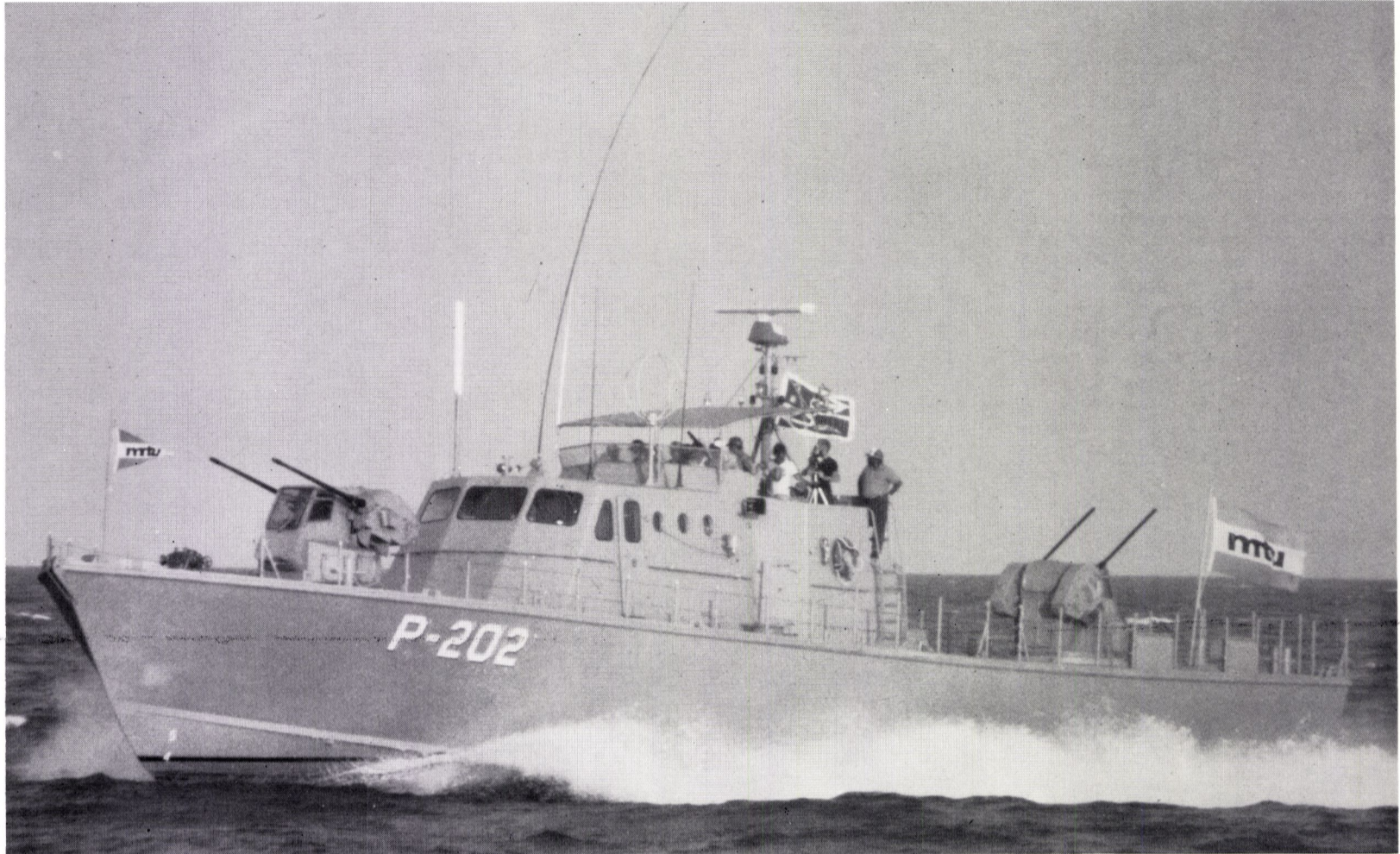
 **ELECTRO-NAV, Inc.**  
MARINE ELECTRONICS

1201 Corbin Street, Elizabeth Marine Terminal, Elizabeth New Jersey 07201 N.J. 201 527-0099 • N.Y. 212 687-7770  
Everything you need in Marine Electronics . . . from every important manufacturer.

**How Shell's Tormis**



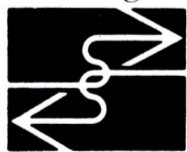
# The 105' patrol boat from Swiftships.



## It's making a world of difference.

All over the world, the all-aluminum 105' patrol boat from Swiftships is fast becoming the most demanded vessel for territorial water and shore patrol.

The construction quality is first class—performed under the most rigid quality control standards. With a 23 foot beam, mid-ship depth of 10 feet and a draft (appendage) of 7-1/2 feet, the 105' patrol boat is powered by a variety of turbo charged diesel engines including GM, MTU and Caterpillar.



A combination of these various types of propulsion plus the twin or triple screw configuration gives the craft a

top speed of 35 to 42 knots.

A full selection and location arrangement of ordnance suits is available. From the Emerlec 30mm, with complete fire control system, to 40mm, 20mm, 50 caliber, 30 caliber, 7.62mm and 81mm mortar. Of course, these armament selections can be customized to meet any specifications including missiles and torpedoes.

The 105' patrol boat from Swiftships. It's versatile. It's quality. It's powerful. And that's all the difference in the world.

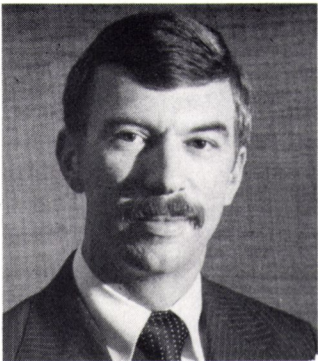
Call or write for details and our catalog.

# swiftships inc.

P.O. Box 1908, Morgan City, Louisiana 70380 U.S.A.  
Telephone 504/384-1700, Telex 58-6453



**Moore-McCormack Lines  
Elect Hahn Treasurer**



Edward W. Hahn

Edward W. Hahn has been elected treasurer of Moore-McCormack Lines, Incorporated, it was announced by Robert E. O'Brien, president and chief operating officer. Moore-McCormack Lines is the ocean shipping subsidiary of Moore McCormack Resources, Inc. (listed NYSE, Pacific) of which Mr. O'Brien is also a director and vice president.

Mr. Hahn joined Moore-McCormack Lines in June 1971. He was appointed director of planning and budgeting in May 1973, and was elected assistant treasurer of Lines in June 1974.

After graduating from the United States Merchant Marine Academy at Kings Point, N.Y., in 1966, Mr. Hahn sailed as a deck officer for American Export Lines until August 1969. He then

entered the Harvard Business School, from which he received an MBA degree in June 1971.

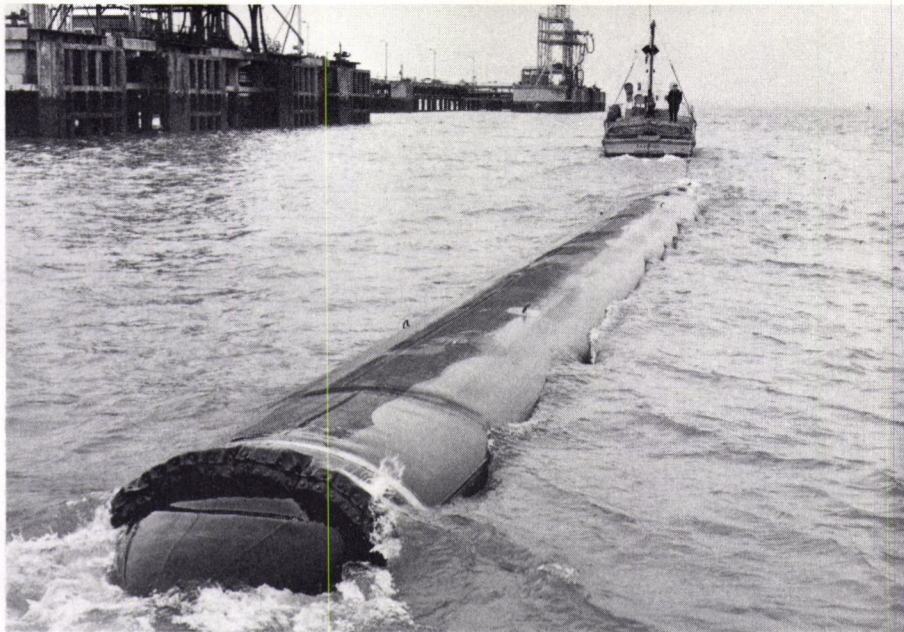
**Newport News To Convert  
Exxon Tug And Barge  
At Cost Of \$10 Million**

Exxon USA, Houston, Texas, has announced that it has signed a contract in excess of \$10 million with Newport News Shipbuilding, a Tenneco company, for the conversion of the seagoing tug Exxon Sunshine State and its companion barge Port Everglades into a 27,290 deadweight-ton tanker.

Scheduled for later 1977 delivery, the vessel will measure 552 feet 6 inches in length and 95 feet in breadth. Maximum cargo capacity will be approximately 194,000 barrels.

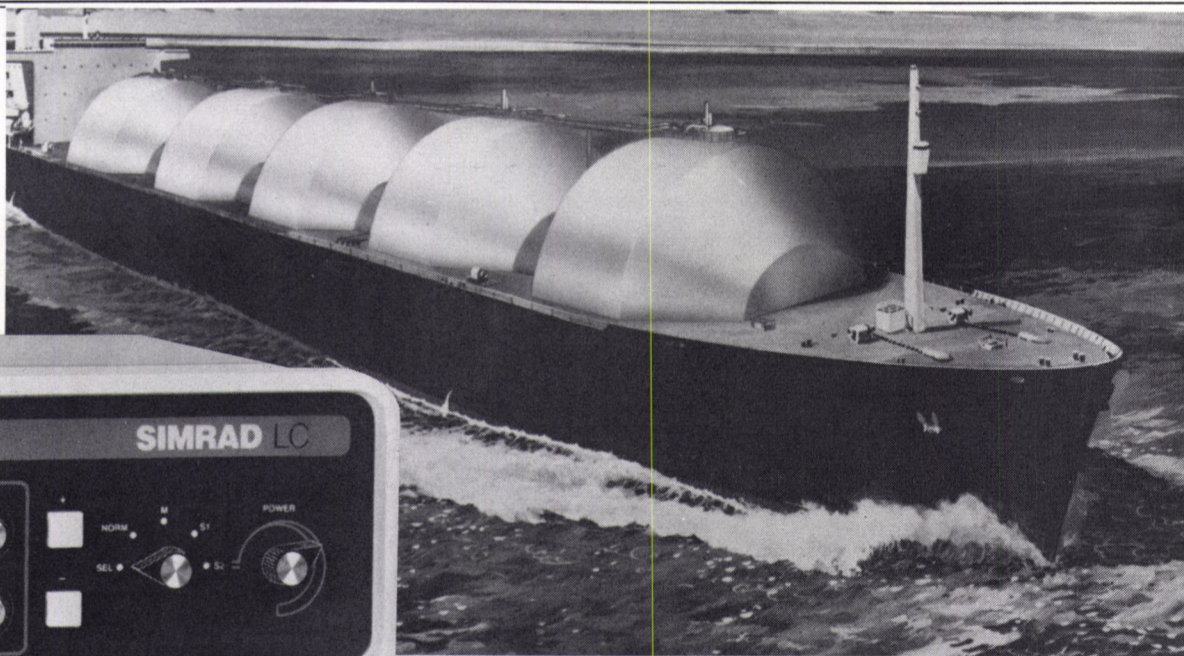
The conversion work generally involves cutting away part of the bow of the tug and installation of the propulsion plant into a notch in the stern of the barge. The converted unit will be powered by two existing diesel engines with approximately 6,000 combined horsepower.

Newport News Shipbuilding will also provide a new steel deckhouse for the tanker, which will contain a new navigation bridge and completely self-contained modules for all accommodation spaces.



**DUNLOP DRACONE BARGE** — An ideal solution to many oil-spill problems is provided by Dunlop Dracone Barges — towable, flexible containers that can be collapsed or rolled for ease of storage and transport. Manufactured by Dunlop GRG Division, they are available in a wide range of sizes (1,200 to 290,000 gallons), they can be moved quickly by air or sea to a disabled tanker or an oil-spill site; on arrival, they are instantly available as floating tanks for oil or oil-water mixtures. These barges are made of tough, petroleum-resistant synthetic rubber and nylon fabric. Their buoyancy and great strength enable them to be towed and maneuvered where conventional barges could not go. They ride well at sea-anchor, even in the roughest of seas. In addition to being utilized for oil spills, Dracones are ideally suited for transporting bulk liquids such as fresh water, refined petroleum products, and numerous other liquids. These barges have proved successful and economical by major international oil companies, oil-spill co-ops, and government agencies, etc., around the world. For complete information and engineering assistance, contact William Wood and Associates, P.O. Box 7886, Metairie (New Orleans), La. 70010.

**The Ship...  
LNG  
Aquarius**



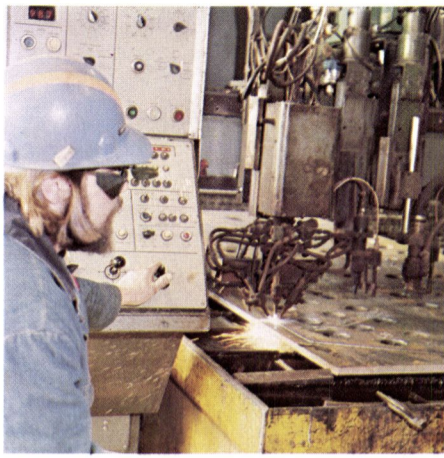
**The Loran...Simrad LC204...**  
a solid choice for a ship that's going places

THE SUPPLIER... ELECTRO-NAV... a solid choice for all your marine electronic equipment.

 **ELECTRO-NAV, Inc.**  
MARINE ELECTRONICS

1201 Corbin Street, Elizabeth Marine Terminal, Elizabeth New Jersey 07201 N.J. 201 527-0099 • N.Y. 212 687-7770  
Everything you need in Marine Electronics... from every important manufacturer.





# The quality is steady as she goes



At Marinette Marine, we still believe in the Master's Touch. It makes a quality difference that stays with you whatever course you chart. On the high seas. Inland waterways. Harbor service.

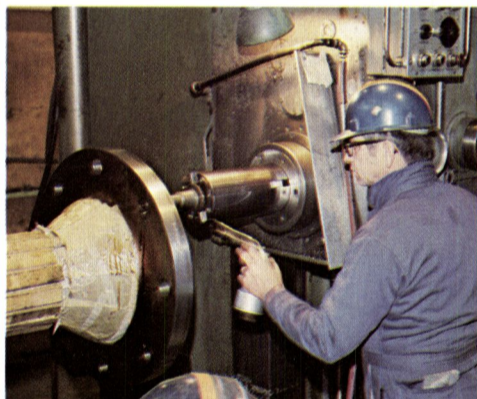
It's the perfect complement to the efficiency of our numerically controlled machines and electronic production surveillance techniques.



Marinette Marine applies the Master's Touch in the building of landing craft. Barges. Oceanographic research vessels. Special purpose commercial craft from 40 to 300 feet.

We're particularly strong in building multiples — a "good economics" point to remember.

Marinette Marine. Where men, machines and methods have compiled a 5-year-plus record for on-time deliveries *at the agreed upon cost*. Come aboard!



the new wave in commercial shipbuilding



**Marinette Marine**

Marinette, Wisconsin 54143  
(715) 735-9341 Telex 910-270-1388





# How Shell's Tornus keep thousands of work boats

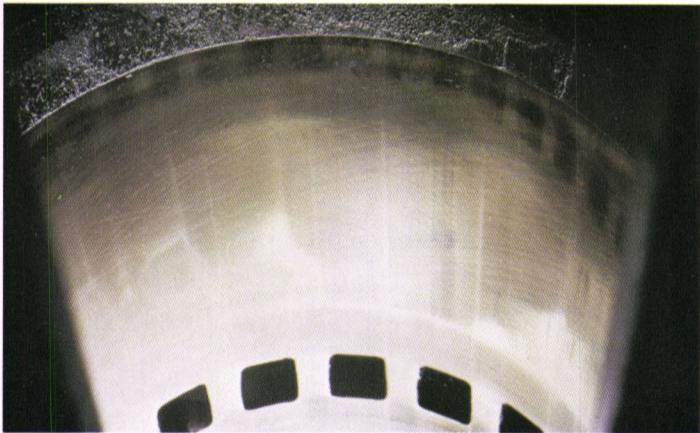




# Oil has helped churning ahead for over ten years.



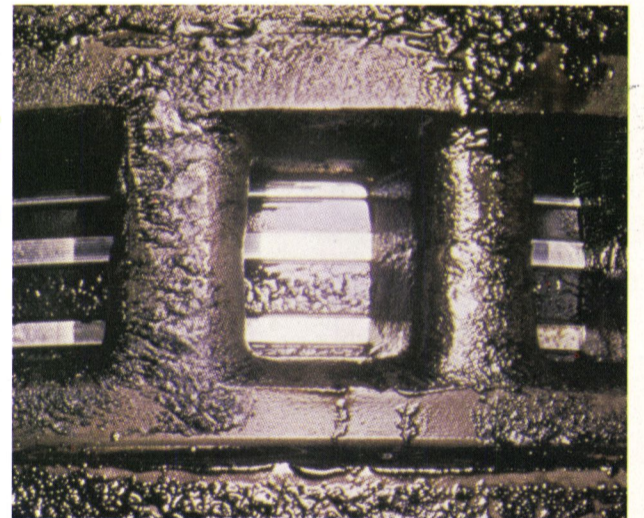
Engines in hard-working inland waterways towboats, (above), and ocean-going tugs (left) have their work cut out for them. So does the engine oil. High-dispersancy Tornus Oil protects main engines against wear, helps promote operating efficiency.



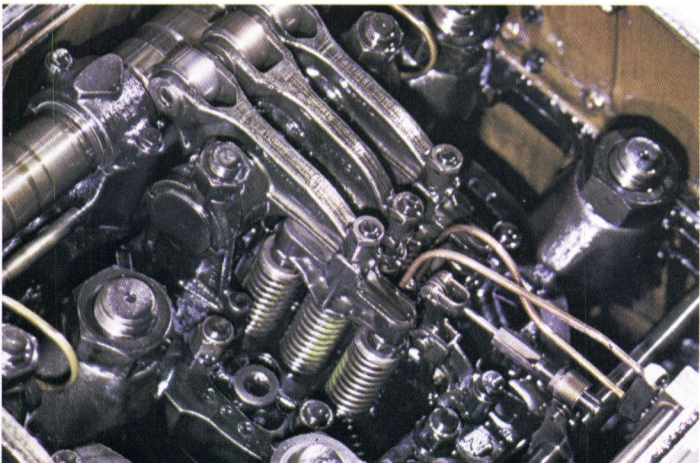
After 18,864 hours this cylinder liner from an EMD-12 645 E5 still shows original crosshatch marks. A tribute to the excellent wear protection of Shell Tornus Oil.



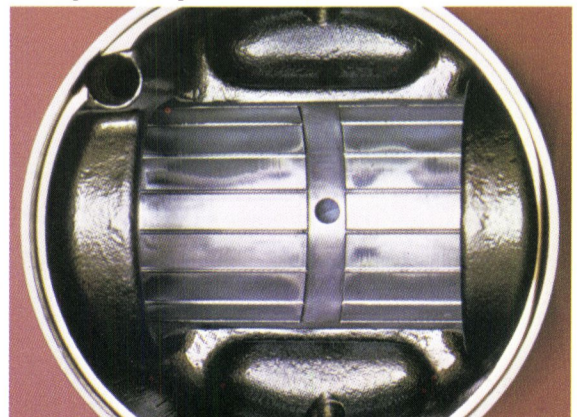
After over 23,000 hours, piston #1 of the starboard engine of an EMD 16-645 E7 shows light lacquer on skirt; rings in good condition, none stuck; only normal drag lines. Tornus Oil fights wear and lacquer buildup.



Ports are wide open from EMD 645 E with 20,000 engine hours on Tornus Oil. No deposits. Rings in good condition without need for replacement.



In this top deck of an EMD 645's port engine, note the highly polished appearance of cams and followers, the clearly visible green paint on the spring. Yet this engine has never received an oil changeout in 18,852 hours.



Much of the lead overlay is still intact on this wrist pin bushing from an EMD-12 645 E5 after 18,864 engine hours. No feathering of silver into the grooves. Tornus Oil has provided excellent lubrication.



From the same engine as the wrist pin bushing, this piston undercrown is clean, free of deposits. Tornus Oil resists sludge, lacquer and carbon deposition. This promotes cooler running pistons.

Since 1965, Tornus Oil has been helping tugs and towboats stay on the job in oceans, harbors, the Gulf and inland waterways. There's good reason why.

Look at the critical engine parts below, photographed after extended periods of service. All were on Tornus Oil for 18,000 to 23,000 hours. All showed normal wear and were exceptionally clean and free of power-robbing deposits.

With Tornus, the oil gets dirty, the engine stays clean. And cleanliness is extremely important in keeping power up and fuel consumption down.

## Caprinus® R Oil

may help your fleet even more.

Shell's Caprinus R Oil can help extend oil drain intervals *indefinitely* in EMD power, and stretch the service life of oil filters. It offers excellent alkalinity retention to combat corrosive combustion products and help reduce frequency of overhauls. Caprinus R is Shell's answer to the need for extra high performance in modern high-output, medium-speed diesels.

Get all the facts. Write for our brochures on Tornus Oil and Caprinus R Oil. There's information in them that could help you trim operating costs.

Write Shell Oil Company,  
Mgr. Commercial Communi-  
cations, One Shell Plaza,  
Houston, Texas  
77002.



Come to **Shell for answers**



**\$3-Million Heavy Lift Gear Systems Contract Awarded To Contecco**

Contecco, Inc., 55 Morris Avenue, Springfield, N.J. 07081, has announced that it has been awarded a contract of approximately \$3 million to design and supply four heavy lift gear systems, each having a safe working load capacity of 216 metric tons.

Two systems will be installed on each of two vessels owned by American Heavy Lift Co. and presently under construction at Peterson Builders, Inc., Sturgeon Bay, Wis.

The two systems on each vessel are arranged so that their lifting capacities can be combined, resulting in a possible single lift of 432 metric tons.

Delivery of the equipment will be by the middle of 1978.

**Union Carbide Awards Seatrain Shipbuilding \$35-Million Contract**

Seatrain Shipbuilding Corp., the Brooklyn shipyard subsidiary of Seatrain Lines, has announced that it has been awarded a \$35-million contract from Union Carbide to rebuild the former containership Seawitch into a chemical carrier.

According to the announcement, the contract involves the refurbishing of the vessel's after section containing its propulsion machinery and the joining with a new forward section.

To be renamed the Chemical Discoverer upon completion of the work, the converted ship is scheduled for delivery in the third quarter of 1979. The conversion job is scheduled to begin within a few weeks.

The contract is the second to be awarded Seatrain Shipbuilding by Union Carbide thus far this year. Seatrain is currently building two oceangoing barges for the chemical company.

**Santa Fe Receives Offshore Contract From Chilean Firm**

Santa Fe Engineering Services Co., a subsidiary of Santa Fe International Corporation, Orange, Calif., has been awarded a contract by Empresa Nacional del Petroleo, the national oil company of Chile, to provide design and management services for offshore drilling and production facilities.

The first phase of the contract includes the design of a self-contained platform drilling rig, the design of several production and drilling platforms, and planning for submarine pipelines connecting the structures to shore.

Santa Fe also will procure and supervise the fabrication of the rig, which is scheduled to be shipped from Houston, Texas, next January.

The platforms will be installed in water depths of 66 to 164 feet in the Strait of Magellan, east of the first narrows off the coast of Posesion and Daniel oil fields. The structures will be designed for currents of 4 to 5 knots, tides of 33 feet and winds of 115 miles per hour.

**Dapco Marine Seeks Financing To Build Two Towing/Supply Vessels**

The Maritime Administration has received a request for a Title XI guarantee to aid in financing the construction of two twin-screw, 3,000-hp, oceangoing towing/supply vessels from Dapco Marine Corporation, Suite 512, Richards Building, 837 Gravier Street, New Orleans, La.

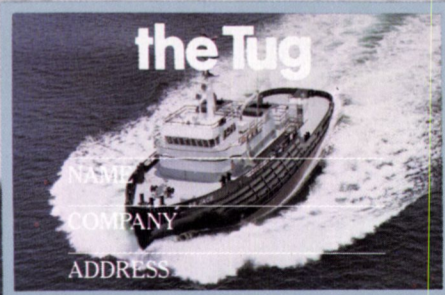
Dapco Marine will operate the new vessels in the offshore oil trade, primarily in the Gulf of Mexico, the Caribbean, and the Atlantic East Coast. The firm presently operates an oceangoing tug in North Sea drilling service. The vessels will cost approximately \$2.3 million each and are scheduled for delivery in October and December 1977.

Dapco Marine is a subsidiary of Drilling and Production Tool Corporation.

**The ocean going, rig towing, ship and anchor handling Tug from Halter is the very best multi-purpose ocean tug you can buy... anywhere.**



We build tugs for towing ships, barges and drilling rigs, for anchor handling and offshore support, for inland and harbor use, ship handling, mooring, docking, and tendering. And we build special use tugs for unusual operations. We can build the tug you need. Ask us. Halter Marine Services, Inc. Box 29266 New Orleans, La. 70189 U.S.A. Dept. MR Tel: 504/254-1222 International Telex—6821246 Domestic Telex—58-4200 Cable: HALMAR.



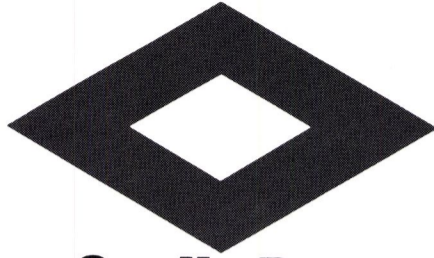
**The Total Shipbuilding Group®**





# THERE IS A DIFFERENCE IN TUGBOAT COMPANIES.

- ◆ The largest and most powerful fleet of tugs.
- ◆ Eight new tugs in six years.
- ◆ More tugs under construction.



**Curtis Bay  
Towing Company**

Over 60 years of service.

Philadelphia □ Baltimore □ Hampton Roads

- ◆ Skilled personnel.
- ◆ 3 port communications.
- ◆ 24 hours a day operation.



Tugs CAPE HENRY 3500 hp and CAVALIER 2360 hp docking SEALAND MARKET



## Pacific N.W. Section Hears Paper On Marine Cathodic Protection

The Pacific Northwest Section of The Society of Naval Architects and Marine Engineers met recently at Sir Winston's Restaurant in Portland, Ore., for a presentation on marine cathodic protection. The meeting was opened by **John Mitchell** of Northwest Marine Iron Works, who is vice chairman for the Columbia River Area. Mr. Mitchell announced that **John Cauduro**, general manager of Progress Electronics Company, Portland, had been appointed Technical and Research Committee chairman for the section.

For the technical session, **Joseph A. Lehmann**, P.E., vice president and general manager for Norton Corrosion Ltd., Woodinville, Wash., presented a paper titled "Marine

Cathodic Protection." The presentation was augmented with slides depicting a variety of cathodic protection system installations and some component failures.

In his paper, Mr. **Lehmann** stated that cathodic protection is the one method by which virtually complete corrosion control can be achieved on new or existing subsurface steel structures without prior treatment of the metal surface of the adjoining environment. Essentially, the cathodic protection process is simply "corrosion in reverse." On marine structures, there are multiple conditions resulting in the establishment of numerous and intense galvanic cells. For example, seawater near the surface contains a large amount of oxygen as compared to water at greater depths. The steel surfaces which are oxygen starved become anodic to

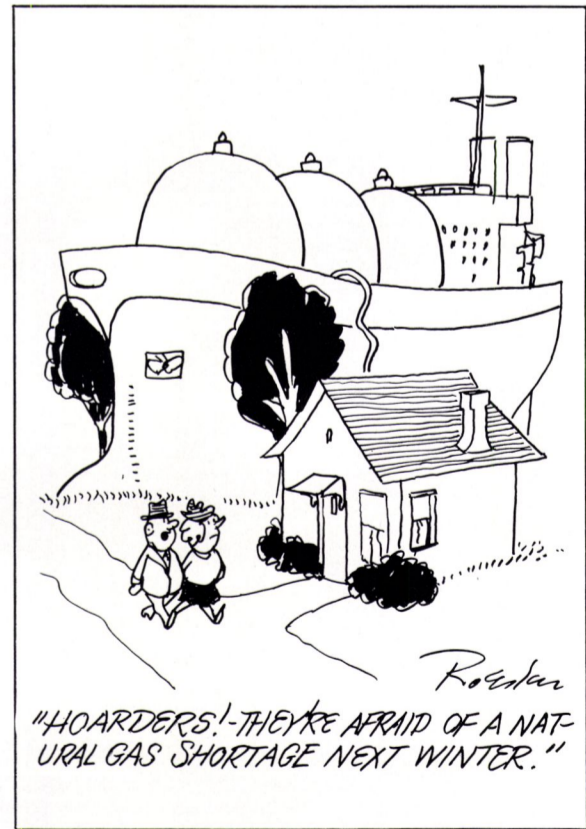
those areas where oxygen is plentiful. Hot worked welded seams are usually anodic to adjacent cold rolled plate. Submerged or buried steel encased in concrete interconnected to bare steel in mud or water results in corrosion attack on the bare steel at the junction with the encased steel. Variations in the environment give rise to local concentration cells. These cells can be set up by differences in oxygen, temperature, agitation, water velocity and, in fact, by almost any heterogeneous exposure condition. Once a potential difference has been established, the corrosion cell will begin to function.



Shown at the Pacific Northwest meeting, left to right: **William Dahlbeck**, Papers chairman; **Douglas Hendrix**, chairman, Pacific Northwest Section; **Joseph Lehmann**, author, and **John Mitchell**, vice chairman, Columbia River Area.

Realizing that no corrosion occurs at the cathode, a structure can be protected if its entire surface can be made to be cathodic with relation to the auxiliary anode which is expendable. Essentially, there are two types of cathodic protection—galvanic anode and impressed current systems. The two systems are similar in that they both deliver a d-c current to the structure being protected, forcing it to be cathodic or "cathodically protected." The paper then continues on to explain the criteria for protection and design considerations. The test includes information on how to calculate galvanic anode requirements.

Copies of the paper are available through the Section librarian, **Mrs. L.S. Bracken**, Todd Shipyards, P.O. Box 3806, Seattle, Wash. 98124.



# COMET MARINE SPARE PARTS and EQUIPMENT

For **FAST** delivery

OUR WAREHOUSE CONTAINS A LARGE INVENTORY OF DECK AND ENGINE SUPPLIES READY FOR IMMEDIATE SHIPMENT... INCLUDING...

### INGERSOLL-RAND

air compressors, parts & accessories

### PROTO HAND TOOLS

wrenches, hammers, screwdrivers, sockets, pliers, cutters etc.

### BURNER REPLACEMENT PARTS

Todd-CEA Babcock & Wilcox

### GLASSES, GAUGE

### MARINE INSTRUMENTS

Pressure Gauges • Thermometers  
• Dial Thermometers • Cargo Tank Thermometers • Recording Instruments  
• Recording Charts • Accessories & Fittings

### PUMPS & REPLACEMENT PARTS

Allis-Chalmers	Ingersoll-Rand	Gould Pumps
Aurora	Warren	Coffin Pumps
Dean Bros.	Worthington	Pacific Pumps
Fairbanks-Morse		

### SAFETY EQUIPMENT

Stewart R. Browne

### SOOT BLOWERS

Copes Vulcan Diamond

### TURBINES & REPLACEMENT PARTS

### FLANGE GASKET—MECHANICAL SEALS

PSI Industries Sealol-Chempro Flexibox

Write for free brochure showing our complete list of products and services.

# COMET MARINE SUPPLY CO.

157 PERRY STREET, NEW YORK, N.Y. 10014 • TEL. (212) 675-8776



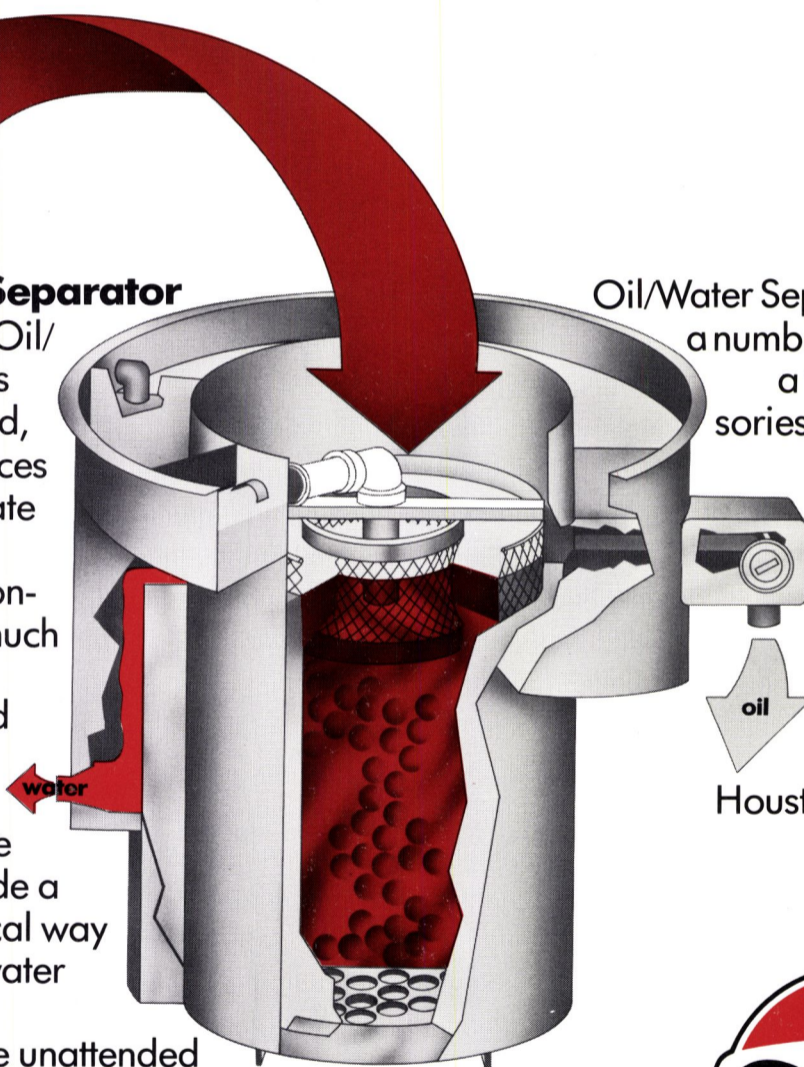


# When oil gets in your bilge and ballast.....

## An Oil/Water Separator can get it out.

Oil/Water Separators are self-contained, single-stage devices which can separate free oil from oil/water mixtures containing from as much as 15% oil to less than 100 ppm and handle surges at 100% oil for short periods. The separators provide a simple, economical way to clean up oily water discharges.

They operate unattended with an alarm that automatically sounds an oil discharge. And to top it off they keep printed records of the amount of oil that has been separated.



Oil/Water Separators come in a number of models with a variety of accessories to fit your need.

For a brochure and further information, call your Gulf pro, or write Gulf Oil Corporation, Dept. 152, P.O. Box 1563, Houston, Texas 77001.



Gulf Oil Corporation



## Union Mechling Forms Water Analytics Division

Union Mechling Corporation has announced the formation of a new division, Water Analytics, to provide more complete consulting services for total transportation and distribution problems incidental to water movement.

According to **Ralph G. Kennedy III**, managing director, Water

Analytics is an "organization of operating, engineering, marketing, financial and management personnel structured into teams of specialists designed to work with a client's individual transportation and distribution problems."

Mr. **Kennedy** explained that the service will include analysis and recommendations for the most practical and economical solutions

to problems involved in transporting raw materials, intermediate products and finished goods to their destinations.

Water Analytics will provide consulting services for: Inland Waterways Cost/Capacity Analyses, Barge/Towboat Operating/Service Analyses, Commodity/Rate Studies, Simulation/Operation Research, Intermodal Analyses, and Transportation and Distribution Analyses.

Water Analytics is located at 210 Sixth Avenue, Pittsburgh, Pa.

Union Mechling Corporation, one of the nation's largest river transportation companies, is a subsidiary of Dravo Corporation.

## Halter To Build Two Tug/Supply Vessels For Point Marine, Inc.

A request for a Title XI guarantee to aid in the financing and construction of two twin-screw 3,000-hp, 185-foot tug/supply vessels has been received by the Maritime Administration from Point Marine, Inc., P.O. Box Drawer 2120, Morgan City, La.

The vessels will be built by Halter Marine Services, Inc., New Orleans, La., at an estimated actual cost of \$1.65 million each, with delivery scheduled in December 1977 and January 1978. Point Marine will operate the new vessels in the offshore drilling trade in both U.S. and foreign waters. Point Marine is presently the owner and operator of two other tug/supply vessels.

## Raymond Ledoux Plans \$4.2-Million Twin-Screw Oceangoing Tugboat

Velvet Ocean Systems, Inc., P.O. Box 101, Hahnville, La., has applied for a Title XI application to aid in financing the construction of a twin-screw, oceangoing tugboat.

Estimated actual cost of the vessel is \$4.2 million. Southern Shipbuilding Corporation, Slidell, La., is the shipbuilder. The vessel will be 148 feet long and powered by two 3,600-bhp diesel engines. The applicant is owned by **Raymond K. Ledoux**, who has been engaged in domestic marine operations since 1969. The new vessel will be operated in the worldwide offshore oil trade.

## NAVIMOR Poland Makes Brochure Available On Services And Facilities

Represented by the Foreign Trade Enterprise, NAVIMOR Polish Shiprepair Yards in Gdansk has announced the publication of a new brochure describing the various facilities available to vessel owners worldwide.

Ships of up to 70,000 tons dwt can be docked, and a 100-ton-capacity floating crane is available. All types of ship repair, overhaul, conversions and ship lengthening are offered, as well as navigational and electrical equipment repairs.

Every type of Mac Gregor hatch cover can be manufactured and repaired at the facility.

For further information or a copy of the brochure, contact Capt. **Z. Pienkawa**, NAVIMOR, U.S.A., One World Trade Center, Suite 3557, New York, N.Y. 10048.

*This advertisement appears as a matter of record only.*

**\$14,644,000**

## Austral Entente

*A container and unitized cargo vessel, bareboat chartered to*

## Farrell Lines Incorporated

*with equity investment by*

## General Electric Credit Corporation

*We initiated and arranged a leveraged lease financing for the lengthening of this vessel, including the offering of \$10,530,000 principal amount of United States Government Guaranteed Ship Financing Notes and Bonds.*

**White, Weld & Co.**  
Incorporated

International Investment Bankers  
One Liberty Plaza, New York, N. Y. 10006

May 24, 1977





**Our ways can serve you better.**

From blueprint to finished vessel, at FMC we have the flexibility to custom build a wide variety of marine structures to your specifications.

We can do it because we are **equipped**:

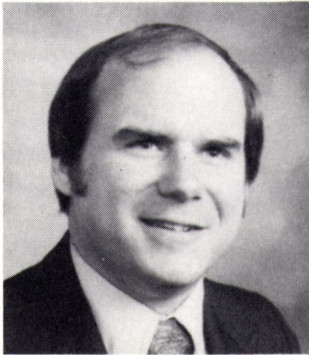
Acres of assembly bays house computerized lofting, numerical burning, and automatic welding equipment. Our yard offers 200 ton capacity crane service to 650 foot side-launch ways, and most importantly, qualified people who know how to do their job right!

We're versatile. We have the ways to serve you better. Contact us. Call or write Vice President, Sales, FMC Corporation, Marine and Rail Equipment Division, 4700 N. W. Front Avenue, Portland, Oregon 97208. Telephone (503) 228-9281, Telex 36 0672.

**FMC** Transportation  
Equipment



**Reel-O-Matic Systems  
Appoints R.S. Fields  
General Manager**



Ronald S. Fields

Ronald S. Fields has been appointed general manager of Reel-O-Matic Systems, Inc. (formerly Columbia Products, Inc.).

Previously, Mr. Fields was in charge of purchasing for this manufacturer of wire and cable reeling and handling equipment, located at 418 Hellam Street, Wrightsville, Pa. 17368.

**Chicago Bridge Plans  
Yard For Ingleside**

Chicago Bridge & Iron Company has submitted an application to the Galveston Engineer District for a permit to construct a marine yard on the right bank of the Gulf Intracoastal Waterway at Mile 539, Port Ingleside, Texas.

Approximately 132,000 yards of material would be removed to form two slips 600 feet long by 110 feet wide with 190 feet between the slips. A bulkhead would be constructed along the entire area. Approximately 900,000 yards of material would be excavated from in front of the bulkhead to the Corpus Christi Ship Channel to form a connecting channel 500 feet wide and 15 feet deep.

The facility would be used to unload materials from barges for the construction of offshore structures which would be launched on barges and towed to sea.

**First Of Four San Clemente-Class Tankers  
Designed And Built By NASSCO For OSG  
Christened In Ceremonies At NASSCO Yard**



Participants in the naming ceremony of the S/S Overseas Chicago included, left to right: Roland A. Kjelland, president, NASSCO; C. Larry French, executive vice president, NASSCO; Frank Drozak of Seafarers International Union; the Honorable Robert J. Blackwell, Assistant Secretary for Maritime Affairs, U.S. Department of Commerce (featured speaker); Alan F. Delp, vice president, First National Bank of Chicago and president, First Chicago Leasing Corporation; Mrs. Delp, matron of honor, S/S Overseas Chicago; Mrs. Neil McKay, sponsor, S/S Overseas Chicago; Neil McKay, vice chairman, First Chicago Corporation and of the First National Bank of Chicago; John McCoy, principal surveyor, American Bureau of Shipping; Ran Hettena, director, Overseas Shipholding Group, Inc. and president, Maritime Overseas Corporation; Capt. Richard Brown, U.S. Coast Guard, Officer in Charge of Marine Inspection, and Sherman J. Kemmer of Sohio Petroleum Company.

The S/S Overseas Chicago, 90,000-dwt San Clemente-Class tanker, was christened recently during brief ceremonies on the ship's forecastle.

Mrs. Neil McKay, wife of the vice chairman of First Chicago Corporation and the First National Bank of Chicago, sponsored the new vessel. Mrs. Alan F. Delp, wife of the vice president of the First National Bank of Chicago and president of First Chicago Leasing Corporation, served as matron of honor. The third lady on the christening platform was a special guest of the sponsor, Mrs. Donald C. Clark, wife of the president of Household Finance Corporation.

Others who participated in the event were the Honorable Robert J. Blackwell, Assistant Secretary for Maritime Affairs, U.S. Department of Commerce, who was featured speaker. Ran Hettena, director, Overseas Shipholding Group, Inc., and president, Maritime Overseas Corporation; Roland A. Kjelland, president, National Steel and Shipbuilding Company (NASSCO), and C. Larry French, executive vice president and general manager, NASSCO.

The Overseas Chicago is the first of four San Clemente-Class tankers to be designed and built by NASSCO for subsidiaries of Overseas Shipholding Group, Inc. (OSG).

She is 894 feet long, has a beam of 105 feet, a depth of 64 feet, and is the maximum size that can transit the Panama Canal. The latest in automation has been designed in the ship's operational controls.

The new tankers incorporate special pollution abatement and related safety features, including double bottoms, inert gas sys-

tems, anticollision radar, high-capacity clean ballast systems, and sewage treatment plants.

OSG is the only publicly owned company engaged exclusively in the ocean transportation of bulk commodities in both the worldwide and U.S. shipping markets. OSG is the largest independent owner of unsubsidized U.S.-flag tankers.

The name Overseas Chicago was derived from The First Chicago Leasing Corporation, a subsidiary of The First Chicago Corporation, through which long-term financing was arranged on all four San Clemente-Class tankers ordered by OSG.

All four tankers have been time-chartered to The Standard Oil Company (Ohio), commencing upon delivery for use in the Alaskan oil trade.

NASSCO is owned equally by Kaiser Industries Corporation and Morrison-Knudsen Company, Inc., and managed by Kaiser Industries.

**New Bearing Brochure  
Available From Sealol**

A four-page brochure, covering Sealol's new, maintenance-free, phenolic bearings with molded-in TFE linings, is available from Sealol, Inc. The brochure describes the advantages, construction and characteristics of the new bearings, and includes a listing of ships in which they are now already in use or are being fitted.

Because of the integral TFE linings, the bearings are completely self-lubricating and require no external lubrication system. Thus, initial installation costs are considerable lower and maintenance costs are eliminated.

For further information, write William Condon, Sealol, Inc., Providence, R.I. 02905.

**Shipping chemicals  
or liquids of any kind  
isn't for kids.**



When you're shipping chemicals or petroleum products, you can't afford to take a chance with an inexperienced shipper. Inexperience, outdated or inadequate equipment can create disastrous effects, endangering lives, property and your company's good reputation.

Transporting liquid cargo by barge is Chotin's business and has been for over 75 years. Chotin can offer you *reliable* and *safe delivery* of your liquid cargo anywhere along the inland waterway system, Gulf of Mexico or east coast. Your liquid cargo travels in modern, well maintained equipment under the watchful eyes of some of the most *highly skilled* and *experienced* personnel available. Shipping chemicals or petroleum isn't kid stuff — it requires experienced professionals . . . call us.

**We're the experts**





## U.S. Steel Orders Colt-Pielstick Engines For Huge Ore Carrier

Two Colt-Pielstick marine engines with associated gearing, supporting equipment and monitoring systems have been ordered from Colt Industries, Fairbanks Morse Engine Division in Beloit, Wis., by United States Steel Corporation of Pittsburgh, Pa. **John Morgan**, president of the Fairbanks Morse Engine Division, announced the multimillion-dollar order.

The pair of 18-cylinder engines will provide propulsion power for a large self-discharging bulk carrier which will be built by the AMSHIP Division, The American Ship Building Company of Lorain, Ohio. Each engine will drive an inboard turning, controllable-pitch propeller through a single reduction gear. The vessel will be 1,000 feet long with a beam of 105 feet. This is the fourth ship in the "Super Carrier" series built by American Ship, but is unique in several regards. The first three are also Colt-Pielstick powered, with one in operation and the other two under construction. The U.S. Steel ship has different hull lines, midship section, unloading arrangement, and a greater horsepower engine package than the other three ships.

**R.D. Jacobs**, manager of marine sales, said that the two Colt-Pielstick engines are each rated at 9,630 hp at 520 rpm. The ship will be capable of carrying in excess of 58,000 long tons of taconite pellets at midsummer draft. The vessel will be self-discharging, utilizing a single loop belt concept serving the five cargo holds of the ship. The loop belt transfers the iron ore pellets into a shuttle conveyor that can project outboard from either side of the ship for unloading up to 10,000 long tons per hour into a dockside, hopper fed, conveyor system.

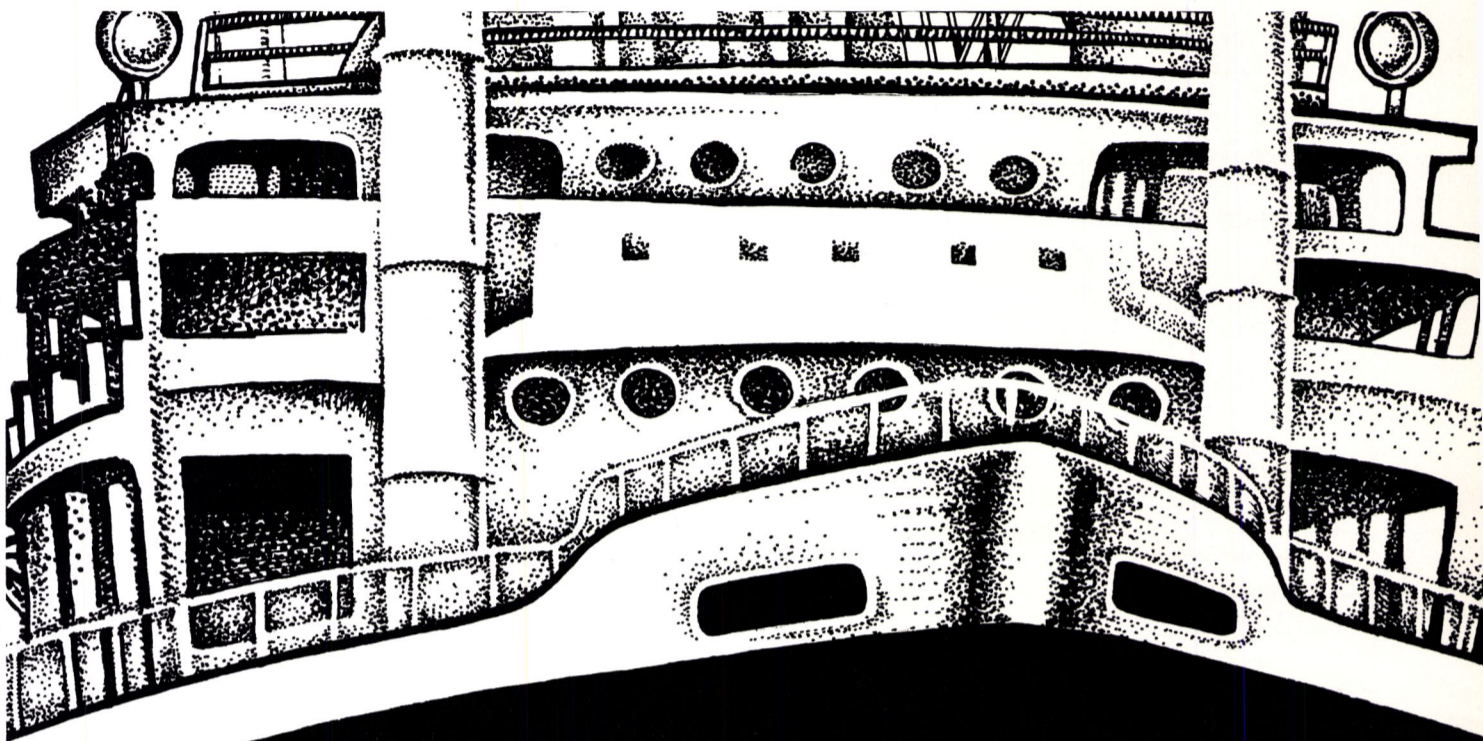
The new vessel is expected to be in operation for the 1979 shipping season. The 18-cylinder, Colt-Pielstick engines are V-configuration and will propel the ship, fully loaded, at about 16½ mph. They are designed to burn heavy fuel up to 3,500 seconds Redwood viscosity at 100°F. Colt-Pielstick diesels are available from 12 to 18 cylinders and have a 15.75-inch bore and 18.11-inch stroke (400 mm by 460 mm). The engine is built by licensees worldwide and is the most widely used, high-horsepower, medium-speed marine diesel—furnishing power for more than 1,000 ships. The engines will be manufactured in Colt Industries, Fairbanks Morse Engine Division's plant at Beloit—one of the largest and most modern large engine facilities in the United States. Marine diesels are tested on a 30,000 bhp dynamometer—the highest rating in the United States.

Mr. Jacobs also pointed out that

Fairbanks Morse Engine Division will furnish the engine monitoring consoles, bridge and engine control room to meet USCG and ABS 1976 rules (ACCU requirements) for a "no-man" engine room watch. "The centralized engine room and bridge controls with the performance monitoring system will give reliable operation of the machinery and ship by simplifying the operations through

automation. The automation will allow more time for a high level of onboard ship maintenance." Two control levers are on each console — one for each engine/gear/propeller system. Control level positioning determines the engine speed and load as well as the pitch of the propeller for that engine. Four modes of control are possible through a control mode selector. The first allows separate

control at engine room console of engine speed and propeller pitch by an engineer. The second mode gives combined engine room control where the engine speed and propeller pitch follows a predetermined program. The third mode is the same combined program from the bridge, and the fourth provides pitch control from the bridge and speed control from the engine room.



## Raytheon makes Doppler Systems for small big slow fast ships.

FORE/AFT SPEED  
23.8

And for every size and speed in between. In fact, no matter what your ship — tug, LNG, RO-RO, containership — you can upgrade your shipboard navigational capability and increase the margin of safety with one of these modular doppler systems from Raytheon:

**The DSN-400.** For maximum shipboard navigation capability with simultaneous and continuous fore/aft and lateral speed indication and depth measurement.

**The DSL-300.** For fore/aft speed monitoring with switch-selectable lateral speed indication and optional depth measurement.

**The DSL-200.** If your requirement is merely for a single-axis speed log with optional depth measurement.

DEPTH BELOW KEEL  
920

A Raytheon Doppler System for every shipboard requirement — all with these common benefits: easy installation... high visibility digital readout... bottom tracking to 1000 feet with automatic switchover to water mass tracking... flexibility of repeater design and installation... full compatibility with other shipboard electronics such as true motion radar, navigation computers and collision avoidance systems... highly reliable solid state digital circuitry to keep initial cost and operating cost exceptionally low.

Raytheon's family of doppler systems is backed by Raytheon's reputation for dependability in marine electronics. Over 75 years of experience make Raytheon the leader in the field. So upgrade your shipboard navigational capability — and navigational safety — with a Raytheon Doppler System. Your small big slow fast ship will be better for it. For details write Marketing Manager, Raytheon Maritime Systems, Portsmouth, R.I. 02871, U.S.A.

**RAYTHEON**



# T-2 EQUIPMENT

Selected Items Listed

## UNUSED G.E. MAIN PROPULSION STATOR

Type ATB-2 — serial No. 6978272. 2300/2370 volts — 60/62 cycles — 3 phase — 3600/3720 RPM — amps armature 1237/1315 — 4925/5400 KW — 1.0 P.F.

## T-2 UNUSED G.E. MAIN PROPULSION STEAM TURBINE WITH ROTOR

10 Stage — 435# — 720°T.T.  
Turbine complete with rotor — serial No. 109166 — 4925/5400 KW — 3600/3720 RPM — 10-stage — 435# — 720°TT — 28.5" VAC.

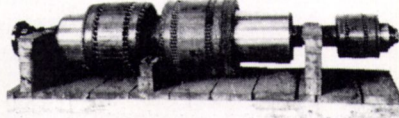
## WESTINGHOUSE MAIN PROPULSION STEAM TURBINES

1 unit shrouded  
WILL SELL ROTORS SEPARATELY

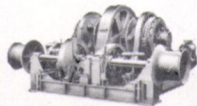
## WESTINGHOUSE MAIN PROPULSION GENERATOR STATOR

From Ex-Pecos — in like-new condition. With A.B.S.

## WESTINGHOUSE 538 KW AUX. GENERATOR EXCITER ARMATURE



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



## T-2 WINDLASSES (Located West Coast)

AH&D Model S-505 — for  
2 5/16" chain. Engine 12 x 14  
— operating weight 42,700 lbs.  
1 HESSE-ERSTED — LOCATED EAST COAST

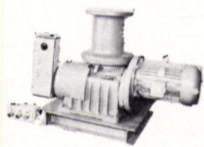
## COMPLETE WESTINGHOUSE 538 KW TURBO GENERATORS

Complete steam end, reduction gear, electrical end.  
Some units recently overhauled for U.S. Government.

## WESTINGHOUSE 538 KW TURBINE ROTORS

## NEW DOCKSIDE OR SHIPBOARD MOORING CAPSTANS — REVERSING

Duty 10,000 lbs @ 60 FPM



MOTOR: 10 HP—totally enclosed —fan cooled—continuous duty—horiz. flange mounted—special shaft & oil seal fitted—440/3/60 —1760 RPM. CONTROL: Marine type watertight pushbutton — forward/reverse/stop—watertight starter box. DIMENSIONS: Barrel 10" diam.—top flange 14 1/2" diam.—bottom flange 16 1/2" diam.—ht. of spool 16"—approx. 26" wide & 36" long.

IMMEDIATE DELIVERY FROM STOCK

## 9 x 12 2-SPEED ALL-STEEL STEAM WINCHES

for use as

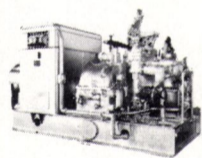
## MOORING WINCHES OR GENERAL USE

20,000 LBS @ 110 FPM — 7450 LBS @ 250 FPM  
DRUM CAPACITY: 1250' of 1" wire in 9 layers or 2200' of 3/4" in 12 layers. Weight 11,300 lbs. DRUM DIMENSIONS: 22" diameter—20" between flanges; flange diameter 40"; two 16" gypsies.

Drum brake—contracting band type—asbestos lining—foot operated. WINCH DIMENSIONS: 12' long—8' wide —5' 10" high. Reconditioned by U.S. Navy. Equal to new.



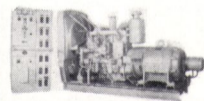
## G.E. 600 KW GEARED TURBO GENs.



450/3/60/1200 RPM—961 amps —type AT1—0.8 PF. TURBINE: FSN-FN-20 6-stage — 525 lbs/825°F—superheat 355°/371°F. GEAR: 10033/1200—RPM 1033 — total — 6390 lbs. steam/hr. steam flow.

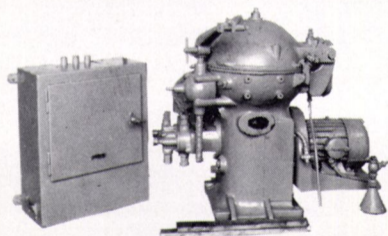
## 75 KW CUMMINS EMERGENCY DIESEL GENERATOR SET

as removed from  
U.S.N. Ship "Pecos"



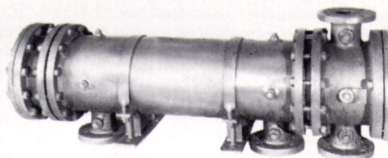
ENGINE: Electric starting 6-cylinder Cummins, radiator cooled, with alarms. GENERATOR: 75 KW — 93.8 KVA — 440/3/60 — 1200 RPM — 120 amps. Field circuit 125 volts — 15.4 amps — with free-standing switchgear.

## FUEL OIL OR LUBE OIL PURIFIER



De Laval — 600 GPM — type B-1529C-60 — with 3 HP 440/3/60 motor. Mfg by German De Laval. Has new stainless steel bowl. Spare parts available.

## LUBE OIL AND FRESH WATER COOLERS



## LUBE OIL COOLER

42.5 Square feet—weight 660 lbs—87 tubes 5/8" 0.049.

## FRESH WATER COOLER

75.2 Square feet—weight 800 lbs—102 tubes 5/8" 0.049.  
SUITABLE FOR ENGINES UP TO 900 BHP

## C4-S-A1 KAISER VESSEL

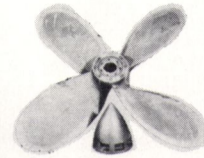
## MACHINERY

Formerly Operated By Bethlehem Steel Co.

- 1 H.P. Westinghouse turbine — S.H.P. 4500 — 5358 RPM — 440# — 740°TT — instruction book 6535.
- 1 L.P. Turbine Rotor
- 3 Worthington-Moore 400 KW aux turbine rotors — seven stage—6097 RPM—form S6
- 1 Set reduction gears—type 14x10—single reduction double helical—6097/1200—for aux turbo generator sets
- Also quantity of boiler safety valves 1 1/2" & 2" Consolidated
- 1 Set HP & LP couplings for Westinghouse HP & LP turbines — 9000 SHP normal — 9900 SHP maximum
- Two main stop valves — boiler — 600 series — 5" Crane
- Pumps

## FOR LST VESSELS

### • PROPELLERS — Port & Starboard

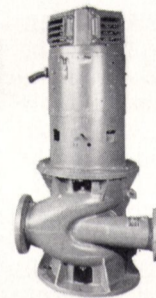


Also for tugs & motor vessels having LST propellers. 7.0' Diameter — 4.583' pitch. Weight 1820 lbs. Available: 2 Starboard (reconditioned) 2 port (reconditioned) 1 port (new). Bronze.

### • FIRE & BILGE PUMPS

Manufactured by Gould — horizontal centrifugal — bronze. 4" Suction—3" discharge—250 GPM @ 100 PSI—2200 RPM—30 HP 230 VDC motor with magnetic starter.

### • BALLAST PUMPS



Gardner-Denver — bronze — vertical — total suction lift 15' — 8" suction — 6" discharge — 1500 GPM @ 25 lbs — 1750 RPM. MOTOR: 30 HP — 230 VDC — 112 amps — made by Century.

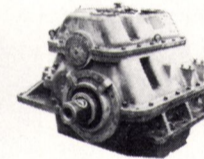
### • ANCHOR WINDLASS MOTORS

Vertical — 20 HP — 230 volts D.C.

### • RAMP WINCH MOTOR

20 H.P. gearhead deck ramp winch motor.

### • PORT & STARBOARD REVERSE AND REDUCTION GEARS



1 Set — with Airflex clutch. Ratios — 2.48:1 forward — 2.52:1 astern. Suitable for use with 12-567A & 12-278A engines. Port & starboard units.

## MATCHED PAIR

## 12-278A G.M. ENGINES

900 HP @ 744 RPM — 8 3/4" x 10 1/2" — 12 cylinders — VEE type on common base with reduction gear — 2.48:1—Falk—port & starboard. Will sell separately.

### • MISCELLANEOUS

- Bronze Triplex Strainers
- Pneumatic Control Stands
- Combination Lube Oil & Fresh Water Pump for Reduction Gear

## SPECIAL OFFER T-2 AUXILIARY GENERATOR ROTORS

## G.E. AUX. TURBINE ROTORS DORV-325M — 5645 RPM

For G.E. 525 KW TURBO GENERATOR SETS



Very little use. In like-new condition. Balanced, and with A.B.S. Certificate.

STATIONARY BLADING AVAILABLE



# THE BOST

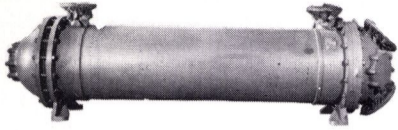
313 E. BALTIMORE

Main Office: (301) 477-1111



## ROSS COOLERS

ALL EX-LST UNITS—FORMERLY USED WITH 12-278A & 12-567A ENGINES



### TYPE 1596 — 317 SQ. FT.

12-567A use — water-to-water — flanged — 2-pass. 196 Cupro nickel tubes — 5/8" diam. — 18 Bwg. Copper shell — cupro-nickel heads. 5" seawater inlet — 4" freshwater inlet. Centers of fresh water inlets 84" — overall cooler length 9' 7-3/8".

### TYPE 1566 — 252 SQ. FT.

12-567A use. Oil to water — flanged — Shell OD 16". 2-Pass — 196 Cupro-nickel tubes — 5/8" diameter — 18 BWG. 5" Seawater inlet — 3" oil inlet. Centers of oil inlets 55".

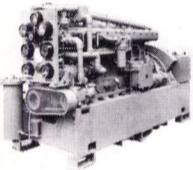
### TYPE 1460 — 160 SQ. FT.

2-Pass — 15" diameter — 80" overall — 5" seawater inlet — 3" oil inlet — 5/8" tubes. Centers of oil inlets 49 1/4". Copper shell.

### TYPE 848 — 75 SQ. FT.

Single pass — copper shell — 8" diameter — oil inlet & outlet 1 1/2" — overall length 60".

## 100 KW GBD-8 DIESEL GENs.



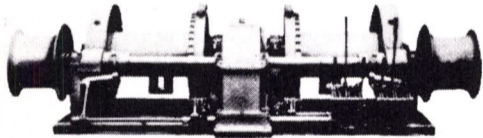
From LST vessels. 120/240 VDC — 417 amps — stab shunt — 1200 RPM — Delco gen. — self-excited. ENGINE: Superior GBD-8 — 8 cyl — 5 1/2 x 7 — 150 HP — 30 volt electric starting. Reconditioned to ABS. Dry wt 10,000 lbs — DAL 124" — 65-11/16" high — 42" wide. Ht necessary to pull piston 68". Fuel consumption 0.620 lbs/hr

## DOUBLE-DRUM TOWING-MOORING-UTILITY WINCHES

### DUTY:

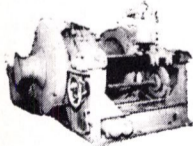
30,000 LBS @ 50 FPM  
15,000 LBS EACH DRUM

USING BOTH DRUMS SIMULTANEOUSLY



DRUM: 22" diameter — 36" face — 2500 feet of 1 1/4" wire. Equipped with spooling device. MOTOR: 75 HP — 230 VDC — under-deck mounted — 262 amps — 1140 RPM. Complete with all controls — mfg by Commercial Iron Works. Winch heads declutchable. OAW 16'9" — OAH 57" OA Depth 7'7".

## 100,000 lb. Almon Johnson Constant Tension Mooring Winches

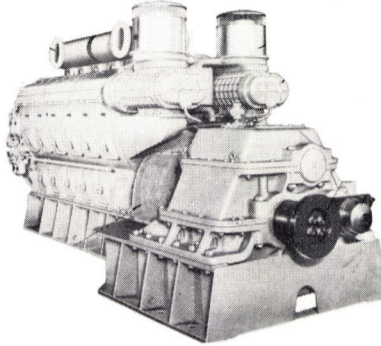


1 Available. In very good condition. Series 232 mooring & anchoring winches — automatic self-tensioning. Wide range from 100,000 lb line pull at 10 FPM to 26,000 lbs at 400 FPM. Gypsy line pull 12,000 lbs at 125 FPM. Drum declutchable through spiral jaw clutch for free spooling.

Driven by 50 HP — 230 VDC motors — Westinghouse CK — 575 RPM — 1/2 hour — 75°C rise — stab. shunt — 181 amps — max. RPM 1900. Cutler-Hammer brake — 18" — type NM.

## MATCHED PAIR 900 H.P. G.M. 12-567A DIESEL ENGINES

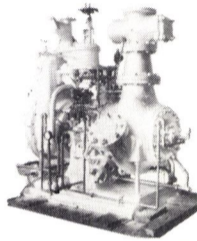
with Falk reverse and reduction gears



ENGINE: 12-567A — 8 1/2 x 10 — VEE type — 2-cycle — 747 RPM — electric starting — serial Nos. 1041 & 1060. GEAR: Falk Air Flex — reverse and reduction — 2.48:1 forward — 2.52:1 reverse.

## COFFIN FEED PUMPS — ALL SIZES —

### TYPE DE



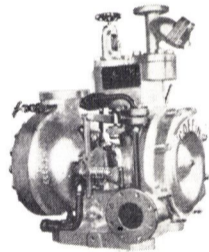
#### 3 TYPE DE-2

#### 540 GPM 1870' NET HEAD

8450 RPM — 585 PSIG — 0° — 200° superheat — exhaust pressure 15 lbs — NSPH 30 — typical serial 4683DE

#### 2 TYPE DE-B 214 GPM 2070' NET HEAD

7040 RPM — 241 HP. Steam pressure 597 PSI — superheat 100° — 300°F. Typical serial No. DEB 1-25-37

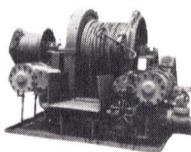


### TYPE CG

#### 2 TYPE CG 350 GPM 1880' NET HEAD

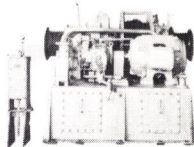
7220 RPM — 311 HP. Steam pressure 580 PSIG — 0° — 100° superheat. Exhaust 15 lbs — typical serial #5437-CG-8-33

## 12 x 14 AUTOMATIC STEAM TENSIONING MOORING WINCHES



CAPACITY: First layer 20,000 lbs. @ 100 FPM, 16,000 lbs. @ 150 FPM. Drum will stow 1500 ft. of 1 1/2" wire rope in 9 layers. Overall width 8' 4 1/2" — overall length 8 1/2". 3" Steam connection — 4" exhaust. Drum 2' diameter — drum width 2' 6 3/4". Manufactured by American Engineering Co.

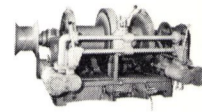
## 50 H.P. ELECTRO-HYDRAULIC SINGLE DRUM SINGLE GYPSY MOORING OR CARGO WINCHES



"B" end size 5. Complete with deck mounted control.

7400 LBS at 220 F.P.M. — up to 700 feet of 1" wire. With hydraulic brake assembly. 50 HP — 440/3/60 squirrel cage Reliance motor — 1180 R.P.M. — 66 amps — Frame CC445N. Water Bug hydraulic pumps and motor. "A" end size 5 —

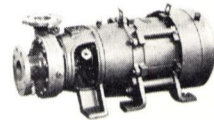
## 7 x 10 CLYDE DOUBLE DRUM WINCH



Drum 8500 lbs. @ not less than 120 FPM; 13,000 lbs. at no specified speed. Gypsy head 22,500 lbs. static pull. Foot brake to hold 17,000 lb. pull. Steam cylinders with standard 250 P.S.I. DIMENSIONS: 9' 5 3/4" wide over winch heads — 5' 10 1/2" wide over bedplate — 4' 1" deep over bedplate — 6' 5" overall (brake pedal, etc.) — 2" steam — 2 1/2" exhaust. Drums 16" diameter — 20" wide — 33 13/16" over flanges. Rebuilt by U.S.N. equal to new.

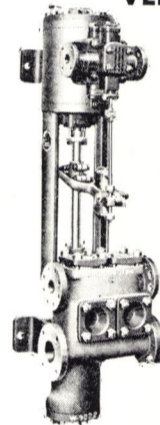
## PUMPS

### INGERSOLL-RAND FIRE & FLUSHING PUMPS



Reconditioned — with A.B.S. — 200 G.P.M. — 160 P.S.I. discharge. Suction 3 1/2" — discharge 3" — 3500 RPM — bronze construction — flanged. MOTOR: 20 H.P. — 440/3/60/3600 RPM — G.E. type KF — Frame 326 — full load amps 28.

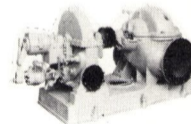
### UNUSED WORTHINGTON VERTICAL SIMPLEX PUMPS



7 1/2 x 4 x 10 — 3" suction — 2" discharge — 1 1/4" steam — 1 1/2" exhaust. OAH 5'2"; OA depth 23"; OAW over air dome 2'2". Weight about 800#. Suitable for Liberty Ships EC-2 & Victory Ships VC2, AP2 & AP3. (Fuel oil service) Liquid capacity from 8 to 20 GPM — up to 350#. Also suitable for small boiler feed service. Steam WP 220# and 10# exhaust.

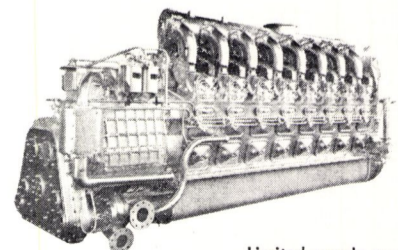
\$795

### TURBINE-DRIVEN CIRCULATOR



6300 GPM at 25' or 4000 GPM at 35'. Pump — 12 x 14 — 75 HP turbine — 600 lbs — 5 lbs back pressure — 1200 RPM. Turbine manufactured by Whiton — type B.K.S. Pump manufactured by Lawrence

## G.M. 16-278A 1700 H.P. DIESEL ENGINES



Limited supply remaining

Complete, clean and in very good condition. As removed from U.S. Naval vessels. 1700 HP @ 750 R.P.M. Your inspection invited.

# N METALS CO.

ST. • BALTIMORE, MD. 21202

1900 Marine Dept.: (301) 355-5050

INQUIRE ABOUT ANY ITEMS YOU NEED!



# MOST WANTED...BY THOUSANDS

## OVER 16,000 WORLDWIDE BUYERS

THIS RECORD BUYING POWER REQUEST CIRCULATION IS THE LARGEST IN THE ENTIRE WORLD...THOUSANDS MORE THAN ANY OTHER MARINE MAGAZINE INCLUDING...

MARINE ENGINEERING/LOG • MOTOR SHIP • OCEAN INDUSTRY • MARINE EQUIPMENT NEWS • OFFSHORE • SEATRADE • SEA TECHNOLOGY • WATERWAYS JOURNAL • WORK BOAT • WORLD DREDGING & MARINE CONSTRUCTION

### MARITIME REPORTER/Engineering News

#### TOTAL WORLD WIDE BUYING POWER

(Non-buyers removed)

**BUYING  
POWER**

#### SHIPBUILDING AND SHIP REPAIR:

(Commercial, U.S. Navy and U.S. Coast Guard):  
Companies, directors, owners, presidents,  
vice presidents, secretaries, treasurers,  
superintendents, managers and purchasing agents  
Naval architects, engineers and  
chief draftsmen .....

**5,625**

#### VESSEL OPERATING COMPANIES—OCEAN, RIVERS, HARBORS, OFFSHORE OIL DRILLING AND RELATED OPERATIONS:

(Owners, Agencies and brokers)  
Companies, directors, owners, agents,  
presidents, vice-presidents, managers,  
secretaries and treasurers  
Port engineers, superintendents, purchasing  
agents, port captains, port stewards,  
naval architects and engineers shoreside .....

**8,728**

#### PROFESSIONAL MEN:

Naval architects, engineers and  
consultants shoreside .....

**2,202**

**WORLD WIDE BUYING POWER TOTAL**

**16,555**

**TWICE EACH MONTH...OVER 33,000 COPIES TO BUYERS EVERY MONTH**



# MORE MARINE MANAGEMENT MEN

## OVER 98% REQUESTED...IN WRITING... BY EACH INDIVIDUAL READER

The total worldwide circulation of MARITIME REPORTER/Engineering News is 98.4% personally requested in writing by each individual reader. These requests are dated, audited and must be periodically renewed by each reader. Here is a current circulation list of unequalled quality. Marine advertisers know MARITIME REPORTER is wanted by thousands more marine industry decision-makers.



## A BONUS FOR ADVERTISERS 396,000 FREE DIRECTORY LISTINGS

When you place a series of display advertisements in MARITIME REPORTER for one year you receive at no cost, a listing in the BUYERS DIRECTORY in all 24 issues of MARITIME REPORTER...even if an ad does not appear in every issue.

MARITIME REPORTER has a worldwide circulation to 16,555 marine buyers... TWICE each month. This means over 33,000 copies of MARITIME REPORTER are mailed to buyers every month. This gives each advertiser over 396,000 free directory listings to marine buyers in one year. In addition, every time your advertising appears, it reaches this unequalled audience of marine buyers. No other marine magazine provides this service.

The exposure your advertising receives with marine buyers in MARITIME REPORTER is overwhelmingly superior to anything offered by any other marine magazine.

### IMPORTANT

Other marine magazines mail thousands of free copies indiscriminately to names taken from directories of recipients who have never requested the magazines. Demand to see the official circulation statements...check for non-requested free copies...be sure the readers want the magazine carrying your marine advertising.

You be the judge...ask your own marine customers and prospects which marine magazine they read. When you and your representatives get the answers, give all your advertising to the winner.

**MARITIME  
REPORTER**  
AND  
ENGINEERING NEWS

107 EAST 31st STREET  
NEW YORK, N. Y. 10016  
MUrray Hill 9-3266 • 7 • 8 • 9



## Raytheon Adopts New Warranty Program

Raytheon Marine Company of Manchester, N.H., has announced the adoption of the industry's first two-year warranty covering every product in its marine electronics line.

The new limited warranty covers all parts for a period of two

years and labor for one year from the date of original installation, regardless whether the installation is commercial or recreational. In most cases involving on-board equipment service, Raytheon will also assume travel costs of its authorized service representatives for up to 100 highway miles.

According to **Richard V. Warden**, president of Raytheon Ma-

rine Company, the new warranty is "far and away, the best offered by any manufacturer. We feel that the best way to show our customers and potential customers the confidence we have in the quality of all our products is to give them a guarantee that we're willing to bet money on — one that's better than what the competition offers.

"With the number of manufacturers in the marine electronics field increasing constantly," Mr. Warden said, "established industry leaders like Raytheon have an obligation to the boating public to set standards of performance and reliability that others can strive for."

Raytheon, a pioneer in the development of marine electronics and a leading manufacturer for more than 50 years, offers lines of Fathometer® depth sounders, VHF/FM and SSB radiotelephones, Mariners Pathfinder® radars, and various navigation aids and loud hailer. The company has more than 350 authorized dealers nationwide.

## Clipper Refinancing Seven Crewboats And Building A New One

Clipper Fleet, Inc., 100 Cherry Street, P.O. Box 1606, Panama City, Fla., has applied for a Title XI guarantee to aid in refinancing of the construction of seven existing crewboats and the construction of one new crewboat.

Six of the vessels are 100-foot aluminum crewboats (one is 95 feet long), with capacities for 48 to 60 persons each. They have maximum speeds of 29 mph. The new vessel will be identical to the larger crewboats.

Four of the vessels are owned by Clipper, and three are owned by Hamilton Fleet, Inc., an affiliated company which will be merged with Clipper. All vessels are chartered to oil companies for the offshore oil trade in the Gulf of Mexico.

Estimated depreciated cost of the existing vessels, which were built between 1974 and February 1977, and the estimated actual cost of the new vessel totals \$3.1 million. A shipyard has not been selected for the new construction.

## Clark Transportation Elects P.A. Preville

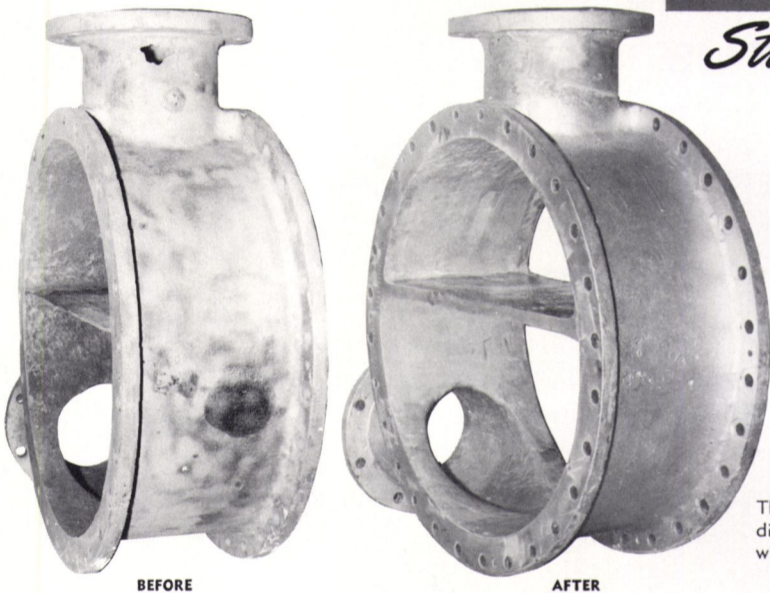
S.D. Clarke, president, Clarke Transportation Canada Ltd., 1155 Dorchester West, P.O. Box 730, Station "B", Montreal, Canada, has announced the election of **P.A. Preville**, P.Eng., as executive vice president of the company. In this new position, Mr. Preville will be responsible for the direction of all Operating Divisions of the company, namely, steamship, road transport, pool car, international, as well as sales and marketing. Mr. Preville joined the company in 1954, upon graduation as a mechanical engineer from McGill and R.M.C. He became manager of the Shipping Fleet in 1961, manager of the Steamship Division in 1967, and general manager, Steamship Services in 1969. He became a vice president in 1972 and vice president, Operations in 1976. This latest appointment completes a reorganization whereby all Clarke's Operating Divisions will report to one executive.

# THOUSANDS OF REPAIR JOBS HAVE BEEN COMPLETED QUICKLY AND ECONOMICALLY

with

## CORDOBOND®

*Strong-Back Materials*



BEFORE

AFTER

First proven under the most difficult conditions by the Navy, the Cordobond Strong-Back Method offers a fast and easy method of repair both aboard ship and ashore. Applied quickly by ship or maintenance personnel, Cordobond Strong-Back products are used extensively for repairing and lining:

Water Boxes	Ventilators
Machinery Castings	Stacks
Ducts	Pumps
Pipes	Sea Valves and Chests
Condenser Covers	Tanks, Bulkheads and Decks
Cooler Heads	Shell Plating Etc.
Tail Shafts	Frozen Pipes, etc.

The Cordobond Strong-Back Components, when used according to directions, will repair anything from a pin hole to a complete break with a patch of great strength that clings tenaciously and lastingly.

### MARINE REPAIR KITS

STANDARD KIT For Ocean Going Vessels JUNIOR KIT For Harbor Craft

SEND FOR LIST OF CONTENTS AND LITERATURE

**CORDOBOND REPAIR KITS CONTAIN ALL THE COMPONENTS AND ACCESSORIES FOR MAKING EMERGENCY REPAIRS AT SEA**

Packed in sturdy Navy type refillable metal containers.

Over 6000 ocean going vessels carry our standard repair kits. Cordobond is not affected by water, oil, gasoline, etc. It does not corrode. It eliminates costly gas freeing. Cordobond is self curing, no applied heat necessary.

### CORDOBOND STRONG-BACK PRODUCTS

Standard Resin Leveling Compound Strong-Back Putty Strong-Back Sealer Steel Putty

# HUBEVA

## MARINE PLASTICS, INC.

382 Hamilton Avenue

Brooklyn, New York 11231

Phone: 212-875-6178 or your local agent

SOLE DISTRIBUTORS OF CORDOBOND STRONG-BACK PRODUCTS

Agents throughout the world

Trained applicators available for repairs or instruction

—Montreal  
Heffernan Tiles Limited  
FRANCE—Dunkirk  
M & R Dekytpotter & Sons.

—Toronto  
Heffernan Tiles Limited  
INDIA—Bombay  
Nautilus International

GREECE—Piraeus  
Marine Technical Bureau  
HOLLAND—Rotterdam  
Van Lessen & Punt N.V.  
HONG KONG—Kowloon  
Marine Supply Company  
ITALY—Genoa  
Cager S.A.S.  
JAPAN—Yokohama  
Inouye & Company Ltd.  
MALAYA—Singapore  
Wah Hong & Company Ltd.  
NORWAY—Stabekk  
A.B. March & Company  
PORTUGAL—Lisboa  
Valadas Lda.  
SOUTH AFRICA—Capetown  
Globe Engineering Works, Ltd.  
—Point Durban  
James Brown & Homer Ltd.  
SPAIN—Bilbao  
Indame S.A.  
—Cadiz  
Consulmar S.L.  
TRINIDAD W.I.—Port of Spain  
R. Landry & Company, Ltd.  
VIRGIN ISLANDS—St. Croix  
Marketing Corp.  
WEST GERMANY—Hamburg  
Van Lessen & Punt GMBH  
BRITISH COLUMBIA—Vancouver  
Scardana Corporation  
FRANCE—Marseille  
Sogerac  
ARABIA—Kuwait  
Industrial Services & Supplies Co., W.L.L.

ALABAMA—Mobile  
Kamil Ship Supply  
CALIFORNIA—Wilmington  
J.M. Costello Supply Co., Inc.  
—San Francisco  
Cordes Bros.  
FLORIDA—Jacksonville  
Weedon Engineering Co., Inc.  
GEORGIA—Savannah  
Southern Marine Supply Co., Inc.  
LOUISIANA—New Orleans  
Hubeva Marine Plastics, of New Orleans, Inc.  
MAINE—Portland  
Chase, Leavitt & Co., Inc.  
MARYLAND—Baltimore  
Tate Temco, Inc.  
NEW JERSEY—Linden  
Beacon Packing & Equipment Co., Ltd.  
OREGON—Portland  
American-Pacific Corp.  
PENNSYLVANIA—Philadelphia  
Philadelphia Ship Maintenance Co., Inc.  
SOUTH CAROLINA—Charleston  
Southeastern Supply Co., Inc.  
TEXAS—Houston  
Texas Marine & Industrial Supply Co.  
WASHINGTON—Seattle  
May & Smith Company  
BELGIUM—Antwerp  
Verfaillie & Elsig SPRL  
CANADA—Halifax  
Hubeva Marine Plastics, Halifax  
FLORIDA—Miami  
Seastores Wholesale Co.





## After the damage is done is no time to learn you're not covered.

Whether it's for a construction error in your shipyard or an unexplained loss at sea, your marine coverage is only as good as your contract. And after-the-fact is not the time to learn that your contract is not all you thought it was.

It's not enough to depend on form coverage. You need an experienced marine broker who will ask the questions necessary to tailor your insurance specifically to your needs. And who will make sure your contract is broad enough to cover future contingencies.

Where do you go?

Try us.

R. B. Jones Insurance provides more coverage for tugs and barges than any other major broker. We're recognized specialists in the shipyard trade. We're a national firm, handling all areas of

risk management since 1889. Property. Casualty. Marine. Surety. Employee Benefits.

You don't have to be a client to call.

When it comes to your marine coverage, we believe you can never ask too many questions.

Our experienced staff will be happy to supply answers. Before-the-fact.

R.B. Jones has offices in nineteen cities, with corporate headquarters in Commerce Tower, 911 Main, Kansas City, Missouri 64199. Telephone 816/391-1000. Or call Bill Prendergast, executive vice president of our marine division in New York, at 212/344-5200.

## **R.B. Jones Insurance.**



## Lloyd's Register Pioneers Vibration Monitoring Techniques

Lloyd's Register of Shipping has pioneered the use of vibration monitoring of steam turbines as an alternative to the usual practice of dismantling such machinery for visual examination at the time of the first periodical survey.

Apart from the financial benefits to the owner or operator of the ship, there are possible technical advantages in not disturbing a turbine at an early stage in its operating life.

Although Lloyd's Register's Rules have provided for vibration

monitoring of steam turbines since 1971, the problem has been to devise satisfactory equipment and methods which would provide information at least equivalent to a visual examination.

Lloyd's Register's Technical Investigation Department has considerable experience in the field of vibration monitoring of marine machinery and, in association with the BP Tanker Co. Ltd., and Denholm Ship Management, has carried out first periodical surveys using this alternative method on the oil tanker British Scientist and the ore/oil carrier Nordic Conqueror.

In the case of the British Scientist, the owners, BP Tanker

Co. Ltd., subsequently decided, for other reasons, to open up the turbines, thus affording an opportunity to compare the predicted condition based on vibration analysis with the actual condition determined by visual examination. The correlation of the results was found to be very good and confirmed that the method used was basically sound, and a viable alternative for surveying steam turbines.

Lloyd's Register agrees to the vibration monitoring method of survey, provided the following conditions are met:

1. The turbines are fitted with rotor position indicators as a permanent feature of the installation.

2. Records of vibration readings obtained during the preceding 12 months are available for analysis.

3. Complete sets of vibration records on the forward and after bearings of each turbine are to be taken during part power and full power sea trials using portable vibration analysis equipment. The readings at the bearings are to be taken in the horizontal, vertical and axial directions.

4. The arrangements for the operation of the machinery with one turbine out of action are found in order and suitable for being readily fitted in an emergency.

5. The surveyors are fully satisfied from the full power trial that the turbines remain, as far as can be ascertained, in good working order.

6. The turbine rotor bearings, thrust bearings and flexible couplings are to be opened out after completion of the vibration monitoring exercise.

Lloyd's Register surveyors examine the vibration monitoring techniques to be employed, ascertain the vibration characteristics of the main turbines and assess the full power trials.

Lloyd's Register has the necessary technical equipment to carry out vibration measurements aboard ships, and the capability for analyzing the results, using the Society's own mini-computer or real-time analyzer.

## New Butterfly Valve Operator Brochures Available From Dover

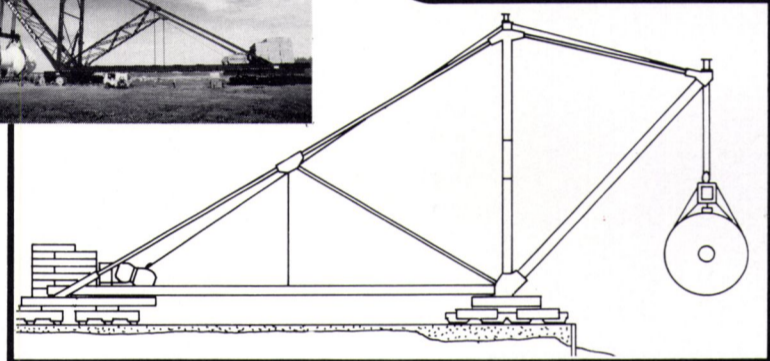
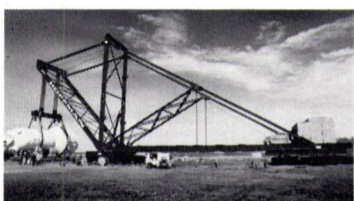
Two new butterfly valve operator brochures are now available from Norris Division of Dover Corporation.

The first, "Air Cylinder Assemblies for Operating 2" to 24" Norris Butterfly Valves," features Norris's new, patented cam action cylinder assemblies which offer many advantages over conventional open-linkage cylinder operators. It graphically illustrates how the mechanical advantage of cam action allows smaller, more economical cylinders to be used in many applications and how the new operator can help reduce operating costs. Dimensions, simplified sizing charts, a solenoid selection chart and description of the many auxiliary accessories for Norris cylinder assemblies are included.

The second brochure, titled "Manual Handles, Gear Operators and Accessories for Norris Butterfly Valves," describes the full line of on-off and throttling handles, gear operators, locking devices, etc., which are available for manual control of Norris valves.

For a free copy of these two new brochures, write **Pat Dillard**, Dover Corporation/Norris Division, P.O. Box 1739, Tulsa, Okla. 74101.

## For Sale/Lease



Rolling Breast Derrick

We have available for sale or lease a versatile hoisting rig which is capable of the configurations shown here.

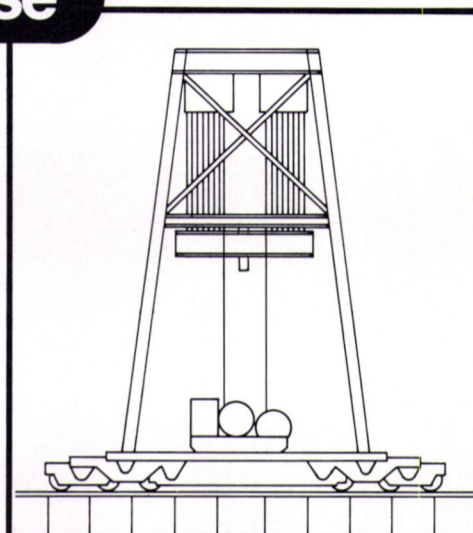
In the breast derrick mode, it has a lifting capacity of 675 tons (tested to 750 tons). In the gantry configuration its rated lifting capacity is 500 tons.

Power is provided by an American Hoist, Model 550, double-drum hoist. The block system is by McKissick.

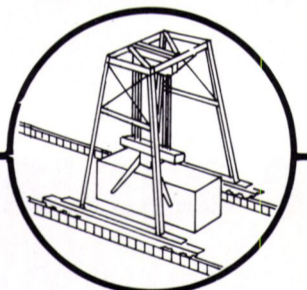
For more information contact S. W. Nowinski.

**Hoffman International, Inc.**

P.O. Box 2828, Port Newark, NJ 07114 Phone: 201-351-4400 TWX: 710-741-5891



Traveling Gantry Crane



**FAST  
REMOVAL  
OF  
PAINT, RUST  
SCALE**

CONSTRUCTION EQUIPMENT

PLANT MAINTENANCE

RIVER & HARBOR ENGINEERS

MARINE INDUSTRY

STORAGE TANKS

OIL REFINERIES

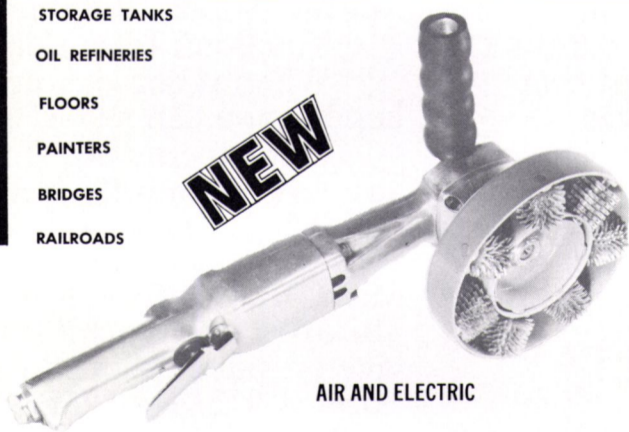
FLOORS

PAINTERS

BRIDGES

RAILROADS

**NEW**



AIR AND ELECTRIC

**SCAVENGER**

**ALSO IN KIT FORM WITH WIRE BRUSH HEAD**

Name \_\_\_\_\_ Title \_\_\_\_\_ Send FREE Catalog \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
a/c \_\_\_\_\_ Tel. \_\_\_\_\_ Please Call \_\_\_\_\_

**CHICAGO MONARCH CORP.**  
Box 9751 Cleveland, Ohio 44140



# Do you have these common complaints about pumps for crude, resid, petrochemicals, refined petroleum products, viscous and non-Newtonian fluids?

- 1) There's no way to change capacity.
- 2) Efficiency could be better.
- 3) They run so hot that you have to cool them.
- 4) When you want them to run really hot, there's no easy way to heat them.
- 5) You're in trouble when they lose their prime.
- 6) Noise and maintenance are real problems.

## Now there is a way to change capacity

GTS (geared twin screw) pumps from De Laval have many features which correct or bypass these difficulties. Take capacity, for example. The plot at right shows flow rate vs. speed for the five casing sizes available. What is important is that within each casing size, there are 4-6 capacities available.

casing size	nominal capacity (USgpm*)
133	100-950
208	400-2900
268	1300-4500
320	2500-5800
400	3400-9000

\* $\Delta P=0$

Capacities can be changed just by changing screw sets (since the capacity of a screw pump depends on the lead of the screws). GTS pumps also give you the opportunity of specifying reversibility with full rated flow in either direction.

## And you can get increased efficiency

Several design and manufacturing features increase economy of operation of GTS pumps. First, the thread profile is a double epicycloid which minimizes internal slip. This adds efficiency points to any calculation. Second, since the profile is symmetrical, tighter machining tolerances are possible. This increases

suction capability and adds to the overall integrity of design. And finally, timing gears are alloy steels, hardened and ground to reduce friction losses still more. All this adds up to fewer kilowatt hours used over the year.

## Temperature control is possible too

Other design features make GTS pumps easy to keep cool or hot, as you desire. These are oversized bearings, the high efficiency timing gears and an extra-large oil reservoir which dissipates heat without the added expense of an external lube cooling system. But if you do want your pump to run hot to maintain fluidity, an integral heat chamber cast into the case can be readily adapted for either steam or hot oil. Complete steam jackets are also available for operating temperatures up to 600°F.

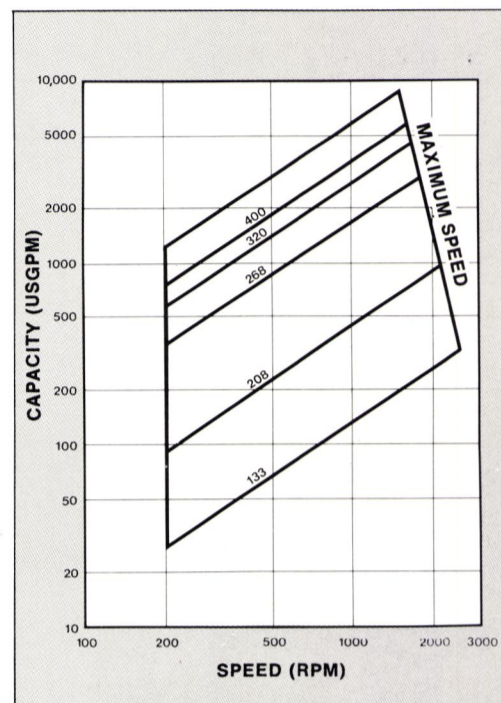
## You don't have to lose your prime

Unlike conventional two-screw pumps, De Laval GTS pumps do not drain completely even if suction lines are evacuated. Fluid retained in the pump keeps screws wetted and lets full suction develop at all times. (For product change-over, there is a plug which permits complete draining.)

If the pump is run dry as in stripping tanks, retained fluid cools and lubricates the seals and packing, preventing damage to shaft or seals. No damage to the screws occurs either, since there is no metal-to-metal contact between the pumping elements. This last feature lets GTS pumps handle water and fluids of low lubricity and high vapor pressure.

## There's no need to shout when this pump is running

The lack of direct screw contact and the unique profile of the screws which



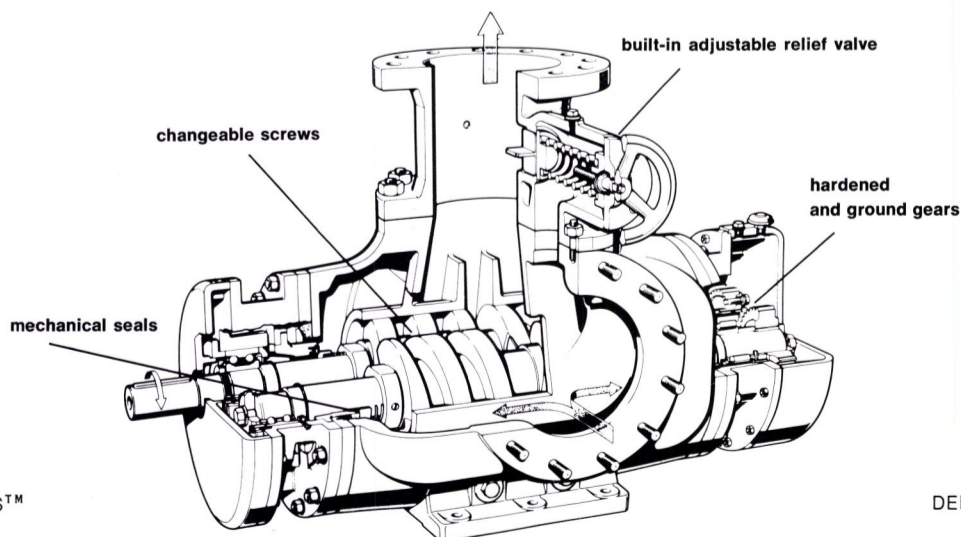
minimizes fluid shear do a lot to reduce noise. GTS pumps operate below 85 dB(A). This has significance not just for OSHA compliance but also for keeping your neighbors friendly.

## There's no need to shout at it either

Maintenance of GTS pumps is really low. If you're skeptical, ask our other customers. Shaft end angular contact ball bearings are grease-lubricated, timing gears and heavy duty roller bearings are oil bath-lubricated. All bearings and gears are external to the fluid being pumped. Mechanical seals are standard and if you need them, you can get tungsten carbide facings for abrasive duty. (Double mechanical seals and stuffing boxes are also available.)

Summing things up, if you need a pump to handle viscosities up to 4,500,000 SSU at discharge pressures up to 300 psig, capable of tolerating suction pressures up to 100 psia and suction lifts up to 26" Hg — a pump that comes in horizontal, vertical and deep well configuration, that's efficient, versatile and not overly demanding of maintenance, that offers the reliability of IMO® three-screw pumps — it will pay you to find out more about the line of De Laval GTS pumps. For information, write IMO Pump Division, De Laval Turbine Inc., POB 321, Trenton, NJ 08602, or call 609: 587-5000.

**DELAVAL**



GTS™

DEL306A



## ABS Forms Republic Of China Technical Committee

A 13-member Republic of China Technical Committee has been formed by the American Bureau of Shipping (ABS). The committee, composed of prominent individuals in ROC maritime affairs, will enable ABS to maintain closer contact with scientific and tech-

nical matters relating to shipbuilding and engineering in the Republic, said ABS chairman and president **Robert T. Young**.

Chairman of the new committee is Vice Adm. **S.T. Wang**, chairman and president of China Shipbuilding Corporation, Taipei; vice chairman is Dr. **Y.S. Li**, president of United Ship Design and Development Center, Taipei.

The inaugural meeting of the

ROC Technical Committee was held on June 7 in Taipei. Mr. **Young**, who was visiting Japan, Taiwan, and Guam, attended the meeting during his visit to Taiwan. Also attending was **Edwin S. Wenzel Jr.**, chief surveyor, from the New York office, and **James L. Dolan**, ABS principal surveyor for the Republic of China, based in the ABS Taipei office.

The formation of the ROC Technical Committee brings to 13 the number of overseas Technical Committees maintained by ABS. In addition to Vice Admiral **Wang** and Dr. **Li**, the members of the new committee are:

**C. Chao**, president, China Union Lines Limited, Taipei; **Y.T. Chao**, president, China Steel Corporation, Kaohsiung; Vice Adm. **M.B. Chi**, president, Taiwan Navigation Company, Taipei; **T.L. Cho**, chairman, China Insurance Company, Limited, Taipei; **S.C. Chu**, president, First Steamship Company, Limited, Taipei; **Shih Hou**, president, Taiwan Machinery Manufacturing Corporation, Kaohsiung; **W.H. Eddie Hsu**, chairman, Eddie Steamship Company Ltd., Taipei; Vice Adm. **C.C. Tsao**, chairman, China Merchants Steam Navigation Co., Ltd., Taipei; Prof. **Chun-Tsung Wang**, director, Institute of Naval Architecture, National Taiwan University, Taipei; **Y.F. Yang**, vice president, China Petroleum Corporation, Taipei and Rear Adm. **H.P. Yen**, president, Taiwan Shipbuilding Corporation, Taipei.

Mr. **Hsu**, Vice Admiral **Tsao**, and Vice Admiral **Wang** are Members of ABS.

ABS is a nongovernmental, worldwide ship classification society which is primarily concerned with the establishment of internationally accepted standards, called Rules, for the design, construction, and periodic survey of merchant vessels and marine structures. It is represented in approximately 90 countries. In Taiwan, ABS is represented in Taipei and Kaohsiung, and has a senior surveyor stationed in Keelung.

## Its performance isn't promised.

## It's proven.

Every day several hundred ships depend on the CA-35MS for flexible, on frequency SSB communications.

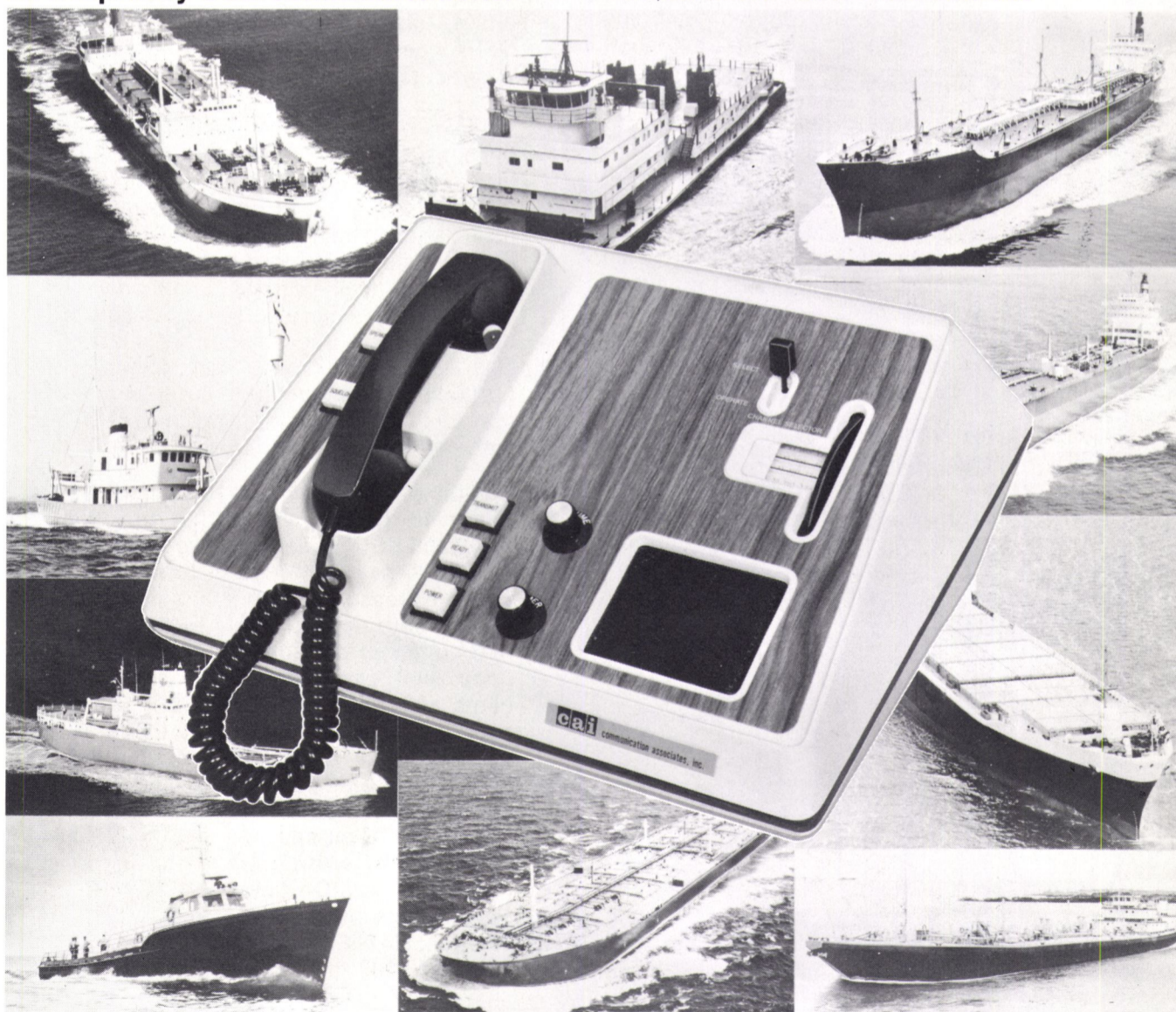
Since many SSB systems work better on the data sheet than on the vessel, news of proven equipment travels fast. In less than three years hundreds of ships, from wooden trawlers to super-tankers, have installed CAI systems.

Our new CA-35MS/Mk II uses the same reliable synthesizer, programming unit, and power supply. The difference is in the transceiver. Broadband tuned circuits permit each of its 10 bands to cover a full 10% bandwidth. It can be programmed to accommodate any 40 standard marine frequencies, or virtually any marine frequency from 2 to 23 MHz. It can also be programmed for any mode: simplex or half duplex, USB, compatible AM, RTTY, or CW.

The control console puts channel and mode selection at your fingertips. Turn a thumbwheel selector and you're instantly on frequency with 1/2 part per million stability. No crystals, no warm-up, no retuning, no problems. Frequency changes within a given band can be made in minutes—even at sea—simply by plugging a different program card into the console's programming drum.

Hundreds of skippers can vouch for it. The Mk II system, with its fully compatible 1,000 watt servo tuned linear amplifier, 150 and 1,000 watt antenna couplers and complete accessories, is described in a new folder. Phone or write for it today.

COMMUNICATION ASSOCIATES, INC.  
200 McKay Road, Huntington Station, N.Y. 11746  
Telephone: 516-271-0800 / TWX: 510-226-6998



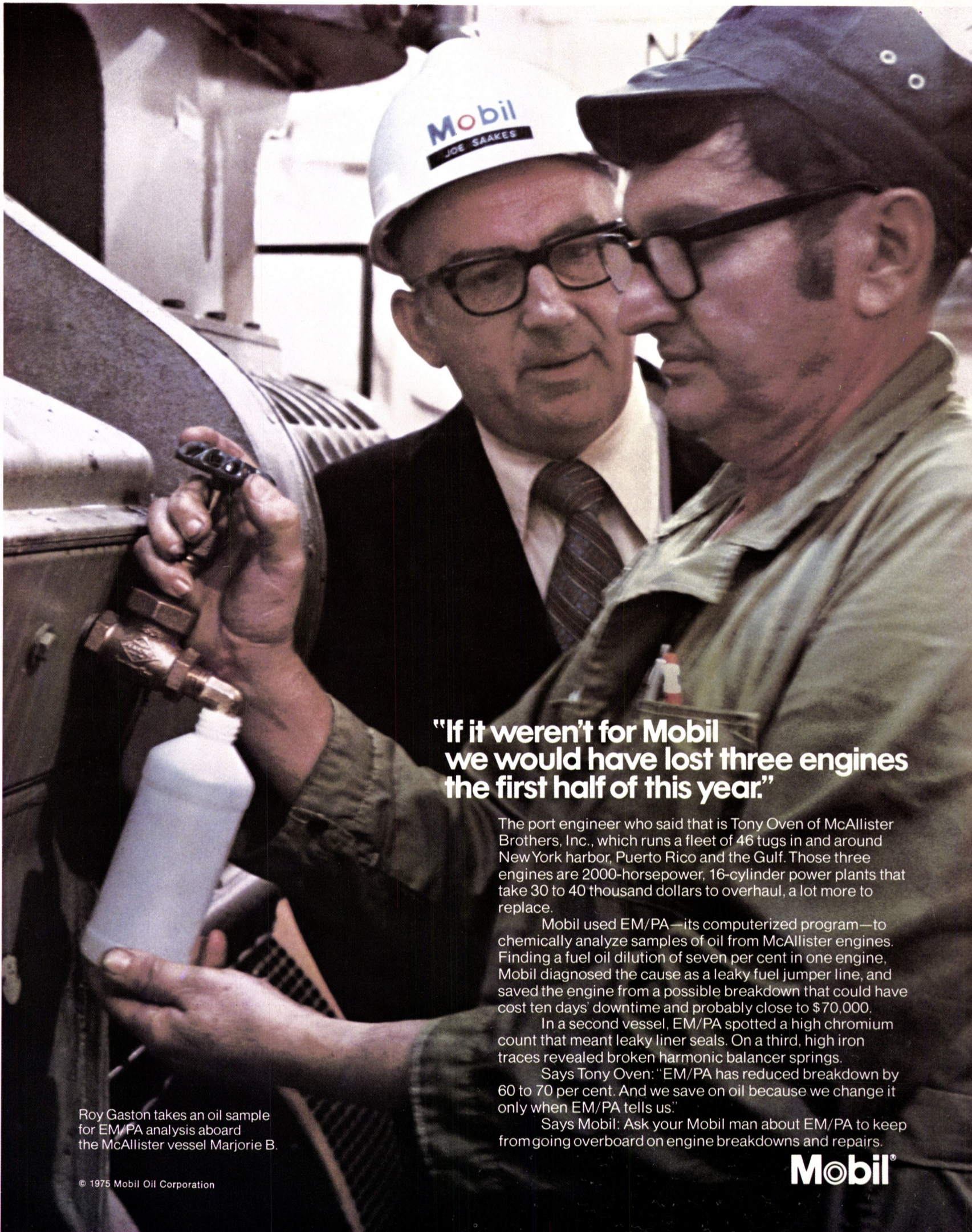
## Eugene Guest Joins MarineSafety International

**F. Eugene Guest** has joined MarineSafety International as assistant to the director. He was formerly an assistant professor of nautical science at the United States Merchant Marine Academy, Kings Point, N.Y.

MarineSafety International operates a shiphandling training simulator at the headquarters of its parent company, FlightSafety International, Marine Air Terminal, LaGuardia Airport, N.Y. While currently configured for the training of supertanker and LNG carrier deck officers, the simulator is being programmed for simulation of other size vessels.

A native of Canton, Ohio, Mr. **Guest** was graduated from the U.S. Merchant Marine Academy with a Bachelor of Science degree in 1966. After eight years as a deck officer on passenger, dry cargo and container vessels, he became assistant professor of nautical science at Kings Point in 1974. He is presently a candidate for the Ph.D. degree at New York University.





**"If it weren't for Mobil  
we would have lost three engines  
the first half of this year."**

The port engineer who said that is Tony Oven of McAllister Brothers, Inc., which runs a fleet of 46 tugs in and around New York harbor, Puerto Rico and the Gulf. Those three engines are 2000-horsepower, 16-cylinder power plants that take 30 to 40 thousand dollars to overhaul, a lot more to replace.

Mobil used EM/PA—its computerized program—to chemically analyze samples of oil from McAllister engines. Finding a fuel oil dilution of seven per cent in one engine, Mobil diagnosed the cause as a leaky fuel jumper line, and saved the engine from a possible breakdown that could have cost ten days' downtime and probably close to \$70,000.

In a second vessel, EM/PA spotted a high chromium count that meant leaky liner seals. On a third, high iron traces revealed broken harmonic balancer springs.

Says Tony Oven: "EM/PA has reduced breakdown by 60 to 70 per cent. And we save on oil because we change it only when EM/PA tells us."

Says Mobil: Ask your Mobil man about EM/PA to keep from going overboard on engine breakdowns and repairs.

Roy Gaston takes an oil sample  
for EM/PA analysis aboard  
the McAllister vessel Marjorie B.

© 1975 Mobil Oil Corporation

**Mobil®**



**Propulsion Systems, Inc.  
To Supply Bow Thrusters  
For Two Ro/Ro Vessels**

Propulsion Systems, Inc., 21213-76th Avenue South, Kent, Wash. 98031, has been awarded a contract to furnish bow thrusters for two heavy lift ro/ro cargo vessels of about 3,000 dwt. These ships are being built by Peterson Builders, Sturgeon Bay, Wis. The ves-

sels will be operated by the Gulf Trading and Transportation Company, and will service all U.S. and possibly foreign ports carrying heavy or odd-sized cargoes.

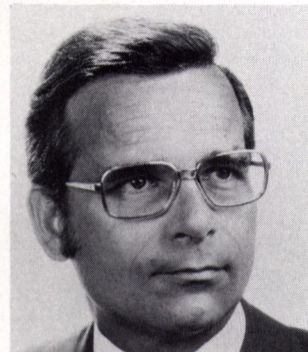
The thrusters will be driven by 600-horsepower a-c electric motors, and have controllable-pitch propellers, allowing stepless remote control of thrust from zero to full to either port or starboard. The second of these two

thrusters will be the 200th thruster delivered by PSI. These units are of the same size and type as the first thruster delivered by PSI after incorporation in 1961.

PSI now has available 14 basic thruster sizes from 24 to 3,000 horsepower of fixed or controllable pitch, available in the form of tunnel thrusters or steerable compass thrusters which, in turn, may be fixed, removable or retractable.

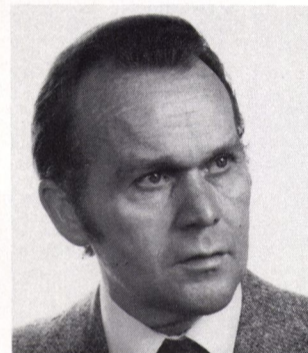
**MTU Companies Name  
Two Vice Presidents**

At the general meetings of Motoren- und Turbinen Union Munchen GmbH and Motoren- und Turbinen-Union Friedrichshafen GmbH, Dr.-Ing. **Wolfgang Hansen** and **Gunter Welsch** have been appointed vice presidents of the two MTU companies.



**Wolfgang Hansen**

Dr.-Ing. **Hansen**, deputy vice president of MTU Munchen's Production Division, is now responsible for Quality Assurance, Standards and Materials.



**Gunter Welsch**

Mr. **Welsch** will be responsible for Personnel, Legal Matters and Procurement at the two MTU companies. During his previous activities at Daimler-Benz AG since February 1, 1959, he maintained very close ties with MTU through long-standing promotional activities, ultimately as manager of Group Projects and Cooperations.

**Dravo Receives Order  
For 35 Barges From  
J. Russell Flowers, Inc.**

Dravo Corporation, Pittsburgh, Pa., has received an order from J. Russell Flowers, Inc., an affiliate of Flowers Transportation, Inc., for 35 barges.

The order consists of seven 195-foot by 35-foot by 12-foot hopper barges with lift-off covers and twenty-eight 195-foot by 35-foot by 12-foot semi-integrated open hopper barges.

The barges will join the fleet of the Greenville, Miss., firm, which operates as a contract carrier for coal, grain and other dry bulk commodities on the Inland Waterways System.

Dravo Corporation operates one of the nation's largest inland waterways shipyards at Neville Island, near Pittsburgh.

**Almost everything  
on land and sea  
is within our power.**

Your one safe source for hundreds of Caterpillar engines.


A hospital never skips a beat in a brownout, because Caterpillar power is there. A tugboat finds the muscle to tow a great ship out to sea, with a Caterpillar diesel engine.

Caterpillar is a great deal more than machines that move the earth. It's the power behind boats large and small, for work or pleasure; it's standby power for services and industry; low-cost power for trucks. And it provides that power with hundreds of different Caterpillar engines — all proven dependable — all backed by Cat Plus total customer service.

And they are all available at *the source* for power on land and sea.



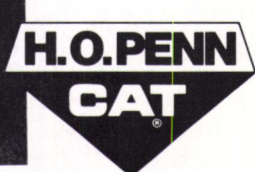
Armonk, N.Y. • Bronx, N.Y. • Westbury, L.I., N.Y. • Poughkeepsie, N.Y. • Tuxedo, N.Y. • Newington, Ct.

Caterpillar, Cat and  are trademarks of Caterpillar Tractor Co. Caterpillar Lift Trucks are manufactured by Towmotor Corporation, a Subsidiary of Caterpillar Tractor Co.

**H.O. PENN**

YOUR CATERPILLAR & CATERPILLAR LIFT TRUCK DEALER

**POWER**





# MOBIL IS PUTTING ITS VINYL WHERE ITS OIL IS.

On over 100 steel platforms far out in the Gulf of Mexico.

The platform shown here, protected by a Mobil high-build vinyl paint based on Union Carbide vinyl resins, has already gone 8 years without needing so much as a touch-up.

Another rig has gone an incredible 18 years with only a single spot-blasting and touch-up. The new coat went on directly over the old, forming a chemical bond as tough and durable as the original.

This unique recoatability means vinyl can lower maintenance costs, especially under

conditions of high humidity and wear. So today, Mobil is coating all of their platforms destined for the Gulf—where maintenance costs are high—with recoatable vinyl.

If you'd like to know more about lowering your own maintenance costs, please write for our informative brochure to Union Carbide Corporation, Dept. JLS, 270 Park Avenue, New York, N.Y. 10017.

You'll find we can help put a recoatable vinyl wherever you have a corrosion problem.

**PEOPLE PLANNING THE FUTURE.**

**UNION  
CARBIDE**

Coatings Materials



## Combustion Engineering Publishes Metric Manual

Combustion Engineering, Inc., Stamford, Conn., has published a 196-page manual entitled "SI Metric Practice Guide." It was compiled to help engineers, students and others understand the SI (Système International d'Unités) metric system and to assist them in converting units of measure from customary to SI metric and vice versa.

The Guide is in agreement with the established practices of major U.S. standards organizations and technical societies.

Helpful features include grouping of units and quantities dealing with a specific subject. For example, all energy-related units are given a classification number for indexing and then placed in one section of the manual. This permits quick access to conversion information.

Inquiries should be sent to Combustion Publishing Company, 277 Park Avenue, New York, N.Y. 10017.

## Wall Shipyard, Inc. Names Mark Hogan

Mark Hogan, former manager of the Hunt Shipyard, Harvey, La., has been named executive vice president of Wall Shipyard, Inc., also at Harvey. A veteran of 37 years in the maritime industry, he is expected to help provide executive leadership in developing the firm's various programs, according to Charles W. Wall Sr., president.

Mr. Hogan's first job was at Todd Shipyards, Galveston, Texas. He moved on to Mobile, Ala., where he was associated with the Alabama Dry Dock & Shipbuilding Company for 17 years. Prior to joining Hunt Shipyard, he was manager at the Harrison Brothers Shipyard, also in Mobile.

Widely known in the marine industry, he was an organizer and is president of the Mark Twain Club, and is an active member of the Harvey Canal Association, the Marine Club of New Orleans, and The American Waterways Operators, Inc.

## Northern California Section Honors Past Chairmen —Hears Paper On Maneuvering In Shallow Water



Past chairmen of the Northern California Section, are left to right: (bottom row) Reginald C. Warner, Robert Herbert, Joseph Busch, Donald Reardon, Packard Schade, and Adm. E.P. Kranzfelder; (middle row) James Stasek, Hugh Downer, Arthur Haskell, George Childs, Lewis Summers, H.P. Stewart, and William Swan; (top row) Graham Fraser, Miklos Kossa, Leslie Harlander, Randolph Paulling, Morris Guralnick, and William Hickman.

The Northern California Section of The Society of Naval Architects and Marine Engineers met recently to honor its past chairmen, and hear a paper by Douglas J. Loeser, graduate student, University of California.

The paper, titled "Determination of Maneuvering Properties in Shallow Water by Impulse Response Techniques," discusses the investigation of shallow-water maneuvering phenomenon with the use of an impulse technique developed as part of a larger project at the University of California, Berkeley. The author notes that theoretical procedures have been checked against both tank experiments and full-scale vessel observations with reasonable correlation. The full range of phenomenon, from vessels being 10 times less responsive to turning forces in shallow as opposed to deep water and the radical fluctuation of turning characteristics, remains to be investigated.

Discussers were: Randolph Paulling, University of California; Robert Herbert, naval architect; William Webster, University of California; Chris Barry, MGA Associates, and David Pritchard, Chevron Shipping.



Also at the Northern California Section meeting, are left to right: King-Tau Liu, Meetings Committee chairman, Herbert Associates; Douglas J. Loeser, University of California, Berkeley, student, author, and William Swan, Section chairman, General Electric Co.

# MOVIES

Providing the finest in American Television Entertainment to Private Industry Around the World. All programs are prepared on U-matic VideoCassette Tapes to American NTSC Broadcast Standards. Short term rental contracts available to qualified clients. Available for use on marine vessels and shore base facilities outside the Continental United States. For information contact our executive offices in Houston, Texas U.S.A.

● Licensed International Television Distributors.

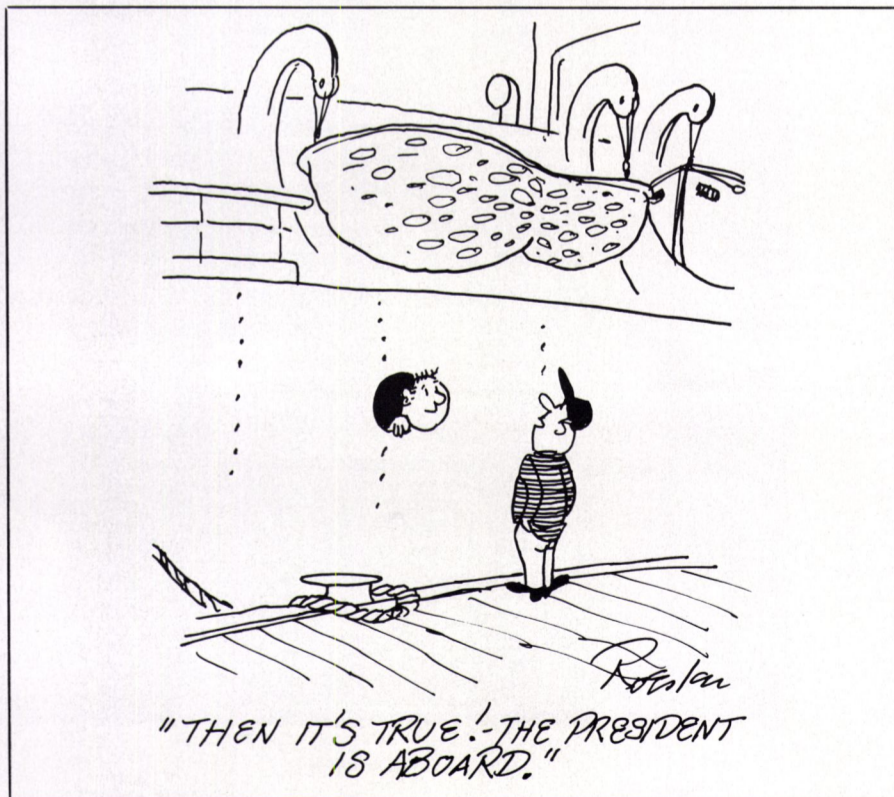
## SPORTS

### World Wide Television Entertainment

# Televideo Corporation

HOUSTON TELEVISION STUDIOS

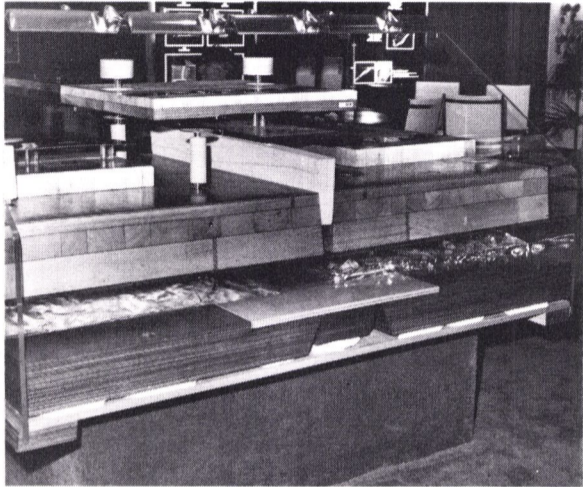
1014 Wirt Road · Houston, Texas 77055 phone (713) 681-6613





**Cryogenic Structures Corp.  
Will Exhibit LNG Containment  
Systems In Dusseldorf, Germany**

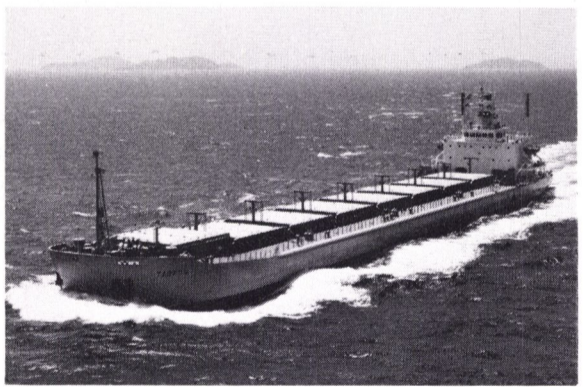
Cryogenic Structures Corporation, Northvale, N.J., will exhibit production-size components and insulation panels of various LNG containment systems in Booth 2027 at LNG-5, the 5th International Conference and Exhibition on LNG, Dusseldorf, Germany, August 28-September 1. CSC is a subsidiary of Baltek Corporation.



One of the displays at the CSC booth at LNG-5 will be a model of the Technigaz Integrated System.

CSC is an independent organization in the United States devoted to the design and fabrication of insulation for any type of LNG containment system which owners, operators, or shipyards may specify — spherical, self-supporting, supporting, prismatic, membrane, or other. The company's specialists have been involved in the development of marine LNG insulation since the industry's conception in 1952.

In attendance at Booth 2027 for Cryogenic Structures Corporation will be **Jacques Kohn, Jean Kohn, Wm. Mel Roberts, and Joseph Pantalone.**

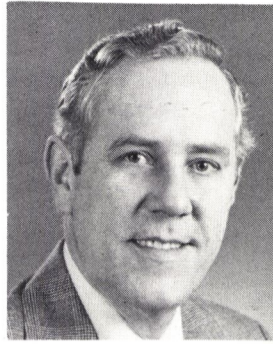


**FROM HITACHI ZOSEN** — The Tarpon, shown above, a 14,924-dwt bulk/oil carrier built at Hitachi Zosen's Mukaishima Shipyard, was recently delivered to her owner, Lib Ore Steamship Co., Inc. The second of two sisterships ordered by Lib Ore Steamship Co., the Tarpon left Japan for Surinam after delivery. Since she is scheduled for service in the tropical waters around South America, Trinidad and Tobago, the Tarpon has barge type construction with a shallow draft and thick shell plates. She is designed to take bauxite in her center cargo hold, which is flanked on both sides with tanks for oil and caustic soda. Powered by Nohab Polar F216V diesel engines and classed by the American Bureau of Shipping, the Tarpon has a length of 488 feet, a beam of 70 feet, and full load draft of 23 feet.

**American Manufacturing Co.  
Realigns Sales Territories**



Joseph A. Berthelot



Otto J. Stann

**Robert L. Stanton**, vice president of American Mfg. Co., Inc., one of the world's largest producers of synthetic and natural fiber ropes, has announced the appointment of **Joseph A. Berthelot** as national sales manager. He joined the company in 1958 as a salesman at their New Orleans, La., branch, and has held three executive sales positions prior to his present post. He will headquarter at the new Honesdale, Pa., plant.



E. Charles Bouren



George A. Talbot

Simultaneously, a realignment of sales territories was put into effect with Mr. **Berthelot** assuming administrative responsibility for the Northeast Region.

**Otto J. Stann**, with American since 1944, will supervise the Central Region from St. Louis, Mo. **E. Charles Bouren**, from their former Midwest Division since 1953, will serve the Southern Region from the new Lafayette, La., plant. **George A. Talbot**, with American since 1953, will be in charge of the Western Region.

**New Brochure Describes  
Caterpillar Engine Capability**

Caterpillar's commitment to the engine business is the subject of a new 14-page, full-color brochure. "Caterpillar Engine Capability" discusses all the elements of the company's engine program, from research and design to product support.

The brochure includes details of the company's Mossville, Ill., complex, thought to be the largest single location diesel engine manufacturing facility in the world. Numerous photographs show manufacturing, research, and parts distribution scenes at company locations on several continents. Also described are the five families of Caterpillar Engines, ranging from 85 to 1,425 horsepower and matched to a variety of truck, marine, electric power generation and industrial applications.

For a free copy of "Caterpillar Engine Capability," write **Charles H. Bolton**, Caterpillar Industrial Division, Peoria, Ill. 61629.

**J. Ray McDermott Plans  
\$50-Million Semisubmersible**

J. Ray McDermott & Co., New Orleans, La., said it plans to have constructed for its fleet a semisubmersible construction barge for use in installing drilling and production platforms in unusually rough waters.

The offshore-construction concern said it is taking bids for construction of the barge, which it designed and expects to have built for more than \$50 million. It said the barge is designed to operate in 20-foot seas, compared with commercial equipment, which can operate in no more than 10-foot seas.

McDermott said the American-flag vessel is expected to be completed by December 1978.

**For Sale  
NEW TUBING**

Approx. 500 L.F. 11" O.D. x 8½" I.D.  
Cold Drawn Seamless Mechanical  
Tubing, Low Carbon. ASTM A-518

Chemicals	C - .18	S - .016
	MN- .93	SI- .16
	P - .014	

**Foundation Systems, Inc.**

30303 Beck Road  
Wixom, Michigan 48096  
(313) 624-5900

**BOARDING  
EQUIPMENT  
TO MEET YOUR NEEDS**

STANDARD SIZES & CUSTOM-BUILT  
**SHIPS' LADDERS  
GANGWAYS  
PIER STANDS**  
ALSO SAFETY TREADS & GRATINGS



Call Us For Quotes!

**RAMPMASTER  
INCORPORATED**

1226 N.W. 23RD AVENUE FORT LAUDERDALE, FLORIDA 33311  
TELEPHONE 305 584-5990

**CAL-SHIP**

**(4) DRYDOCKS**  
TO 3000 TONS — 400' LONG

**VOYAGE REPAIR  
24 HOUR - 3 SHIFT  
FAST TURNAROUND  
FULL SERVICE  
SHIPYARD**

CALIFORNIA SHIPBUILDING & DRY DOCK COMPANY  
1601 WEST WATER STREET  
LONG BEACH, CALIFORNIA 90802  
CABLE ADDRESS: OCEANS TELEPHONE (213) 436-3281



## Dry Dock Association Elects Massa President

Alfred C. Bruggemann, outgoing president of the New York and New Jersey Dry Dock Association, has announced the election of **Robert L. Massa** as president for the new term. Mr. Massa was born and educated on Staten Island, N.Y., and attended Wagner College and Rutgers Univer-

sity. After serving his ship repair apprenticeship at Bethlehem Steel Corporation, he worked for Foster Engineering Corp.

For the past 23 years, Mr. Massa has been with Coastal Dry Dock & Repair Corporation, which operates in the former Brooklyn Navy Yard. He has been in charge of estimating repairs, and purchasing, and became vice president in 1966. On behalf of the as-

sociation, he has spoken before many Congressional meetings and hearings and has written several articles for maritime publications.

Serving with Mr. Massa as vice president of the association will be **Michael Gallagher**, executive vice president of Rodermond Industries, Inc., and as treasurer, **Robert Burke**, president of Union Drydock & Repair Company.

Mr. Bruggemann, president of

Perth Amboy Dry Dock Co., said he was proud of the association's solidarity the past two years and looks forward to even greater accomplishment during Mr. Massa's term.



Robert L. Massa

New York and New Jersey Dry Dock Association, founded in the early 1900s, represents nine ship repair facilities in the area, including its newest member—Bethlehem Steel Corporation of Hoboken, N.J. It advocates passage of beneficial legislation in Washington, D.C., represents the shipyards through the Shipbuilders Council of America, and discusses common problems of the shipyards. It has been successful in helping to change the Dry Dock Safety Certification, the sales tax in New Jersey, and in bringing more Navy work into the Port of New York.

## Hansen And Tidemann, Inc. Names Mitchell To Head First West Coast Office

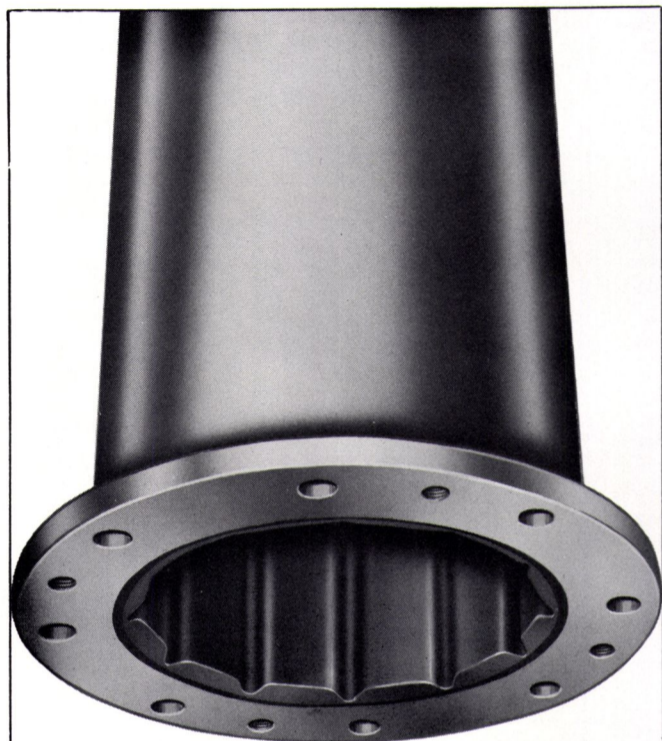
Hansen and Tidemann, Inc., has announced the opening of its first West Coast office in San Francisco to provide a broader range of service to its customers in the West.

**George Mitchell**, with some 20 years in the transportation industry, has been named regional manager for the West Coast.

Hansen and Tidemann, Inc., maintain 20 offices throughout the United States and Mexico, and have been steamship agents and chartering brokers for 41 years.

The office, 111 Pine Street, Suite 1315, San Francisco, Calif. 94111, will provide services for a variety of trade routes represented by H&T, including Seaspeed Services, which operates the world's largest roll-on/roll-off ship in the Mideast trade, Unigulf Line, and Surinam Line, among others.

Mr. Mitchell's experience includes overseas sales in Hong Kong and Japan. His most recent position before joining H&T was as deputy director of the Port of Stockton, Calif. Mr. Mitchell attended Fairleigh Dickinson University in New Jersey and is a resident of Walnut Creek, Calif.



# Clean

Because any water "oils" it.

There's no oil and no grease in a Cutless rubber bearing from Moffitt. And no oil seals to wear, leak and replace. No way to cause oil slicks, pollution and summonses. Any water "oils" this clean-running bearing... fresh water or salt, clear or sand-filled. Exclusive "Water Wedge" channels molded into a rubber lining lubricates shaft and bearing faces.

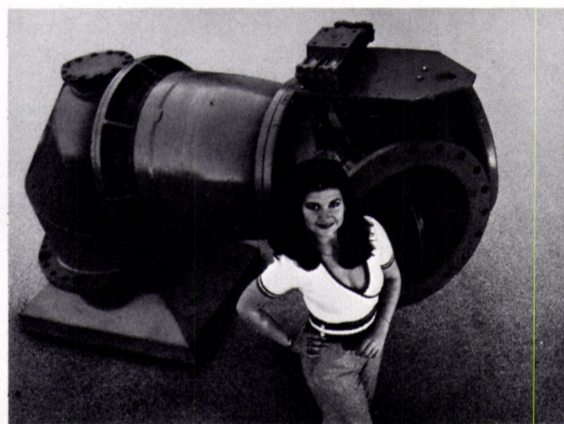
The low friction of metal shaft turning on water lubricated rubber increases engine horsepower conversion to propeller thrust, reduces fuel consumption, lengthens bearing life. The soft-tough Goodrich Cutless rubber liner can yield to accommodate slight shaft misalignment. And lasts almost forever.

Available in a wide range of load capacities and shaft diameters for new construction and overhauls. Worldwide distribution through yards and marine stores. Or phone us for same-day shipment from our 20,000-bearing stocks.

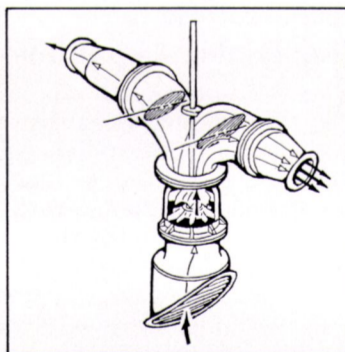
**LUCIAN MOFFITT, INC.**  
NATIONAL and INTERNATIONAL DISTRIBUTORS  
P.O. Box 1415, AKRON, OHIO 44309

## OMNITHRUSTER™

THE HYDRO-JET  
MANEUVERING SYSTEM  
MORE THAN A BOW THRUSTER



- **Nozzles—80% Smaller than conventional systems**  
Reduce drag, save fuel, increase speed, reduce passage time
- 12 Basic Systems from 25 HP to 585 HP, up to 26 lbs. thrust per HP, AC, Hydraulic, or Direct Drive
- Nozzles thrust in or out of the water
- Thrusts while underway and in currents.
- Thrusts port and starboard without reversing motor
- Works with ship's auto-pilot and other electronic input
- Simpler and more effective than controllable pitch thrusters; yet competitively priced with conventional thrusters
- Acts as backup steering and propulsion system
- Easy installation in new construction or retrofits for shallow or deep-draft vessels



**EXCLUSIVE PROPORTIONAL THRUSTER controls direction and force with simple AC Motor, Hydraulic, or Direct Drive.**

For our engineering recommendations at no cost to you, send details of your vessel and its use.

OMNITHRUSTER INC.  
10880 Wilshire Boulevard, Dept. F  
Los Angeles, California 90024  
(213) 475-9487



## Tidewater To Acquire Oil And Gas Firm

At a special meeting of shareholders held in New Orleans, La., the shareholders of Tidewater Marine Service, Inc., voted their approval of the company's plan to acquire Hilliard Oil & Gas, Inc. of Menlo Park, Calif. Hilliard Oil & Gas, Inc. is a closely held firm engaged primarily in the exploration for and development of oil and gas and the operation of domestic, onshore oil and gas properties. The firm maintains offices in Menlo Park, Calif.; Denver, Colo.; Oklahoma City, Okla.; Midland and Houston, Texas, and Lafayette, La.

Shareholders also voted approval of a proposal to change the name of the company to Tidewater Inc. by amendment of the Certificate of Incorporation. Tidewater's chairman and president **John P. Laborde** said the board of directors intends to make the amendment effective at the earliest appropriate time consistent with an orderly transition to the new name. He said TDW would become the new ticker symbol for Tidewater common stock.

## New Register Shows Ro-Ro Fleet Much Larger

The theoretical world ro-ro fleet container capacity is almost half that of the world containership fleet. This startling fact emerges from the new Register of Ro-Ro Vessels, just published by international shipping consultants, Westinform.

It has unfortunately been true that in most discussions of the ro-ro concept there has been a dearth of hard facts about the total fleet. Numbers, capacity, age, etc., have largely been unknown, and the details of only relatively few individual vessels have been available.

It is to meet this need for information that the "Westinform Register of Ro-Ro Vessels 1977" has been compiled. The owner and/or operator of every single vessel listed in the Register has been approached in order to obtain the details essential in a ro-ro operation. For example, the total lane length, width and clear height are shown separately for each deck, and at each access point, the location and restrictions as to height width and weight on the ramp are shown. Westinform have also analyzed the fleet in terms of flag, size and year and build distribution.

Experience gained through processing the information sent in by owners enabled Westinform to calculate the total linear length of the overall fleet, and hence the container capacity. The linear lane length is normally preferred as a measure of ro-ro capacity, compared to gross registered tonnage, and it is claimed that this is the first time that such an

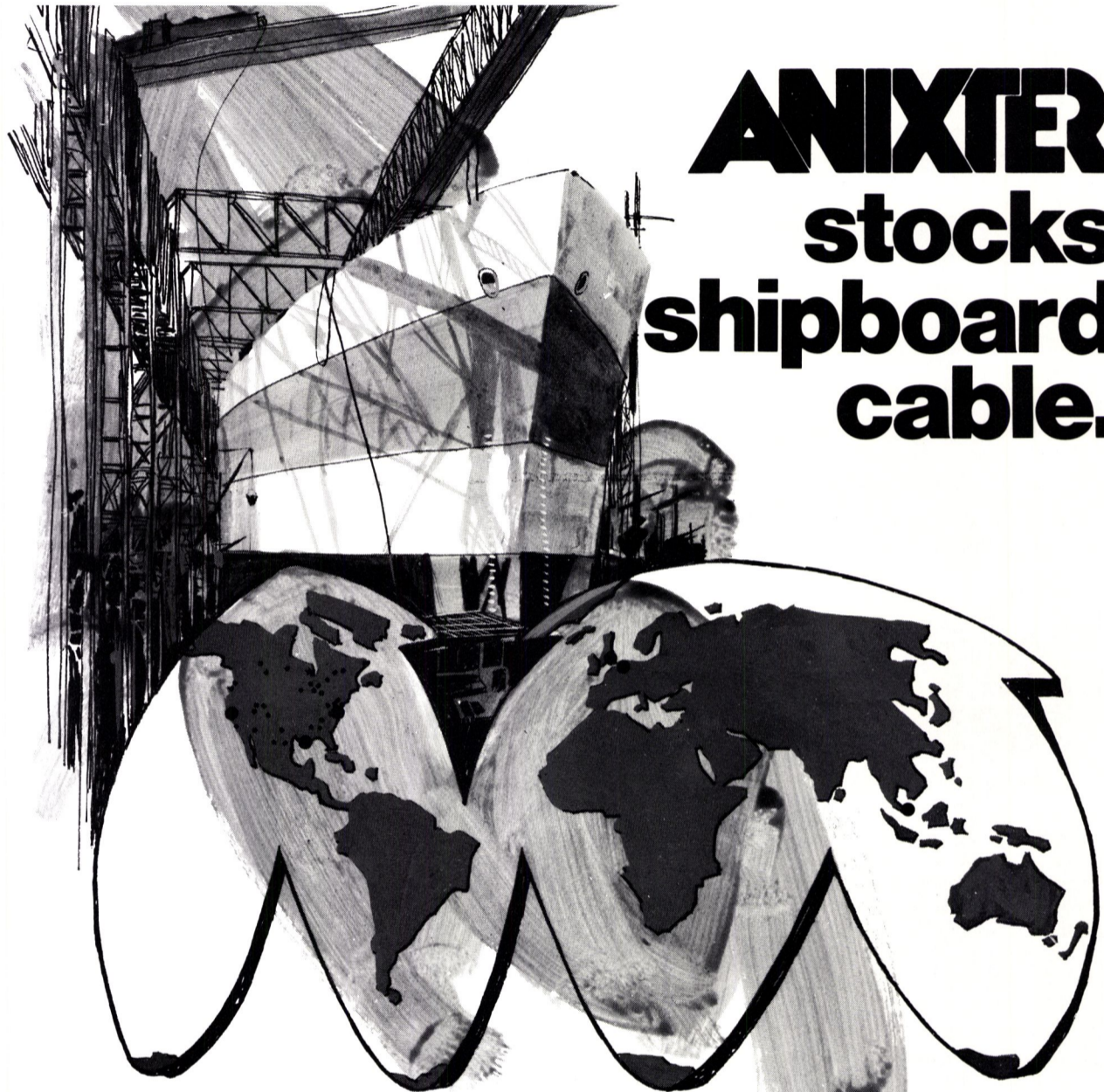
assessment of the total length has been published.

The main part of this new Westinform publication is the Register of Vessels, which is in alphabetical order by ships' name. Train carriers have been distinguished separately as these constitute a very different type of vessel, as have newbuildings on order. Alphabetical ordering by name is not always suitable when the search is according to another

categorization, for example, when one is looking for vessels of a particular size, or belonging to a certain owner or manager. This can be a time-consuming process when the fleet is only ordered according to the ship's name, so a cross reference has been provided, grouping vessels in the following ways: in order of gross registered tonnage; under alphabetical order of owner/manager; under the shipyards that constructed them; un-

der the manufacturer of the engine installed.

The Westinform Register of Ro-Ro Vessels contains over 500 pages of information, including all the standard register details such as Draft, Dwt, Nrt, Grt, Beam, Loa, Speed, etc. Individual copies can be obtained for U.S. \$50 each, including postage, from The Westinform Service, 9 Cork Street, London, England W1X 1PD.



# ANIXTER stocks shipboard cable.

any length. every spec. anytime. everywhere.

ANIXTER'S huge stock of shipboard cable is never more than a few hours away from the major shipbuilding ports in the world. Whether as a single source of supply for long-range projects or as an emergency source for maintenance and repairs, ANIXTER can deliver whatever you need, exactly where you want it. If you require special sizes, we'll stock that for you.

And at ANIXTER, there's never a minimum order. We'll cut your cable to any length you specify. That's just one of the reasons we say: "We're serious about service."

**FREE METRIC CONVERTER**

**ANIXTER**

Name \_\_\_\_\_

Title \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Mail to Dept.: 6-F  
Anixter Bros., Inc. • One Concourse Plaza • 4711 Golf Road • Skokie, IL 60076

ANIXTER'S huge stock of shipboard cable is never more than a few hours away from the major shipbuilding ports in the world. Whether as a single source of supply for long-range projects or as an emergency source for maintenance and repairs, ANIXTER can deliver whatever you need, exactly where you want it. If you require special sizes, we'll stock that for you.

An invaluable tool for converting cross sectional areas of standard metric stranded conductors.

INTERNATIONAL: London 01-561-8118; Singapore 2924611; Amsterdam (020) 922409. EAST COAST: New York (914) 592-8800; GULF: New Orleans (504) 581-1241; WEST COAST: San Francisco (415) 352-3100



## Advanced Marine Vehicles Conference Issues Call For Papers

Papers are solicited for the Fourth Annual Conference on Advanced Marine Vehicles. This three-day unclassified meeting is sponsored by the American Institute of Aeronautics and Astronautics (AIAA) and The Society

of Naval Architects and Marine Engineers (SNAME) in cooperation with the American Society of Naval Engineers (ASNE), the Marine Technology Society (MTS), and other technical societies. It will be held in San Diego, Calif., on April 17-19, 1978. The conference is intended to provide an open forum for the presentation and discussion of past experience, current status, and future out-

look for military and commercial advanced marine surface vehicles and their associated subsystems.

Papers are solicited in three general areas:

1. **Operations** — Including economics, regulations, requirements, reliability, maintainability, safety, logistic support, testing, and roles and missions.

2. **Vehicles** — Including air cush-

ion, hydrofoil, planing, small waterplane area, surface effect, wing-in-ground effect, hybrid, and new concepts.

3. **Supporting Systems and Technologies** — Including power, lift, propulsion, dynamics, fuels, sensors, weapons, navigation, collision avoidance, structures, materials, fabrication, and environmental effects.

Papers should be structured for approximately 20 minutes' presentation. Preliminary drafts of papers, or abstracts of at least 1,000 words, should be submitted in triplicate to either Technical Program Co-Chairman, to arrive no later than October 7, 1977. Important charts and figures should be included if possible.

The Technical Program Co-Chairmen are: SNAME, **David M. Krepchin**, Manager, M. Rosenblatt & Son, Inc., 1007 Fifth Avenue, San Diego, Calif. 92101; AIAA, Prof. **Donald M. Layton**, Code 67-Ln, Naval Postgraduate School, Monterey, Calif. 93940.

Authors will be mailed notification of acceptance by December 2, 1977. Photo-ready manuscripts of selected papers will be required for publication not later than March 1, 1978. Authorization to present papers and included data is the responsibility of the author.

The General Chairman of the conference is **Wilfred J. Eggington**, President, Rohr Marine, Inc., P.O. Box 2300, Chula Vista, Calif. 92012.

## Seaward Announces New United Kingdom Subsidiary



Jack Joseph

Seaward, Inc., 6269 Leesburg Pike, Falls Church, Va. 22044, has acquired a majority interest in Seafast, Ltd. of Aberdeen, Scotland.

Seafast's managing director **Jack Joseph** founded the company to provide leasing and sales of marine equipment to the petroleum and shipping industries. Seafast stocks SEA CUSHION fenders, SEA FLOAT buoys, oil pollution control equipment, winches, compressors, mooring equipment and other marine-related products.

Mr. Joseph is a British citizen and long-time resident of Aberdeen. He may be contacted at Seafast, Ltd., 469 Union Street, Aberdeen, Scotland AB1 2DB.

# You'd expect to find nothing but shade-tree mechanics in Savannah.



Arthur Waters is proof that Savannah can grow its own first-class ship-repair talent.

Besides talent, Arthur has some qualities you might not find in the big city. He's reliable, straightforward, and persistent. He'll stick with your job to be sure that you and the regulatory folks are satisfied.

At the Savannah Yard that's the attitude everyone has. We have to have it. Because we know you won't come to Savannah just for our cranes, drydocks and specialized shops.

You'll come because you've heard about guys like Arthur Waters. And our prices. And our speed. And our professionalism.

Savannah Machine and Shipyard Company.

We do scheduled drydocking, voyage repairs, and major conversions.

Check us out. And remember this. Before all those hotshots moved to the big city they were grown in places like Savannah.

## The Savannah Yard.

Savannah Machine and Shipyard Co.

P.O. Box 787, Savannah, Ga. 31402

Tele. (912) 233-6621

74 Trinity Place, Suite 1800

New York, N.Y. 10006, Tele. (212) 432-0350



## Tidewater To Acquire Oil And Gas Firm

At a special meeting of shareholders held in New Orleans, La., the shareholders of Tidewater Marine Service, Inc., voted their approval of the company's plan to acquire Hilliard Oil & Gas, Inc. of Menlo Park, Calif. Hilliard Oil & Gas, Inc. is a closely held firm engaged primarily in the exploration for and development of oil and gas and the operation of domestic, onshore oil and gas properties. The firm maintains offices in Menlo Park, Calif.; Denver, Colo.; Oklahoma City, Okla.; Midland and Houston, Texas, and Lafayette, La.

Shareholders also voted approval of a proposal to change the name of the company to Tidewater Inc. by amendment of the Certificate of Incorporation. Tidewater's chairman and president John P. Laborde said the board of directors intends to make the amendment effective at the earliest appropriate time consistent with an orderly transition to the new name. He said TDW would become the new ticker symbol for Tidewater common stock.

## New Register Shows Ro-Ro Fleet Much Larger

The theoretical world ro-ro fleet container capacity is almost half that of the world containership fleet. This startling fact emerges from the new Register of Ro-Ro Vessels, just published by international shipping consultants, Westinform.

It has unfortunately been true that in most discussions of the ro-ro concept there has been a dearth of hard facts about the total fleet. Numbers, capacity, age, etc., have largely been unknown, and the details of only relatively few individual vessels have been available.

It is to meet this need for information that the "Westinform Register of Ro-Ro Vessels 1977" has been compiled. The owner and/or operator of every single vessel listed in the Register has been approached in order to obtain the details essential in a ro-ro operation. For example, the total lane length, width and clear height are shown separately for each deck, and at each access point, the location and restrictions as to height width and weight on the ramp are shown. Westinform have also analyzed the fleet in terms of flag, size and year and build distribution.

Experience gained through processing the information sent in by owners enabled Westinform to calculate the total linear length of the overall fleet, and hence the container capacity. The linear lane length is normally preferred as a measure of ro-ro capacity, compared to gross registered tonnage, and it is claimed that this is the first time that such an

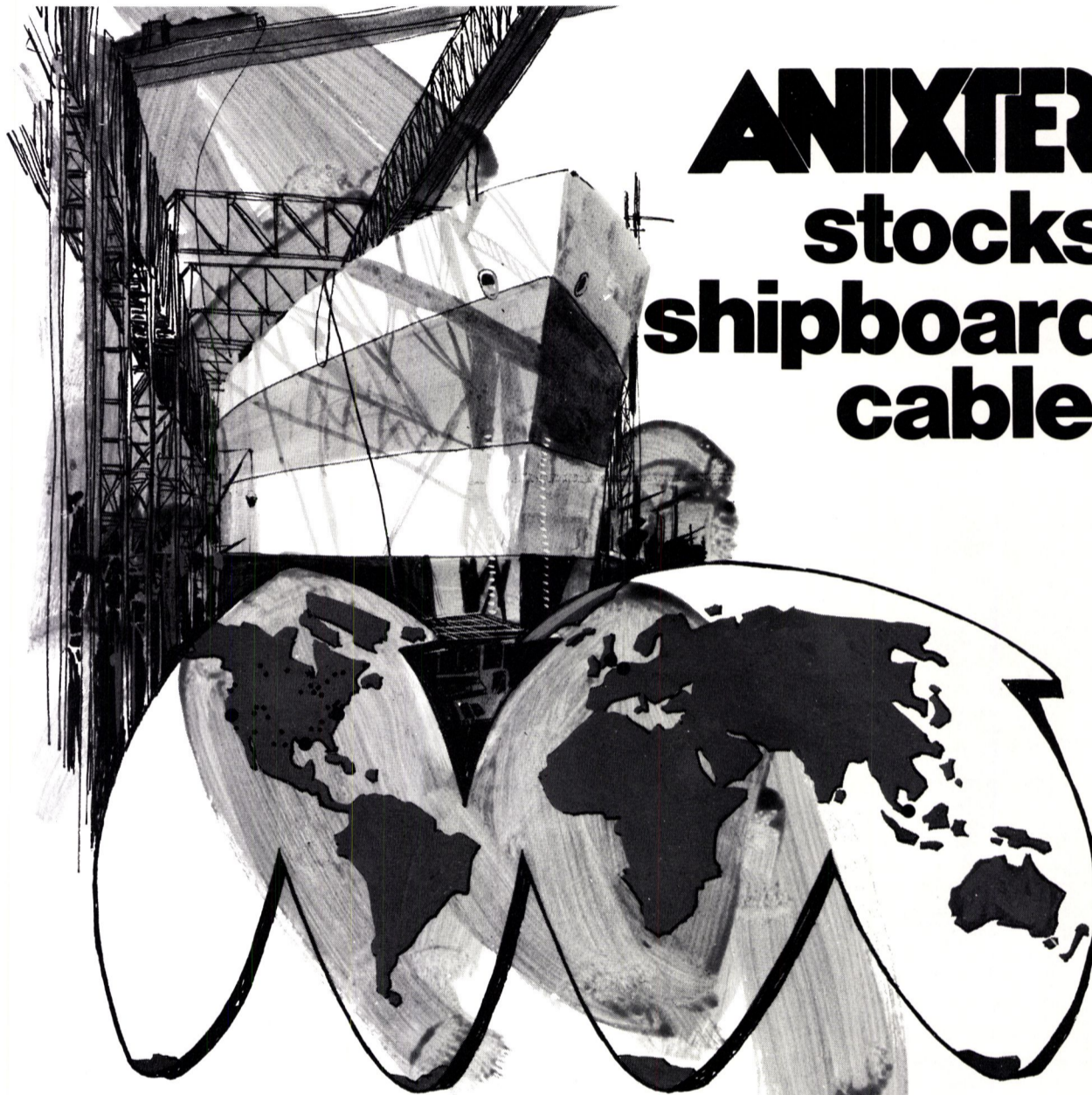
assessment of the total length has been published.

The main part of this new Westinform publication is the Register of Vessels, which is in alphabetical order by ships' name. Train carriers have been distinguished separately as these constitute a very different type of vessel, as have newbuildings on order. Alphabetical ordering by name is not always suitable when the search is according to another

categorization, for example, when one is looking for vessels of a particular size, or belonging to a certain owner or manager. This can be a time-consuming process when the fleet is only ordered according to the ship's name, so a cross reference has been provided, grouping vessels in the following ways: in order of gross registered tonnage; under alphabetical order of owner/manager; under the shipyards that constructed them; un-

der the manufacturer of the engine installed.

The Westinform Register of Ro-Ro Vessels contains over 500 pages of information, including all the standard register details such as Draft, Dwt, Nrt, Grt, Beam, Loa, Speed, etc. Individual copies can be obtained for U.S. \$50 each, including postage, from The Westinform Service, 9 Cork Street, London, England W1X 1PD.



# ANIXTER stocks shipboard cable.

any length. every spec. anytime. everywhere.

ANIXTER'S huge stock of shipboard cable is never more than a few hours away from the major shipbuilding ports in the world. Whether as a single source of supply for long-range projects or as an emergency source for maintenance and repairs, ANIXTER can deliver whatever you need, exactly where you want it. If you require special sizes, we'll stock that for you.

And at ANIXTER, there's never a minimum order. We'll cut your cable to any length you specify. That's just one of the reasons we say: "We're serious about service."

**FREE METRIC CONVERTER**

**ANIXTER**

Name \_\_\_\_\_

Title \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Mail to Dept.: 6-F  
Anixter Bros., Inc. • One Concourse Plaza • 4711 Golf Road • Skokie, IL 60076

INTERNATIONAL: London 01-561-8118; Singapore 2924611; Amsterdam (020) 922409. EAST COAST: New York (914) 592-8800; GULF: New Orleans (504) 581-1241; WEST COAST: San Francisco (415) 352-3100



## Advanced Marine Vehicles Conference Issues Call For Papers

Papers are solicited for the Fourth Annual Conference on Advanced Marine Vehicles. This three-day unclassified meeting is sponsored by the American Institute of Aeronautics and Astronautics (AIAA) and The Society

of Naval Architects and Marine Engineers (SNAME) in cooperation with the American Society of Naval Engineers (ASNE), the Marine Technology Society (MTS), and other technical societies. It will be held in San Diego, Calif., on April 17-19, 1978. The conference is intended to provide an open forum for the presentation and discussion of past experience, current status, and future out-

look for military and commercial advanced marine surface vehicles and their associated subsystems.

Papers are solicited in three general areas:

**1. Operations**—Including economics, regulations, requirements, reliability, maintainability, safety, logistic support, testing, and roles and missions.

**2. Vehicles**—Including air cush-

ion, hydrofoil, planing, small waterplane area, surface effect, wing-in-ground effect, hybrid, and new concepts.

**3. Supporting Systems and Technologies**—Including power, lift, propulsion, dynamics, fuels, sensors, weapons, navigation, collision avoidance, structures, materials, fabrication, and environmental effects.

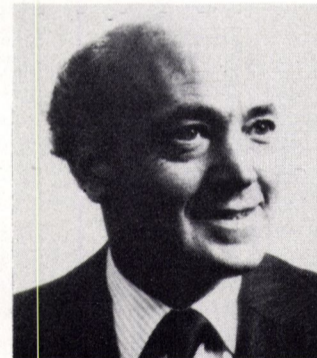
Papers should be structured for approximately 20 minutes' presentation. Preliminary drafts of papers, or abstracts of at least 1,000 words, should be submitted in triplicate to either Technical Program Co-Chairman, to arrive no later than October 7, 1977. Important charts and figures should be included if possible.

The Technical Program Co-Chairmen are: SNAME, **David M. Krepchin**, Manager, M. Rosenblatt & Son, Inc., 1007 Fifth Avenue, San Diego, Calif. 92101; AIAA, Prof. **Donald M. Layton**, Code 67-Ln, Naval Postgraduate School, Monterey, Calif. 93940.

Authors will be mailed notification of acceptance by December 2, 1977. Photo-ready manuscripts of selected papers will be required for publication not later than March 1, 1978. Authorization to present papers and included data is the responsibility of the author.

The General Chairman of the conference is **Wilfred J. Eggington**, President, Rohr Marine, Inc., P.O. Box 2300, Chula Vista, Calif. 92012.

## Seaward Announces New United Kingdom Subsidiary



Jack Joseph

Seaward, Inc., 6269 Leesburg Pike, Falls Church, Va. 22044, has acquired a majority interest in Seafast, Ltd. of Aberdeen, Scotland.

Seafast's managing director **Jack Joseph** founded the company to provide leasing and sales of marine equipment to the petroleum and shipping industries. Seafast stocks SEA CUSHION fenders, SEA FLOAT buoys, oil pollution control equipment, winches, compressors, mooring equipment and other marine-related products.

Mr. Joseph is a British citizen and long-time resident of Aberdeen. He may be contacted at Seafast, Ltd., 469 Union Street, Aberdeen, Scotland AB1 2DB.

# You'd expect to find nothing but shade-free mechanics in Savannah.



Arthur Waters is proof that Savannah can grow its own first-class ship-repair talent.

Besides talent, Arthur has some qualities you might not find in the big city. He's reliable, straightforward, and persistent. He'll stick with your job to be sure that you and the regulatory folks are satisfied.

At the Savannah Yard that's the attitude everyone has. We have to have it. Because we know you won't come to Savannah just for our cranes, drydocks and specialized shops.

You'll come because you've heard about guys like Arthur Waters. And our prices. And our speed. And our professionalism.

Savannah Machine and Shipyard Company.

We do scheduled drydocking, voyage repairs, and major conversions.

Check us out. And remember this. Before all those hotshots moved to the big city they were grown in places like Savannah.

## The Savannah Yard.

Savannah Machine and Shipyard Co.

P.O. Box 787, Savannah, Ga. 31402

Tele. (912) 233-6621

74 Trinity Place, Suite 1800

New York, N.Y. 10006, Tele. (212) 432-0350



**Midland-Ross Corp.  
Appoints Whiteman  
For Marine Business**



Donald R. Whiteman

Donald R. Whiteman has been appointed marine marketing manager for the Electrical Products Division, Midland-Ross Corporation, according to an announcement by John Bower, vice president-marketing.

Mr. Whiteman will be responsible for all marketing activities for the company's extensive line of marine industry products and will be located at the company's headquarters in Pittsburgh, Pa.

He has long been associated with the marine industry, previously serving as marine product manager for the RPC Division of Midland-Ross, and was Eastern regional manager for Rayco Wagner Equipment Company.

Midland-Ross specialized marine products include electrical receptacles, plugs, switches, lighting fixtures, floodlights and cable support channels. The company also supplies receptacles and plugs for over-the-road and shipboard refrigerated containers (reefers).

**ITT Decca Marine  
Introduces Two New  
Navigation Aids**

ITT Decca Marine is now offering the new low-priced 701 and 708 Loran C receivers to help mariners take full advantage of the expanding coverage of the Loran C navigation system.

The Model 701 is an exceptionally compact unit and easy to operate. It comes preprogrammed for your operating area, with up to four lines of position available. These can be four lines of position in one chain or two lines of position in each of two different chains. Just turn it on and in a matter of seconds the 701 displays two lines of position, providing an accurate fix.

The 701 provides coverage over an area approximately 1.3 million square miles. For example, when programmed for the 9930 chain serving Eastern North America, the 701 gives accurate position fixes from Nova Scotia to the Gulf of Mexico.

On the West Coast, where there are four chains, a 701 could be preprogrammed to cover either Alaskan waters, Canada, Wash-

ington State to Mexico, or any combination of four secondary and two master stations.

The Model 708, only slightly less compact than the 701, has been developed for effortless and foolproof navigation with any present and future Loran C chains in the world. Select the desired chain and pair of secondary stations on the thumb-wheel selector. Then turn on the

708 and within 25 to 100 seconds two digital lines of position will be displayed.

Both the 701 and the 708 meet U.S. Coast Guard recommendations for true Loran C accuracy by using third cycle matching of all eight pulses to measure micro-second time differences between Loran C master and secondary signals. Additionally, both receivers monitor their own per-

formance and that of Loran C transmitting stations to assure navigators that they are making full use of Loran C accuracy, with fixes accurate within 400 yards and repeated fixes within 50 feet.

For more information, visit any of the more than 100 ITT Decca Marine dealers and service centers, or contact ITT Decca Marine, P.O. Box G, Palm Coast, Fla. 32037.

# Fleet owners: Wrestling with MSD regulations? Winning is easy with Filteron S/MSD.

The Filteron S/MSD (Special/Marine Sanitation Device) is a Type I system designed to help you certify existing ships before the January 1978 deadline or new vessels before January 1980.

After surveying your treatment needs, we will design and build an S/MSD to be installed on one representative vessel. We will handle all USCG certification hassles, and every other identically equipped ship in your fleet will be automatically certified. If applicable, existing discharge pumps and holding tanks will be used as part of the system.

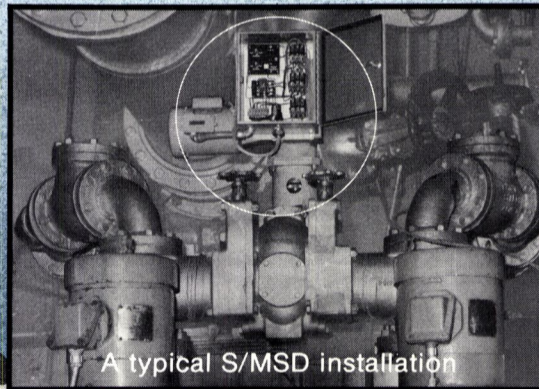
Amortized fleet installation costs are low because installation takes place during normal dockside operations and requires no major piping changes. Maintenance costs are low because a Type I system does not depend upon delicate bacteria or other complex treatment methods.

For vessels with no existing equipment, Filteron MSDs complete with discharge pump and treatment tank are available in a variety of sizes for crews of 10 to 1000. All are designed for easy retrofit through existing hatches.

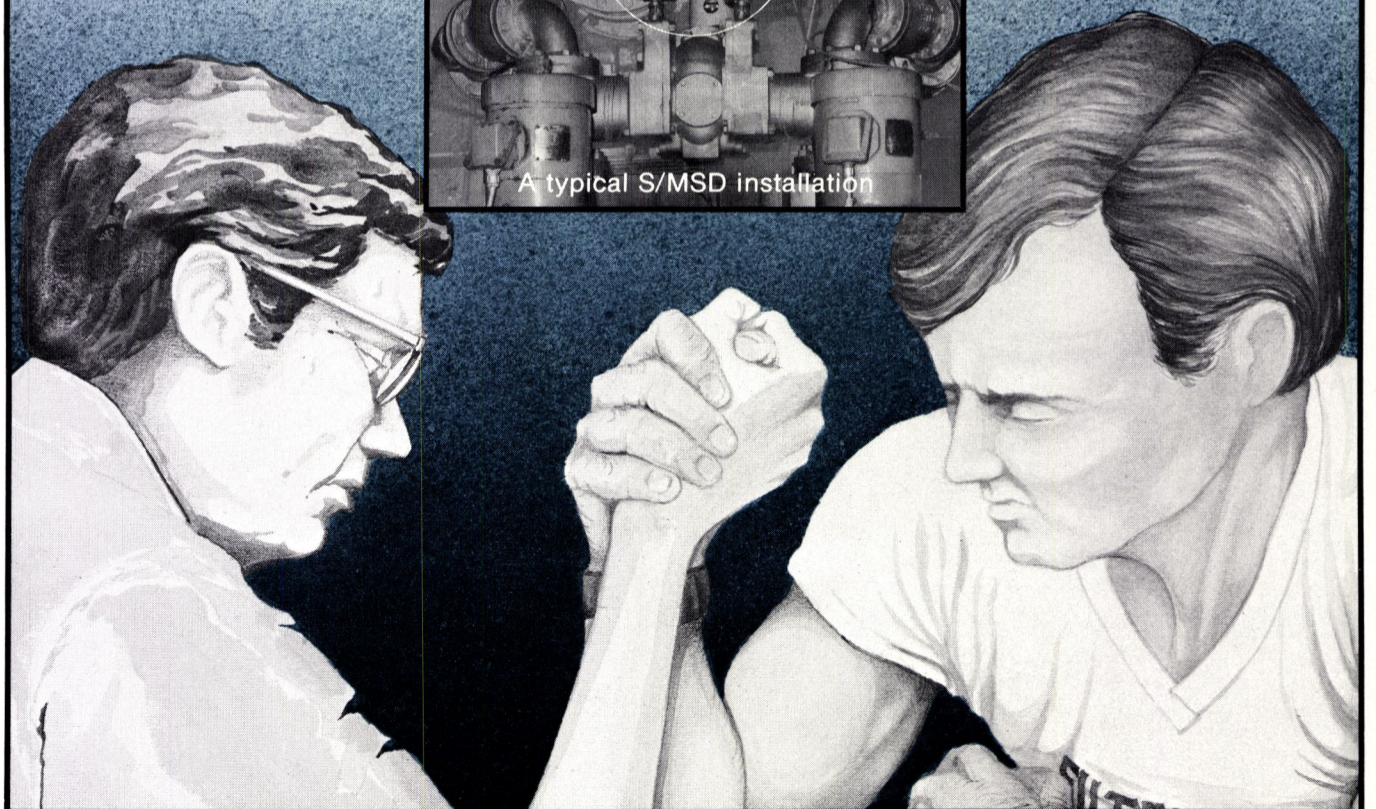
Several fleet owners are already saving time and money and eliminating certification problems with the S/MSD system. Filteron can help. Call George Behrendt or Leon Potter for more information, (713) 494-6111.

## **FILTERON<sup>®</sup> MSD**

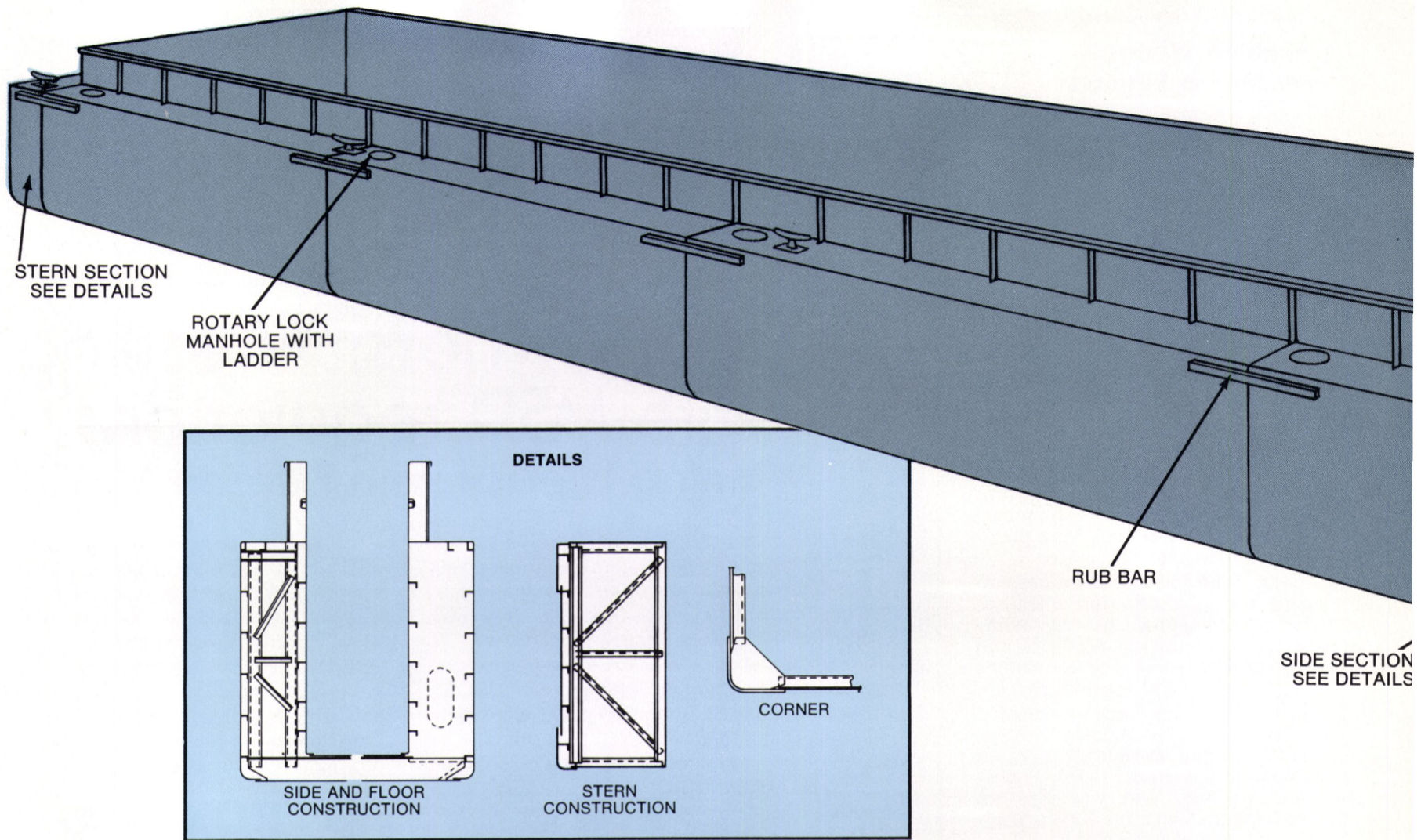
A Product of the  
**BAYLOR** Company  
P.O. Box 36326  
Houston, Texas 77036  
Telex: 762-232  
Cable: BAYCO-HOUSTON



A typical S/MSD installation







**With a Jeffboat hopper  
is what you get.**

**Let us prove it.**



Certainly all rake barges appear to be the same. But appearances can be fooling.

For instance, Jeffboat welding stands alone for quality and detail supervision. After a weld, there is a slag residue. Jeffboat eliminates this slag upon inspections, to be sure that the weld is true and strong. In addition to painstaking care in welding, Jeffboat offers you superior fitting, joining, sizing and plate preparation.

A century of craftsmanship with generations of dedicated vessel

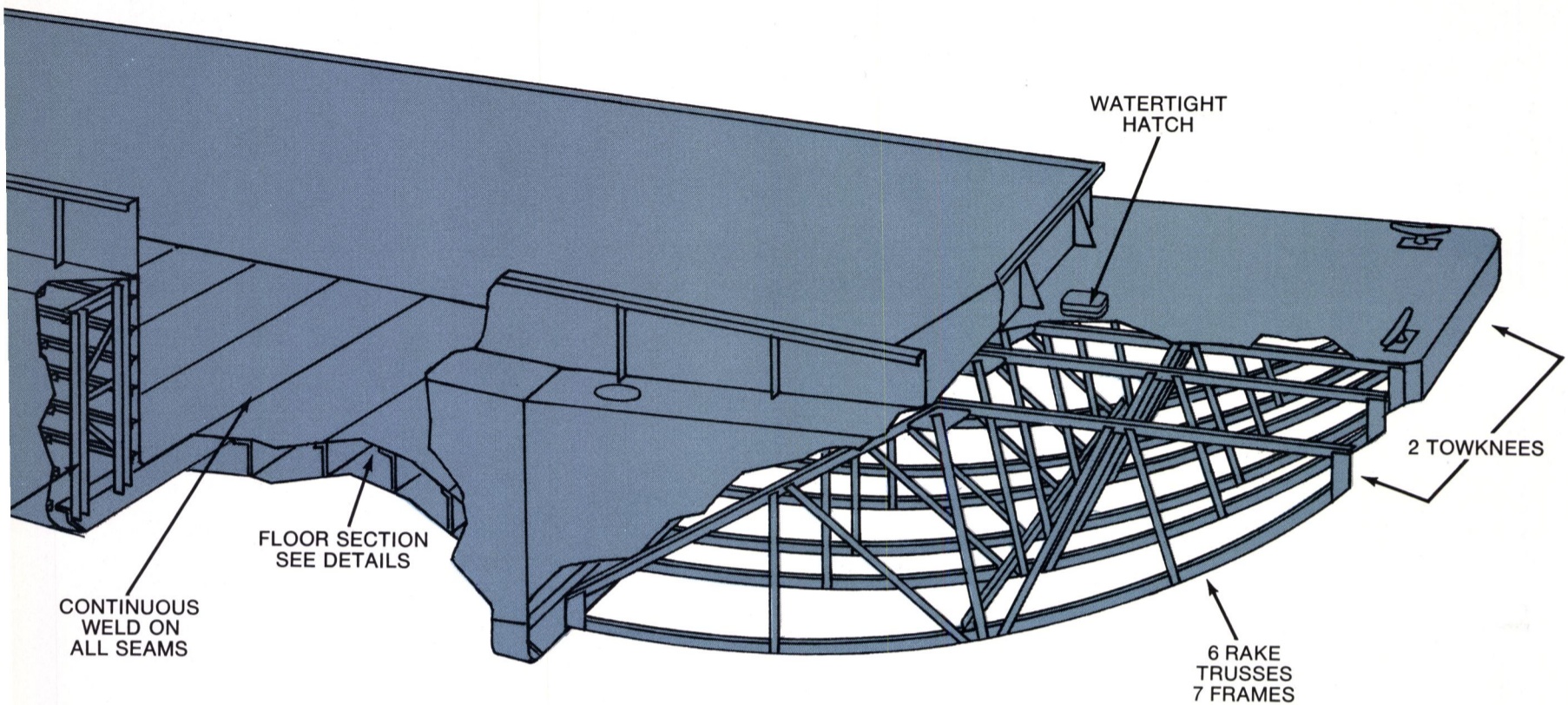
designers and builders is behind every Jeffboat barge.

As a result, you get a heavier, better constructed, truly crafted vessel for years of profitable service.

But don't just take us on trust. Trust your own figures.

We invite comparison—the entire life of the vessel is the true cost of ownership, not the initial investment. No one can match the added service of our vessels,





# barge, what you don't see and truly need.

## FILL IN YOUR BARGE SPECS AGAINST OUR STANDARD SPECS AND JUDGE

because only Jeffboat quality can mean extra years of dependable performance with minimal maintenance problems.

You've filled in the chart. See how it adds up, then call us.

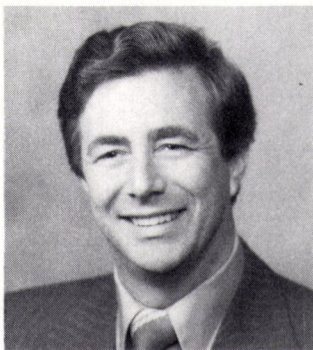
**JEFFBOAT**

P.O. Box 610,  
Jeffersonville, Indiana 47130.  
Phone (812) 288-0100.

Description	Jeffboat	Your Specs	Description	Jeffboat	Your Specs
Dimensions	195'x35'x12'		Side Plating	3/8"	
Cubic Capacity	70,000		Side Framing	5x3x3/16" 1 Long'l.	
Tons at 9'0" Draft	1,536		Hopper Side Pl.	5/16"	
Steel Weight	266.4 T		Stern Box Length	5'6"	
Height at Side	12'		Stern Corners	5/8"	
Coaming Height	4'		Top Knuckle	5/8"	
Length of Rake	27'6"		Lower Knuckle	5/8"	
Rake Bottom Pl.	1 1/32"		Deck Pl.	5/16"	
Headlog Pl.	5/8"		Transom	Straight	
Trusses & Frames	6 & 8		Transom Pl.	3/8"	
Bottom Pl.	1 1/32"		Deck Fittings	2 butt. chocks 12 kevels	
Innerbottom Pl.	1/2"		Rub Bars	Intermittent at top	
Side Box Width	3'3"		Wheelabrator	Yes	
Top Hopper Flange	13"		Paint	1 ct. barge paint	



**Electro-Nav Names  
Woolf General Manager  
San Francisco Office**



**Brian Woolf**

**Robert E. Negron**, president of Electro-Nav, has announced the appointment of **Brian Woolf** as general manager of its new branch office, Electro-Nav San Francisco.

**Mr. Woolf** brings with him a great deal of marine electronic experience to assist Electro-Nav West Coast customers. He graduated from Kingston Polytechnic College, England, with a degree in electrical and electronic engineering. **Mr. Woolf** worked in the

Radar Development Labs at Decca Radar, England, and then transferred to ITT Decca Marine in the United States and held various marketing positions, including that of marketing manager. For the past four years, **Mr. Woolf** has been the area manager for the northern West Coast area.

Electro-Nav is one of the largest suppliers of marine navigation and communication equipment in the United States, and are the U.S. distributors for the S.G. Brown Gyro Compass, the Norwegian Radio Room Equipment, Electromagnetic Speed Logs, Clear View Screens, and the Thomson CSF Sonar Doppler Equipment. They are also area distributors for such well-known companies as ITT Decca, Motorola Triton, Konel, CAI Single Sideband Equipment, Krupp Radar Echo Sounding, and Simrad Loran C, just to mention a few.

Electro-Nav San Francisco will temporarily have its headquarters at Electro-Nav San Francisco, c/o **Brian Woolf**, 2656 Sundance Court, Walnut Creek, Calif. 94598.

**SNAME Los Angeles Section Discusses  
Use Of Concrete For Marine LNG Tankage**



Members of the SNAME Los Angeles Section gather before the meeting on the S/S Princess Louise. Shown are, left to right: **Bill Hood**, secretary-treasurer; **Abraham Person**, author; **Bob Apple**, chairman; **Frank Kuntz**, vice chairman, and **John Hollett**, Papers Committee chairman.

The members and guests of the Los Angeles Metropolitan Section of The Society of Naval Architects and Marine Engineers were welcomed aboard the S/S Princess Louise for their recent meeting. **Bob Apple**, chairman of the Section, opened the meeting and introduced the head table. **John Hollett** previewed the June field trip to Rockwell International for touring their ship propeller blade facility.

**Mr. Hollett** then introduced **Abraham Person**, author of the evening's paper titled "Qualification Program for the Use of Concrete for Marine LNG Tankage." **Mr. Person** is assistant chief engineer for Global Marine Development, Inc. of Newport Beach, Calif. The purpose of the Global Marine Program is to simplify the Marine LNG Containment System for Floating Offshore Facilities, and to reduce its cost. They have proposed to the United States Coast Guard a research and test

program to qualify prestressed concrete as a secondary barrier. The USCG has accepted the program concept, and it is now in the financial development stage. The proposed use of prestressed concrete as a marine LNG secondary barrier, and the program to qualify this material to USCG requirements was the subject of **Mr. Person's** paper.

The program will integrate research, analysis and tests for meeting two objectives. First, to qualify prestressed concrete to USCG requirements for a marine LNG secondary barrier and second, to provide tools and data to design prestressed concrete materials for a marine LNG secondary barrier. The proposed tests include material property, quality assurance, and large and small-scale tests that are integrated to provide the necessary data for qualification of the material and for supplying design data. The program is expected to start sometime this year.



**3 STEEL-FLOATING  
DRYDOCKS  
1000-1250-1500 D.W.T.**

**FOR SALE or LEASE**

*Zidell is currently beginning production on these units which will be fully equipped and ready for delivery in January, 1978.*

Standard equipment will include: On-Board, remote-controlled flood and discharge systems, mechanical positive backup for safety, fast flood and discharge to expedite docking and undocking, automatic centerline positioning . . . hauling blocks . . . full array of lighting, ventilation and intercom system.

**1000 D.W.T. CAPACITY**—Length O.A.—180 ft., Breadth O.A.—70 ft.  
Depth from top of wingwalls—30 ft.  
Clear span between wingwalls—56 ft.  
Will handle vessels to 18 foot draft.

**1250 D.W.T. CAPACITY**—Length O.A.—200 ft., Breadth O.A.—75 ft.  
Depth from top of wingwalls—30 ft.  
Clear span between wingwalls—62 ft.  
Will handle vessels to 18 foot draft.

**1500 D.W.T. CAPACITY**—Length O.A.—200 ft., Breadth O.A.—80 ft.  
Depth from top of wingwalls—32 ft.  
Clear span between wingwalls—68 ft.  
Will handle vessels to 20 foot draft.

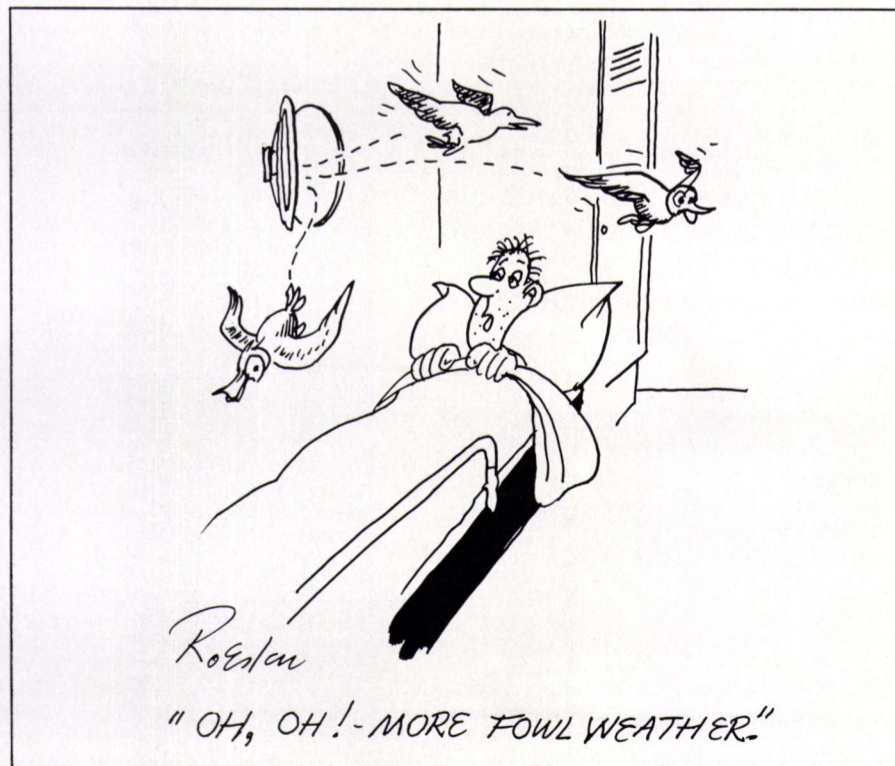
Contact: Stan Rosenfeld or Tom Sherwood for more details



Marine Construction Division

**ZIDELL EXPLORATIONS, INC.**

3121 S.W. Moody Ave. • Portland, Oregon 97201  
Phone: 503/228-8691 • Telex: 36-0503 • Cable "ZIDELL"

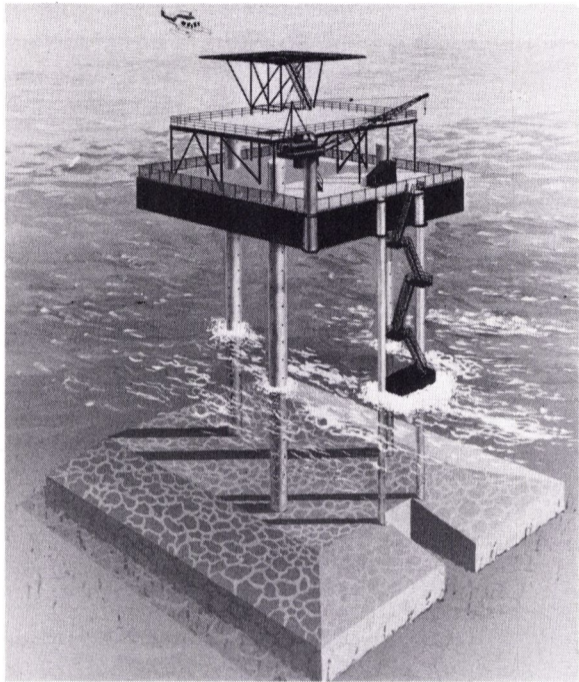




## Bethlehem Beaumont To Build Self-Setting Production-Storage Platform For Phillips Petroleum

The Lafayette, La., office of Phillips Petroleum Company has awarded a contract to Bethlehem Steel Corporation's Beaumont, Texas, shipyard for construction of a self-setting production-storage platform. It will have a liquid hydrocarbon storage capacity of 11,350 barrels, and will be used offshore Texas.

The unit is the basic Bethlehem design, modified and developed by the cooperative effort of Phillips and Bethlehem to serve better the specific requirements of Phillips in the Texas offshore water.



This design of a self-setting production-storage platform, shown above, will have a hydrocarbon storage capacity of 11,350 barrels and will be used offshore Texas. Bethlehem's Beaumont, Texas shipyard is scheduled to complete the unit in December 1977.

The self-setting production-storage unit is a mat-supported jackup unit similar in configuration to the Bethlehem mat-supported jackup drilling unit. The production equipment, heliport, and quarters will be installed in the shipyard prior to the platform's being set on location in the producing fields in 54 feet of water in the Gulf of Mexico. The platform is scheduled for completion in December 1977.

The self-setting production-storage facility consists of an elevated platform supported on three tubular columns, which are in turn affixed to the supporting mat structure resting on the floor of the Gulf. The mat will provide underwater storage for liquid hydrocarbons, using Bethlehem's patented salt-water displacement system. Several compartments within the box-like platform will also provide a small portion of additional storage.

The elevated platform is a box girder-type structure, which performs several functions, i.e., provides buoyancy while the unit is in transit and while the mat is being set on location. After the unit has been set, the platform is jacked above the ocean surface to a height sufficient to provide storm wave clearance.

The fixed jacking pins are then secured in order to transfer the vertical load of the platform to the columns. Subsequently, the horizontal load transfer devices are installed between the columns and the platform. The column jacks are then removed and returned to the shipyard. Upon the eventual depletion of reserves at the first location, the entire

unit will be recovered by reinstalling the jacks and reversing the latter procedure.

The Lafayette office of Phillips Petroleum played a very active role in developing the design of this unit and incorporated numerous features into this concept. Typical of these are the ability to deliver produced hydrocarbon from the underwater storage tanks without the interruption of production, the ability to divert and retreat emulsion-cut production without going to submerged storage first, and the capability of handling all fluids to prevent accidental discharge or contamination. Many safety and environmental protection precautions additional to regulatory requirements have been included. Phillips has also secured the necessary approval from USCGS to install the platform.

Bethlehem introduced its "first" mat-

supported production platform in 1950, followed by the introduction of its first underwater storage facility in 1960. The combination of the technology of both companies, along with Bethlehem's many years of rig-building experience, has resulted in the development of this self-setting production platform.

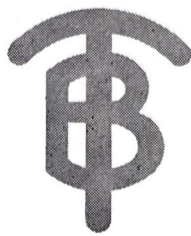
## American President Lines Promotes Henry Kozlowski

American President Lines has announced the promotion of **Henry Kozlowski** to senior vice president-operations and control. He assumes responsibility for vessel operations, terminals, engineering and maintenance, in addition to his existing duties of corporate planning, traffic and equipment control.

# get the best



# get TURECAMO on your side



The Turecamo fleet of modern, powerful tugs is available around-the-clock for the docking and undocking of ships of all sizes. Over the years, Turecamo tugs have also established an enviable record in all phases of sound, harbor, coastwise and canal towing. Put this experience to work for you.

**DOCKING • UNDOCKING**—harbor, sound, coastwise, canal and lake towing

## TURECAMO COASTAL & HARBOR TOWING CORP.

P.O. BOX 201  
OYSTER BAY, N.Y. 11771

TEL: (212) 442-7400

ONE EDGEWATER STREET  
STATEN ISLAND, N.Y. 10305

MATTON  
TRANSPORTATION CO.  
INC.

TURECAMO  
TRANSPORTATION CORP.

MATTON  
SHIPYARD CO. INC.

TURECAMO TANKERS  
INC.



## Prudential Installs Fleetwide Preventive Maintenance Program

Spyros S. Skouras, chairman and chief executive officer of Prudential Lines, Inc., has announced that the shipping company has embarked on a fleetwide preventive maintenance program. Mr. Skouras said maritime systems engineers from the Stanwick Com-

pany of Norfolk, Va., ushered in the program by installing preventive maintenance systems aboard the S/S LASH Turkiye in mid-January, and the S/S Santa Isabel in early April.

Eventually, the Prudential fleet, comprised of four LASH class, six Lucia class, four Magdalena class, and two Jet class vessels, will have tailored maintenance programs. As the forerunner

American-flag shipping line in the adoption of a comprehensive planned maintenance program, Prudential hopes to reduce its overall ship maintenance and repair costs.

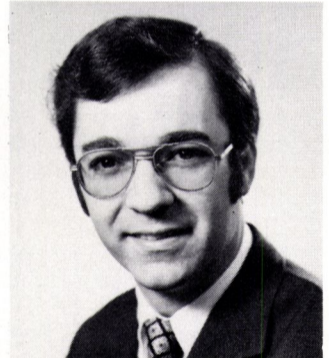
Mr. Skouras said that Prudential's planned maintenance program will result in fewer unplanned equipment repairs, a reduction in time-off service, more efficient use of shipboard maintenance resources, less dependence on shore repair facilities, and longer equipment life.

The systems installed and those planned provide recommended maintenance and the means to schedule, record, and report maintenance actions on all shipboard equipment. This is a prototype system developed for the Maritime Administration utilizing advance software, communications and EDP systems.

Spearheading the inauguration of the project on the first LASH class vessel and the first Lucia class vessel for Prudential Lines are Thomas V. MacEwen, director of engineering, A.P. Knox, marine superintendent, and Jack E. Robinson, assistant director of engineering. Implementing the system aboard the S/S Santa Isabel are Capt. Edward Calabrese and chief engineer Merle Bevington. Richard E. Kelly, director of Maritime Systems Department for Stanwick, developed the preventive maintenance systems with Stanwick engineers John W. Viele, Jack A. Garwood and Robert J. Meurn.

For complete information on the preventive maintenance system, write to Richard E. Kelly, Stanwick Company, 3661 East Virginia Beach Boulevard, Norfolk, Va. 23502.

## Dravo Names Riott Manager, Western Region Engineering Works Div.

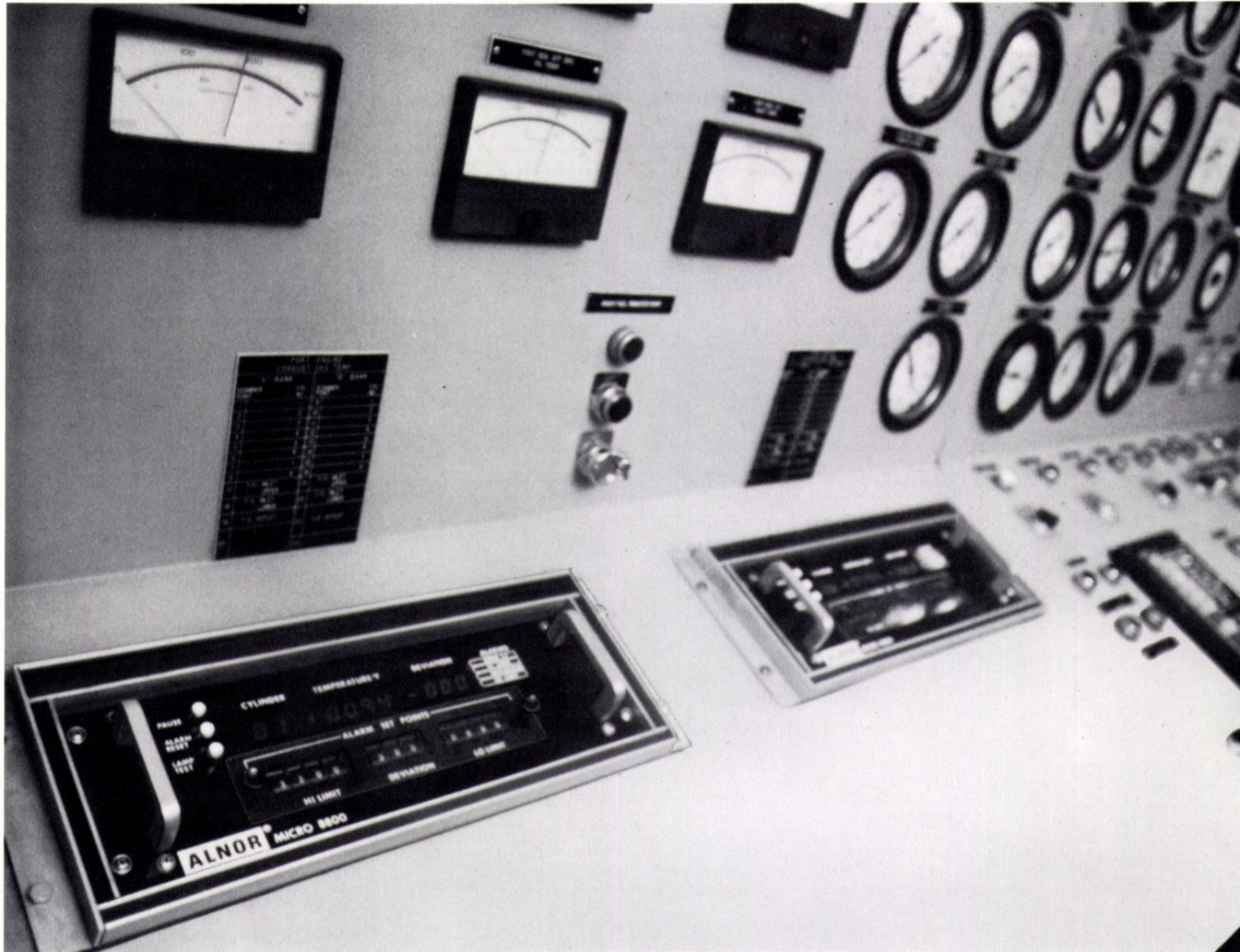


J.M. Riott

J.M. Riott has been appointed manager, Western region for Dravo Corporation's Engineering Works Division. Based in Denver, Colo., he will be responsible for marketing the division's bulk materials handling equipment and systems in the Western United States.

Formerly Eastern sales manager for the company's marine equipment, Mr. Riott has been with Dravo for five years. He is a graduate of the University of Pittsburgh's School of Engineering, and Carnegie Mellon University's School of Industrial Administration.

Dravo, with more than 50 years' experience in designing and building bulk materials handling equipment is one of the world's major designers of bulk handling systems.



## Alnor Micro-8800 alarms engine wear in giant tug-barge.

A pair of Alnor Micro-8800 microprocessor systems aboard the M/V Presque Isle has solved thermal overload that threatened the twin V-16 diesels powering the world's largest tug barge.

The 8 instruments originally monitoring engine temperatures indicated that all was well. But when operators suspected erroneous readings and had the engines torn down during winter layover, their suspicions were confirmed: scuffed cylinder liners, chipped rings and other damages were discovered — result of thermal overload.

Subsequently, ship's owner, Litton Great Lakes Corporation, installed a pair of Alnor Micro-8800 exhaust gas temperature (EGT) monitoring systems.

The solid state Micro-8800 scans up to 32 thermocouple zones—one

per second. A lighted numerical display indicates the temperature of the thermocouple being scanned; instantly computes the most recent average EGT of all cylinders; then compares each cylinder's EGT against average and displays deviation from average. Cylinder EGT's exceeding high or low limits and excess deviation conditions, are indicated by alarm lights on the instrument.

In addition to warning of thermal overload, the Micro-8800 helps increase the fuel efficiency of diesels by indicating whether cylinders are properly balanced.

If you have a big investment in diesel engines, consider a small investment that could add years to their operating life. For more information on the Micro-8800, call Todd Scott, Product Specialist, Digital Systems—312/647-7866.



**ALNOR**® ...digital performance from analog leadership

INSTRUMENT COMPANY 7301 N. Caldwell Avenue, Niles, IL 60648 (312) 647-7866 Telex: 72-4458



**Propulsion Systems, Inc.  
Bow Thruster Ordered For  
1,000-Foot Ore Carrier**

Propulsion Systems, Inc., has been awarded a contract by the American Ship Building Company to provide a PSI/Liaaen, 1,500-hp, BC25-15 Controllable Pitch Bow Thruster. The thruster will be installed in a 1,000-foot self-unloading ore carrier being constructed for U.S. Steel. Eight of these popular model thrusters are being furnished for other ore carriers being constructed by the Bay Shipbuilding Corporation.

For higher horsepower PSI/Liaaen tunnel and rotatable compass thrusters, modifications have been made to incorporate additional extended life and maintainability features required for dynamic positioning and propulsion service. These features include the use of standard controllable-pitch propulsion hubs, sleeve bearings to avoid B-10 life limitations and being able to remove the propeller and shaft as a unit to service the shaft seals. For additional information, write to Peter Wennberg, Propulsion Systems, Inc., 21213-76th Avenue South, Kent, Wash. 98031.

**National Cargo Bureau  
Appoints Captain Gates**



Capt. Donald W. Gates

The National Cargo Bureau has announced the appointment of Capt. Donald W. Gates as vice president and chief surveyor. Captain Gates had been serving as chief surveyor since July 1974. He is a graduate of the State of New York Maritime College and sailed as deck officer and master with Isthmian Steamship Company and United States Lines before becoming a marine cargo surveyor. He has been with the Bureau since its inception in 1952. Captain Gates is an advisor to the U.S. representative to the Inter-Governmental Maritime Consultative Organization (IMCO) Subcommittee on the Carriage of Dangerous Goods, is a member of the U.S. SOLAS Working Group on the Carriage of Dangerous Goods, a member of the American National Standards Institute (ANSI) Committee on Packaging and Transportation of Fissile and Radioactive Material (N-14), ANSI N-552 Committee on Trans-

portation of Nuclear Materials To and From Off-Shore Nuclear Power Plants, National Fire Protection Association (NFPA) Sectional Committee on Storage, Handling and Transportation of Hazardous Chemicals, and American Institute of Marine Underwriters Container Committee, and of the Chemical Transportation Industry Advisory Committee (CTIAC).

Captain Gates is also a member

of the Council of the American Master Mariners, past president of the National Council of Alumni Associations, Marine Society of the City of New York, and The Propeller Club, Port of New York. He is also a Pilot Commissioner for the State of New Jersey. He is recipient of Public Service Commendation from the Commandant of the U.S. Coast Guard for his contribution to marine safety.

The National Cargo Bureau,

Suite 2757, One World Trade Center, New York, N.Y. 10048, is a nationwide nonprofit membership organization dedicated to the safe stowage, securing and unloading of cargo on all vessels. It formulates recommendations to Government on safe stowage of dangerous goods and other cargoes, and offers low-cost cargo loading inspection surveys (breakbulk and containers), and inspection of cargo-handling gear.

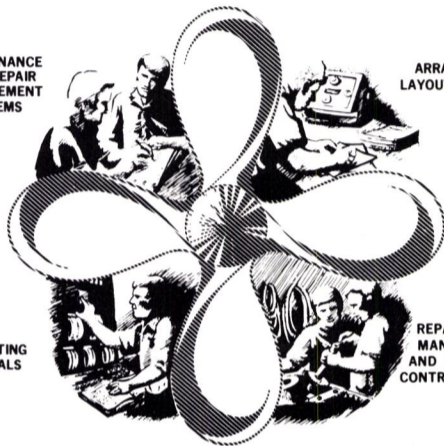
**CONSULTANTS  
TO THE  
MARINE INDUSTRY**

MAINTENANCE  
AND REPAIR  
MANAGEMENT  
SYSTEMS

ARRANGEMENT/  
LAYOUT ANALYSES

OPERATING  
MANUALS

REPAIR PARTS  
MANAGEMENT  
AND INVENTORY  
CONTROL SYSTEMS



**THE STANWICK COMPANY**  
MARITIME  
SYSTEMS DEPARTMENT  
3661 E. VIRGINIA BEACH BLVD., NORFOLK, VA. 23502 • 804-855-8681  
• A DIVISION OF THE STANWICK CORPORATION •

Install...  
Remove...  
Re-Use...

**Electroline  
Fittings...**

...on the job, without heat or special tools and save both time and money!

Positive-grip Electroline swivels, turnbuckles, couplings, balls, hooks and eyes all include a visual-inspection hole for added safety, security. Sizes to fit all ropes, cables and lines from 1/16" to 1-1/2".

For catalog and prices, call or write:

**SUPERIOR SWITCHBOARD & DEVICES**  
Division of **Union METAL**  
MANUFACTURING COMPANY

P. O. Box 590 Canton, Ohio 44701  
Phone (216) 452-4681



**WE WROTE THE BOOK ON  
REMOTE VALVE OPERATORS**

Stow Manufacturing wrote this NEW DESIGN MANUAL to help you design, select, and install Stow Remote Valve Operating Systems.

This detailed, illustrated manual contains everything you need to specify Stow Flexible Shaft, Rigid Rod, or Combination Systems — Systems that centralize valve operation; that control inaccessible valves; that put control where it's safe and convenient.

When it comes to efficient, economical, safe valve operators — Stow's the one. We wrote the book on it. Send for your copy today.



**It's yours free.**

Please send me my Design Manual for Marine Valve Remote Operators.

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_

MAIL TO: **STOW** Manufacturing Co.



Dept. V-277, 86 Bump Road, Binghamton, N.Y. 13902 Phone: (607) 723-6411 Telex 932420  
West Coast Office & Warehouse, 2150 Livingston St., Oakland, CA 94606 Phone: (415) 261-3600



## Maryland Police And United Nations Order Boats From Uniflite

Two more high-speed 28-foot Uniflite patrol boats, identical to four that were delivered and put into service last November, have been ordered by the Marine Division of the State of Maryland's Natural Resources Police for de-

livery in August, according to **James J. Doud**, executive vice president and general manager for Uniflite, Inc.

The new vessels, designed for year-round law enforcement and search and rescue operations on Chesapeake Bay and along the state's Atlantic Ocean shoreline, are the latest additions in the department's modernization program for its nearly 50-boat fleet,

which already includes six Uniflites, 28 and 31 feet long.

The fire-retardant fiberglass boats will be built at Uniflite's Eastern plant at Swansboro, N.C., on the Intracoastal Waterway, and delivered to the Matapeake Terminal, Stevensville, Md., on the eastern shore of Chesapeake Bay for the contract price of approximately \$75,700.

Two 23-foot waterjet propelled

river patrol boats have also been ordered from Uniflite, Inc. by the office of the United Nations in Geneva, Switzerland, for use by the Peruvian police on inland rivers east of the Andes Mountains, according to **John L. Thomas**, Uniflite chairman and president.

The two fire-retardant fiberglass boats are scheduled for delivery to Callao, Peru, on the seacoast next October for the contract price of \$56,900. From there, they will be transported overland across the mountains for patrol and enforcement duty in the remote, dense jungle conditions that prevail in the upper reaches of the Amazon basin.

Each boat will be powered with a single 220-hp Crusader engine driving through a Jacuzzi waterjet propulsion pump giving a shallow draft of only 0.6 meters (about 18 inches). Each will be equipped with a Honda EM400 portable generator to operate a huge searchlight.

For more information, write Commercial & Military Sales Dept., Uniflite, Inc., P.O. Box 1095, Bellingham, Wash. 98225.

## Evergreen Handt Names Capt. Wei Executive VP



Capt. Ming Hung Wei

Capt. **Ming Hung Wei** has been named executive vice president for Evergreen Handt Corp., general agents for Evergreen Line's East Coast/Far East Container service.

The appointment was announced by **Svend Hansen Jr.**, president of Evergreen Handt.

Captain **Wei** is a graduate of the Taiwan Maritime College in Keelung and has served 13 years at sea in virtually every world trade. He has been involved in the North America/Far East trade since 1960.

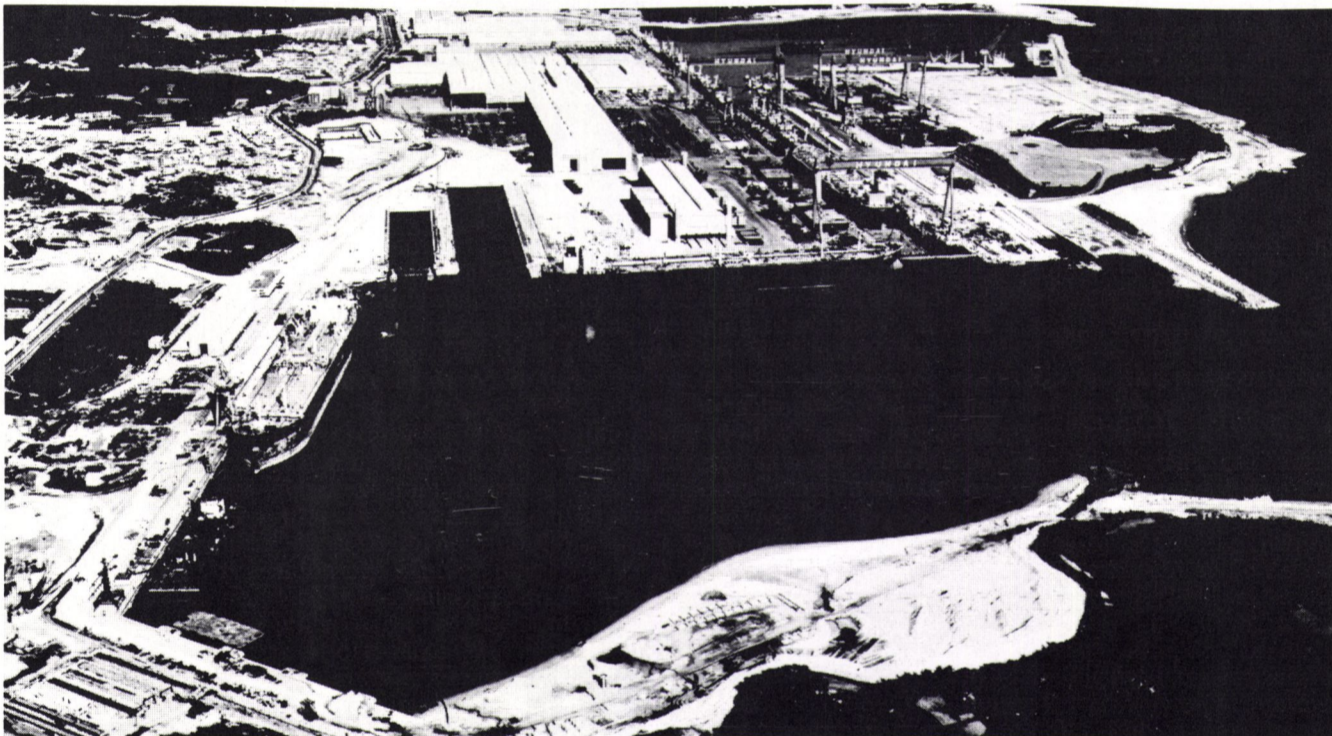
He joined Evergreen Line in 1971, and came ashore for them in 1973 to help establish the U.S. container service. Captain **Wei** was the first Evergreen Line official to come to New York from Taiwan for this service.

Most recently, he was vice president of operations.

Evergreen operates a fleet of modern container vessels from the ports of New York, N.Y., Charleston, S.C., and Baltimore, Md., to the Far East via Pusan, Korea, Keelung and Kaohsiung, Taiwan, and Hong Kong.

# Repairing a vessel can cost you a lot of dollars!

and, if you take it to the wrong dockyard, it can cost you more in time and money!



## Let HMD handle your SHIP REPAIR problems.

**Dependable,  
Economical  
& Fast.**

### Services include :

- All types of engine and hull repairs
- Major conversions and lengthening
- Tank cleaning and slop/sludge disposal



## HYUNDAI MIPO DOCKYARD CO., LTD.

Head Office : 456 Cheonha-Dong, Ulsan 690-02, Korea  
Tel: (ULSAN) 2-9021/5, Tlx: HMDYARD K3589, Cab: "HMDREPYARD"

Seoul Office : 178 Sejongro, Jongro-Ku, Seoul 110, Korea KPO Box 289 Seoul  
Tel: 72-7537, 7656, Tlx: K28361 (HDYARD) Cab: "HDYARD"

Overseas Offices : London, Oslo, Hamburg, Athens, Tehran, New York, San Francisco, Tokyo, Hong Kong

### Agent in U.S.A.:

**Robert M. Catharine**

## JACKSON MARINE CORPORATION

405 Park Ave., New York, N.Y. 10022 Tel: (212) 755-0555 Tlx: 62685 JACKMAR



**Propulsion Systems, Inc.  
Bow Thruster Ordered For  
1,000-Foot Ore Carrier**

Propulsion Systems, Inc., has been awarded a contract by the American Ship Building Company to provide a PSI/Liaaen, 1,500-hp, BC25-15 Controllable Pitch Bow Thruster. The thruster will be installed in a 1,000-foot self-unloading ore carrier being constructed for U.S. Steel. Eight of these popular model thrusters are being furnished for other ore carriers being constructed by the Bay Shipbuilding Corporation.

For higher horsepower PSI/Liaaen tunnel and rotatable compass thrusters, modifications have been made to incorporate additional extended life and maintainability features required for dynamic positioning and propulsion service. These features include the use of standard controllable-pitch propulsion hubs, sleeve bearings to avoid B-10 life limitations and being able to remove the propeller and shaft as a unit to service the shaft seals. For additional information, write to Peter Wennberg, Propulsion Systems, Inc., 21213-76th Avenue South, Kent, Wash. 98031.

**National Cargo Bureau  
Appoints Captain Gates**



Capt. Donald W. Gates

The National Cargo Bureau has announced the appointment of Capt. Donald W. Gates as vice president and chief surveyor. Captain Gates had been serving as chief surveyor since July 1974. He is a graduate of the State of New York Maritime College and sailed as deck officer and master with Isthmian Steamship Company and United States Lines before becoming a marine cargo surveyor. He has been with the Bureau since its inception in 1952. Captain Gates is an advisor to the U.S. representative to the International Maritime Consultative Organization (IMCO) Subcommittee on the Carriage of Dangerous Goods, is a member of the U.S. SOLAS Working Group on the Carriage of Dangerous Goods, a member of the American National Standards Institute (ANSI) Committee on Packaging and Transportation of Fissile and Radioactive Material (N-14), ANSI N-552 Committee on Trans-

portation of Nuclear Materials To and From Off-Shore Nuclear Power Plants, National Fire Protection Association (NFPA) Sectional Committee on Storage, Handling and Transportation of Hazardous Chemicals, and American Institute of Marine Underwriters Container Committee, and of the Chemical Transportation Industry Advisory Committee (CTIAC).

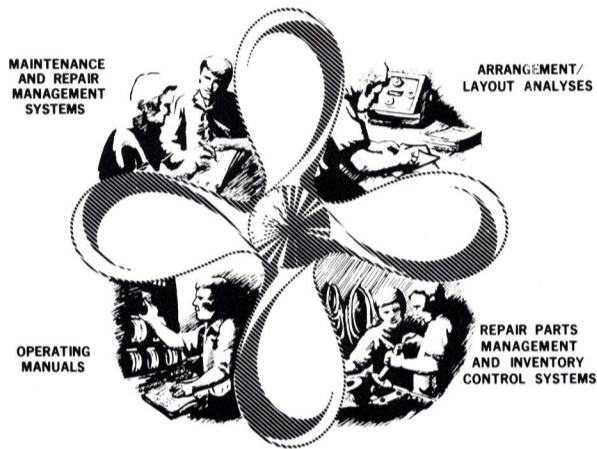
Captain Gates is also a member

of the Council of the American Master Mariners, past president of the National Council of Alumni Associations, Marine Society of the City of New York, and The Propeller Club, Port of New York. He is also a Pilot Commissioner for the State of New Jersey. He is recipient of Public Service Commendation from the Commandant of the U.S. Coast Guard for his contribution to marine safety.

The National Cargo Bureau,

Suite 2757, One World Trade Center, New York, N.Y. 10048, is a nationwide nonprofit membership organization dedicated to the safe stowage, securing and unloading of cargo on all vessels. It formulates recommendations to Government on safe stowage of dangerous goods and other cargoes, and offers low-cost cargo loading inspection surveys (breakbulk and containers), and inspection of cargo-handling gear.

**CONSULTANTS  
TO THE  
MARINE INDUSTRY**



**THE STANWICK COMPANY**  
MARITIME  
SYSTEMS DEPARTMENT  
3661 E. VIRGINIA BEACH BLVD., NORFOLK, VA. 23502 • 804-855-8681  
• A DIVISION OF THE STANWICK CORPORATION •

Install...  
Remove...  
Re-Use...

**Electroline  
Fittings...**

...on the job, without heat or special tools and save both time and money!

Positive-grip Electroline swivels, turnbuckles, couplings, balls, hooks and eyes all include a visual-inspection hole for added safety, security. Sizes to fit all ropes, cables and lines from 1/16" to 1-1/2".

For catalog and prices, call or write:

**SUPERIOR SWITCHBOARD & DEVICES**  
Division of **Union METAL**  
MANUFACTURING COMPANY

P. O. Box 590 Canton, Ohio 44701  
Phone (216) 452-4681

**WE WROTE THE BOOK ON  
REMOTE VALVE OPERATORS**

Stow Manufacturing wrote this NEW DESIGN MANUAL to help you design, select, and install Stow Remote Valve Operating Systems.

This detailed, illustrated manual contains everything you need to specify Stow Flexible Shaft, Rigid Rod, or Combination Systems — Systems that centralize valve operation; that control inaccessible valves; that put control where it's safe and convenient.

When it comes to efficient, economical, safe valve operators — Stow's the one. We wrote the book on it. Send for your copy today.



**It's yours free.**

Please send me my Design Manual for Marine Valve Remote Operators.

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_

MAIL TO: **STOW**

Manufacturing Co.



Dept. V-277, 86 Bump Road, Binghamton, N.Y. 13902 Phone: (607) 723-6411 Telex 932420  
West Coast Office & Warehouse, 2150 Livingston St., Oakland, CA 94606 Phone: (415) 261-3600



## Maryland Police And United Nations Order Boats From Uniflite

Two more high-speed 28-foot Uniflite patrol boats, identical to four that were delivered and put into service last November, have been ordered by the Marine Division of the State of Maryland's Natural Resources Police for de-

livery in August, according to **James J. Doud**, executive vice president and general manager for Uniflite, Inc.

The new vessels, designed for year-round law enforcement and search and rescue operations on Chesapeake Bay and along the state's Atlantic Ocean shoreline, are the latest additions in the department's modernization program for its nearly 50-boat fleet,

which already includes six Uniflites, 28 and 31 feet long.

The fire-retardant fiberglass boats will be built at Uniflite's Eastern plant at Swansboro, N.C., on the Intracoastal Waterway, and delivered to the Matapeake Terminal, Stevensville, Md., on the eastern shore of Chesapeake Bay for the contract price of approximately \$75,700.

Two 23-foot waterjet propelled

river patrol boats have also been ordered from Uniflite, Inc. by the office of the United Nations in Geneva, Switzerland, for use by the Peruvian police on inland rivers east of the Andes Mountains, according to **John L. Thomas**, Uniflite chairman and president.

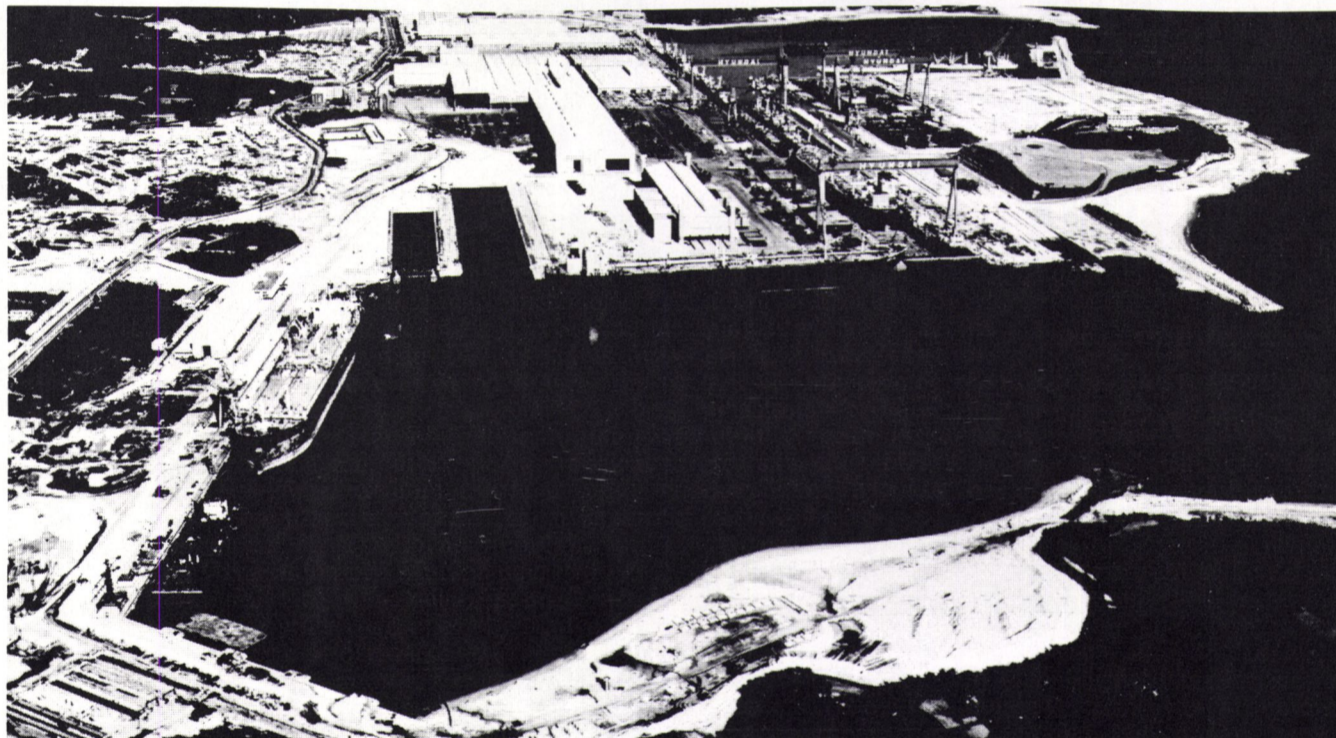
The two fire-retardant fiberglass boats are scheduled for delivery to Callao, Peru, on the seacoast next October for the contract price of \$56,900. From there, they will be transported overland across the mountains for patrol and enforcement duty in the remote, dense jungle conditions that prevail in the upper reaches of the Amazon basin.

Each boat will be powered with a single 220-hp Crusader engine driving through a Jacuzzi waterjet propulsion pump giving a shallow draft of only 0.6 meters (about 18 inches). Each will be equipped with a Honda EM400 portable generator to operate a huge searchlight.

For more information, write Commercial & Military Sales Dept., Uniflite, Inc., P.O. Box 1095, Bellingham, Wash. 98225.

# Repairing a vessel can cost you a lot of dollars!

and, if you take it to the wrong dockyard, it can cost you more in time and money!



## Let HMD handle your SHIP REPAIR problems.

**Dependable,  
Economical  
& Fast.**

### Services include :

- All types of engine and hull repairs
- Major conversions and lengthening
- Tank cleaning and slop/sludge disposal



## HYUNDAI MIPO DOCKYARD CO., LTD.

Head Office : 456 Cheonha-Dong, Ulsan 690-02, Korea  
Tel: (ULSAN) 2-9021/5, Tlx: HMDYARD K3589, Cab: "HMDREPYARD"

Seoul Office : 178 Sejongro, Jongro-Ku, Seoul 110, Korea KPO Box 289 Seoul  
Tel: 72-7537, 7656, Tlx: K28361 (HDYARD) Cab: "HDYARD"

Overseas Offices : London, Oslo, Hamburg, Athens, Tehran, New York, San Francisco, Tokyo, Hong Kong

Agent in U.S.A.:

**Robert M. Catharine**

**JACKSON MARINE CORPORATION**

405 Park Ave., New York, N.Y. 10022 Tel: (212) 755-0555 Tlx: 62685 JACKMAR

## Evergreen Handt Names Capt. Wei Executive VP



Capt. Ming Hung Wei

Capt. **Ming Hung Wei** has been named executive vice president for Evergreen Handt Corp., general agents for Evergreen Line's East Coast/Far East Container service.

The appointment was announced by **Svend Hansen Jr.**, president of Evergreen Handt.

Captain **Wei** is a graduate of the Taiwan Maritime College in Keelung and has served 13 years at sea in virtually every world trade. He has been involved in the North America/Far East trade since 1960.

He joined Evergreen Line in 1971, and came ashore for them in 1973 to help establish the U.S. container service. Captain **Wei** was the first Evergreen Line official to come to New York from Taiwan for this service.

Most recently, he was vice president of operations.

Evergreen operates a fleet of modern container vessels from the ports of New York, N.Y., Charleston, S.C., and Baltimore, Md., to the Far East via Pusan, Korea, Keelung and Kaohsiung, Taiwan, and Hong Kong.



## Mitsubishi To Convert Sea-Land Containerships

Mitsubishi Shipbuilding Group of Japan has received a contract from Sea-Land to undertake major conversions of four of its T3-class containerships at a total cost of about \$50 million.

Beginning next January, the ships will be withdrawn in succession from Sea-Land's recently up-rated Rotterdam-Middle East service, but will be returned to that trade once their conversions are completed.

Basically, of the old ships only the mid-bodies will be saved, refurbished and equipped with modern, economical Sulzer diesel engines. Mitsubishi will join these mid-bodies to newly constructed bow and stern sections.

On completion, the ships should have a length of 662 feet, a speed of 18.5 knots, and a capacity of 593 of Sea-Land's 35- and 40-foot containers. In a return to original containership practice, they will also be equipped with two container cranes.

"This self-sustaining capability is of particular benefit when calling at the congested ports of the Mideast," a Sea-Land statement said.

The ships will be reconstructed to meet U.S. standards and requirements, will fly the U.S. flag and be manned by American crews.

## Marine Electronics Dealers Establish Reciprocal Service

In a joint announcement, **Gerald A. Gutman**, president of NAV-COM, Inc., **Tom Collins**, president of Collins Marine Corporation, and **Don Derryberry**, vice president of Gulf Radiotelephone and Electronics, introduced a new high level of service called R.S.V.P. for vessels making port in or near New York, San Francisco, Houston, Aransas Pass and Galveston, Texas, and Morgan City, La.

Mr. Gutman explained the new R.S.V.P. service by saying: "Our three-way agreement provides each other's customers with the same high-quality service they would get 'at home.' This reciprocal service is necessary today, more than ever before, because navigation and communication equipment is becoming more and more sophisticated.

"The problem is compounded," Mr. Gutman continued, "by skyrocketing vessel operating expenses which cost shipowners many thousands of extra dollars if turnaround time or time en route is increased because of malfunctioning equipment or the inability to get rapid, expert repairs."

Reciprocal service is one way that NAV-COM, Collins Marine

and Gulf Radiotelephone have chosen to assure their customers that they are getting the best service available. All three companies maintain the highest level of marine electronics engineering capability, but in addition, each can now call on the other for specific information about installation made by one of the group.

"If a system installed by one of the R.S.V.P. members malfunctions while the vessel is in

my area," said Collins Marine president **Tom Collins**, "our engineers and technicians will be capable of the fastest turnaround possible."

Reached at his company's office in Pasadena, Texas, Gulf Radiotelephone vice president **Don Derryberry** added: "Our R.S.V.P. service agreement does not represent a merging of our three companies. It is, however, one way we provide our customers with

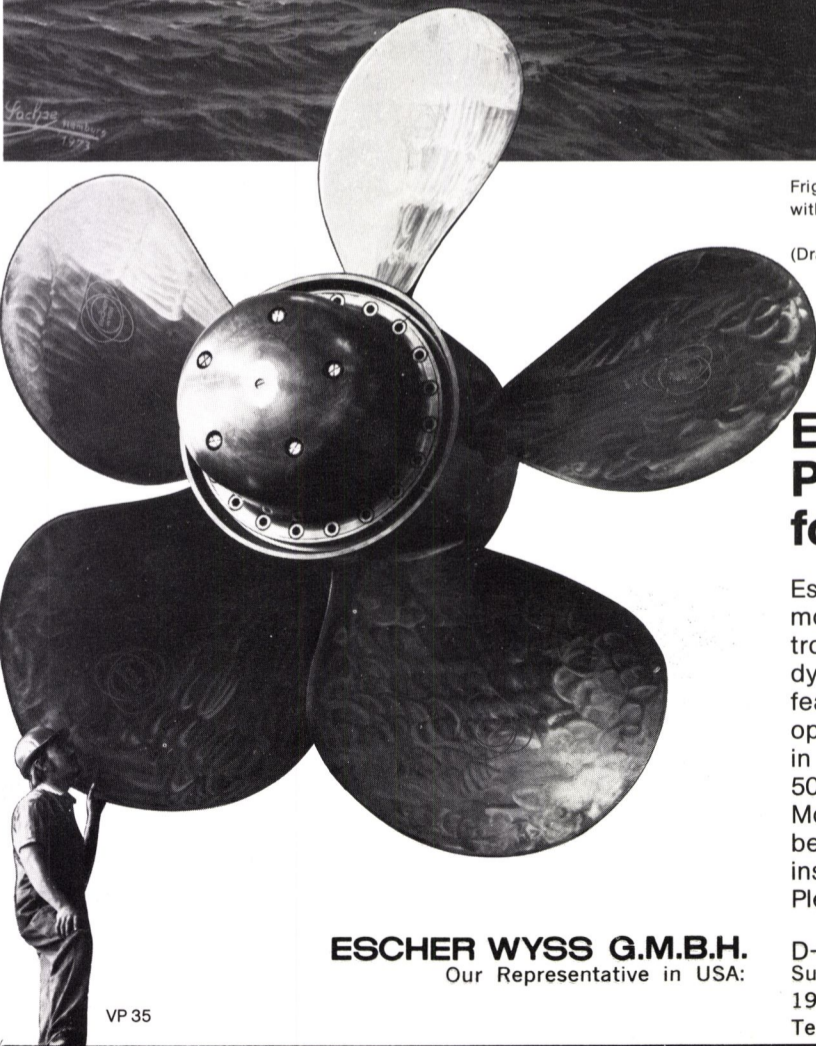
superb service when they need it on the East or West coasts."

The three companies are located as follows:

East Coast—NAV-COM, Inc., 2 Hicks Street, North Lindenhurst, N.Y. 11757.

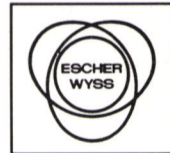
West Coast—Collins Marine Corporation, Pier 32, Embarcadero, San Francisco, Calif. 94107.

Gulf Coast—Gulf Radiotelephone and Electronics, Inc., 333 Watters, Pasadena, Texas 77504.



Frigate "NITEROI" and five sister ships with two Escher Wyss controllable pitch propellers

(Drawing by J. Sachse, Hamburg)



## Escher Wyss Controllable Pitch Propellers for Naval Vessels

Escher Wyss Propellers for naval vessels meet the most exacting requirements for highly loaded controllable pitch propellers in terms of design, hydrodynamics, hydroacoustics and manufacture, they feature superior workmanship and reliability in operation. This modern design is already in service in the 30000 HP range and is also available for the 50000 HP range and upwards.

More than 1250 Escher Wyss propellers have so far been delivered, including more than 250 plans installed in naval vessels.

Please write for further information.

**ESCHER WYSS G.M.B.H.**  
Our Representative in USA:

D-7980 Ravensburg, Tel. (0751) 831, Telex 0732901 Sulzer Bros. Inc.

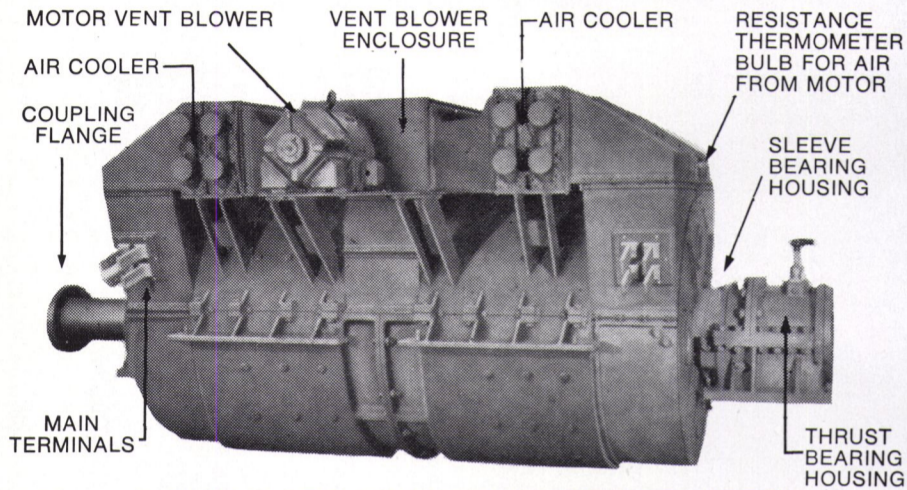
19 Rector Street, New York, N.Y. 10006  
Tel. (212) 425-4560, Telex: 620219



# ZIDELL HAS THIS EQUIPMENT AVAILABLE NOW!

## 4 only—2700 H.P. MOTORS

415 volts D.C.—280 RPM, Totally Enclosed



These DOUBLE ARMATURE SUBMARINE MOTORS would be excellent for: Drill Ships/Platform, Dredge Pump Drives or Mine Hoist Motors.

- 2 — Motors have been A-1 Reconditioned by a manufacturers shop and carry A.B.S. Certification.
- 2 — Motors are used and will be removed from a Submarine in the very near future.

## 1 only—3 Drum CLYDE HOIST

Model 10 with Swinger

### ADDED FEATURES

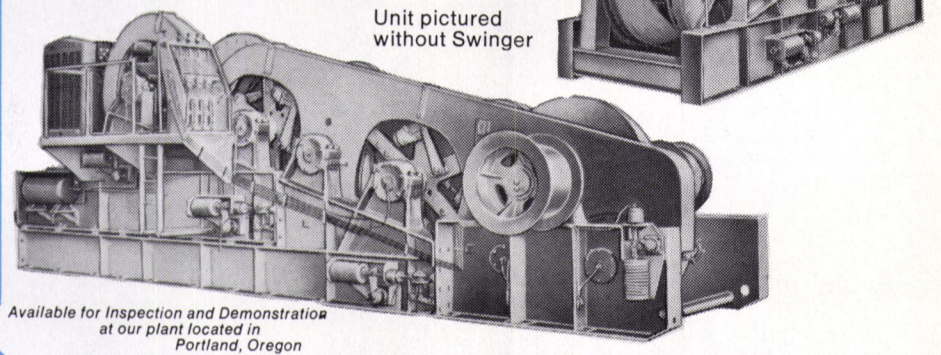
POWER: G.M. 8V-71 Diesel with 3 Stage Torque Converter 11.500 series and Air Compressor.  
 OP. CONTROLS: All Air, Air Paul and Air Friction Brakes with Controls console mounted at operators stand.  
 CLUTCH: Internal expanding band friction, two shoes, 50" dia. and 6" wide.  
 BRAKES: External contacting, single band, two piece construction, 57" dia. and 7" wide.  
 BEARINGS: Drums are taper roller bearing mounted. All shafts turn in Anti-friction bearings.  
 SWINGER: Two drum attached type with slack take up.

Less than 1,000 Hours operating time on Unit — Ready to work NOW!

### HOIST SPECIFICATION

MODEL: Frame 10—3 drum with 2 drum swinger.  
 LINE PULL: 30,000 Lbs.  
 DRUM SIZE: Dia. 25"—lgth. 36"—Figs. 57"  
 DRUM CAP.: 4170 Ft. of 1 1/8"  
 3500 Ft. of 1 1/4"  
 RATING: 37,500 lbs. S.L.P. at 150 FPM—  
 Sec. on larger wire rope.

This Unit is in EXCELLENT CONDITION — Ready to work NOW—THE PRICE IS RIGHT!



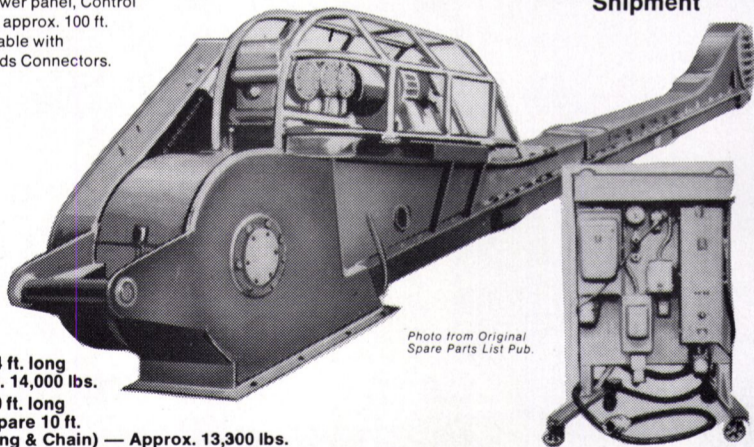
Available for Inspection and Demonstration at our plant located in Portland, Oregon

## 2—SHIP DISCHARGERS

• PORTABLE—Bulk Cargo • BUHLER—Type SKT-11"

TWO (2) IN STOCK Ready to go . . .

Complete with 440 volt, 3 phase, 60 cycle power panel, Control Stands and approx. 100 ft. of Power Cable with Crouse Hinds Connectors.



- 1 — Only 54 ft. long approx. 14,000 lbs.
- 1 — Only 40 ft. long (with spare 10 ft. of Tubing & Chain) — Approx. 13,300 lbs.

Each with 75 HP, TEFC Motor, 220/440 volts, 3 phase, 60 cycle and Twin Disc Fluid Coupling and Gear Reducer.  
 Model: 14.5 HCMR-16.

CAPACITY: Up to 150 Tons of Wheat per hour (prox. Max. Material Size 2" to 3").  
 Will Handle — Grain, Soy Beans, Phosphate, Nitrate, Potash, Kaolin, China Clay, Fertilizer, Alfalfa Pellets and other similar bulk materials.

- Reasonably Priced
- Ready to work NOW!

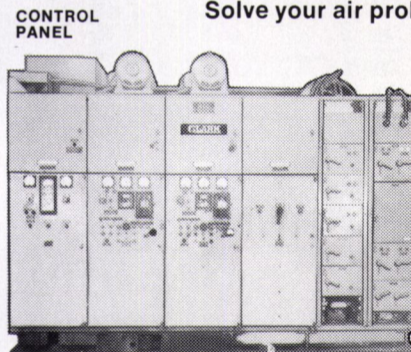
• Immediate Shipment

CONDITION USED-EXCELLENT and priced to move NOW!

WRITE FOR FREE BROCHURE

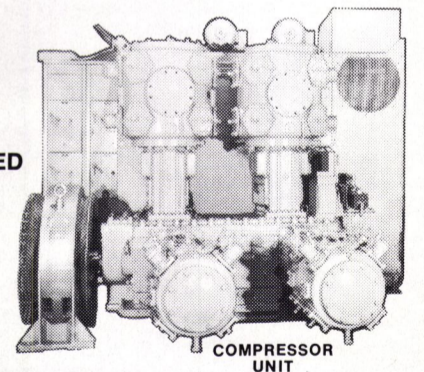
## 4 only—2500 C.F.M., 125 P.S.I. AIR COMPRESSORS

Solve your air problems with these units and save!



Manufactured by Clark—Model CMA, Horizontal Opposed Cylinder Design. Powered by 500 H.P. Synch. Motor, 2400/4160 volts, 3 Phase, 60 Cycle, 600 RPM, and includes Starter.

Equipped with Self Contained, Closed Water System, Radiator Cooled.



- 1 — UNIT IS COMPLETELY OVERHAULED
- 1 — UNIT, USED — AS IS
- 2 — UNITS ARE INSTALLED IN A RAILWAY CAR.
- 2 — Railway Cars are available for these units, if so desired.

These Compressors are skid mounted, packaged units. They were originally installed in railway cars as Emergency Air Supply on the West Coast by the Navy Bureau of Yards and Docks.

Ideal for Shipyard or other large volume air consumers.

For additional information and Quotation, Please Contact:

**Hugh Sturdivant**

Sales Manager, Marine & Industrial Sales Div.

Phone: 503/228-8691

Telex: 36-0503 • Cable: "ZIDELL"

Marine and Industrial Sales Division of

**ZIDELL**  
**EXPLORATIONS, INC.**  
 3121 S.W. Moody  
 Portland, Oregon 97201



# SHIPBOARD EQUIPMENT

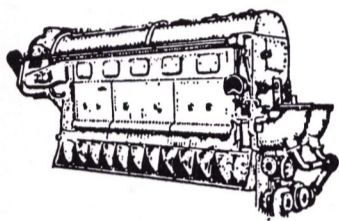
From

# ZIDELL

EXPLORATIONS  
INC.

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

## MARINE DIESEL ENGINES



**MATCHED PAIR . . . FAIRBANKS-MORSE Model 38D8-1/2** — 1 Port; 1 Starboard. Used condition, 1800 HP, 800 RPM, 2 cycle, 8 1/2" 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.

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 — 400 KW, WORTHINGTON Turbine, 200 PSI with Crocker-Wheeler Generator, 400 KW, 120/240 Volts DC, Type CDC, 1200 RPM.

7 — 300 KW, ALLIS-CHALMERS Turbines, 440 PSI, 5645 RPM, with Westinghouse Generators, 300 KW, 120/240 Volts DC, 1200 RPM.

2 — 300 KW, WESTINGHOUSE Turbines, 440 PSI, 5920 RPM, with Westinghouse Generators, 300 KW, 120/240 Volts DC, 1200 RPM.

2 — 300 KW, TERRY Turbines, 440 PSI, Type TM-5, 5965 RPM, with Crocker-Wheeler Generators, 300 KW, 120/240 Volts DC, 1200 RPM.

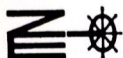
1 — 300 KW, ALLIS-CHALMERS Turbine, 440 PSI, 470 HP, 8000 RPM, with Allis-Chalmers Generator, 300 KW, 240/240 Volts DC, Type HO, 1200 RPM.

1 — 250 KW, DE LAVAL Turbine, 440 PSI, 360 HP, 10,000 RPM, with Crocker-Wheeler Generator, 250 KW, 240/120 Volts DC, Type CCD, 1200 RPM.

12 — 60 KW, WESTINGHOUSE Turbines, 89.4 HP, 200 PSI, 7283 RPM, Type M-20-EH, with Westinghouse Generators, 60 KW, 120 Volts DC, 1800 RPM.

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

**FAST REPLIES  
ON YOUR  
INQUIRIES!**



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.



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 A 1/4	Size A3	Size A8
Size A 1/2	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).



## AIR COMPRESSORS

1—GARDNER-DENVER, 150 CFM, 125 PSI, Class WB, Size 7x5 3/4 x5, 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.

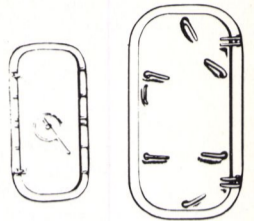
2—WORTHINGTON, 20 CFH, 3000 PSI, 4 stage, 585 RPM, with Worthington Steam Turbine, 47 HP, 5502 RPM.

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."

## STEEL WATERTIGHT DOORS

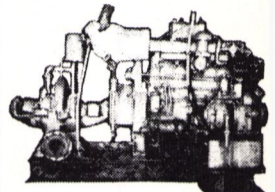
Used, Good Condition, Trimmed Frames.



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

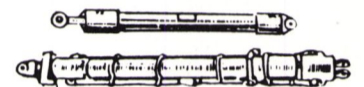
26"x48"-4 Dogs—\$60.00 ea.  
26"x57"-6 Dogs—\$80.00 ea.  
26"x60"-4 Dogs, 6 Dogs—\$86.00 ea.  
26"x66"-6 Dogs, 8 Dogs—\$100.00 ea.  
26"x66"-Q.A. Type—\$175.00 ea.

## FIRE PUMPS



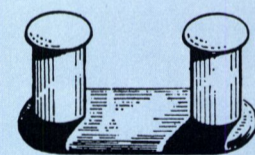
2—BUDA, Model 6-LD-468, Diesel Engine 6 cylinders, 100 BHP, Marine, Gardner Denver, centrifugal Pumps, Bronze, horizontally split case, 1000 GPM, 280' head, 6" suction and 5" discharge.

## HYDRAULIC CYLINDERS

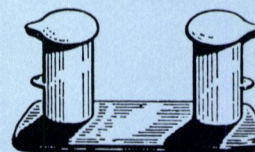


Bore	Overall Stroke	Rod Diameter	Retracted Length	Action
10"	12"	3.75"	45 1/2"	double
10"	26"	3.75"	58 1/2"	double
2"	8"	1 1/2"	20"	double
2.5"	15"	1.12"	25 1/2"	double
3"	8"	1.37"	15 1/2"	double
6"	8"	4"	144"	double

## DOUBLE BITS



STYLE A



STYLE B

Used, clean, good, suitable for reuse. Predominantly 12" and 14" sizes, 2 styles, Many other sizes in stock, ranging from 6" to 18".

Specify quantity, size and style required for fast quotation.

## ANCHOR CHAINS

USED - GOOD



1 3/8" Size                      2 1/4" Size  
1 1/2" Size                      2 3/8" Size  
2 1/8" Size



## Offshore Engineering Trainees

**IMODCO**, rapidly expanding Los Angeles-based pioneer in the design and development of offshore marine terminal facilities, has openings for two Maritime Academy graduates for training within the organization. Minimum of two years of tanker or bulk carrier experience. Positions look to permanent career positions within the marketing or engineering departments, depending upon which discipline best suits selectees. Worldwide travel.

Write to Personnel Manager, **IMODCO**, 10960 Wilshire Blvd., Los Angeles, Calif. 90024 with resume and salary requirements.

An Equal Opportunity Employer M/F



## MEMORIAL UNIVERSITY OF NEWFOUNDLAND

### Faculty Position In Shipbuilding Engineering

Applications are invited for faculty positions in shipbuilding and naval architecture at the rank of Assistant, Associate or Full Professorial level. The undergraduate programme at Memorial is newly established and offers opportunities for faculty members to participate in its development.

Salary is negotiable on basis of relevancy of advanced degrees and experience.

Send resume and names of three references to:

**Dr. R.T. Dempster, Dean,**  
Faculty of Engineering and Applied Science,  
Memorial University of Newfoundland,  
St. John's,  
Newfoundland, Canada  
AIC 5S7.

## DESIGN ENGINEER

### MARINE REFRIGERATION AND AIR CONDITIONING

For leader in marine contracting.  
Headquarters N.Y./N.J. area

Send resume to:

Box 617 Maritime Reporter/Engineering News  
107 East 31 Street New York, N.Y. 10016

## WANTED SHIPYARD MANAGER

To supervise all operations in shipyard specializing in tug and barge construction and repair. Must have estimating experience. Send past employment experience to:

Box 615 Maritime Reporter/Engineering News  
107 East 31 Street New York, N.Y. 10016

## TECHNICAL NAVAL ARCHITECT

A progressive Gulf Coast shipyard with an established Engineering Department needs a Technical Naval Architect to spec out, set up and operate an in-house mini computer to perform all the technical calculations. Permanent position with good salary, extensive experience is not necessary. Reply to:

Box 616  
Maritime Reporter/Engineering News  
107 East 31 Street  
New York, N.Y. 10016

## SALES SPECIALIST — MARINE —

**RESPONSIBILITIES:** Sales of fuel processing equipment systems to marine ship owners and operators. Conducting operational testing and on board surveys as required.

**REQUIREMENTS:** B.S. Marine or B.S.M.E.-Direct Marine Market Sales experience (Capital equipment). Background in Pumps, Boilers, Combustion Control, Turbines, Chemicals preferred.

Immediate opening due to rapid growth. Relocation not required. Travel: 20% to 40%.

Send resume in confidence to  
V. M. Baker, stating salary requirements  
All resumes acknowledged



An Equal Opportunity Employer M/F

## TANKER SPECIALISTS

Our client, a growing NYC tanker firm, requires the following personnel, preferably with LNG experience—**PORT ENGINEER** with Chief Engineer's license, \$35,000.

ALSO

**OVERSEAS REPRESENTATIVE** with Captain's license, \$35,000 U.S. base + allowances.

Fees paid by company—send resume to:

**RISWOLD & ASSOCIATES, INC.**

200 Park Ave., Suite 344-E  
New York, New York 10017

## YARD SUPERINTENDENT

A progressive full service ship and barge construction company has an immediate opportunity for an individual with proven experience in ship and/or barge construction. This position necessitates a close working relationship with a variety of management personnel. Career success requires an energetic, self-starter who can combine experience, creativeness and leadership in accomplishing production objectives. A minimum of ten (10) years of experience is desirable.

Interested applicants should submit their resume along with salary requirements in complete confidence to:

Box 601 Maritime Reporter/Engineering News  
107 East 31 Street New York, N.Y. 10016

"An equal opportunity employer"

**GULF COAST DISTRIBUTOR WANTED, FOR FINEST LINE OF MARINE SHOCK CORDS.** Area leads will be passed on for follow-up. Send qualifications. All replies confidential.

Wm. B. Bliss Inc.

381 Park Avenue South, N.Y., N.Y. 10016

## HYDRAULICS

**SERVICE • REPAIR PARTS • CONSULTING**  
**CUNNINGHAM MARINE HYDRAULICS CO., INC.**

201 Harrison St. • Hoboken, N.J. 07030  
Phones: Hoboken (201) 792-0500-01-02  
New York (212) 267-0328



**Engineers—Marine Diesel Chief Engineer—First Engineer,** unlimited HP or motor towing acceptable. Top salaries, fringe benefits, paid leave, transportation. Reply to

**Ingram Ocean Systems Inc.**

P. O. Box 30368

New Orleans, La. 70190

**THE PORT OF PORTLAND**  
POST OFFICE BOX 3529  
PORTLAND, OREGON 97208

## CONSTRUCTION OF FLOATING DRY DOCK NO. 4 NOTICE TO CONTRACTORS

Sealed proposals for the Construction of Floating Dry Dock will be received by the Purchasing Manager of the Port of Portland, 700 Northeast Multnomah Street, Portland, Oregon (mailing address: Post Office Box 3529, Portland, Oregon 97208) until 2:00 p.m., August 31, 1977, and thereafter publicly opened and read.

The proposed construction includes one steel floating dry dock of the following dimensions:

Length overall	982 feet
Length over pontoons	902 feet
Width overall	228 feet
Depth overall	73 feet

Sixty percent (60%) plans will be available to prospective bidders approximately May 16, 1977. Final plans and specifications and other bid documents are scheduled to be available on July 13, 1977. Copies of the plans, specifications and other bid documents may be obtained as they become available upon deposit of Two Hundred Dollars (\$200), which deposit will be refunded upon return of the documents in good condition within two (2) weeks after the bid opening.

All bid price proposals must be submitted in the form as provided by the Port and be accompanied by a certified or cashier's check or bid bond payable to the Port of Portland in an amount equal to ten percent (10%) of the amount bid. A prequalified bidder will be allowed to bid on the Port design or the Port design as modified by an approved equal alternate design for framing of the hull structure.

Prospective bidders are encouraged to bid on the design provided by the Port for the framing of the hull structure. However, alternate design proposals for the **hull structure framing only** will be considered by the Port if they comply with the following:

- They are received on or before June 24, 1977.
- They are submitted by prospective bidders that have applied for prequalification.
- They are limited to framing of the hull structure and are submitted in the format outlined in "Criteria and Format for Submittal of Alternate Designs for Framing of Hull Structure."
- They are accompanied by a design review fee in the amount of \$10,000.

Alternate designs for framing of hull structure will be reviewed and approved or disapproved by the Port for bidding as an equal to the Port design not later than July 21, 1977.

Bidders are required to prequalify. Prequalification applications must be received at least ten (10) calendar days before the bid opening. Bidders are requested to submit their prequalifications not later than July 1, 1977, to ensure adequate time for processing.

THE PORT OF PORTLAND

Lloyd Anderson  
Executive Director



## SALES ENGINEER

MARINE REFRIGERATION  
AND AIR CONDITIONING  
PARTS AND SERVICE

To cover N.Y. and N.J. area  
Salary plus incentive

Send resume to:

Box 618 Maritime Reporter/Engineering News  
107 East 31 Street New York, N.Y. 10016

## CHEMICAL SALES

Marine water treatment and cleaning chemicals for shipboard and account development. Self-starter with 3 to 5 years experience. Technical degree or background required. Excellent salary and benefits. Send resume with salary history to V.P.-Marketing, P.O. Box 507, Linden, N.J. 07036

## SYNCRON LIFT® DRYDOCKS AND TRANSFER SYSTEMS

Estimates at no cost or obligation

PEARLSON ENGINEERING CO., INC.  
P.O. BOX 8/MIAMI, FLA. 33156/(305) 271-5721  
TELEX: 051-9340/CABLE: SYNCRONLIFT



WELD-SALE PLATENS  
2-1/2' x 5' IN STOCK 4' x 4'  
5' x 5' 5' x 8'  
TOOLING, STANDS & LEGS IN STOCK

WELDSALE CO.  
Div. J.A. Cunningham Equip., Inc.

2151 DREER ST., PHILA., PA. 19125 215-739-7474

## -CREWBOATS-

FOR SALE

ALL ALUMINUM CAMCRAFTS

- (2) 77' Twin Screw
- (2) 90' Triple Screw
- (3) 100' Triple Screw

## -UTILITY BOATS-

FOR SALE

- (1) 110' Halter (Steel)
- (1) 108' Swiftships (Alum.)

All in excellent condition and  
C. G. Certified.

All vessels on jobs operating in  
Gulf of Mexico

Call (318) 232-2850

O S T, Inc., P. O. Box 52169  
Lafayette, La. 70505

## "Exclusively in our hands for sale"

Two well maintained operating tugs

Tug PAULINE HOLMES — wood construction —  
83x22x12 — Built 1946 — 115 gross tons —  
main engine EMD 6-278-2, Clutched reduction  
gear — pilot house controls

Price: \$25,000

Tug MARY E. HOLMES — 83x21x10 — 110 gross  
tons — Built 1928, rebuilt 1971 — Fairbanks  
Morse, Model 37F14, 690HP — pilot house  
controls

Price: \$50,000

Both tugs fine condition. Can be seen in Boston  
Harbor. For further information please contact

W.J. Hall  
Maxwell Harris  
148 State Street  
Boston, Mass. 02109  
Tel: (617) 227-1500

## DON'T LOOK IN THE CRYSTAL BALL!

Call

The  
Barge People



## WE RENT BARGES

AVAILABILITY INCLUDES:

OIL BARGES  
SHALE BARGES  
DECK SERVICE BARGES  
OCEAN CERTIFIED DECK BARGES

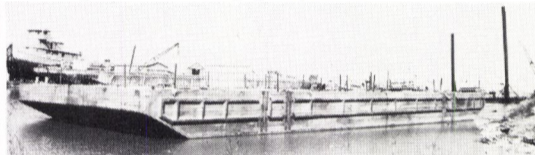
A PART OF OUR LARGE AND VARIED FLEET

## McDONOUGH MARINE SERVICE

NEW ORLEANS (504) 949-7866  
HOUSTON (713) 452-5887  
PARKERSBURG (304) 485-4494  
TELEX: 58-4393  
P. O. BOX 26206  
NEW ORLEANS, LA. 70186  
TELEX: 86-9412  
P. O. BOX 1825  
CHANNELVIEW, TEX 77530  
PARKERSBURG, W. VA. 26101

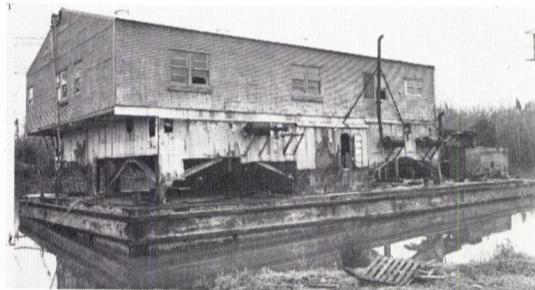
## FOR SALE/LEASE/LEASE PURCHASE

Deck barge (160' x 54' x 12'), built to A. B. S. specs.  
1972 (Good Condition) \$150,000.00



## FOR SALE

Barge with living quarters approx. 50' x 80' fully  
Insulated, Air Conditioned. Must Sell \$25,000.00



Phone or Write  
(504) 366-3571 P.O. Box 808 Marrero, La. 70072  
ATTN: Mr. Jim Lane

## FOR SALE

1 ALL STEEL CARFLOAT	294' X 38' X 10'
1 ALL STEEL DECK SCOW	140' X 40' X 8'
1 ALL STEEL CARFLOAT	340' X 40' X 10'
1 ALL STEEL DECK SCOW	200' X 34' X 9'
1 ALL STEEL CARFLOAT	240' X 34' X 9'
1 ALL STEEL DECK SCOW	120' X 66' X 9'
1 ALL STEEL CARFLOAT	330' X 38' X 10'
2 BRIDGE BUILDER WORK BOATS	TWIN SCREW 671 GM DIESEL POWER

10 AIR OPERATED DECK WINCHES  
15 ANCHORS 4,000 lb. through 12,000 lb.  
60 ALL STEEL 5 ft. DIA. NAVY BUOYS

CONTACT:

MR. MICHAEL GOLDRICK  
SCHIAVONE CONSTRUCTION COMPANY  
1600 Paterson Plank Road  
SECAUCUS, N.J. 07094  
(201) 867-5070 Ext. #289  
TELEX #125978

## EXCELLENT CONDITION — READY TO GO

2 — 1200 HP G.M. 12 CYL. MODEL 12-567 AC 720 RPM  
DIESEL ENGINES  
2 — 2400 HP F.M. 12 CYL. MODEL 38D8 1/8 850 RPM  
DIESEL ENGINES  
1 — 3200 SHP DOUBLE INPUT SINGLE OUTPUT FARRELL  
BIRMINGHAM 1.81-1 REDUCTION GEAR WITH HYD.  
COUPLINGS AND FAWICK CLUTCH  
ALBERT HELLER 212-855-8643  
87 HAMILTON AVENUE, BROOKLYN, N.Y. 11231

# REPAIR SHIP

EX-U.S.N.S. MARKAB  
(AR-23, ATTACK REPAIR)

## For Sale or Lease

- Built 1941
- Overhauled 1963
- Decommissioned 1968

C-3 Cargo (S), Length (o.a.) 492', Beam 69'-6",  
Draft (max.) 25', Displacement (tons) full 14,900

THIS SHIP IS INHERENTLY SUITED TO SERVE  
AS A FULLY SELF-CONTAINED, REPAIR-  
SUPPORT VESSEL FOR OFFSHORE OPERA-  
TIONS, OR NEAR A REMOTE ONSHORE CON-  
STRUCTION SITE.

Condition is excellent. Machine shop includes  
10 ft. x 300 ton Cincinnati press brake, 12 as-  
sorted lathes to 10 ft. centers, milling ma-  
chines, boring mills, sheet metal equipment,  
and a large pipe bender. A complete foundry  
is also on board. Shipboard power is provided  
by five 8-278A diesels, driving five 350 KW,  
440 volts AC, 600 RPM generators. This ves-  
sel to be sold or leased non-propelled.

Located in Portland, Oregon  
CONTACT: HENRY DANSEREAU

## ZIDELL EXPLORATIONS, INC.

3121 S.W. Moody Ave. • Portland, Oregon 97201  
Phone 503/228-8691 • Telex 36-0503 • Cable "Zidell"

## Europe's Largest Marine Stocks

FACTORY RECONDITIONED

WITH CERTIFICATES

Anchors (1500)	(60) Generators
Chain Cables (3000 t)	(250) Pumps
Winches (150)	(35) Lifeboats
Windlasses (50)	(20) Gangways
Accommodation	
Ladders (30)	Spare Parts

PROMPT DELIVERY ALL PORTS  
ASK FOR OUR STOCKLIST

## WILLEM POT B.V.

45 Stationsplein—Rotterdam

HOLLAND

TELEX: 22496

Phone: 11 98 70

Grams: "Windlass"

## TURBINE GENERATORS & PARTS

From Stock

300 KW — 400 KW — 500 KW — 600 KW  
750 KW — 1000 KW — 1250 KW — 1500 KW

American Manufacturers

## Nicolai Joffe Corporation

SAN FRANCISCO (415) 761-0993  
445 Littlefield Ave. (Box 2445)  
So. San Francisco, CA 94080



NEW YORK  
SALES OFFICE  
(212) 832-3320

BEVERLY HILLS  
MAIN OFFICE  
(213) 878-0650

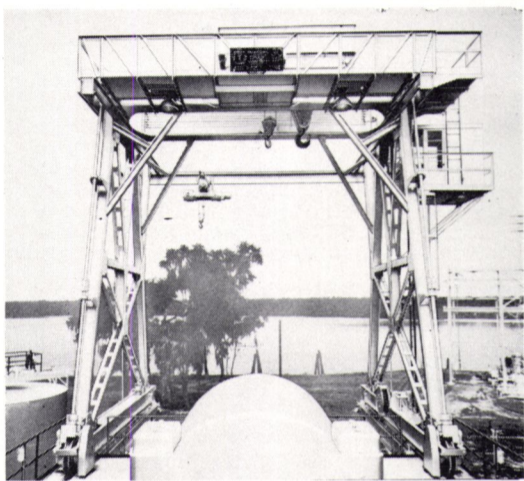


## FOR SALE TWO TUGS

- 85 x 24 x 10  
Built 1951  
8 cylinder Fairbanks Morse OP  
(1,280 HP)  
144 Gross tons  
Price \$120,000
- 100 x 26 x 12 1/2  
Under 200 Gross tons  
Built 1945, rebuilt 1971  
Repowered in '71 with 10 cylinder  
Fairbanks Morse OP  
Pilot house controls  
Price \$200,000

These two tugs can be seen U.S. East Coast.  
For further information please contact

**W.J. Hall, Maxwell Harris**  
148 State Street  
Boston, Mass. 02109  
Tel: (617) 227-1500



130/25 ton, Gantry Crane  
60' span, 65' high, 135' lift  
1950, excellent

**ARNOLD HUGHES CO., INC.**  
16437 Harper Ave.  
Detroit, Michigan 48224  
313-886-7792

## SHIPS PARTS

MARINE PARTS  
NOW DISMANTLING

Engine Parts • Electric Motors  
Pumps • Generators • Many  
other Surplus and Supplies Available  
One of the West Coast's Largest Ship  
Dismantling Operations.

### SCHNITZER INDUSTRIES

American Ship Dismantling Operations  
4200 N.W. Front, Portland, Ore. 97210  
Phone (503) 224-9900  
W.U. Telex: 36-0144 PTL

Cable: SCHNITZERBRO, PTL  
Mailing address: 3300 N.W. Yeon Ave.  
Contact — Bruno Moreschi, Sales Mgr.

### WHIRLEY CRANE FOR SALE

NEW UNUSED AVAILABLE NOW  
130/50/15 TON 150 FT BOOM  
95 FT HIGH 32 FT TRACK  
Box 117 Maritime Reporter/Engineering News

## RIVER TERMINAL DEVELOPMENT COMPANY

The Largest Inventory of Used Equipment  
in America

### MARINE DIESEL GENERATORS

- 6 Ea. — Fairbanks Morse 38-1/8 D 8-1/2 O.P.  
(Mexican Hat) Engines Drive Westing-  
house Generator at 1375 KW 900  
V.D.C.
- 6 Ea. — Fairbanks Morse Mod. 38E5 1/4, 6  
Cylinder O.P. A.C. Generator, 200  
KW, 250 KVA, 450 V 321 Amp., 900  
RPM 3 Ph., 60 Cycle.
- 9 Ea. — G.M. 3-268-A 339 HP, 1200 RPM  
Westinghouse Gen. 200 KW, 250  
KVA, 450 V-AC, 320 Amps, 3 Ph.,  
60 Cycle.
- 4 Ea. — G.M. 3-268-A 143 HP Gen. 100 KW,  
450 V. AC, 3 Ph., 60 Cycle.

### MARINE PROPULSION DIESEL ENGINES

- 1 Ea. — Nordberg Serial No. TSM-216230  
D.H.P. 1700-hp  
Bore 21 1/2" Stroke 29"
- 1 Ea. — Busch Sulzer main engine #1477  
type 8-DHBM-27 1/2 180 rpm BHP  
1700 — B.S. 20 1/2 x 27 1/2
- 1 Ea. — Hamilton main engine size 21.5x27.5  
180 rpm engine #8103

### VESSELS

- 2 — Salvage Lifting Vessels — 225' L-35'  
B-10'D. with 2 Johnson 100,000#  
S.L.P., 50 HP, D.C. Motors G.M.  
Diesel Generators Sets Pumps, Deck  
Rigging, Crew Quarters — Galley.

### CONTACT:

**MR. MARIO PANZA**  
RIVER TERMINAL DEVELOPMENT COMPANY  
PORT KEARNY  
SOUTH KEARNY, NEW JERSEY 07032  
TELEPHONE: (201) 589-0063  
TWX — 710-995-4466

## COFFIN BOILER FEED PUMPS

DEB — DE — CG — F

COMPLETE PUMPS or PARTS

Exchange or Sale

## Nicolai Joffe Corporation

SAN FRANCISCO (415) 761-0993  
445 Littlefield Ave. (Box 2445)  
So. San Francisco, CA 94080



NEW YORK  
SALES OFFICE  
(212) 832-3320

BEVERLY HILLS  
MAIN OFFICE  
(213) 878-0650

## FOR SALE

New self rendering electric towing winch. Geared for  
66 long tons make-Clarke Chapman & Co., Ltd., com-  
plete with spares. Ward Leonard controls complete  
with spares. Capable of accommodating around 2000  
ft. of 1 1/2" wire. Open to any and all offers. Sold  
F.O.B. Vancouver B.C. For more information phone  
area code 604 384 3690 after 5 P.M. or write:

**Lorne Murray**  
1442 Finlayson Pl.,  
Victoria B.C.  
V8T4W5  
Canada

FOR SALE (2) G.E. DE51 class MARINE 4600 KW 2700V  
93.3 cycle 400# G, 28.5" at turbine. BRAND NEW STEAM  
TURBINE GENERATORS AND CONDENSER. Originally stand  
by for destroyer escort. New 1942, never used.

**EVEREADY MACHINERY COMPANY**  
805 Housatonic Avenue, P.O. Box 1780  
Bridgeport, Conn. 06604  
Tel: 203-334-9471-2

## WINCHES—Steam or Air Operated

Stockless Anchors 3,000 lbs. through 27,500 lbs. in stock,  
FOB Jersey City

Large inventory of surplus chain and fittings

Supply of new chain, including ten shots of 2 5/16" and  
twenty shots of 2 5/8"

9 x 12 American Hoist & Derrick Winches, reconditioned  
equal to new

Spare parts for all steam winches

## STANDARD STEAM WINCH CO., INC.

Agents for The Crosby Group

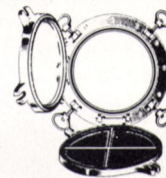
16 Beaver St., N.Y., N.Y. 10004 212/269-1557

## BRASS — BRONZE — ALUMINUM

Portlights & other quality marine  
hardware made to order.

### LLOYD & SCOTT BRASS FOUNDRY, INC.

22nd and Tatnall Streets  
Wilmington, Delaware 19802



Serving the marine industry  
for over 50 years.

Tel: (302) 655-2217

- 1 — Cedarapids 1200# Asphalt Plant, Productive capacity  
in excess of 350 Tons/hr. with all pollution equip-  
ment, fully portable.
- 2 — Hot Asphalt Storage Silos (heated) with conveyors  
and electronic weigh scales.
- 1 — Flat Deck Barge 120' x 42' x 12' Spuds 40' x 40' x  
70' hydraulic power up and down — can load line.
- 1 — 800 HP Tugboat, complete refit, GM 16V149 Engine,  
meets all U.S. and Canadian regulations.
- 1 — Fiat Allis HD41 Dozer with Ripper
- 5 — Aveling Barford 10 Ton quarry Trucks — ideal for tun-  
nel work as they drive in either direction.  
All equipment excellent.

**CAN-AM MACHINERY EXCHANGE, P.O. Box 1120,**  
Windsor, Ontario, Canada. N9A 6P9.

Phone: 519-948-5261 Telex: 064-77828

## TURBO-ELECTRIC

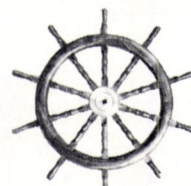
## T-2 TANKER "PECOS"

LOA 523' — beam 68' — depth 39' 3" — 16,286 dead-  
weight tons — 141,148 barrel cargo tank capacity, Ex  
U.S. Navy. Can be converted to offshore drill ship.  
Details on request. A T-2 sister ship is now operating  
successfully in the Gulf of Mexico. This ship is in very  
good state of repair. Also suitable for floating storage.  
Ship's power plant will produce 6000 KW — 2300/3/60  
— .1 PF. Can be converted to D.C. for drilling. Direct  
inquiries to H.B. Chait. For non-transportation use.

### THE BOSTON METALS COMPANY

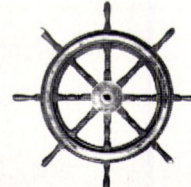
313 E. Baltimore St.  
539-1900

Baltimore, Md. 21202  
(301) 355-5050



### New-Wood Steering Wheels

Beautiful hardwood finish,  
brass hubs. 36" and 48"  
over spokes. In stock; im-  
mediate delivery. Prices on  
request.



### 36" Ships Wheels

Brass bound on rim with  
brass hub marked "John  
Hastie & Co. Ltd—Green-  
ock"

### THE BOSTON METALS COMPANY

313 E. Baltimore St.  
539-1900

Baltimore, Md. 21202  
(301) 355-5050



# BUYERS DIRECTORY

## AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231  
Nance Industries, P.O. Box 1547, Beaumont, Texas 77704  
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 19523  
Way-Wolff Associates Inc., 45-10 Vernon Blvd., Long Island City, N.Y. 11101

## BABBITT METALS

E.L. Post & Co., Inc., 233 Broadway, New York, N.Y. 10007

## BEARINGS—Rubber, Metallic, Non-Metallic

Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062  
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309  
Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

## BLASTING—Cleaning—Equipment

Atlantic Sandblasting & Coatings, Inc., 505 Faulkenburg Road, Tampa, Florida 33619  
Aurand, 1270 Ellis Street, Cincinnati, Ohio 45223  
Clemco Industries, 2177 Jerrold Ave., San Francisco, Ca. 94124  
Wheeler-Frye, 621 S. Byrkit Avenue, Mishawaka, Ind. 46654

## BOILERS

Combustion Engineering, Inc., Windsor, Connecticut 06095  
Way-Wolff Associates Inc., 45-10 Vernon Blvd., Long Island City, N.Y. 11101

## BOW STEERING SYSTEMS

Jackson-Stafford Corporation, P.O. Box 272, Long Beach, Miss. 39560

## BOW THRUSTERS

Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081  
Maritime Industries Ltd., 6307 Laurel St., Burnaby, B.C., Canada V5B 3B3  
Omnihruster Inc., 10880 Wilshire Blvd., Suite 614, Los Angeles, CA 90024  
Propulsion Systems Inc., 21213 76th Ave. South, Kent, Wash. 98031  
Schottel of America, Inc., 21 N.W. South River Dr., Miami, Fla. 33128

## BUNKERING SERVICE

Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y., N.Y. 10019

## CARGO TRANSFER & ACCESS EQUIPMENT

MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016

## CHOCKING SYSTEMS

Philadelphia Resins Corp., 20 Commerce Drive, Montgomeryville, Pa. 18936

## COILS—Cooling, Heating, Ventilating

Colmac Coil, Inc., Colville, Wash. 99114  
Nuclear Cooling, Inc., 1410 W. Lark Industrial Park, Fenton, MO 63026

## CONTAINERS—Cargo Container Handling

Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

## CONTAINER LASHINGS & COMPONENTS

Line Fast Corp., 805 Grundy Ave., Holbrook, N.Y. 11741

## CONTROL SYSTEMS

Automated Marine Systems Division, Litton Systems Canada Limited, 21101 Oxnard St., Woodland Hills, CA 91364  
Delaval Turbine Inc., (Gems Sensors Div.) Spring Lane, Farmington, Conn. 06032

Foxboro/Trans-Sonics, Inc., P.O. Box 435, Burlington, Mass. 01803  
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913  
William E. Hough Co., 1101 N.W. Ballard Way, Seattle, Wash. 98107

Propulsion Systems Inc., 21213 76th Ave. South, Kent, Wash. 98031  
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

Teleflex, Inc., P.O. Box 218, North Wales, Pa. 19454

## COOLING EQUIPMENT

E. J. Bowman (Birmingham) Ltd., Aston Brook Street East, Birmingham B6 4AP, England

## CORROSION CONTROL

Ameron Corrosion Control Div., Brea, Calif. 92621  
Eureka Chemical Co., P.O. Box 2205, So. San Francisco, CA 94080  
M & T Chemicals, Rahway Avenue, Rahway, N.J. 07065  
Woolsey Marine Industries, Inc., 100 Saw Mill Road, Danbury, CT 06810

## CRANES—HOISTS—DERRICKS—WHIRLEYS

Clyde Iron, a unit of AMCA International Corp., Suite 200/Stockton Bldg., University Office Plaza, Newark, Del. 19702  
AB Hagglund & Soner, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523  
M. P. Howlett, Inc., 410 32nd St., Union City, N.J. 07087  
Lake Shore Inc., P. O. Box 809, Iron Mountain, Mich. 49801  
Marathon LeTourneau Company, P.O. Box 2307, Longview, Texas 75601  
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501  
Weeks Stevedoring Co., Inc., 216 North Avenue East, Cranford, N.J. 07016

## DECK COATINGS

American Abrasive Metal Co., 460 Coit St., Irvington, N.J. 07111

## DECK COVERS (METAL)

MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016  
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696  
Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027

## DECK MACHINERY—Cargo Handling Equipment

AB Hagglund & Soner, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523  
Appleton Marine, Appleton Machine Co., 618 S. Oneida St., Appleton, WI 54911  
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134  
J.D. Neuhaus, Witten-Heven, Hebezeuge, D 5810 Witten-Heven, West Germany  
New England Trawler Equipment Co., 291 Eastern Ave., Chelsea, Mass. 02150  
Skagit Corporation, P.O. Box 151, Sedro-Woolley, Wash. 98284

## DIESEL ACCESSORIES

Alnor Instrument Co., 7301 N. Caldwell Avenue, Niles IL 60648  
Controls, Inc., 2655 U.S. Rt. 22, Union, N.J. 07083  
General Thermodynamics Corporation, 150 Ballardvale St., Wilmington, Mass. 01887  
Piston Products, Inc., 1140 Bloomfield Avenue, P.O. Box 1079, West Caldwell, N.J. 07006

## DIESEL ENGINES

Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021  
Caterpillar Tractor Co., Industrial Division, Peoria, Ill. 61629  
Colt Industries Inc., Power Systems Div., Beloit, Wis. 53511  
Electro-Motive Division General Motors, La Grange, Illinois 60525  
Göthen Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231  
M.A.N. (Maschinenfabrik Augsburg-Nürnberg AG), Dept. Vw. 89 Augsburg 1, Postfach, Germany  
Mitsui Engineering & Shipbuilding Co. Ltd., 6-4 Tsukiji, 5-chome, Chuo Ku, Tokyo, Japan  
Oosterhuis Industries Inc., 1800 Engineers Road, Belle Chasse, La. 70037  
H.O. Penn Machinery Co., Inc., 1561 Stewart Ave., Westbury, N.Y. 11590  
Power & Propulsion Systems, Inc., 9821 Katy Freeway, Houston, Texas 77024

## DIVERS

Undersea Systems, 112 W. Main St., Bay Shore, N.Y. 11706

## DOCK BUILDERS

GHH Sterkrade Ferrostaal Overseas Corp., 17 Battery Place, New York, N.Y. 10004

## DOORS—Watertight—Joiner

Overbeke-Kain Co., 20905 Aurora Rd., Cleveland, Ohio 44146  
Walz & Krenzer Inc., 400 Trabold Road, Rochester, N.Y. 14624

## ELECTRICAL EQUIPMENT

AMP Special Industries (Div of AMP Products Corp), P.O. Box 1776, Paoli, Pa. 19301  
Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013  
Merrin Electric, 1120 Clinton Street, Hoboken, N.J. 07030  
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014  
Port Electric Supply, 157 Perry Street, N.Y., N.Y. 10014  
Rapid Electric Co., Inc., P.O. Box 2915, Brookfield, CT 06804  
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

## EVAPORATORS

Riley-Beard Inc., Maxim Evaporator Div., P.O. Box 1115, Shreveport, La. 71130

## FAIRLEADS—Blocks and Rigging

Crosby Group, Box 3128, Tulsa, Okla. 74101

## FANS—VENTILATORS

Aerovent, Inc., #1 Aerovent Drive, Piqua, Ohio 45356  
Camar Corp., 186 Prescott St., Worcester, Mass. 01605  
Coppus Engineering Corp., 344 Park Avenue, Worcester, Mass. 01610  
Merrin Electric, 1120 Clinton Street, Hoboken, N.J. 07030  
Zidell Explorations, 3121 S.W. Moody St., Portland, Ore. 97201

## FENDERING SYSTEMS—Dock & Vessel

Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004

Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062  
Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850

## FINANCING—Leasing

General Electric Credit Corp., P.O. Box 8300, Stamford, Conn. 06904  
Manufacturers Hanover Leasing Corp., 350 Park Av., N. Y., N.Y. 10022  
Rhode Island Hospital Trust Natl. Bank, 15 Westminster Street, Providence, R. I. 02903

## FITTINGS & HARDWARE

Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207  
Superior Switchboard & Devices, Division of Union Metal Manufacturing Company, P.O. Box 590, Canton, Ohio 44701

## FURNITURE

Bailey Joiner Co., Inc., 74 Sullivan Street, Brooklyn, N.Y. 11231  
Inland Marine Industries, 1818 Harrison St., San Francisco, CA 94103

## GANGWAYS

Rampmaster Inc., 1226 N.W. 23rd Ave., Fort Lauderdale, Fla. 33311

## HULL CLEANING—Blasting

Butterworth Systems, Inc., P.O. Box 9, Bayonne, N.J. 07002  
MP Industries Inc., 1200 Ponca St., Baltimore, Md. 21224  
U.S. Phosmarine Inc., 3186 Airway Ave., Bldg. F, Costa Mesa, CA 92626  
Wheeler-Frye, 621 S. Byrkit Ave., Mishawaka, Ind. 46654

## HYDRAULICS—Launching Equipment

Hydraulics, P.O. Box 1068, Goleta, Calif. 93017  
Sperry Vickers, P.O. Box 302, Troy, Michigan 48084

## INERT-GAS GENERATORS

Airfilco Engineering, Inc., 1901 Julia St., New Orleans, La. 70113

## INSULATION—Cloth, Fiberglass

Armo (Hitco-Materials Division), 1600 W. 135 St., Gardena, CA 90249  
Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

Cryogenic Structures Corp., 10 Fairway Court, Northvale, N.J. 07647  
Havg Industries, Inc. (A subsidiary of Hercules, Inc.) 900 Greenbank Road, Wilmington, Delaware 19808

## INSURANCE

Adams & Porter, 1819 St. James Place, Houston, Texas 77027  
R.B. Jones Insurance, 911 Main St., Kansas City, MO 64199  
R.B. Jones Insurance, 120 S. Central Ave., St. Louis, MO 63105  
R.B. Jones Insurance, 160 Water St., New York, N.Y. 10038

## KEEL COOLERS

Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

## LADDERS

Duo-Safety Ladder Co., 513 West 9th Ave., P.O. Box 497, Oshkosh, Wis. 54901

## MACHINE TOOLS

Master Machine Tools, Inc., 1300 East Avenue A, Hutchinson, Kansas 67501

## MARINE CONSTRUCTION

Morrison-Knudsen Company, Inc., P.O. Box 7808, Boise, ID 83729

## MARINE EQUIPMENT

Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013  
Beaver Tool & Machine Co., 525 S.E. 29th St., Oklahoma City, OK 73109  
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014  
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, N.Y. 10550  
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080  
Merrin Electric, 1120 Clinton Street, Hoboken, N.J. 07030  
Thompson Marine Supply, Inc., 11 Broadway, New York, N.Y. 10004  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

## MARINE PROPULSION

Combustion Engineering, Inc., Windsor, Connecticut 06095  
Delaval Turbine Inc., Turbine Div., Trenton, N.J. 08602  
Maritime Industries Ltd., 6307 Laurel St., Burnaby, B.C., Canada V5B 3B3  
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014  
Schottel of America, Inc., 21 N.W. South River Dr., Miami, Fla. 33128  
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523

## MARINE SERVICE

General Electric, Schenectady, N.Y. 12345

## MOORING SYSTEMS

Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110

## NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

Alpha Engineers, 7215 N.E. 13th Ave., Vancouver, Wash. 98665  
American Standards Testing Bureau, Inc., 40 Water Street, New York, N.Y. 10004

Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, Md. 20015  
Anchorage Marine Services Incorporated, 844 Biscayne Boulevard, Miami, Florida 33132

J.L. Bludworth, P.O. Box 5217, Houston, Texas 77012  
Boquer & Associates, P.O. Box 30184, New Orleans, La. 70190  
Breit & Garcia, Naval Architects, 441 Gravier St., New Orleans, La. 70130

CADCOM Inc., 2024 West St., Suite B, Annapolis, Md. 21401  
R.A.CADY-Marine Survey Practice, 2301 Leroy Stevens Road, Mobile, Ala. 36609

Catalina National, Inc., 1725 Monrovia Ave. (Suite A4), Costa Mesa, CA 92627

C.D.I. Marine Co., Regency East, Suite 222, 9951 Atlantic Blvd., Jacksonville, Florida 32211

Childs Engineering Corp., Box 333, Medfield, Mass. 02052  
Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517

Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02026  
Francis B. Crocco, Inc., Box 1411, San Juan, Puerto Rico

C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048

Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119  
Designers & Planners, Inc., 114 Fifth Ave., New York, N.Y. 10011  
M. Mack Earle, 103 Mellor Ave., Baltimore, Md. 21228

Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034

Christopher J. Foster, Inc., 14 Vanderventer Ave., Port Washington, N.Y. 11050

Friede and Goldman, Ltd., 225 Baronne St., New Orleans, La. 70112  
Gibbs & Cox, Inc., 40 Rector Street, New York, N.Y. 10006  
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110

Morris Guralnick Associates, Inc., 550 Kearny Street, San Francisco, Calif. 94108

J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, N.Y. 10048

Hydraulics, Incorporated, 7210 Pindell School Road, Howard County, Laurel, Maryland 20810

Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227

Littleton Research and Engr. Corp., 95 Russell St., Littleton, Mass. 01460

Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567  
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114

Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746

Maritime Service Company, 1357 Rosecrans St., Suite B, San Diego, CA 92106

Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225

John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048

George E. Meese, 194 Acton Rd., Annapolis, Md. 21403

Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742

Nelson & Associates, Inc., 2001 N.W. 7th Street, Miami, Florida 33125

Nickum & Spaulding Associates, Inc., 811 First Ave., Seattle, Wash. 98104

Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114

Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156

S.L. Petchul, Inc., 1380 SW 57th Ave., Fort Lauderdale, Fla. 33317

Potter & McArthur, Inc., 50 Hunt Street, Watertown, Mass. 02172

Proto-Power Management Corporation, P.O. Box 494, Mystic, Conn. 06355

M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.

Schmah and Schmah, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316

Seaworthy Engine Systems, P.O. Box 327, Canton, Conn. 06019

George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007

T. W. Spaetgens, 156 West 8th Ave., Vancouver, Canada V5Y 1N2

SRS Shipping Research Services Inc., 205 S. Whiting St., Alexandria, VA 22304

The Stanwick Company Maritime Systems Department, 3661 E. Virginia Beach Blvd., Norfolk, VA 23502

R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wis. 54235

Richard R. Taubler Inc., Treadway Towers, 9 E. Lookerman St., Dover, Delaware 19901

Technical Marine Associates, Inc., 1040 Biscayne Boulevard, Miami, Fla. 33132

H.M. Tiedemann & Co., Inc., 295 Greenwich Ave., Greenwich, Conn. 06830

Timco, 951 Government St., Suite 2161, Mobile, Alabama 36604

Uhlig & Associates, Inc., 8295 S.W. 188th St., Miami, Florida 33157

Undersea Systems, 112 W. Main St., Bay Shore, N.Y. 11706

Wesley D. Wheeler Associates, Ltd., 104 East 40 St., Suite 207, New York, N.Y. 10016

## NAVIGATION & COMMUNICATIONS EQUIPMENT

American Hydromath Co., Buckwheat Bridge Rd., Germantown, N.Y. 12526

Automated Marine Systems Division, Litton Systems Canada Limited, 21101 Oxnard St., Woodland Hills, CA 91364

Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746

Comsat General Corp., 950 L'Enfant Plaza, S.W., Washington, D.C. 20024

Dynell Electronics Corp., 536 Broad Hollow Road, Melville, N.Y. 11746

Edo Corporation, 13-10 111th Street, College Point, N.Y. 11356

Electro-Nav, Inc., 1201 Corbin St., Elizabeth Marine Terminal, Elizabeth, N.J. 07201

Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011

ITT Decca Marine Inc., P.O. Box G, Palm Coast, Fla. 32037

Konel Corporation, 271 Harbor Way, So. San Francisco, Calif. 94080

Krupp Atlas-Elektronik, A Div. of Krupp Intl. Inc., P.O. Box 58218, Houston, Texas 77058

Lorain Electronics Corp., 2307 Leavitt Road, Lorain, Ohio 44052

Maganovox Navigation Systems, 2829 Maricopa St., Torrance, Ca. 90503

Mico, Inc., 109 Beaver Court, Cockeysville, Md. 21030

Nav-Com, Inc., 2 Hicks Street, North Lindenhurst, N.Y. 11757

Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103

Raytheon Co., Submarine Signal Div., P.O. Box 360, Portsmouth, R.I. 02871

Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

Standard Communications Corp., P.O. Box 92151, Los Angeles, CA 90009

Teledyne Systems, 19601 Nordhoff St., Northridge, Calif. 91324

Tracor, Inc., Industrial Products Div., 6500 Tracor Lane, Austin, Texas 78721

## OIL PURIFIERS—Separators

Golden Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231

Gulf Oil Corp./Gulf Oil Co.-U.S., P.O. Box 1563, Houston, Texas 77001



## BUYERS DIRECTORY (continued)

Baylor Company, P.O. Box 36326, Houston, Texas 77036  
 Colt Industries, Water & Waste Management Operation, Beloit, Wisc. 53511  
 Demco, Inc., P.O. Box 94700, Oklahoma City, OK 73109  
 Eureka Chemical Co., P.O. Box 2205, So. San Francisco, CA 94080  
 LaMere Industries, Inc., (Marland Environmental Services and Clear Water, Inc.) 227 N. Main Street, Walworth, WI 53184  
 Mapco, 1437 So. Boulder Ave., Tulsa, Okla. 74119  
 Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696  
 Microphor, Inc., P.O. Box 490, Willits, CA 95490  
 Red Fox Industries, P.O. Drawer 640, New Iberia, La. 70560

**PROPELLERS: NEW AND RECONDITIONED—SYSTEMS**  
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150  
 J.W. Berg, S-430 90 Ockero, Gothenburg, Sweden  
 Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081  
 Coolidge Propellers, 1601 Fairview Ave. East, Seattle, Wash. 98102  
 Escher Wyss GmbH, P.O. Box 798, Ravensburg, Germany  
 Federal Propellers, 1501 Buchanan Ave. S.W., Grand Rapids, Mich. 49502  
 Propulsion Systems Inc., 21213 76th Ave. South, Kent, Wash. 98031  
 Voith Schneider—U.S. Agent: Krupp International, Inc., 550 Mamaroneck Ave., Harrison, N.Y. 10528

**PUMPS—Repairs—Drives**  
 Delaval Turbine Inc., IMO Pump Division, P.O. Box 321, Trenton, N.J. 08602  
 FMC Corporation, Pump Division, 326 So. Dean Street, Englewood, N.J. 07631  
 Jim's Pump Repair Co., 165-20 Chapin Ct., Jamaica, N.Y. 11432  
 Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030  
 Terry Corporation, P.O. Box 1200, Windsor, CT 06101  
 Worthington Pump Inc., P.O. Box 1250, Mountainside, N.J. 07092

**RATCHETS**  
 CM American, Division Columbus McKinnon Corp., P.O. Box 74, McKees Rocks, Pa. 15136

**REELS—Coiling Systems**  
 Reel-O-Matic Systems Inc., 418 Hellam St., Wrightsville, Pa. 17368

**REFRIGERATION—Refrigerant Valves**  
 Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231  
 Port Refrigeration Div., 157 Perry Street, New York, N.Y. 10014  
 Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 19523

**RIGGING & BLOCKS**  
 Crosby Group, P.O. Box 3128, Tulsa, Okla. 74101  
 D. Van Beest En Zn.B.V., P.O. Box 57, Merwestraat 1-5, Sliedrecht, The Netherlands  
 Superior Switchboard & Devices, Division of Union Metal Manufacturing Company, P.O. Box 590, Canton, Ohio 44701

**ROPE—Manila—Nylon—Hawesers—Fibers**  
 American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431  
 Jackson Rope Corporation, Ninth & Oley Streets, Reading, Pa. 19604  
 Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110  
 The Cordage Group, Columbian Drive, Auburn, N.Y. 13021  
 Wall Rope Works, Inc., Beverly, N. J. 08010

**RUDDER ANGLE INDICATORS**  
 Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
 Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011  
 Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

**SCAFFOLDING EQUIPMENT**  
 Trus Joist Corp., P.O. Box 60, Boise, Idaho 83707

**SCALERS**  
 Chicago Monarch, Box 9751, Cleveland, Ohio 44140  
 The Dalen Co., Wooster, Ohio 44691

**SHAFTS, SHAFT REVOLUTION INDICATOR EQUIP.**  
 Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043  
 Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
 Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

**SHIPBREAKING—Salvage**  
 American Ship Dismantlers, Inc., Division of Schnitzer Industries, 3300 N.W. Yeon Avenue, Portland, Ore. 97210  
 The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202  
 General Metals of Tacoma, Inc., 1902 Marine View Dr., Tacoma, Washington 98422  
 National Metal & Steel Corp., 691 New Dock St., Terminal Island, Cal. 90731  
 Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

**SHIP BROKERS**  
 Agemar, P.O. Box 1465, Maracaibo, Venezuela  
 Capt. Astad Company, Inc., 231 Carondelet St., New Orleans, La. 70112  
 Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004  
 Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006  
 Vensport, Apartado Postal No. 1201, Maracaibo, Venezuela

**SHIP MODELS**  
 Jas Foley & Son, 506 Seventh Street, Santa Monica, Calif. 90402

**SHIPBUILDING STEEL**  
 Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
 Bethlehem Steel Corp., 25 Broadway, New York, N.Y. 10004

**SHIPBUILDING—Repairs, Maintenance, Drydocking**  
 Arab Shipbuilding & Repair Yard Co., P.O. Box 5110, Bab-Al-Bahrain Building, Bahrain, Arabian Gulf  
 Astilleros Espanoles, S.A., 17, Padilla, Madrid 6, Spain  
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150  
 Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004  
 Bludworth Shipyard, Inc., (Subsidiary of Elpac, Inc.), 8502 Cypress St., Houston, Texas 77012  
 Carrington Slipways Pty, Ltd., Old Punt Road, Tomago, N.S.W., Australia 2322  
 Conrad Industries, P.O. Box 790, Morgan City, La. 70380  
 Curacao Drydock Co., Inc., P.O. Box 153, Willemstad, Curacao, Netherlands Antilles  
 Dravo Corporation, One Oliver Plaza, Pittsburgh, Pa. 15222  
 Dravo Steelship Corp., R.4, Box 167, Pine Bluff, Ark. 71602  
 Economic Development Industrial Corp. of Boston, 60 Congress St., Boston, Mass. 02109  
 Equitable Shipyards, Inc., P.O. Box 8001, New Orleans, La. 70122  
 FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208  
 General Dynamics, Quincy Division, Quincy, Mass. 02169  
 Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126  
 Harland & Wolff Shipbuilding & Engineering, Queens Island, Belfast, Northern Ireland  
 Havre de Grace, Havre de Grace, Md.  
 Hillman Barge & Construction Co., P.O. Box 510, Brownsville, Pa. 15417  
 Hitachi Shipbuilding & Engrg. Co., Ltd., 47 Edobori 1-Chome, Nishi-Ku, Osaka, Japan  
 Hongkong United Dockyards Ltd., Kowloon Docks, Hong Kong  
 Hyundai Mipo Dockyard Co., Ltd., 456 Cheonha-dong, Ulsan, Korea  
 Hyundai Shipbuilding & Heavy Industries Co., Ltd., 5 World Trade Center, Suite 679, New York, N.Y. 10048  
 Jeffboat, Inc., Jeffersonville, Ind. 47130  
 Kawasaki Heavy Industries, Ltd., Kawasaki Kisen Kaisha, Ltd., 8 Kaigan-dori, Kuta-ku, Kobe, Japan  
 Keppel Shipyard Ltd., P.O. Box 2169, Singapore  
 Kockums Shipyard, S-201, 10 Malmo 1, Sweden  
 Lantana Boatyard, Inc., 808 N. Dixie Hwy., Lantana, Fla. 33460  
 Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134  
 Marathon Manufacturing Company  
 Marathon LeTourneau Offshore Company, 1700 Marathon Building, 600 Jefferson, Houston, Texas 77002

Marathon LeTourneau Gulf Marine Division, P.O. Box 3189, Brownsville, Texas 78520  
 Marathon LeTourneau Marine Division, LeTourneau Rural Station, Vicksburg, Mississippi 39180  
 Marathon LeTourneau Offshore Pte., Ltd., P.O. Box 83, Taman Jurong Post Office, Singapore 22, Singapore  
 Marathon Shipbuilding Company, P.O. Box 870, Vicksburg, Miss. 39180  
 Marathon Shipbuilding Company (U.K.) Ltd., Clydebank Dunbartonshire, G81-1YB, Scotland  
 Marinette Marine, Ely Street, Marinette, WI 54143  
 Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047  
 Mercantile Marine Engineering & Graving Docks Co., N.V., Antwerp, Belgium  
 Misener Industries, Inc., 5353 Tyson Avenue, P. O. Box 13625, Tampa, Fla. 33681  
 Mitsui Shipbuilding & Engrg. Co. Ltd., 6-4, Tsukiji 5-chome, Chuo-ku, Tokyo, Japan  
 Monark Boat Co., P.O. Box 210, Manticello, Ark. 71655  
 Murray & Stewart (Marine) (PTY) Ltd., Ocean Road-Table Bay Harbour, P.O. Box 1909, Cape Town 8000, South Africa  
 National Steel & Shipbuilding Corp., San Diego, Calif. 92112  
 Navimor U.S.A., One World Trade Center, Suite 3557, New York, N.Y. 10048  
 Neorion Shipyards Syros, Ltd., Syros, Greece  
 Newport Ship Yard Inc., 379 Thames St., Newport, R.I. 02840  
 Northwest Marine Iron Works, P. O. Box 3109, Portland, Oregon 97208  
 O.A.R.N. (Officine Allestimento-Riparazioni Navi), P.O. Box 1395, Genoa, Italy 16100  
 Paccoco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501  
 Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla. 33156  
 Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862  
 Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767  
 St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111  
 Sasebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-ku, Tokyo, Japan  
 Savannah Machine & Shipyard Co., P.O. Box 787, Savannah, Ga. 31402  
 Sembawang Shipyard (Pte) Ltd., P.O. Box 3, Sembawang, P.O. Singapore, 27  
 Sumitomo Heavy Industries Ltd., 2-1 Ohtemachi 2-chome, Chiyoda-ku, Tokyo, Japan  
 Swiftships Inc., P.O. Box 1908, Morgan City, LA 70380  
 Terrin Shipyards, Societe Provencale des Ateliers Terrin, 287, Chemin De La Madraque, 13345 Marseille—Cedex 3, France  
 Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004  
 Uniflite Inc., P.O. Box 1095, Bellingham, Wash. 98225  
 Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087  
 Vancouver Shipyards Co., Ltd., 50 Pemberton Ave., North Vancouver, B. C., Canada  
 Wiley Mfg., a unit of AMCA International Corp., Suite 200/Stockton Bldg., University Office Plaza, Newark, Del. 19702

**SHIP STABILIZERS**  
 Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

**SHOCK CORDS**  
 Wm. B. Bliss Inc., 381 Park Ave. So., New York, N.Y. 10016

**SMOKE INDICATORS**  
 Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

**STUFFING BOXES**  
 Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

**TANK CLEANING**  
 Butterworth Systems Inc., P.O. Box 9, Bayonne, N.J. 07002  
 Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

**TANK LEVELING INDICATORS**  
 Gems Sensors Div., Delaval Turbine Inc., Spring Lane, Farmington, Conn. 06032  
 GPE Controls, Inc., 6511 Oakton Street, Morton Grove, Illinois 60053

**TOWING—Vessel Chartering, Lighterage, Salvage, etc.**  
 Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002  
 Chotin Transportation, Inc., 1414 One Shell Square, New Orleans, La. 70139  
 Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202  
 Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771  
 Gulf Mississippi Marine Corp., 225 Baronne St., New Orleans, La. 70112  
 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  
 Smit International (Americas) Inc., 17 Battery Place, New York, N.Y. 10004  
 Suderman & Young Towing Co., Inc., 918 World Trade Building, Houston, Texas 77002  
 Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305  
 N.V. Bureau Wijsmuller, Postbus 510, IJmuiden, Holland

**TURBINES**  
 Camar Corp., 186 Prescott St., Worcester, Mass. 01605  
 Nicolai Joffe Corp., P.O. Box 2445, South San Francisco, CA 94080  
 Terry Corporation, P.O. Box 1200, Windsor, CT 06101

**UNDERWATER SERVICES**  
 Undersea Systems, 112 W. Main St., Bay Shore, N.Y. 11706

**VACUUM LIFT SYSTEMS**  
 Myers-Sherman Company, Grainvayor Division, So. Illinois Street, Streator, Illinois 61364

**VALVES AND FITTINGS—Hydraulic—Safety Flanges**  
 American-Darling Valve, Div. of American Cast Iron Pipe Co., P.O. Box 2727, Birmingham, Ala. 35202  
 Flexitall Gasket Co., 5 Linden Street, Camden, N.J. 08102  
 Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696  
 Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027  
 Stow Manufacturing Co., 86 Bump Road, Binghamton, N.Y. 13902  
 Valve Services Corp., 266 54th St., Brooklyn, N.Y. 11220  
 Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928  
 Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

**VIDEO EQUIPMENT**  
 Televideo Corporation, 1014 Wirt Road, Houston, Texas 77055

**WEATHER FORECASTS**  
 Fleetweather, Orbit Lane, Hopewell Junction, N.Y. 12533

**WINCHES**  
 Clyde Iron, a unit of AMCA International Corp., Suite 200/Stockton Bldg., University Office Plaza, Newark, Del. 19702  
 Gearmatic Co., Ltd., 7400 132nd St., Surrey, B.C., Canada  
 Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134  
 Skagit Corporation, a subsidiary of The Bendix Corporation, Sedro-Woolley, Washington 98284

**WINDOWS**  
 Kearfoot Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, N.Y. 10550

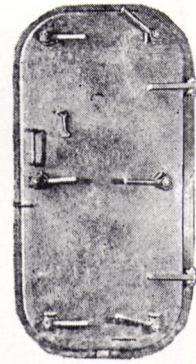
**WIRE AND CABLE**  
 Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076  
 Elkan Electric Cable Co., 248 Third St., Elizabeth, N.J. 07206

**WIRE ROPE—Slings**  
 Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
 Bethlehem Steel Corp., Bethlehem, Pa. 18016

**WORK PLATFORMS—Self-Propelled**  
 Chamberlain Manufacturing Corp., 845 Larch Ave., Elmhurst, Ill. 60126

**ZINC**  
 Smith & McCorken, 153 Franklin St., New York, N.Y. 10013

## FOR SALE NEW WATERTIGHT DOORS



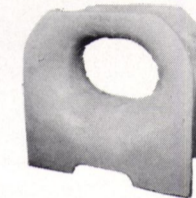
6-Dog right and left hand hinged steel doors — with frames. Built and tested to A.B.S. specifications.

### SIZE

26"x48" 26"x66"  
26"x60" 30"x60"

EACH DOOR

**IMMEDIATE DELIVERY**



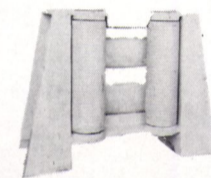
## NEW 7" RADIUS PANAMA CHOCKS

(MEET PANAMA REGULATIONS)

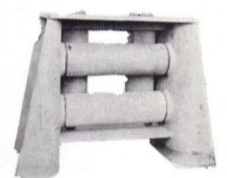
With extended legs for welding to deck. IMMEDIATE DELIVERY FROM STOCK.

## NEW — UNUSED SHIPBOARD TYPE UNIVERSAL FAIRLEADS

BUILT IN U.S.A. — 4-ROLLER TYPE



OUTBOARD VIEW

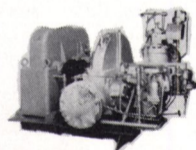


INBOARD VIEW

Opening between vertical rollers 10" — opening between horizontal rollers 4". Roller size 7 1/2" — pin size 2 1/2". Rollers 24" long. Six are 28" high — 12 are 34" high (Extended legs for welding to deck.) All are 18 1/4" x 33 1/2" at top angled to 44" x 46 1/2" at bottom. Steel 7/8" thick, coated with rust preventative. Rollers have grease fittings. Plans available on request. SUITABLE FOR VESSELS UP TO 200,000 TONS. WIRE SIZE UP TO 5" CIRCUMFERENCE OR 95 TONS. NORMAL BREAKING STRENGTH. MAXIMUM LEAD 80°.

## 700 HP CARGO PUMP TURBINE AND GEARS

with oil operated hydraulic governor

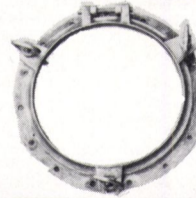


TURBINE: Mfg by GE—type DP—700 HP—5000 RPM—inlet pressure 560 PSIG—exhaust pressure 2 PSIG—temp. 490°—steam inlet 6" — outlet 10". Pump rotation is clockwise when standing at pump end and facing turbine & gear. Turbine is single stage with 2-row bucket wheel—pressure lubricated bearings—carbon shaft packing. Speed is regulated by oil-relayed governor system. REDUCTION GEAR: 5000 RPM to 1425 RPM output. Typical turbine serial #126910/911. G.E.I. Book 27200B.

### THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202  
539-1900 (301) 355-5050

## 16" PORTLIGHT SPECIAL



These fine 16" heavy bronze portlights, with 3 dogs, were recently removed from cargo ships and represent the finest workmanship of its kind. Whether for actual or ornamental use, why buy replicas when you can buy the real thing. Complete with 3/4" glass.

PRICED TO SELL  
QUANTITY DISCOUNTS AVAILABLE

### THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202  
539-1900 (301) 355-5050



# Our LTG reheat boiler. For increased reliability in today's energy-saving reheat steam plants.

The LTG (Low Temperature Gas) reheat boiler from Combustion Engineering utilizes either C-E's reliable V2M-8 or V2M-9 boiler configuration, with a separately fired, water-cooled reheat furnace added after the main generating bank. The reheater is mounted above the boiler outlet in a relatively low temperature gas environment.

During the reheat mode of operation, fuel flow is divided between the superheat and reheat furnaces. But during non-reheat modes of operation, the fuel flow to the reheat furnace is secured. The reheat tubes are not subjected to high temperature gases. So no cooling steam is required. There are no dampers to fail.

There's no chance of exposure to high radiant heat output.

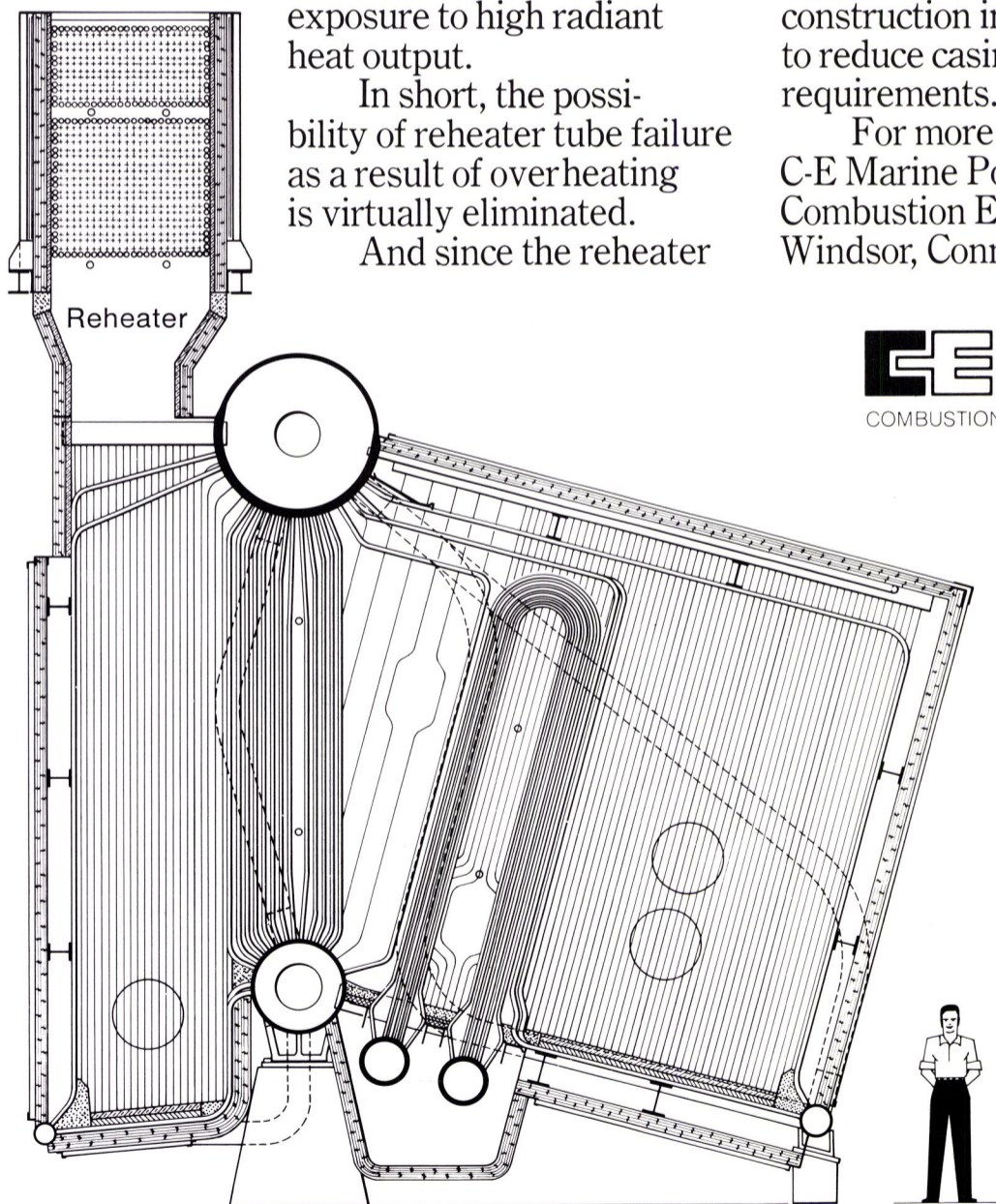
In short, the possibility of reheater tube failure as a result of overheating is virtually eliminated.

And since the reheater

is located in a relatively low temperature gas environment, maldistribution of steam flow during normal reheat operation becomes less critical, allowing for a lower pressure drop.

Then, too, dependability is increased and maintenance needs are decreased through the use of bare alloy steel tubing in the reheater, vertical superheaters, and welded wall construction in both furnaces to reduce casing and refractory requirements.

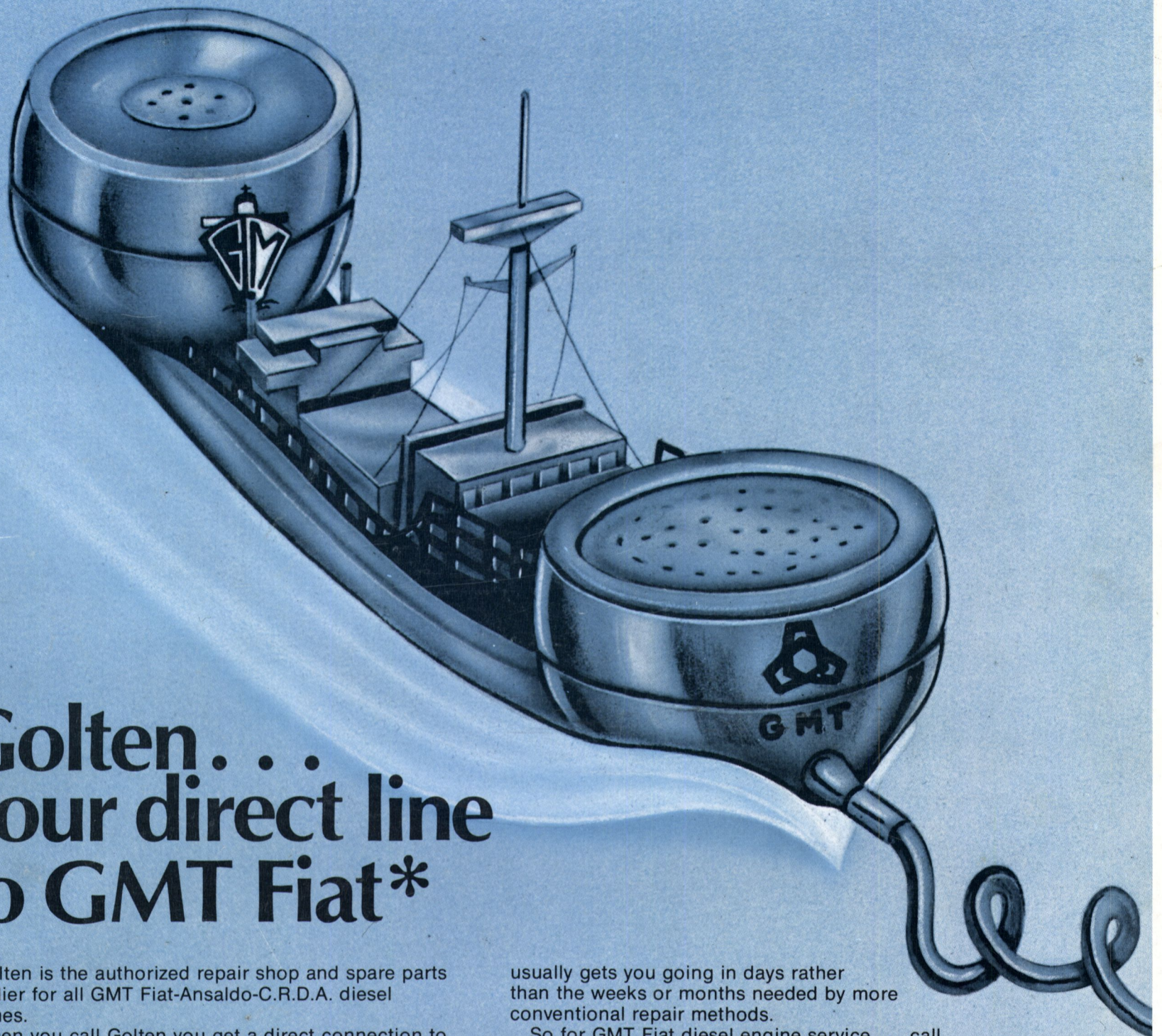
For more information, write C-E Marine Power Systems, Combustion Engineering, Inc., Windsor, Connecticut 06095.



**CE POWER SYSTEMS**  
COMBUSTION ENGINEERING, INC.

**C-E experience pays off. On the bottom line.**





# Golten... your direct line to GMT Fiat\*

Golten is the authorized repair shop and spare parts supplier for all GMT Fiat-Ansaldo-C.R.D.A. diesel engines.

When you call Golten you get a direct connection to GMT Fiat diesel engine expertise and quality. Our GMT Fiat engineers are on location in N.Y., ready to deal with your most severe diesel problems.

Our *bonded* warehouses maintain large inventories of spare parts and supplies, saving you the costly time and expense of ordering from Europe. Combined with Golten's patented, in-place repair processes you get expert service and quality products. In fact, Golten

usually gets you going in days rather than the weeks or months needed by more conventional repair methods.

So for GMT Fiat diesel engine service... call Golten... your direct line to GMT Fiat.



## GOLTEN MARINE CO., INC.

160 Van Brunt Street, Brooklyn, New York 11231  
Phone: (212) 855-7200 Telex: 22-2916 Cable: GOLTENS

330 Broad Ave., Wilmington, Calif. 90744  
Phone: (213) 549-2550 TWX: 910-345-7480 Cable: GOLTENS



### OTHER MEMBERS OF THE GOLTEN GROUP

Atlantic Diesel A/S  
Oslo 1, Norway  
Golten Ship Repair, Inc.  
Portland, Maine 04104

Norlantic Diesel, Inc.  
Fairhaven, Mass. 02719  
Golten Industri A/S  
Telemark, Norway

Golten Service B.V.  
Rotterdam, Holland  
Golten Service Co., Ltd.  
Kowloon, Hong Kong

Golten Service (Singapore)  
PTE. LTD., Singapore 13.

\*Grandi Motori Trieste Fiat-Ansaldo-C.R.D.A.