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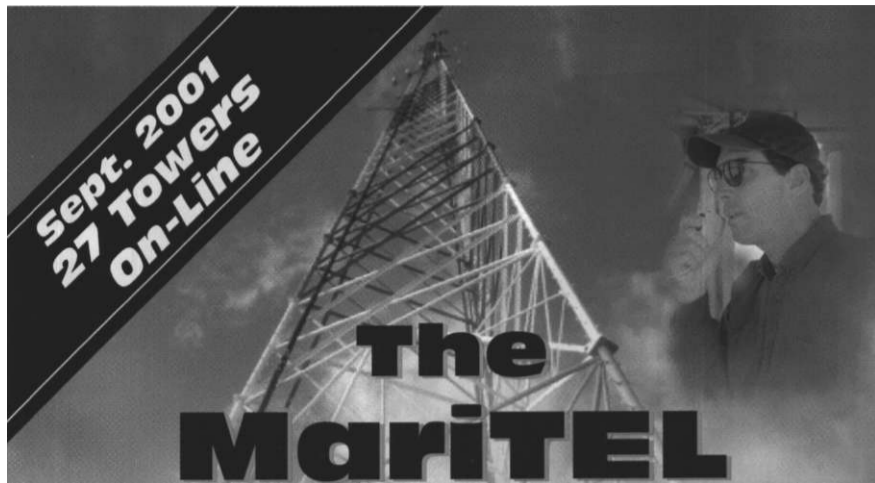


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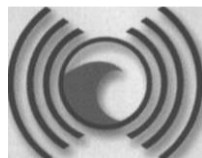
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Founder. **John J. O'Malley 1905 - 1980**
Charles P. O'Malley 1928- 2000

On the Cover: McAllister Towing and Transportation has, for 137 years, built a reputation of owning and operating state-of-the-art vessels. The color, inset photograph is the recently delivered Janet M. McAllister, performing during its christening ceremony in New York. Read about the company's colorful history and promising future, starting on page 26

Photo Credit: **Stephenie Hollyman**

8 Two for One

Konecranes-Munckloader 68-ton gantry cranes for open-hatch bulk carriers is enabling these unique vessels to become even more efficient. — by David Tinsley, technical editor

26 Family Tradition t

In 137 years, McAllister Towing and Transportation has built one of the more formidable and recognizable marine companies in the United State|. Upon delivery of the ultra high-technology Z-Drive tugboat Janet M. McAllister, *Maritime Reporter & Engineering News* examines the past, present and future prospects of one of the great names in marine transportation.

by Greg Trauthwein

31 Welcome to the Diesel Age

In 1927 young Anthony McAllister bought and installed the company's first ever marine diesel engine aboard Daniel McAllister, a move that initially got the young man fired, but eventually saved the company a lot of money.

40 Marine Propulsion Annual

The business of supplying marine propulsion equipment and systems has been consolidated into the hands of fewer, larger companies. The big diesel engine supply market surely feel the entrance of a new Korean competitor.— by David Tinsley, technical editor

50 Is it Real, or Is it...

Marine training and education is reaching amazing new levels of realism in the classroom with a spate of recent simulator installations. Read the rules on picking the best course to fulfill your company's needs.

37 Seaman's Church Institute Dedicates Houston Facility

55 Ship's Store: Boatbuilder's Guidebook

Also in this Edition

- 12 New & Notable
- 18 E-Commerce: Modern Maritime Makes its Mark
- 24 Super Barge Touted for Strengths
- 62 Buyer's Directory
- 64 Advertising Index
- 65 Classifieds

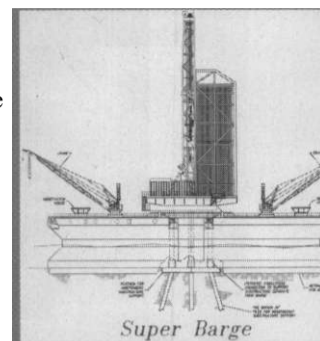
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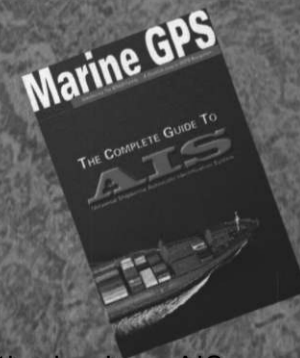
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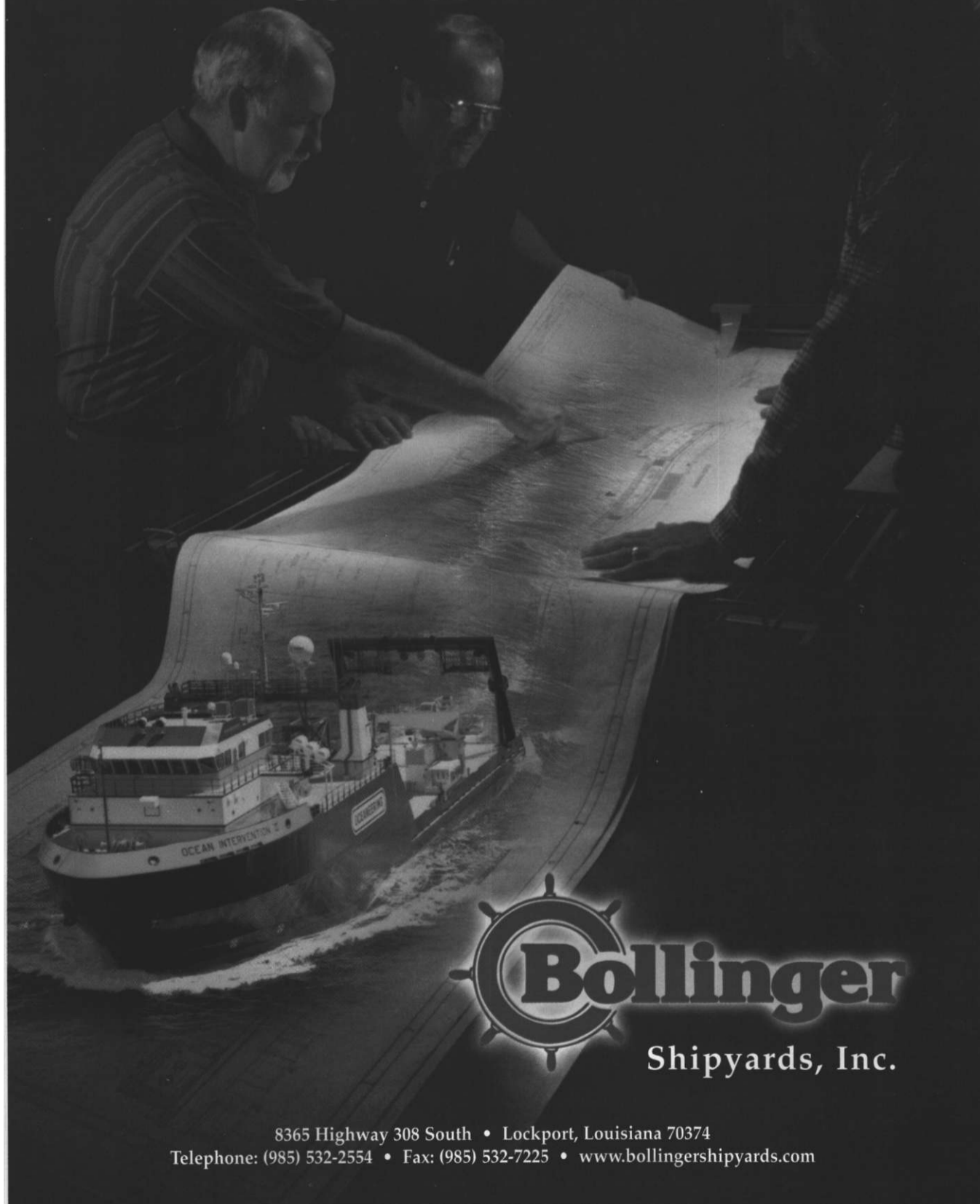
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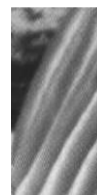
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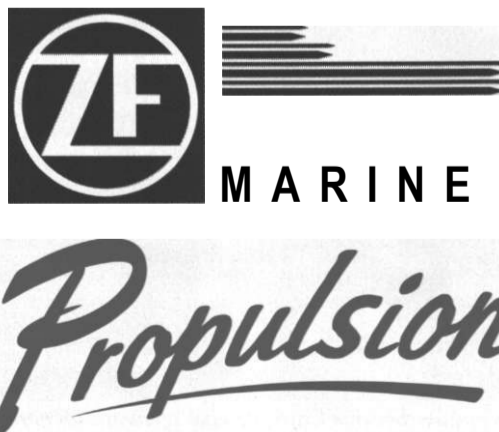
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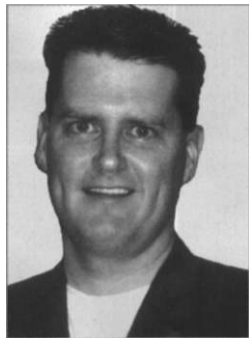
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Editor's Note

When There is No Safe Haven

There is a disturbing trend developing internationally that will surely be an agenda topping item for the International Maritime Organization in the coming year. At press time the Norwegian RoRo vessel Tampa, its crew of 27 and a reported 438 refugees — including 22 women and 43 children — was still in limbo.



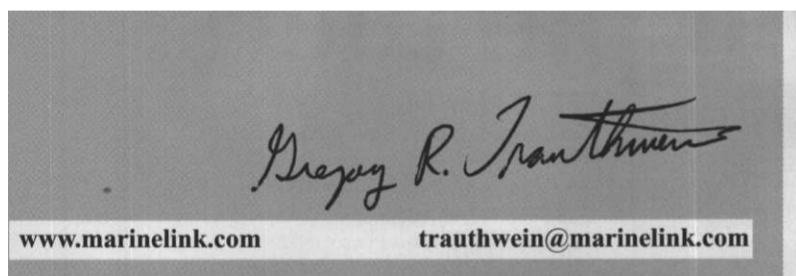
On Sunday, August 26, 2001 in Indonesian territorial waters, Tampa received a call from the Rescue Coordination Centre (RCC) Australia asking it to rescue a fishing vessel in distress, as she was apparently the closest vessel. The Captain was told by RCC Australia that the ship was holding roughly 80 people. The Tampa, which was built to accommodate 40 people safely, suddenly found herself having to rescue 438 people. After the rescue, the ship resumed its voyage toward Indonesia, at which point a group of refugees reportedly approached the captain and crew and promised "dramatic action" if the ship attempted to take them back to Indonesia. Given the number of refugees, the captain saw no alternative but to deviate course and find the nearest port.

However, no safe haven was to be found.

Earlier this year there was a situation involving the gas carrier Castor, which a near fatal deckplate crack in mid-voyage and was denied safe harbor for fear of a potential environmental disaster.

Maritime organizations are speaking out on the Tampa matter loud and clear, as BIMCO noted in a news release: "The international community has chosen to ignore international protocols and regulations regarding the safe and timely disembarkment of such refugees ... Moreover, forcing a vessel to continue navigation whilst burdened with such a large number of people on board, for which she is neither designed nor equipped, is a reckless disregard of the stipulations incorporated into SOLAS."

The Center for Seafarers Rights (CSR) of the Seamen's Church Institute of New York & New Jersey perhaps put it best: "A cherished and protected maritime tradition is a mariners' obligation to go to the aid of all persons in distress at sea, without regard to their nationality, status or religion," said Douglas B. Stevenson, Director of the Center for Seafarers' Rights in a letter to the Australian Prime Minister and the Ambassador to the United States. "We are very concerned that no actions be taken by any state that might create a disincentive for vessels to respond to a distress at sea. Australia's detention of the M/V Tampa and refusal to accept the shipwreck survivors places an unreasonable financial burden on the ship and establishes a negative precedent for those masters and shipowners to comply with their moral and legal obligation to rescue persons in distress at sea."



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Hyundai Mipo Gets Chem Carrier Contract

Hyundai Mipo Dockyard won a \$60 million order to build two chemical carriers — bringing the company's orders to build and repair vessels so far this year amounting to \$980 million.

Enterprise Ships Arrested

As shipping companies continue to suffer with the sagging world economy, bondholders who financed the Greek-controlled shipping company Enterprises Shipholding last month had arrested a second of the company's container-ships to force repayment of a \$175 mil-

lion junk bond on which it defaulted in June. The company has a fleet of 17 refrigerated ships, 15 of which are laid up. It also has five container vessels, two of which are laid up and two of which are under arrest. The Canmar Supreme has been held in the port of Fos, France since August 24. Enterprises defaulted

on the bond's \$7.76 million semi-annual interest coupon in July.

Transas Gets BV Type Approval

Bureau Veritas (BV) issued a type approval certificate for the Navi-Sailor 2400 ECDIS from Transas Marine. The certification procedures resulted in the full acceptance of the similar type approval, which was given to the Transas ECDIS in October 1999. Navi-Sailor 2400 ECDIS is capable of displaying S-57 official charts published by national Hydrographic Offices, ARCS by UKHO, TX-97 charts in the Transas proprietary format and several other electronic chart databases.

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ThyssenKrupp Selling

Shipping Unit

ThyssenKrupp AG will reportedly gain more than \$350 million from the sale of its Krupp Seeschiffahrt shipping unit. The unit, which has annual turnover of about \$200 million, will be sold to General Ore Intl., which is a U.S. based company.

Wartsila Wins Enviro Award

DNV granted Wartsila's Finnish companies, Wartsila Finland Oy and Wartsila Technology Oy, ISO 14001 environmental certification in recognition of the functionality of Wartsila's environmental management system. Wartsila's ISO 14001 environmental management system covers all the company's operations: sales, manufacturing, R&D and service. In May 2001 Wartsila and its partner Carnival Corp. received an award for the best environmental contribution within the cruise and ferry industry.

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Vessels Join LauritzenCool

The eight Polar vessels managed by Hamburg Sud will join the LauritzenCool fleet in December and January, including: Polar Argentina, Polar Brasil, Polar Chile, Polar Colombia, Polar Ecuador and Polar Uruguay, which were all built in 1992-93 and operate at a speed of 21 knots. Each also offers 529,369 cu. ft.; and 47 FEU on deck. Also joining the fleet are Polarstern and Polarlicht, both built in 1998 and offering 564,280 cu. ft. and 104 FEU on deck. These two also operate at 21 knots. LauritzenCool sprang out of the amalgamation of the two leading reefer operators Lauritzen Reefers and Cool Carriers, well known for their widespread global activities and strong customer orientation.



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Open-hatch bulk carrier technology, championed by specialist operators in the North American trade, is to be taken an important stage further through the



Stig Gustavson, president and CEO KCI Konecranes

adoption of deck gantries promising gains of up to 50 percent in cargo handling productivity. Whereas a 40-ton lift capacity is the norm for the traveling cranes fitted on such vessels, which are typically heavily involved in pulp and paper transportation, each of a new series of 48,000-dwt bulkers is to be equipped with a pair of Konecranes-Munckloader gantries plated at 68-tons apiece.

Designed for optimized handling and stowage of a wide range of unitized forestry goods, industrial cargoes, and containers, with the hatchways opening out to the full width of the holds, the latest newbuilds have been ordered from Oshima Shipbuilding. Singapore-based contractual owner Masterbulk will assign the four vessels to Star Shipping, which it jointly owns with Grieg Shipping of Norway.

Engineering and the key components

for the deck gantries will be supplied from Konecranes VLC in Finland, although the crane structures will be manufactured and assembled in Korea by Daewoo. The cranes will be barged in fully-erected form to Japan, for installation by Oshima, in readiness for vessel handovers in 2003/2004.

Crane throughputs of up to 1,200-tons per hour are anticipated with the new equipment, signaling an important advance over a rates of around 800-tons per hour attributed to 40-ton units fitted to 39,000-dwt open-hatch bulkers commissioned in 1999/2000. A current series of newbuilds with 40-ton capacity cranes from the same stable is expected to achieve around 900-tons per hour per unit.

The significant growth in lift capacity and corresponding improvements in ship turnaround performance have been secured with only a marginal increase in

equipment weight, so that revenue-earning deadweight is scarcely penalized. Masterbulk is understood to be considering upgrading the cargo handling outfit on its preceding series of 39,000-dwt

(Continued on page 10)



Aerial view of the KCI Konecranes facility.

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Investment in A Shipboard Gantry Crane History

The first open hatch vessel (12,000 dwt) with gantry cranes was delivered to Oestberg's Rederi, in Norway, December 1962. This revolutionary vessel and crane design was a result of cooperation between Oestberg, Crown Zellerbach Co. and the Munck Group in Bergen.

Crown Zellerbach Co. was one of the leading pulp and paper companies, located in San Francisco. Its shipping department was headed by Clyde Jacobs, who was a driving force in making the Open Hatch design the new standard for paper and pulp transportation at sea. At that time the vessels were primarily based on the traditional "Shelter Deck" design and the loading and unloading was done with complicated "boom and winch" arrangements. The Open Hatch Bulk Carrier, or OHBC, as the vessels are commonly referred to, are unique in its design in many respects. With its large and square holds, they are designed to carry unitized cargo, and to offer high efficiency with respect to capacity utilization. Paper and Pulp is typically referred to as "Unitized Cargo," which means that most cargo units have uniform dimensions and weight. To utilize maximum capacity, the cargo must be stowed up alongside the hold sides, which again necessitates square holds. Unlike conventional bulk carriers, which have small hatches for entry of electro-hydraulic grabs, the hatches on OHBC vessels cover the entire beam of the ship. This is necessary for stowing, loading and unloading alongside the vertical walls of the holds. As a result, the hatches are therefore designed to be a structural part of the ship. The Munckloader Gantry Crane was the first to utilize hydraulic jacks on the crane legs for the task of lifting the hatches, and using the gantry motion to the horizontally move and position the hatches.

Munckloader developed a new generation of gantry cranes in 1993. The new design enclosed most of the electrical and mechanical components inside the main construction, helping to make the outside surface as smooth as possible. This was done to protect components and reduce maintenance and spare part needs.

Operational and rigging speeds were significantly increased, and it was the first gantry crane to utilize frequency controlled AC motors.

KCI Konecranes is a leading engineering group specializing in advanced overhead lifting solutions and maintenance services. The last fiscal year ended — 2000 — was a particularly prosperous one for the company, as operating

income grew 23 percent, net sales grew 19 percent, and order intake grew 42 percent, according to Stig Gustavson, president and CEO. The crane industry, by his estimation, is still a fragmented one, and an industry in need of contin-

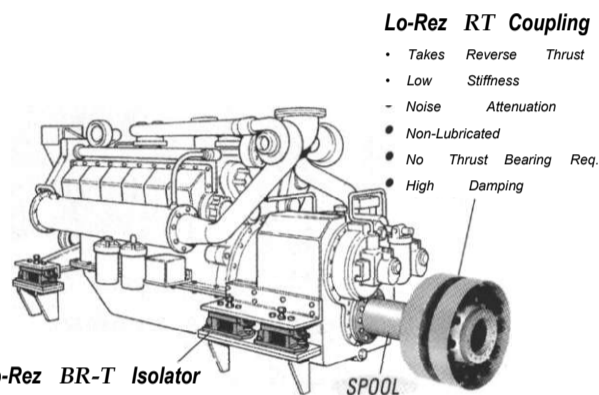
ued consolidation. KCI Konecranes has been a lead proponent of this consolidation, acquiring 10 companies in 2000. According to Gustavson, the company has the resources and desire to continue this trend.

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Investment in Design

(Continued from page 8)

open-hatch bulkers, which used two 40-ton Konecranes-Munckloader gantries manufactured and fitted in Finland.

The ships came from Stocznia Szczecinska.

Stocznia Gdynia ordered a total of 14

cranes from Konecranes for a series of seven 40,000-dwt vessels due to be delivered to Westwood Shipping Line of the U.S. during 2002-2003. The age profile of the world fleet of open-hatch bulkers, reckoned to number 159 ships, suggests a steady replacement newbuild demand over the next 10 years.

Standards for A New Era

One of the most respected names in the development of vessel designs suited to volume demand and series production, and still widely identified with the 'Liberty' ship replacement era, GTR

Campbell Marine Consultants has fostered new links with the industry in China. The recent opening of new headquarters for the Canadian firm and its associated company Algoship Designers in Nassau, Bahamas, was accompanied by a first deal for the latest addition to its standard ship portfolio, a 700-dwt inter-island ferry.

While the bulk carrier bloodline is perpetuated in a host of new projects involving Chinese and South Korean yards, the extension of the GTR Campbell concept to the ferry domain involves a combined passenger and cargo carrier dubbed the Fiesta type. Ordered by FastMail Shipping Company from Xinhe Shipyard, and incorporating accommodation for 100 passengers, she will be placed into service between Florida and the Bahamas.

The ferry initiative complements the GTR Campbell imprint on bulker new-build schemes currently under way at four other Chinese yards, and totaling 20 ships. The extent and scale of activity is a measure of the continuing influence of a design house that made such an important contribution to the Japanese shipbuilding industry's earlier rise to international prominence.

Indeed, the new standard types have a distinguished pedigree, since GTR Campbell Marine Consultants and Algoship Designers spring from the same organization which originated the 13,600-dwt Freedom, 21,500-dwt Fortune and 22,500-dwt Friendship designs, acclaimed 'maids-of-all-work' for the dry cargo tramp trades.

GTR Campbell International had been formed in Halifax, Canada, in the late 1940s by Scottish naval architect George Campbell, who moved the company to Japan in 1950. After a period of reduced involvement in shipbuilding, the firm returned to the standard ship sector in 1994 under its present name, headed by Antony Prince. The re-emergence was heralded by the introduction of the 29,500-dwt Fantasy design, reflecting close reading of the market's needs on the part of Prince, who has been with the organization for 29 years. He had been the 'right-hand man' to the late George Campbell.

Currently, a new breed of GTR Campbell-developed wide-hatch bulker, the Festiva, is being turned out at Jingjiang Shipyard for Dockendale Shipping and the Clipper Group. Delivery of the first pair of 27,000 dwt newbuilds in a six-ship series was imminent at press time.

The company is also constructing the 52,000-dwt, double-skin Galaxy Handymax bulker type, a four-ship program at the Jingjiang yard to the account of Clipper and Dockendale.

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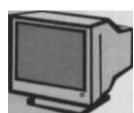
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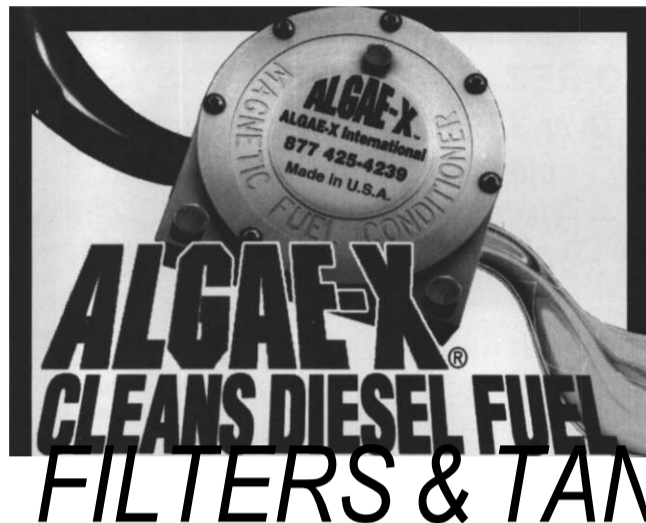
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We would like to thank Princess Cruises for their foresight and dedication to being the environmental leader in the Cruise Industry. The excellent partnership we forged with them and Alaska Electric Light & Power was instrumental in ensuring the successful completion of this project.



Photo courtesy of Princess

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New & Notable

Camarc, Kvichak Marine

Team Up Again

Camarc and Kvichak Marine Industries have joined together once again to design and build an all-aluminum 72-ft. (22 m) pilot boat. The new vessel, which is scheduled for a Summer 2002 delivery, is for the Sabine Pilots Association of Groves, Texas, and will operate year-round in the waters of Sabine Pass.

The vessel's power will be supplied by twin Detroit Diesel 16V2000 engines rated for 1,285 bhp each at 2,100 rpm; Hamilton HM651 waterjets were selected for the propulsors. This combination will allow excellent maneuverability, a top speed of 28 knots, and a cruising speed of 26 knots.



The patented popsafe fendering system will be used to protect the vessel's hull while board and pilot transfers are made. Protection and recovery of the pilots in the event of a man overboard will be enhanced with a combination jet guard and stern platform.

Additional features onboard include a 32 kW Northern Lights generator, 1,600 gallon fuel tank, six Beurteaux pilot seats, day galley and crew accommodations, and a full navigational and communication electronics package.

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NASSCO Delivers USNS Pomeroy To U.S. Navy

National Steel and Shipbuilding Company (NASSCO) has delivered to the U.S. Navy, USNS Pomeroy — the seventh new construction ship to be completed by NASSCO under the U.S. Navy's Strategic Sealift Program. A total of eight new construction ships and three ship conversions have been



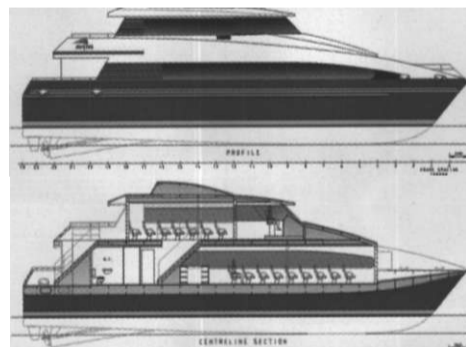
granted to NASSCO under the Navy's 20-ship Strategic Sealift Program. All of the vessels, which honor U.S. Army Medal of Honor recipients, are large, medium-speed, RoRo Ships (LMSRs). This particular vessel is named in honor of Private First Class Ralph E. Pomeroy, who was posthumously awarded the Medal of Honor for his heroic actions in Korea in October 1952.

Measuring 950 ft. (289.5 m), with a beam of 105 ft. (32 m), the vessel can displace approximately 62,000 long tons when fully loaded and has more than 390,000 sq. ft. of cargo carrying space. Powered by gas turbines, the vessel will be able to sustain speeds of up to 24 knots when fully loaded.

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Austal USA Readies 82-ft. Cat For Spring 2002 Delivery

Austal USA in Mobile, Ala., has progressed steadily with its 82-ft. (24.9-m) High Speed Catamaran, which was designed specifically for the U.S. market. Being built alongside the two 150-ft. (45.7-m) Crew/Supply Monohulls for Otto Can-



Gladding-Hearn Delivers Premiere High Speed Passenger Cat



Commencing this summer, passengers traveling from Point Judith to Block Island, R.I. by ferry, can, for the first time, make the trip in about half the time. In July, Island Hi-Speed Ferry received a new 99-ft. (30.4 m) Athena, a high-speed catamaran ferry built by Gladding-Hearn Shipbuilding. The 250-passenger fast ferry has a top speed of 34 knots when loaded with a dwt of 18.6 tons, and completes the 12-mile ocean crossing in about 22 minutes, according to shipyard officials.

Designed for commuter and tourist service by Incat Designs of Sydney, Australia, the ferry is operated by the start up company partnered with Boston Harbor Cruises.

The all-aluminum vessel is powered by twin Caterpillar 3412E, 1,100 bhp diesel engines, which drive Hamilton HM 521 waterjets through ZF 1950 reduction gears. The vessel features Incat's single chine Z-bow hulls. The resulting longer waterline improves the vessel's high-speed performance and sea-keeping ability. Its Vosper/MDI active trim tab motion control system is expected to reduce its motion by as much as 60 percent.

Interior arrangements include upholstered seating for 190 passengers, a snack bar, and three heads. Heating and air conditioning is provided by a 150,000 btu system.

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Length	99 ft. (30.1m)	GPS	Northstar
Beam	30 ft. (9.1m)	Depth sounder	Datamarine
Depth	11 ft. (3.3 m)	Compass	Ritchie
Draft	5 ft. (1.5 m)	Loud hailer/siren	2 x Raytheon
Coast Guard Certification	Subchapter K	Fuel	2,000 gal.
Main engines	4 x Caterpillar	Fresh water	300 gal.
Engine supplier	Southworth Milton	Sewage holding	300 gal.
Gear	4 x ZF	Crew size	4-5
Waterjets	4 x Hamilton	Speed (loaded)35 knots
Keel coolers	Split pipe	Air conditioning120,000 btu supply to
Genset	4 x John Deere/Marathon 55 kW	Radars	Main deck with two additional
Radar	2 x Furano		.25 ton units to supply wheelhouse and Tier II

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dies LLC, the 82-ft. (24.9-m) catamaran is a 25-knot vessel with a 26-ft. (7.9-m) beam capable of carrying at least 189 passengers, designed to CFR 46 Subchapter K and Classed by ABS.

While several companies have expressed an interest in this vessel, no firm contract has been signed. Austal USA, which is currently seeking out a firm offer, encourages interested parties to contact them directly in Mobile, Ala.

The Austal Design team in Australia has experience in designing catamarans and monohulls in the range from 80 to 330 ft. (24.3 to 100.5 m), with speeds from 20 to 50 knots. This design group also, uniquely, benefits from being part of a shipbuilding group where lessons learned from vessels built and in-service are constantly being fed back to make each new vessel a step up in functionality and maintainability.

The Main Deck was designed around a 3-5-3 arrangement with 36-in. aisles as required by the 1990 Americans with Disabilities Act (ADA). Access to meet ADA in fact makes the aisles 6 in. more than USCG require, thus adding one ft. to the beam of the vessel.

The concept for this vessel was that it would work as either a Subchapter T vessel (149 seats or less) or Subchapter K (150 or more). Thus the Main Deck was designed around the potential of 149 seats (supplied by Beurteaux), which can be achieved by removal of the kiosk/concession midships, replacing with an extra 18 seats.

Speed and economy were important design goals and an appreciation of the types of routes this vessel would operate plus a strong awareness of the need to minimize wake wash, which is a critical issue in the U.S. environment) led to a speed of 25 knots, which also meant that fixed pitch propellers could be used, further keeping costs down.

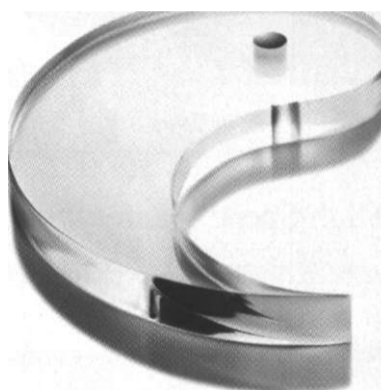
The vessel's required 2 x 1,100 hp installed power comes from twin Caterpillar 3412E diesel engines, which will drive fixed pitch props through ZF BW 190 CB gearboxes although at this time a potential customer's preference may lead to this being changed to Twin Disc. Fuel consumption is a low 111 gallons per hour for the main engines at full power.

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Main Particulars	
Classification ..	ABS
Length, (o.a.) ..	82 ft. (24.9 m)
Beam	26 ft. (8 m)
Depth, (molded)	9 ft. (2.8 m)
Draft	6 ft. (1.7 m)
DWT	40,000 lbs.
Propulsion	2 x Caterpillar 3412E diesels at 1,000 hp @ 2,300 rpm
Speed	25 knots

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New & Notable

A&B Industries Delivers

Model-Bow Tug To Luhr Bros.

A&B Industries of Morgan City located in Amelia, La. recently delivered a 76 x 26 x 10 ft. (23.1 x 7.9 x 3 m) model-

bow tug to Luhr Bros. Contractors of Columbia, Ill. The Bill G will be providing service for Luhr Bros, in its construction operations on the waters of Lake Michigan.

Several special features were required

to work in the area due to low bridge clearance and high water conditions. Among these requirements were that all equipment above the Pilothouse roof be designed to fold down. Both the Mast and Radar Base were designed to meet

these requirements. Other features include dual Spotlights, one Port and one Starboard, and Bow Pudding that extends to the 12-ft. (3.6-m) mark.

Main propulsion is supplied by two Caterpillar 3508B diesels, producing a total of 1,710 hp at 1,800 rpm. The engines are connected to Michigan 70 x 60-in. four-bladed, stainless steel wheels through Twin Disc MG-5310DC marine gears with 4.96:1 reduction ratios; pneumatic controls are from Wabco and hydraulic steering is provided by ESI.

Able to run at approximately 13 knots, the ship's service power comes from twin Caterpillar 3304B gensets, sparking 65kw of electricity each — all of which were serviced by Louisiana Machinery's Morgan City location.

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Morrelli and Melvin Teams Up With Knight And Carver

Morrelli and Melvin has joined forces with Knight and Carver Yacht Center to launch a trio of fiberglass vessels, built to USCG and ABS standards, and certified for operations on Exposed Waters. The hulls have a shape designed for ease of construction and can be built out of various materials. Cruising at speeds from 23 knots to 30 knots allows the operators to reach their destinations in less time.

The company collaborated on a 65-ft. (19.8-m) fast ferry Fjordland Catamaran, which can carry 49 passengers at 28 knots between Skagway, Haines, and Juneau, Alaska. Built for Alaska Fjordlines, this sleek, smooth power catamaran features comfortable, aircraft-style seating and large windows to provide excellent viewing for all passengers.

The 60-ft. (18.2 m) Charter Cat Lucky Lady has been deployed this summer along the rugged Hawaiian coast, cruising at speeds of 22 knots, carrying up to 49 passengers for whale watching and snorkeling. Built for Kauai Sea Tours, its twin 6125A Lugger diesels each produce 425 hp offering passengers a fast, comfortable ride, and the owner's savings with fuel efficiency.

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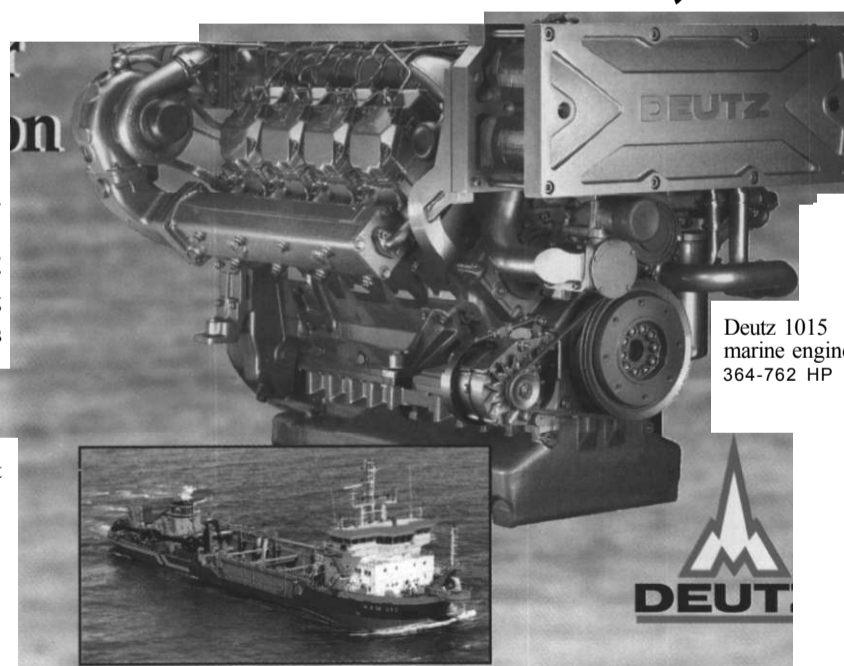
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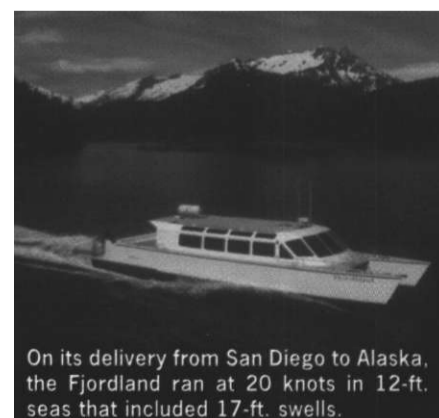
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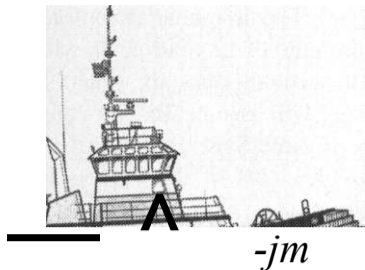
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On its delivery from San Diego to Alaska, the Fjordland ran at 20 knots in 12-ft. seas that included 17-ft. swells.

MARCO Shipyard To Construct Third Millennium Class Tractor Tug



1_j.____-

MARCO Shipyard Seattle has signed a contract to construct a third Millennium Class tractor tug for Harley Marine Services. Measuring 105 ft. (32 m), the multipurpose tug will be identical to its sisterships, Millennium Falcon and Millennium Star, delivered in February and August 2000, respectively.

Construction of the tug is ongoing, with delivery planned for March 2002. Similar to its predecessors, the MARCO-designed tug will have an overall beam of 37 ft. (11.2 m) and a molded depth of 17 ft. (5 m). It will be powered by a pair of Caterpillar 3516B diesels, providing a total of 4,400 bhp that will drive Ulstein Z-drive units, each fitted with 94.5-in. four-bladed props set in nozzles. Deck machinery will feature headline and tow winches from Burrard Iron Works of British Columbia.

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Moran Commissions 10th Z-Drive Tug



Moran Towing has commissioned Diane Moran, its 10th Z-drive tugboat, which was recently christened in a ceremony in New York Harbor. The tug will be used in harbor services. Currently, Moran's other Z-drive tugs are used by the U.S. Navy's Military Sealift Command in Norfolk, Va., and for harbor services in the port of Charleston, S.C.

The vessel is powered by two turbocharged EMD engines, which were chosen for their fuel efficiency, reliability and full compliance with the most recent environmental regulations. The engines deliver a total of 5,100-hp at 900 rpm, driving Z-drives with eight-ft. stainless steel propellers. With a service speed of 13.5 knots, the vessel has a bollard pull of 152,000 lbs. Its bow is equipped with a Markey electric hawser winch, with a drum capacity of 400 ft. of nine-in. spectra/plasma tow line and a minimum drum-brake capacity of 400,000 lbs.

Built by Washburn & Doughty of East Boothbay, Me., the ABS-classed Diane Moran is outfitted with 12-in. D fendering on its side and stern, and 12-in.

wing fendering below the water line. It has a fire-fighting capacity in the form of two SKUM 1,500 gpm fire monitors fed by a 3,000 gpm Aurora fire pump, powered by a 400 hp Caterpillar engine.

With a 32,000-gallon fuel capacity; 7,600-gallon fuel overflow tank and 15,000-gallon water ballast capacity, the tug's electronic gear includes two ICOM VHF radios, two Furuno radars and Danforth Constellation compass.

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Sealift Ship To Be Christened Benavidez At Avondale Shipyard

The seventh and final Strategic Sealift ship in the Bob Hope Class was christened Benavidez in ceremonies at the Northrop Grumman Corporation Avondale shipyard on July 21, 2001.

The new ship whose namesake honors of Medal of Honor recipient Army Master Sgt. **Roy P. Benavidez**, of Lindenau, Tex. is a non-combatant vessel. It is a large, medium-speed, RoRo (LMSR) Sealift ship that will be crewed by civilian mariners and operated under contract to the Navy's Military Sealift Command, Washington, D.C. The LMSR ships are ideal for loading military combat and combat support equipment needed overseas and for re-supplying necessary equipment and supplies during national crisis. The ship's six-deck interior has a cargo capacity of approximately 400,000 sq. ft. and its RoRo design makes it ideal for transporting helicopters, tanks and other wheeled and tracked military vehicles. Two 110-ton single pedestal twin cranes make it possible to load and unload cargo where shoreside infrastructure is limited or non-existent. A commercial helicopter deck enables emergency, daytime landings.

The 950-ft. (289.5 m) Sealift ships are among the largest in the Navy fleet. Longer than three football fields, Benavidez has a beam of approximately 106 ft. (32.3 m), a draft of 35 ft. (10.6 m) and displaces 62,069 long tons. With 65,160-shaft-hp, the diesel-powered ship can cruise at speeds in excess of 24 knots with an endurance range of 13,000 n.m.

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Cummins To Power Flat Decked RoRo Ferry

The province of New Brunswick will take delivery next October of a new car ferry for the run between L'Etete on the mainland and Deer Island in the Bay of Fundy. Currently under construction at the Hike Metal Products yard on Lake Erie in Ontario, the new ferry will make its delivery trip down the St. Lawrence Seaway and River before rounding Nova Scotia to its operation route just north of the Canada-U.S. border.

The new ferry's design includes a pair of Z-drives set fore and aft on the corners. The Rolls Royce Ulstein drives will each be powered by a six-cylinder Cummins KTA19 engine producing 550 hp at 1,800 rpm.

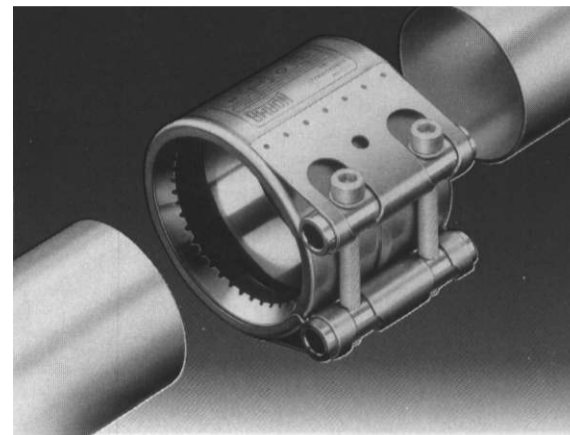
Measuring 140 x 40 ft., (42.6 x 12.1 m) the all-steel (with the exception of the wheelhouse) flat-decked RoRo ferry is equipped with ramps at either end; its wheelhouse is set on a bridge over the car deck, which is designed to carry up to 24 full size cars.

Seating is provided in the accommodation for 14 persons plus a wheelchair allowing a minimum of 45.7 cm seat width per person. The three lanes for cars are arranged with ramps for and aft, while the Z-drives and engine houses are located on one side fore and aft. side.

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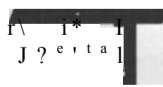
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Chiles Offshore Signs Contract With BP

Chiles Offshore has executed a three-year contract with BP Trinidad and Tobago LLC for the use of the ultra-premium jackup drilling rig the Chiles Coronado, (formerly known as the Tonalá). The Chiles Coronado is currently undergoing limited modifications and upgrades before leaving the Gulf of Mexico for Trinidad. The rig is currently expected to arrive in Trinidad during the month of September.

Teekay Secures Long-Term Charter Contracts For Five Newbuild Vessels

Teekay Shipping Corporation has signed a contract for the long-term time-charter of five newbuild vessels

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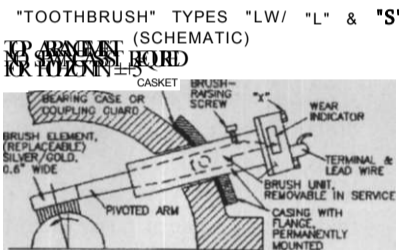
-Operates dry or with oil spray. Self-cleaning.

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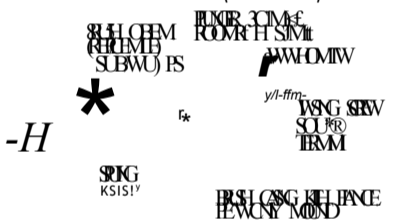
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to Tosco Corporation commencing upon their delivery in 2003. The time-charter contracts are at fixed rates for a minimum of 12 years each, with options to extend for up to an additional six years. Under this agreement, Teekay will assume Tosco's contracts for the construction of three Suezmax and two Aframax tankers. The aggregate cost of the vessels is approximately \$250 million.

Blount-Barker Signs Contract For Sea Wolf Marine Tug

Blount-Barker Shipbuilding signed a contract with Sea Wolf Marine of Bayonne, N.J. to build a 2,400-hp, 85-ft. (25.9 m) double chine, all welded twin-screw tug set for delivery in April 2002. Bristol Harbor Group has been contracted to modify the Blount classic 85-ft. (25.9-m) tug design to take advantage of CNC (computerized numeric controlled) cutting. The tug will be powered by two CAT 3512 engines; 4:1 twin gears and two 65kW generators will supply ship service power.

Keel cooled and equipped with two, four-blade stainless steel propellers, the tug will be used for marine towing along the inland and intracoastal waterways on the East Coast.

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SENECO Signs \$6.5 Million Barge Building Contract

Southeastern New England Shipbuilding Corporation (SENECO), North Kingstown, R.I., has penned a contract with Barges Unlimited of Fall River, Mass. to construct an 80,000-barrel, 320-ft. (97.5 m) double hull barge valued at more than \$6.5 million.

Per the agreement, SENECO will manufacture the largest double hull barge ever constructed in the Northeast.

Work is expected to commence immediately and is expected to take up to one year for completion, at which time it will be utilized by Seaboats for transportation and delivery of light oil products.

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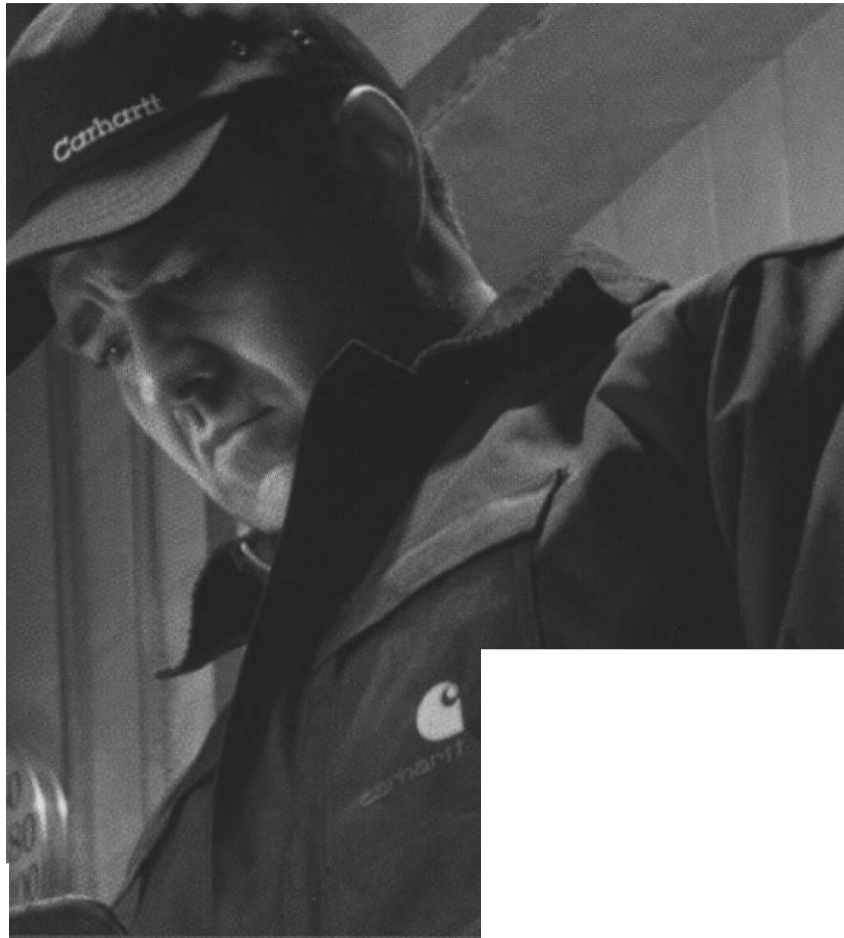
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commerce



Spectria, a leading technology consulting firm, has developed a prototype of a new, knowledge-management-based information portal called SmartShips, for Modern Maritime, Inc., a professional services company for the marine industry.



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Upon full implementation, this new portal, based on Microsoft's new SharePoint knowledge management server, will provide the marine industry's first-ever online regulatory compliance and quality management consulting service based on an easy-to-use enterprise software system. The new Modern Maritime portal model can be applied to other heavily regulated industries where safety, quality and environmental management systems are pervasive.

Spectria provides expertise in many facets of eBusiness development and implementation for corporations, government agencies and academic institutions across the United States and around the world. "The Modern Maritime portal is an excellent example of how one of the oldest industries in the world can benefit from advances in eBusiness technology," said Luis Curet, vice president, Spectria. "This new portal will dramatically reduce the time needed to complete the appropriate regulatory paperwork and give professional mariners greater efficiencies to help them improve the bottom line. The underlying technology infrastructure for this portal can serve as a model for other industries faced with a high degree of regulatory compliance for ongoing operations."

"We're pleased with the result our new information portal has achieved to streamline the complex paperwork required in the maritime industry," said Captain Jamie Clarkson, president and CEO, Modern Maritime. "Spectria was able to expand our management system concept into a working prototype in less than 30 days. The rapid development time combined with the system's ease-of-use have exceeded all of our expectations."

Optimizing Microsoft's SharePoint Knowledge Management Server, Spectria deployed Microsoft's new SharePoint knowledge management server to deploy the portal as a Web-based application, a task not originally intended by Microsoft.

The SharePoint search engine provided a structured search result scheme that was ideal for Modern Maritime. Spectria further produced a complete and comprehensive document change history record, helping users work with the most recent documents available for processing industry regulatory paperwork.

Modern Maritime, Inc. is a professional services company specializing in innovative solutions for marine management systems, regulatory compliance and marine information systems. Modern Maritime is headquartered in Portsmouth, N.H. with personnel located throughout North America and the Caribbean.

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Maersk Field Reps Stay

Up-To-The-Minute With Broden

Broden, Inc. has developed, designed and implemented at Maersk -Sealand a custom sales forecasting system that collects and distributes real-time customer data between field representatives and the corporate office. Termed GAMP (Global Account-Based Marketing Plan), the system gives field reps, at their laptops, accurate and up-to-date data for making decisions locally. The system permits reps and management to track and project volumes of cargoes, determine the most profitable mix of cargo on a ship, and ensure that ships



are not over- or under-subscribed. Broden's solution synchronizes data, so in less than 15 minutes Maersk's corporate office managers and field representatives receive updated data. When computers are idle, software by synchrologic updates and synchronizes data across Maersk's networks.

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Maritime Reporter & Engineering News

Shipping Industry Launches

Ship Recycling Code

An inter-industry working party — comprising the International Chamber of Shipping (ICS), BIMCO, Intercargo, Intertanko, ITOFF, ITF and OCIMF — has launched an Industry Code of Practice on Ship Recycling, outlining the measures which shipowners should be prepared to take prior to disposing of redundant ships. ICS Secretary General, **Chris Horrocks**, said "The Code is a concerted response to the concerns that have been raised about the working and environmental conditions in some of the world's ship recycling facilities, almost all of which are located in developing countries. While the shipping industry cannot determine the conditions in the recycling yards, it can take some practical steps to reduce the risks associated with the dismantling of ships."

In addition to covering the measures that shipowners might take prior to the delivery of ships at recycling yards, such as the cleaning and certification of tanks to hot work and entry standards, the Code incorporates an Inventory of Potentially Hazardous Materials on Board, intended for completion on a ship's last voyage prior to being broken up. Copies of the inventory, suitable for completion, can be downloaded at www.marisec.org/recycling. Horrocks commented:

"We intend to pursue the dialogue with all the parties that have responsibility for ship recycling standards, both inter-governmentally and at industry level.

For instance, we aim to discuss with shipbuilders the need to design ships with their ultimate disposal in mind, and perhaps to develop a "green passport" for new ships, detailing the materials used in their construction and up-dated as necessary during the working life of the vessel. We aim to continue discussions with the ship recycling yards, and perhaps encourage them to develop their own code in relation to shore-based practices.

Strategic Launches Shipping Support Tools

Strategic Software, provider of communications software and shipping database applications to the shipbroking and shipping industries, has unveiled a new generation of the company's internet-based shipping support tools. Built on the StrategicIMX positions and cargo order exchange, launched last November, TankerIMX is specially designed to support and streamline the communications flow in connection with the chartering and operations of tankers.

TankerIMX has been created by Strategic with support from three leading tanker brokerage houses — Dietze & Associates, McQuilling Brokerage and Charles R. Weber. Release 1.0 of TankerIMX was developed in less than six months, delivered on time and within budget. The product simplifies the management of ships positions and cargo orders, thus reducing time spent on collating positions lists and cargo orders and communicating such reports to counter parties. The user-friendly TankerIMX eliminates repetitive manual processes and reduces paperwork through collaborative sharing of voyage data in a private and confidential environment. TankerIMX's Post-Fixture functionality will be released later this year, allowing charterers, owners, brokers, agents, inspectors and other parties to a tanker voyage the ability to capture data at source. The sharing of voyage data in real time will enable better vessel tracking, optimize terminal planning and improve document management.

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ANCHORS CHAINS

Thrane & Thrane Buys Nera's Sat Units

Thrane & Thrane bought the satellite units of Norwegian Nera for around (\$500 billion Danish crowns) \$61.5 million, sending its shares to a four-month high. For the two units Nera SatCom and Nera WBA Satellite, Thrane & Thrane will pay (235 million crowns \$26.4 million in cash and around three million new shares corresponding to around 40 percent of Thrane's total capital after a share capital increase. The intention is to create a manufacturer within satellite ground equipment with the strength to participate in both the mobile and the broadband market segments.

Canada Offers Marine Information Source

The Canadian Center for Marine Communications (CCMC) has launched Diffusion — a marine information and communications technology (ICT) news and information website — at www.ccmc.nf.ca/diffusion.

Diffusion presents content from across Canada and around the world in one comprehensive, one-stop website. Various online and print sources are scanned on a daily basis for the latest developments in marine ICT

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applied to various sectors of the marine market. With specific emphasis on issues affecting the Canadian industry, coverage includes, but is not limited to, marine navigation, systems integration, wireless communications and satellite applications. Diffusion also links into the Canadian Marine ICT Directory, which is a searchable online database of Canadian companies comprising a network of actively involved in the development and commercialization of marine ICT products and services.

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E-Commerce

Barge Management System Increases Efficiency

ALK Technologies, Inc. and Midland Enterprises have created a new Barge Management System (BMS) to help

Midland increase efficiency and competitiveness. Using the Intranet to tightly integrate communications, business,

and systems processes on an enterprise-wide basis, BMS offers a palette of e-commerce functions. Ideas for the sys-

tem were solicited from Midland departments including sales, finance, transportation, operations, and information systems. Phase II, constituting the detailed design, was completed in early 2000 and Phase III, encompassing delivery and installation, was completed in June 2001.

Two primary business goals of BMS are to improve equipment utilization and manage yield potential by analyzing new requests for service. In past years, most barge transportation services operated on long-term contracts with well-defined traffic patterns.

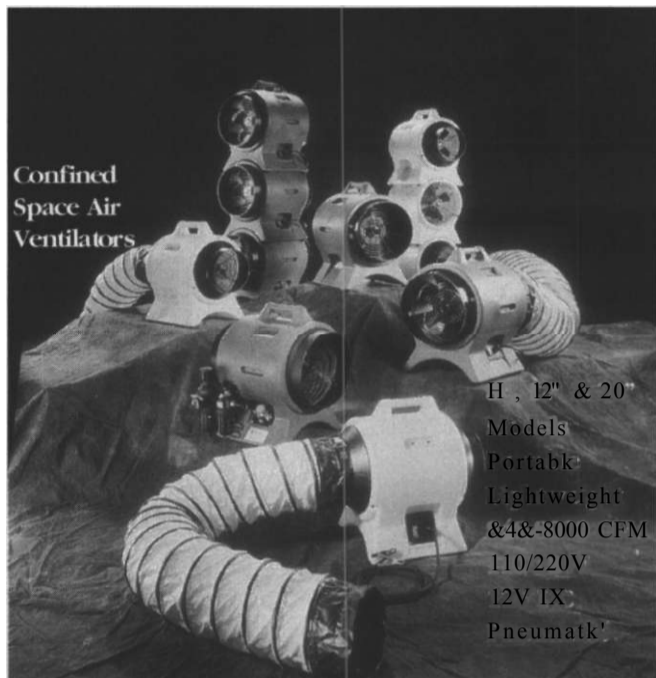
However, recent market changes are causing complex changes, inducing barge companies to re-examine the way they do business.

"Not only has there been an increase in short-term requests for service," said David Seneko, ALK vice president, "but Midland Enterprises is also juggling more customer requests for specific types of equipment. There is a need to know specifically what equipment is available in what location at what time before Midland decides if it makes sense to accept a new order. If the company were to accept new business and then had to move empty equipment over long distances to fulfill it, for example, the yield would not be maximized and existing service might be compromised."

BMS allows Midland to match customer orders with available equipment at specific locations over a 90-day planning horizon. The system reduces barge cycle times by highlighting idle equipment awaiting re-assignment and curtails detention periods for loading and unloading by providing equipment on a just-in-time basis. "Our customers need a transportation partner with expertise, flexibility, innovation and commitment," says Nick Lonnemann, vice president, transportation services at Midland Enterprises. "Our goal is to deliver their commodities safely and expeditiously, and our new Barge Management System will help us meet that goal every time."

Midland Enterprises commenced business as The Ohio River Company more than 75 years ago and currently operates 2,400 barges over more than 7,000 miles of America's inland waterways. Carrying coal, grain, iron, steel ores, and other dry bulk commodities, Midland offers an integrated array of transportation-related services.

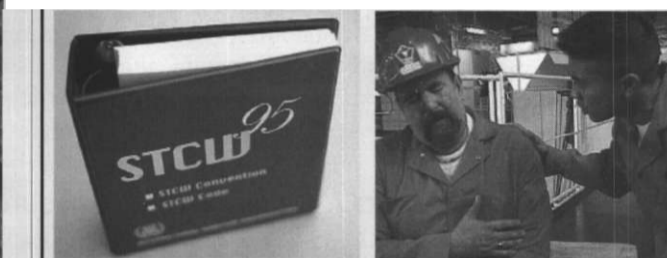
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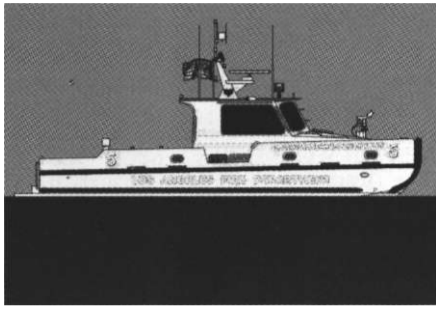
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News

Port of Los Angeles Welcomes Aluminum Fireboats



Subsequent to a lengthy bidding process, the Port of Los Angeles will receive a trio of three all-aluminum fireboats, which will be constructed by Kvichak Marine Industries. Measuring 39 ft. (11.8 m) each, the vessels will be designed by Jensen Maritime Consultants of Seattle. The three new vessels, which will be named Fireboat #1, #3 and #5, will be stationed throughout the Port of L.A. and are scheduled to replace three existing vessels that are each more than 35 years old. A 105-ft. (32-m) steel fireboat, currently under construction at Nichols Bros, of Freeland, Wash, will also join the upgraded fleet in 2002. Each having a beam of 14 ft. (4.2 m), the fireboats will be powered by twin Caterpillar 3126B engines, driving 27-in. propellers through Twin Disc MG-507A gears. A third Caterpillar 3126B engine will be installed as a designated fire engine. The designer predicts that the vessels will be able to move at 27-plus knots when fully loaded and a cruising speed of 25 knots.

Each vessel will also have a Hale fire pump with a 2,400 gpm capacity and a Stang 925545 fire monitor.

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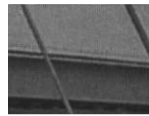
Southwest Marine Lands \$54 Million Contract

The Navy has granted a \$54 million, five-year continuous maintenance contract (encompassing 23 availabilities) for work on DDG-51-class ships to Southwest Marine (SWM). USS Stetham is scheduled to arrive at the shipyard on September 26; the last ship included in the contract will be at the yard on July 12, 2006.

The award, which includes 10 ships, also contains an option for USS Lassen in 2003 and USS Howard in 2004. The work package on each ship includes dry docking, shaft work, underwater hull painting, maintenance, various general repairs, electronic upgrades, structural piping work and alterations. Teaming up with SWM on this contract is Continental Maritime (CMSD), which offers the Navy resources additional to SWM's piers and dry dock.

Chiles Offshore Signs Two 9-Month Contracts With Shell

Chiles Offshore has executed two firm nine-month contract extensions with Shell Exploration & Production Company for the use of the ultra-premiumjack-



up dilling rigs the Chiles Magellan and the Chiles Columbus in the U.S. Gulf of Mexico. The Chiles Magellan has worked for Shell since May 2000 on a well-to-well basis and will start its nine-month contract period at the beginning of August 2001.

Advance Procurement Given For Amphibious Assault Ships

The Avondale Alliance, led by Northrop Grumman Avondale, has been awarded \$113.2 million for advance procurement of long lead materials for

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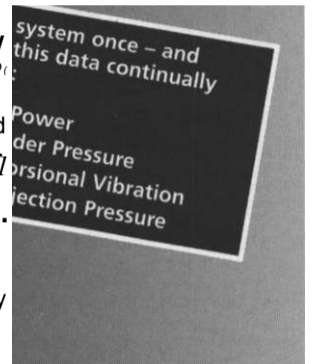
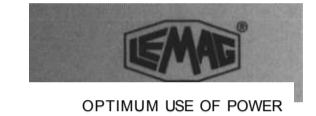
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ships five and six in the San Antonio Class LPD 17 Program.

As prime contractor for the LPD 17 Program, Northrop Grumman Avondale leads the Avondale Alliance — a team comprised of General Dynamics' Bath Iron Works, Raytheon Electronic Systems and Intergraph Corporation.

Design work is complete and the first ship in the program is in production.

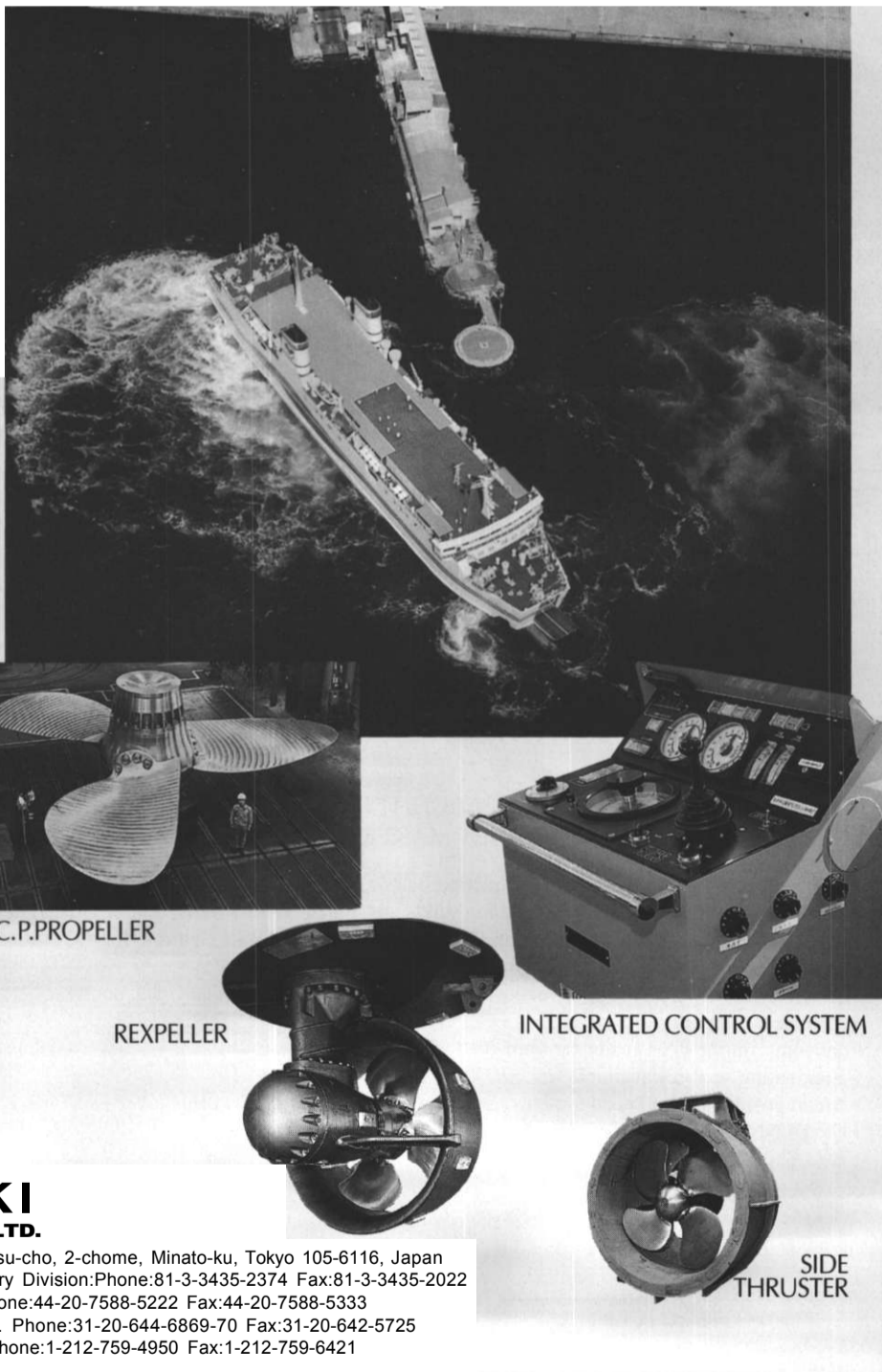
To date, contracts in excess of \$2 billion for four ships have been awarded in the 12-ship program with the eight additional ships planned in the next four to five years. Eight of the ships will be built at Avondale in New Orleans, while

four are currently planned for production at Bath Iron Works in Maine, including the fifth ship, which was part of last month's award. Start of fabrication on LPD 18, New Orleans, will begin at Avondale in February 2002; LPD 19, Mesa Verde will commence at Bath Iron Works in July 2001.



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New Chairman At WQIS

Thomas Guarnera, vice president of Mutual Marine Office (MMO), has been elected to serve as chairman of WQIS, The Water Quality Insurance Syndicate.

The previous chairman, **Ray Marine**, president of International Marine Underwriters (IMU/CU), now known as One Beacon, will be retiring after more than 40 years in the insurance industry. **Mike Jacobs**, vice president, INAMAR — ACE USA, will assume the position as vice chairman of WQIS.

Viking's Evacuation Chute Is Certified

This past May, Viking received tangible evidence of the efforts having been made in terms of research and development through its grant from the U.S. Coast Guard for its Viking Evacuation Chute with associated 100-person automatically self-righting liferafts.

The chute passed the most demanding tests prescribed by the international approval requirements. During a heavy sea trial occurring in the North Atlantic close to the Faroe islands with winds of approximately 15-25 miles/sec. and average wave heights of about 10-26 ft. (3-8 m), the evacuation system was loaded with 15.6 tons in both lee and windward sides — ultimately withstanding this most grueling sea trial.

Tailored to newbuildings as well as the various existing RoRo passenger vessels, the evacuation chute complies with the latest international requirements on their life-saving equipment by July 1, 2001.

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Transas Upgrades Swedish Board Of Navigation Simulator

Transas Scandinavia has upgraded the simulator at the Arko Education center of the Swedish Board of Navigation located just south of Stockholm.

Initially Transas supplied two PC-based Navi-Trainer 3000 simulators and one VTS simulator software package, in summer 1998. Although that original simulator contained no dedicated hardware and featured just one visualization channel per bridge, it was a good platform for future upgrades. In the course of the upgrade, this initial configuration was expanded to a modern-style full mission bridge based on the Navi-Trainer 4000 simulator software. The main bridge is fitted with a complete set of dedicated hardware and seven visualization channels, and two smaller bridges are equipped with reduced sets of kambi controls.

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shore Report

Super Barge Touted For Strengths, Depths


Employed in the oil and gas industry for 60 years, simple and sturdy swamp and posted drilling barges have been a preferred method to drill in shallow

water. This basic design has made it possible for the barge to drill in water depths from six through 24 ft., as well as the ability to be towed and to travel the

Intercoastal waterway, lakes, bays and bayous. With the average drilling depth in the northern Gulf of Mexico ranging between 12,000 and 18,000 ft. in shal-

low water depths, the standard drilling equipment was designed to accommodate drilling depths to 25,000 feet. The new proposed drilling depth is 40,000 ft., which far exceeds the design of standard swamp and posted drilling barges. However, there is a solution. The Super Barge, patented by **Herman J. Schellstede**, has the ability to maintain vessel stability in soft bottom conditions, operating in surf zone ocean areas containing tidal wave conditions driven by hurricane winds, providing lifting equipment to drill to 40,000 ft. depth. In addition, Super Barge is designed to:

- Drill cluster wells and provide well protection systems;
- House solids control systems, which



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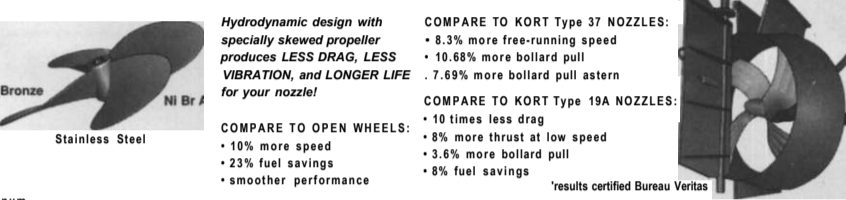
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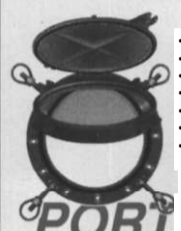
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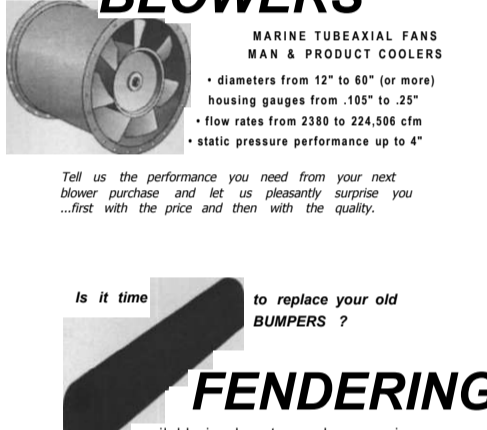
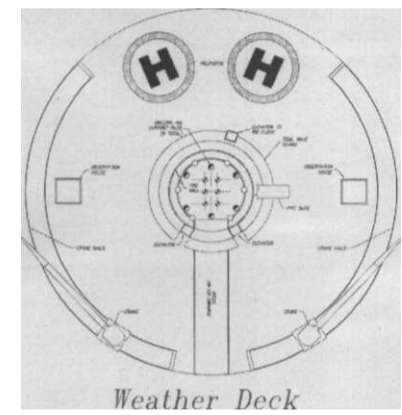
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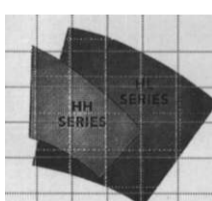


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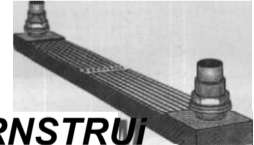
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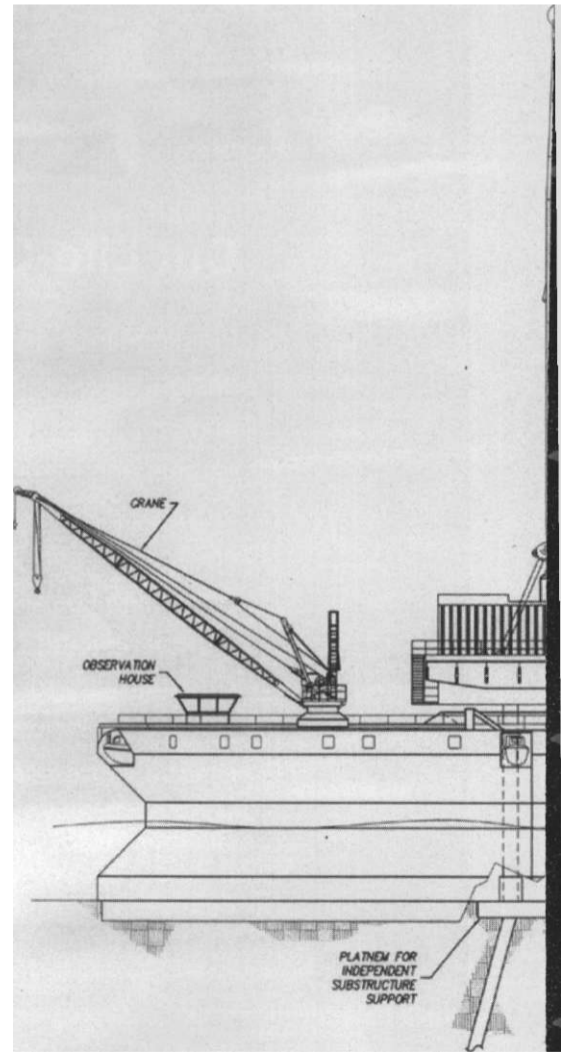


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Offshore Report

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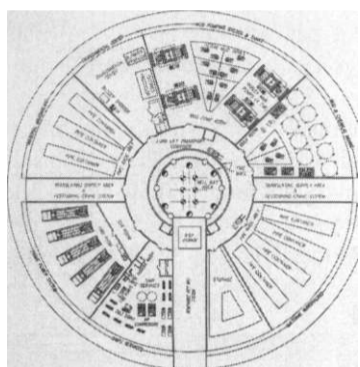
The drilling pod, which is separately supported and described in the Schellstede patent, will eliminate any settlement or misalignment of the drill floor and substructure with respect to the well base.

Herman J. Schellstede and Associates Inc. has served the oil industry world-

wide since 1968. During its 33 years of business in the oil industry, the company has developed various drilling barges, jack-up rigs, submersibles and platform drilling rigs. In 1999, the company developed and obtained a patent on the most advanced drilling barge developed for cluster well drilling,

which is presently working in West Africa. Classed by ABS (restricted service) with USCG Certification, the Super Barge is unique in design, regarding the requirements necessary for drilling to 40,000 ft. employing a barge vessel.

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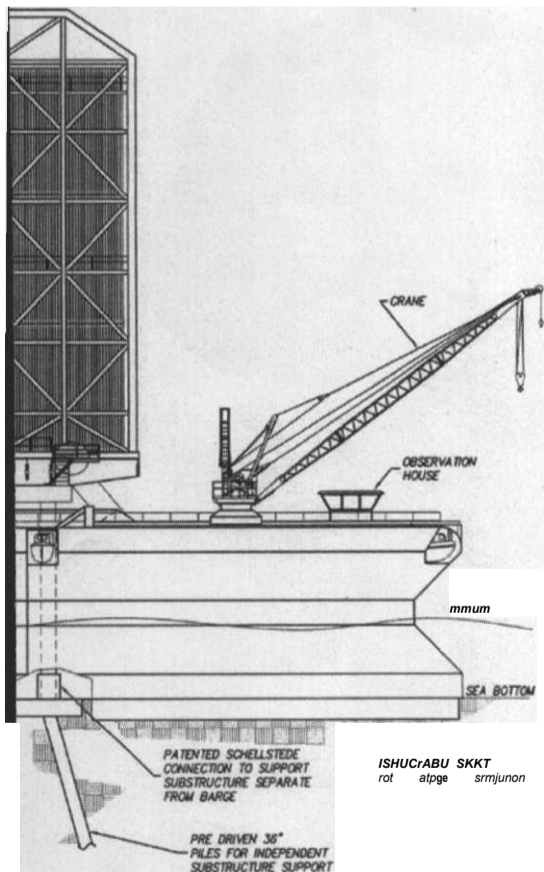


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McAllister Towing and Transportation

After 137 Years—A Legacy Prevails

Through a tumultuous, ever-evolving and always colorful 137 years, McAllister Towing and Transportation has managed to constantly come out ahead. — by Greg Trauthwein

Discussing the marine business with Captain **Brian McAllister** is much like sitting in a "Maritime History 101" course, in that his accumulated knowledge, experience and stories tell the tale of not only the evolution of one company, but an entire industry operating in one of the world's most dynamic ports.

During his more than a quarter of a century at the helm of the family business, Captain Brian McAllister and his company — McAllister Towing and Transportation (MT&T) — have had more than their fair share of wins and losses. However, on the event of the christening of the company's new tugboat Janet M. McAllister — named for McAllister's two-year-old granddaughter, the sixth generation of this historic New York company — MT&T appears to be in as good of shape as ever, prepared to prosper in the ever-changing marine market under the steady guidance of Captain McAllister and all of the McAllister progeny that will follow.

Summarizing almost 140 years of history into the confines of one article is an arduous if not impossible endeavor. McAllister Towing & Transportation, it must be understood, is as much a symbol of New York City as the skyscrapers that adorn the Manhattan skyline. While MT&T is "New York," the company has effectively expanded its influence and markets, and stands today as one of the oldest and largest marine towing and transportation companies in the U.S., operating a fleet of 61 towboats, as well as a number of barges and ferries along the U.S. East Coast and Puerto Rico.

With roots dating back to 1864 when Captain **James McAllister** emigrated from Ireland to New York, shortly thereafter purchasing a small sail lighter which he employed carrying freight between ships and piers in New York Harbor, the company has built an enviable reputation as a leader in the procurement and operation of advanced technology vessels. This adherence to arming itself with the caliber of fleet that will meet today and tomorrow's requirement is embodied in the delivery of the Janet M. McAllister. (Please see related story, page 32)

The Foundation

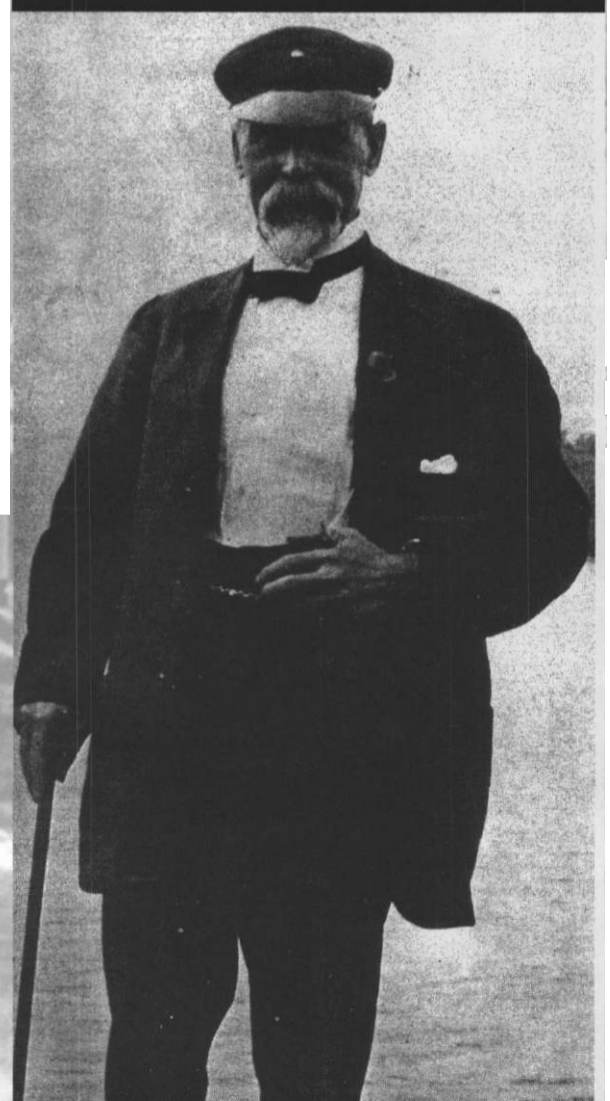
When Captain **James McAllister** — a tall, bearded, handsome man whose family often called him "Whiskers" with affection behind his back — bought and started operating that first sail lighter, it is doubtful he could have known that he was sowing the seeds for one of the more formidable and long-lasting marine businesses in the United States. Modern New York Harbor, much to the dismay of the fraternity of maritime executives with long histories here, is today a far cry from the harbor business that **James McAllister** entered in the 1800s. At that time, taxes on foreign goods entering the port of New York accounted for almost 50 percent of the revenue of the U.S. treasury. In 1884, of the 4,706 arrivals in the Port of New York flying foreign flags, more than a thousand were schooners, 2,600 were brigs and barks, 625 were large sailing ships and 455 were steamers.

•U *ill*

The lighter business in the harbor was booming, and **James McAllister** wanted to acquire more vessels, but needed help. Using money from the business, he paid for family members' passage to New York - first, for brother Daniel at age 19, then William - and also to buy more vessels.

The business eventually grew via a sprawling partnership that included **James McAllister's** brothers, cousin, son and in-laws. Upon adding an additional four or five boats, the Greenpoint Lighterage Co. was formed, with offices located on 31 South St., the fabled "Street of Ships".

The Founder



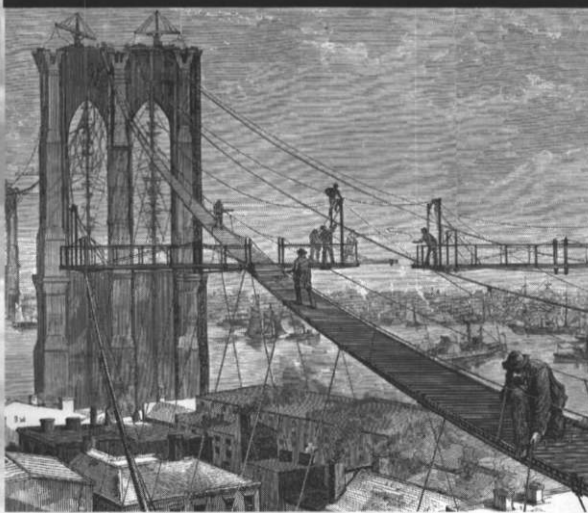
Captain **James McAllister** — aka "Whiskers" — laid the foundation to the McAllister Towing and Transportation dynasty nearly 140 years ago upon his arrival in New York from Ireland.

New York City's Street of Ships



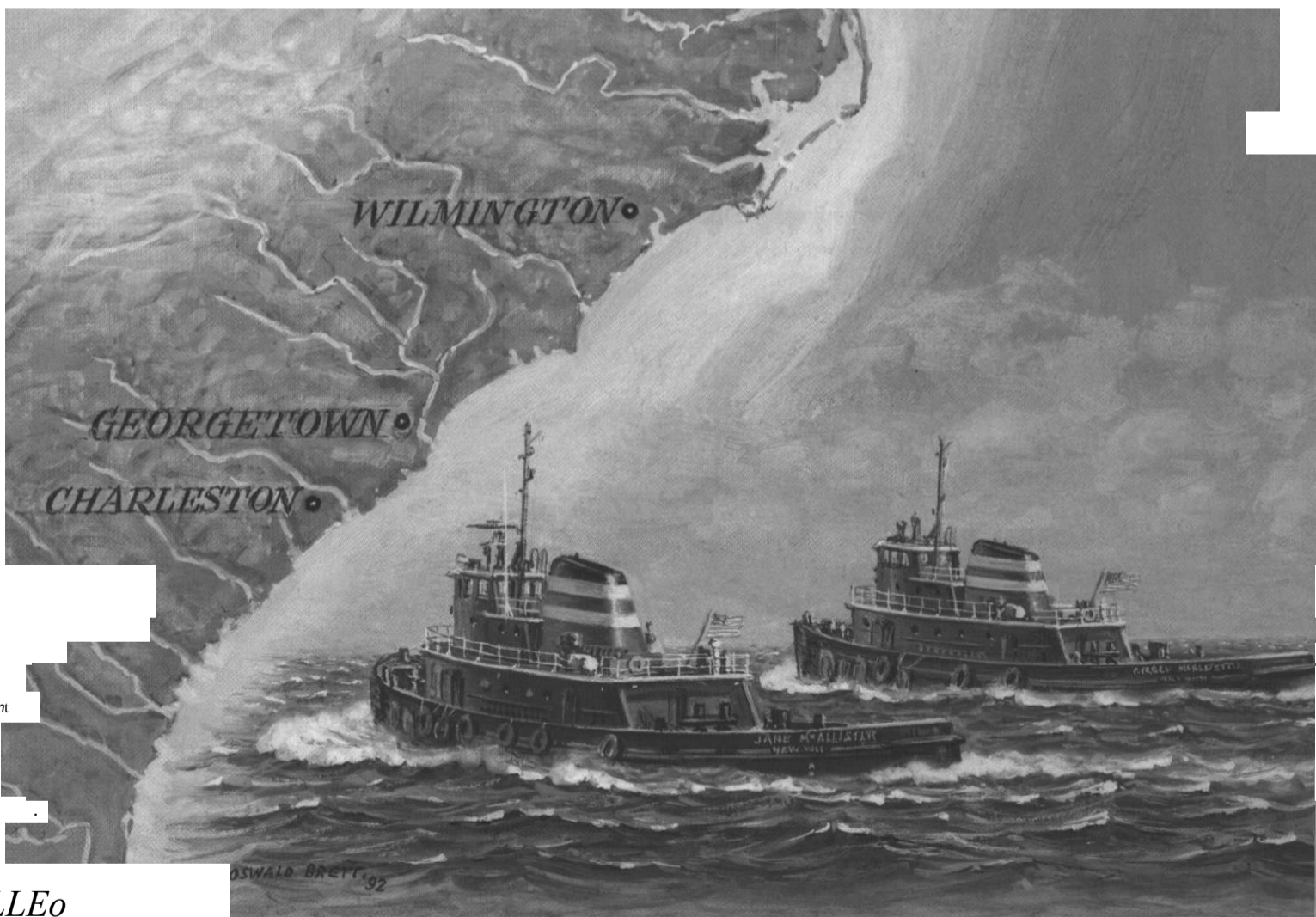
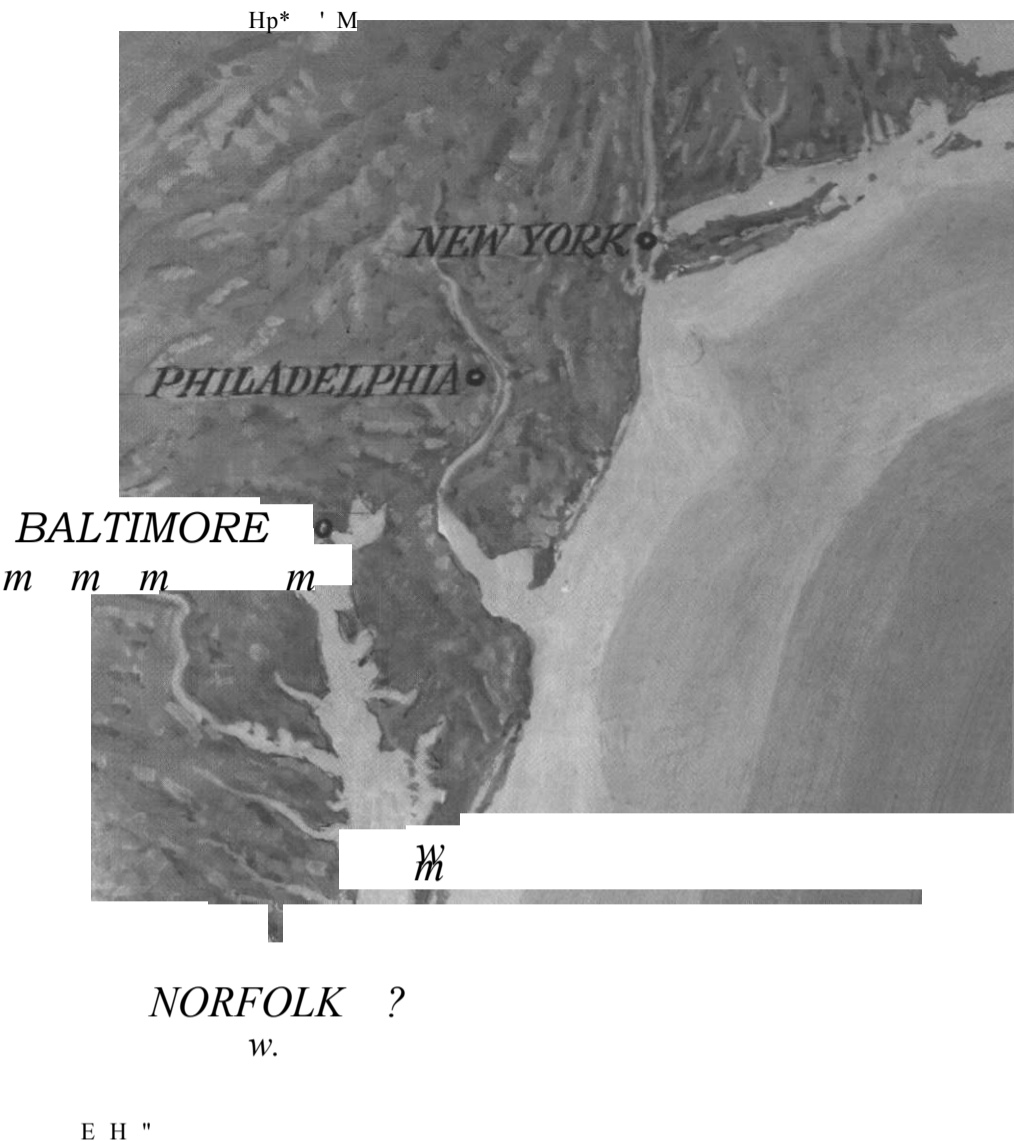
McAllister Towing and Transportation's history is rooted in New York, and the company grew rapidly in the early part of the 1900's operating on the famous "Street of Ships."

The Landmarks



James McAllister and his brothers sailed their wooden lighters laden with cargo past workers, who had just begun construction of the Brooklyn Bridge.

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McAllister

Maritime History

Making the transition from lighterage to towage, with the acquisition of his first tug R.W. Burke in 1876, marked a significant milestone for the company in that it was the company's first propeller-driven vessel. (See story on page 31).

The 75-ft. (22.8-m), 150-hp tug was named after the man who financed its construction in Philadelphia three years earlier. Tugs at this point still proved too much of an extravagance for most shippers for the routine transfer of freight

around the harbor, as slower, yet much cheaper, sail powered vessels were still popular. Towboats, called "luggers," were deployed for towage, and some tugs hauled long tows of barges along the Hudson.

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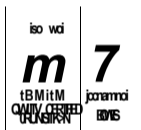
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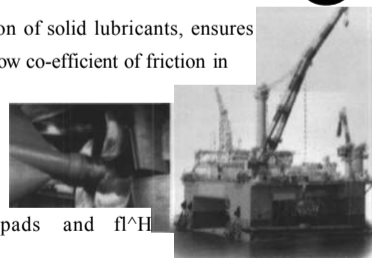
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The McAllisters pose in their office at Broad Street, from which they moved in 1914. L to R: John E. McAllister, Daniel McAllister (seated at desk); James P. McAllister (with mustache); William McAllister (with hands behind back); James McAllister (with beard); Margaret McAllister and Catherine McAllister.

The company also moved into the business of moving oil about the harbor, as A.J. McAllister Sr. once recounted:

"My father had converted a number of his sail lighters into bulk oil carriers by putting bulkheads in them and caulking the bulkheads and the ceiling in the sail-lighter, so that a tank was thereby formed for carrying oil in bulk. They carried perhaps thirty tons of oil. And they sailed it from Bayonne, to Brooklyn, Manhattan, wherever. This small fleet became quite a factor in the moving of oil in the harbor."

It seems though, that the company seemingly missed the boat on another major deal, which would have indeed drastically changed the direction of the family company, as A.J. McAllister once again recounted:

"Reportedly John D. Rockefeller came to my grandfather because he was in the process of forming the major Standard Oil Company, or had dreams of doing it, and offered my grandfather a substantial piece of the company if he

The Great Escape



McAllister grabbed headlines in 1912 when the great Houdini performed the "Great Packing Case Escape" after being shoved overboard from the side of the tugboat J.P. McAllister. Captain Jim made the magician sign a release.

... & The Family, today.



McAllister Towing and Transportation today. L to R: Captain A.J. McAllister, Eric McAllister, Brian McAllister and Buckley McAllister.

would put his fleet in for the acquisition of stock in the new Standard Oil Company. And unfortunately for the McAllisters, my grandfather said no."

Regardless, the company continued to prosper in parallel with the burgeoning shipping business of New York harbor, and by 1900 Greenpoint Towage and Lighterage had acquired more "propellers."

It was around this time that the company officially made the transition to McAllister Brothers, the company name that would exist up until the 1990s.

The New Generation

"When we took over in 1974, we were very aggressive, and understood that east coast port growth was going to flatline," said Captain **Brian McAllister**. And so as the prediction crystallized, so too did the future course of the family's business. The company, founded with the sail lighter that **James McAllister** purchased long ago, moved its last lighterage barge — a shipment of coffee — in 1980.

It was an aggressive attitude towards expansion, combined with a myriad of factors including the fickle oil market, which almost led to the company's demise in the mid 1980s.

"We entered the oilfield business with supply and crewboats out of Houma, La., and eventually grew the fleet to 35 vessels," said Captain McAllister. While the company continued to add an impressive number of vessels, it also continued to add more and more debt, and Brian McAllister's father, Anthony J. McAllister, grew concerned.

I remember my father telling me about the Great Depression, and how the 1930s reduced McAllister from a large, prosperous company to the operation of one tug, he said. "He had to take a job in a shipyard to support his family." While Brian shrugged off the warnings — reasoning there would never be a depression similar to the 1930s again — the bottom nearly fell completely from underneath his feet, literally, with the great oil crash in the mid 1980s.

The company had aggressively acquired — with little or no cash down — a total of 35 supply and crew boats, 18 of which were working in the Persian Gulf. During the mid-80s, Gulf of Mexico supply boat dayrates plummeted from

\$3,500 per day to \$600 per day, and the crews that were working were being paid 50 percent of their wages. The 18 boats that were working in the Persian Gulf, almost overnight, were reduced to three boats working and 15 tied up in Dubai. The boats were tied up literally, yet at the same time had restricted the company financially, as each had an enormous mortgage with the owner signed on for them personally. "The stability of port operations helped the company survive this depression ... barely," Captain Brian McAllister said.

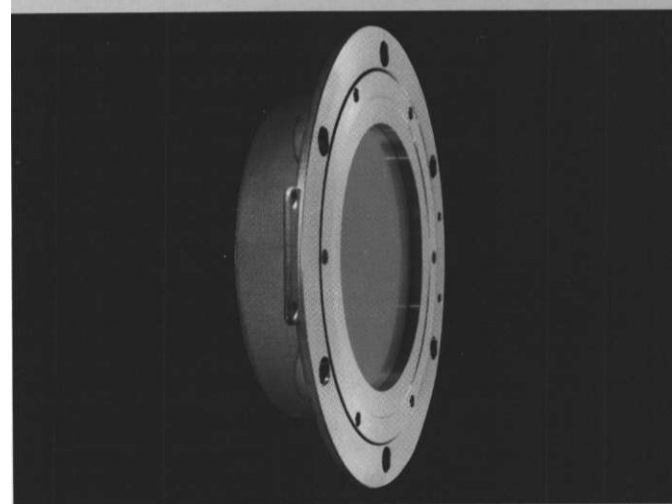
By the early 1990's the price of oil rebounded and the company's fortunes grew with the new oil economy. Now McAllister once again moved into oil field service and even oil production. Brian's brothers and cousins who owned the business all retired, or in the case of his brother **Bruce McAllister**, left to become the Deputy Commissioner for the Maritime Administration in Washington. This left Brian with only one partner who felt the low margin business of tugboating should be sold. This led to a long legal dispute that was ultimately settled. His partner received the offshore services company, Offshore Express, the fabrication company, Offshore Specialty Fabricators, and the oil producing company, Petrotech. Brian retained the tugboat operations and the ferry service from Port Jefferson, N.Y., to Bridgeport, Conn., which was the very foundation of

the company. Most importantly, he retained the company with very little debt "and I'd like to keep it that way," he said emphatically.

A Promising Future

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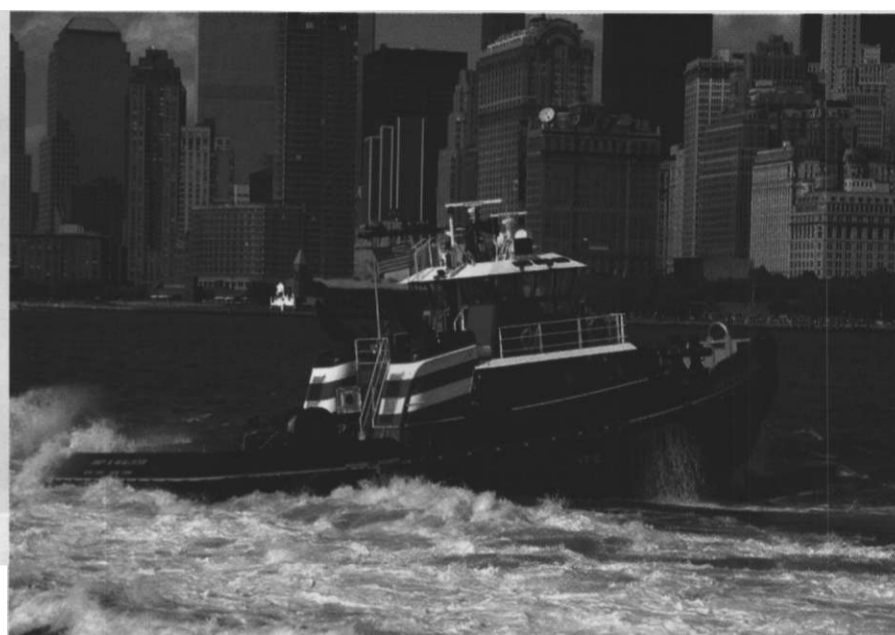
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The tug Helen McAllister, ex Admiral Dewey, was built in 1900 at Port Richmond, N.Y. for the Berwind-White Coal Co. The tug spent the next 55 years as the stalwart of the Berwind-White fleet, towing coal barges to bunker the myriad of ships in New York Harbor. As coal bunkering diminished, the tug was sold to a tug operator in Charleston, S.C. When it was launched, the vessel represented the very latest in technology, much as the new Janet M. McAllister (pictured right) does today. Originally powered with a triple expansion compound steam engine developing 900 hp at a working pressure of 150 psi, the tug was repowered after WWI with a 1930s Fairbanks Morse Diesel engine. In the 1980s McAllister towing acquired a Charleston tugboat company, which owned the vessel. The tug was renamed the Helen McAllister, and continued to work in the ports of Charleston and Georgetown, S.C. In 1992, the vessel was brought to New York Harbor for Operation Sail. Helen retains the characteristic tall stack and the original bell system used to transmit orders to the engineer. Helen's life continues today, as it is now part of the permanent collection of the South Street Seaport Museum. The vessel is available for charter, as are the Seaport's other historic vessels, including the schooner Pioneer and the tug W.O. Decker.

Photo Credit: Stephenie Hollyman



Janet M. McAllister — which was recently built by Eastern Shipbuilding — embodies the company's commitment to investing in the latest technology to stay competitive. See related story on page 32)

Photo Credit: Stephenie Hollyman

worked harder than ever to solidify its core competency — ship docking — while adding the vessels, technologies and services that will sustain it for the coming decades. Brian McAllister takes the company's future very personally, and in the twilight of his career he seeks to re-solidify its foundation to ensure its durability for generations of McAllisters

to come. The aggressive approach employed by Captain McAllister in the mid-70s has been replaced by a more calm rationale, ultimately guided by the desire to see his company transcend another five generations. "When people are young there is an insatiable desire to become big and grow, but you have to

(Continued on page 33)

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Entering the Diesel Engine Age

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recol-
lection, around 1906. I think she was built in Athens, N.Y., on the Hudson River. She ran for 26 years as a coal burner steam tug, non-condensor, which meant that the steam was going up out into the air and they had to get fresh water every day. It took hours to get the tank filled up. She'd turn it into steam to run the engine, and then she'd push it out through the exhaust into the air, not recondensed and used over like the later boats. By 1927, it was impossible to run her anymore as a coal burner and it wasn't worthwhile to convert her to oil because she was too low powered and too small. But diesels were then beginning to become a possibility for marine propulsion. I bought a 375 hp air injection diesel engine and when I came back and told my father that I had bought it, he fired me, because I had spent \$13,000 of money that he didn't think he could afford. However, I had committed the company to the engine and he took it. Thereafter I induced him to let me tear out the steam engine and put the diesel in the Daniel, with all diesel auxiliaries, replacing the steam auxiliaries. There were practically no people in the port in the engineering field who knew about diesel engineering. So, having written my thesis on graduation from Stephens about the marine diesel engine, I was qualified to do what I hooked up to do. Anyway, by 1927 or eight, I had her completed and operating. Now before they converted her from coal and steam to diesel engine, the boat used to burn five or six tons of coal a day, at five or six dollars a ton in those days. She had to go for coal every day, or every second day, depending on how many hours she worked. She

"The Daniel McAllister has been a historical boat in this firm for the reason that I am going to tell you right now. She was built, to my recol-

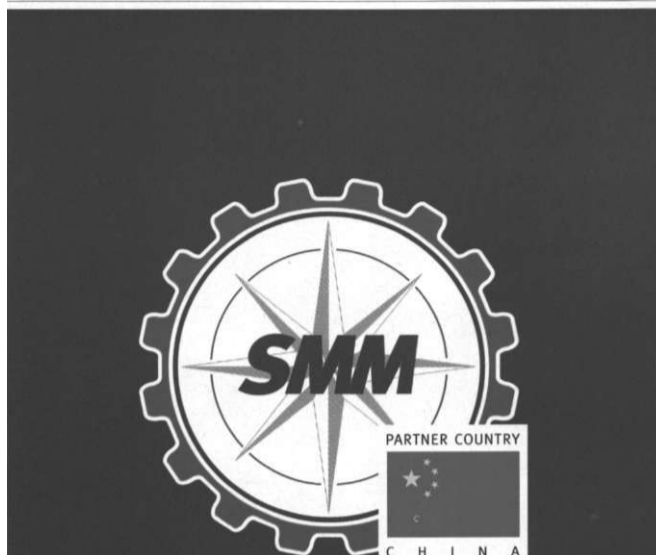
also had to go to the water dock almost daily to get water. This took up a lot of her operating time. When I put the diesel engine in her, I practically doubled the horsepower in her from 200 to 375. She ran, she burned 10

gallons an hour at \$0.04 a gallon, or \$0.40 an hour. So if we ran her for 10 hours, it was four dollars a day for fuel instead of 25 or 30. Not only that, we didn't have to get fuel in her but only once a month. She didn't have to go for water or coal. This gave her much more operating hours. Although my father criticized me terribly for having done it, after she was running awhile, saving all that

money, he started bragging to everyone about what his son from Stephen's Tech had accomplished.

But he would never admit it to me. His friends would come and tell me. She ran all the way into the Second World War with that engine."

— Excerpts from an interview with Anthony J. McAllister, April 15, 1980.



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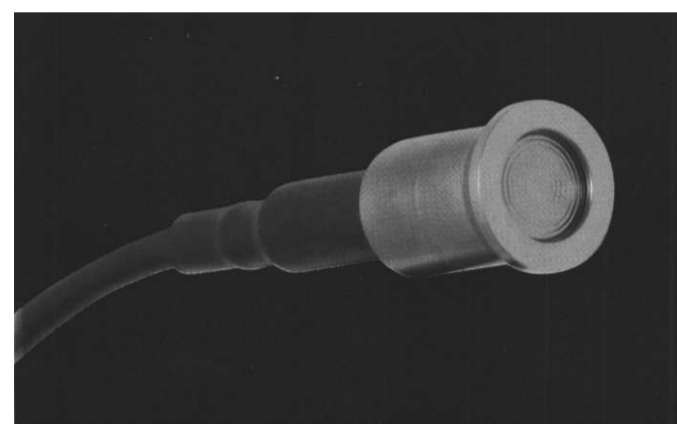
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Young Anthony J. McAllister replaced the tug Daniel McAllister's steam engine with the company's first diesel engine, a 375 hp unit that he purchased for \$13,000. Upon hearing the news that he bought the engine, his father fired him.

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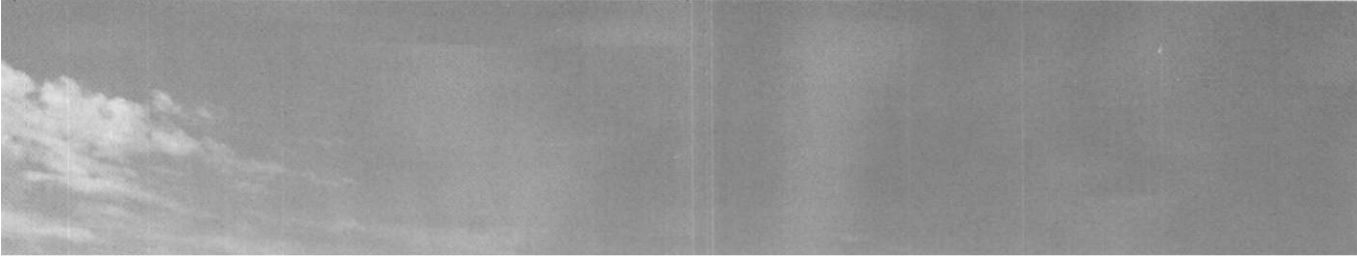
Maritime History

Janet M. McAllister Debuts In N.Y. Harbor

Central to McAllister Towing and Transportation's future growth prospects is the acquisition of vessels like the new Janet M. McAllister, a highly sophisti-

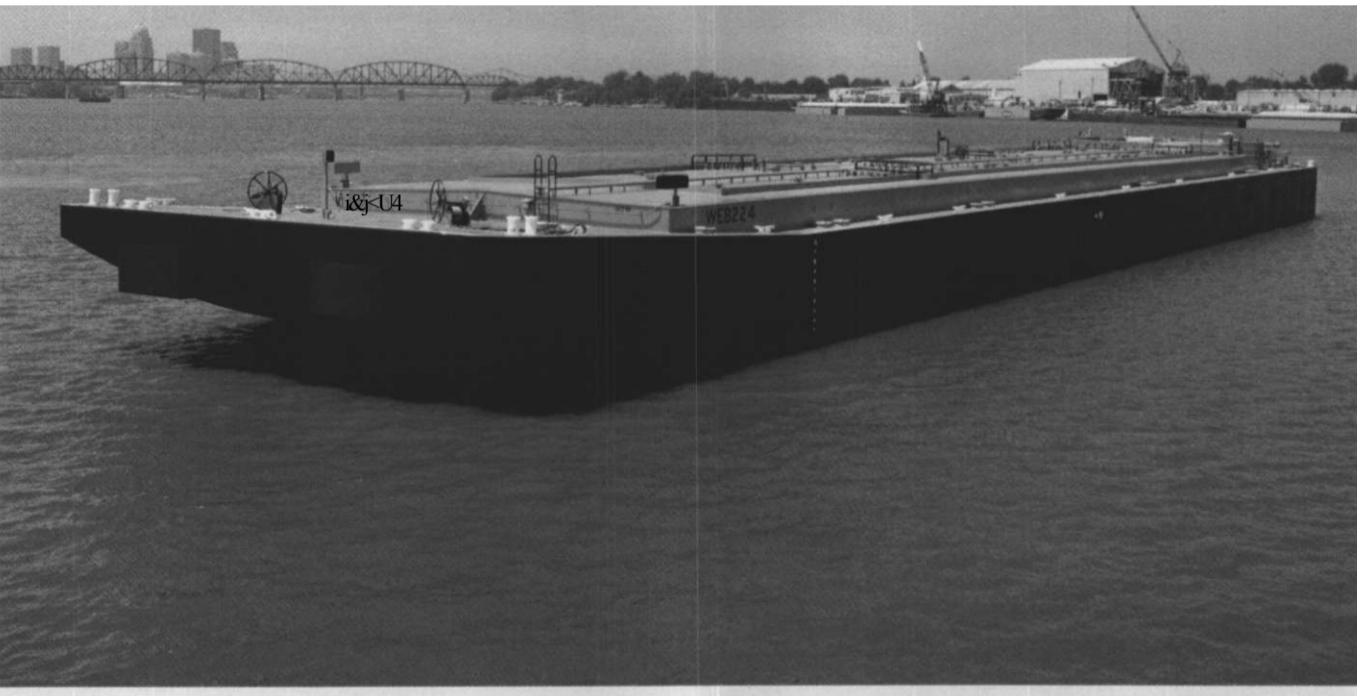
cated Z-drive tug built by Eastern Shipbuilding which "has all of the bells and whistles," according to **Captain Brian McAllister**. New York City recently

welcomed the new vessel, its most powerful tugboat, was named after two-year-old **Janet M. McAllister**, daughter of **Buckley McAllister**, vice president and



Janet M. McAllister, New York's most powerful Z-drive tug, put on quite a show during its christening ceremony in July 2001.

Photo Credit: **Stephenie Hollyman**



The latest addition to the MT&T fleet was named after two-year-old **Janet M. McAllister**, daughter of **Buckley McAllister**, vice president and general counsel of the family-owned company. Photo Credit: **Stephenie Hollyman**

general counsel of the family-owned company.

"My company was started in 1864 by my great grandfather," said President **Captain Brian McAllister**. "Janet is my granddaughter, so she's part of the sixth generation in a family that has stayed in the same line of work."

The event, to welcome the 96-ft. (29.2 m), 5,000-hp, Eastern Shipbuilding-built tugboat home, drew a crowd of industry and non-industry gawkers as the vessel was put through its paces off of Pier 16.

Powered by a pair of EMD 12-645 E7B diesel engines that generate 5,000 hp for the Schottel SRP 1212 Steerable Kort Nozzle Rudder Propellers, the vessel is able to achieve a free running speed of 13.6 knots.

As is to be expected from a vessel of this type, maneuverability is incredible; a fact surely confirmed by the hundreds of people that stopped to stare as the vessel approached the pier at full speed, turning at the last second and initiating a series of tight circular spins.

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Main Particulars

Janet M. McAllister

Builder Eastern Shipbuilding
 Owner McAllister Towing &
 Transportation Co., Inc.
 Designer Jenson Maritime Consult.
 Flag U.S.A.
 Contract Date Oct. 20, 2000
 Launch Date May 1, 2001
 Delivery Date June 26, 2001
 Length 96 ft.
 Breadth, molded 34 ft.
 Displacement 358.95 long tons
 Draft 12.5 ft.
 Depth 14.7 ft.
 Speed 13.7 knots
 Classification ABS
 A1 - Towing Service AMS
 Fuel Oil 31,280 gal.
 Water Ballast 9,240 gal.
 Freshwater 6,700 gal.
 Lube Oil 500 gal.
 Main Engines (2) EMD 12-645 E7B
 Supplier Engines Systems Inc.
 Total HP 5,000 hp @ 900 rpm
 Fire Pump Drive Detroit Diesel
 Z-Drive Propellers Schottel
 Generator Engines Detroit Diesel
 Torsional Couplings American Vulkan
 Engine Controls Schottel
 Steering Controls Schottel
 Deck Machinery NETEC
 Shafting Schottel
 Coatings Devoe
 Radar(s) Furuno
 Compass Ritchie
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 Waste Management Humphrey
 Doors/Ramps/Lifts McFrogg
 Fire Monitors Elkhart
 Foam Eductor Skum
 Fire Monitor Pumps Goulds
 Alarms & Monitoring Marine One

(Continued from page 30)

balance between growth in a correct manner versus taking on too much debt ... and that's tough," McAllister said. "If the decisions are just put to the side, you can end up with a lot of money and no company, or no money and no com-

pany.

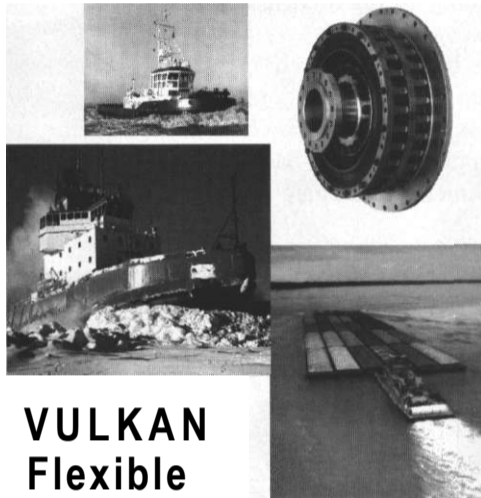
"Is the country headed for a deeper recession? I don't know, but I don't want to become too aggressive now," he said. "I'd much rather make the mistake of increasing the company's liquidity and decreasing our debt, while maintaining our position in an industry that demands

constant rebuilding and upgrading."

But at the same time, he did confide that the company is currently contemplating an acquisition. While he could not elaborate, he did indicate that it would be an acquisition of a business the

(Continued on page 35)

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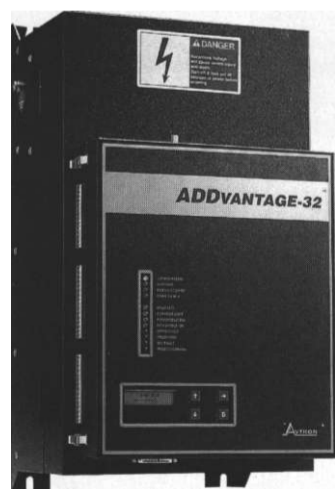
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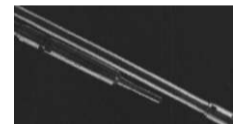
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Maritime History

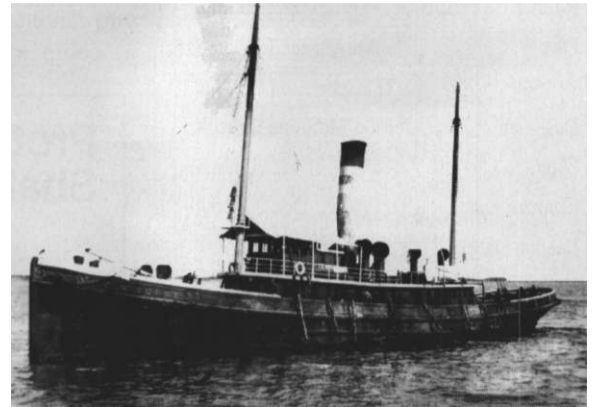
C.W. Morse — An Innovative Vessel

Although not built originally for McAllister Brothers, C.W. Morse was one of the more innovative vessels of its time, and put to good use by the company. The sea-going tugboat was a giant "high seas" tug, one of the largest tugboats in the Atlantic at the time, measuring 154-ft (46.9-m) with a steam engine that generated 1,050 hp. She was built in Bath, Maine for the Kickerbocker Ice Company in 1889 to compete with schooners in the ice trade, and was truly a pioneer of the tug-barge combination.

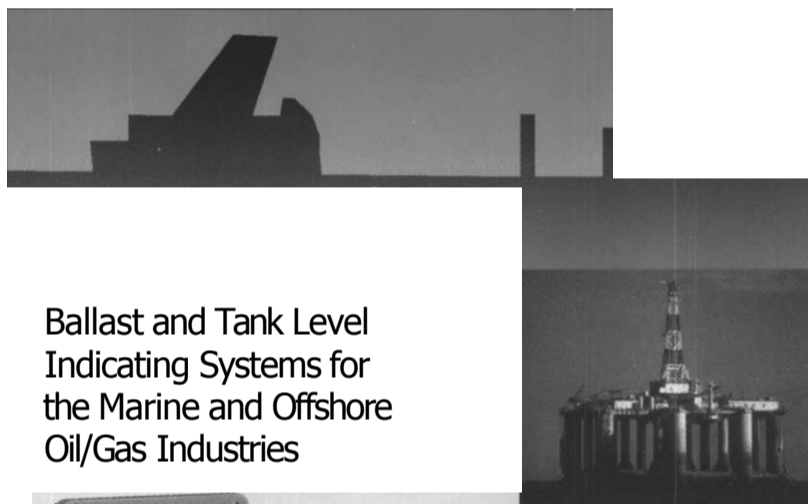
The vessel was bought from Cornell Towing in 1912 and formed the West India Trading Co. as a joint venture. It was decided to employ the vessel to tow a mas-

sive barge loaded with molasses between Cuba and New Orleans, an endeavor that proved very profitable. Four coal-passers shoveled coal to fuel the Morse's furnace while and four oilers and an engineer maintained the tug's massive engine as she plowed through the seas between Havana, Cuba and New Orleans. Condensers recycled steam, freeing the tug of the need to have daily access to freshwater supply.

Both the tug and her barge, on March 7, 1914 by account of Captain **Jim McAllister's** journal, were equipped with a wireless telegraph in case the hawser should break, as the Marconi Company had introduced wireless telegraphy to American shipping in 1904.



The C.W. Morse was a pioneer of the tug-barge combination.



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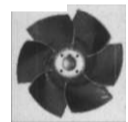
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(Continued from page 33)

company knows: "it would have 100 percent synergy with what we do now ... we're not looking to dive into new fields, or make acquisitions just for an acquisitions sake." The move, if and when it happens, could go a ways in leveling the playing field with longtime rival Moran, which gained a leg up on its close rival with the acquisition of Turecamo maritime in the mid-1990s. "[The purchase] was really a disappointment to me," said **Brian McAllister** in a 1998 interview with *MarineNews* magazine. "McAllister had the reserves to buy Turecamo, but we couldn't resolve our own problems quickly enough."

Of the business MT&T already owns, Captain McAllister admits that the ship docking portion of the business is not an area for future growth, primarily due to the growing trend towards larger ships and deeper channels, meaning that more cargo can arrive on fewer ships. The push for increasingly larger container ships and tankers, often found within the pages of *Maritime Reporter*, is a testament to this trend. He notes that this is hardly a new trend, rather a long, drawn-out attrition which has resulted in the a marked reduction in competition, from nearly 50 tug and towing companies that used to service New York Harbor to, basically, McAllister and Moran today.

Conversely, the demand for Z-drive vessels and their unique capabilities is set to expand significantly, as will the company's fleet of this type over the coming months. While Captain McAllister declares the power and maneuverability of the current Z-drive as outstanding, he does concede that the vessel's capabilities are a bit of an overkill, noting that only rarely will such maneuverability be required in the normal course of operation. However, vessels of this capability are needed to win contracts, and McAllister is ensuring that it is equipped to handle the demand. The new Z-drive fleet — that currently consists of five boats, three owned and two chartered — will be expanded next year, said Captain McAllister. "There are certain clients (for example, the Navy) that demand this caliber of boat. If you don't have them, you don't get the business," he said. "There are bids out right now that require this type of boat, and that's why we built them at 5,000 hp with all of the bells and whistles," so that they could be used in a number of demanding applications.

Identifying oil barging as a potentially significant growth area, the company is also contemplating building an offshore tug that would be able to handle the articulated tug barges, units which have increased in popularity due to their inherent efficiencies, and units that will likely be in higher demand as shuttle

tankers if and when Floating Production Units start operating in the deeper waters of the Gulf of Mexico.

In addition to ATB's, McAllister would like to see the company build on its container barge business. Currently, MT&T owns a pair of container barges holding up to 640 TEU's, which should be high-

ly profitable by now. The company entered into an agreement two years ago to haul garbage from New York to Virginia, but an environmental concern has put the contract on hold with fears of transporting the garbage on the waters of the James River. Meanwhile, the garbage is moving — nearly 12,000 tons

per day — via truck and rail, which are obviously more expensive options. McAllister is confident, however, that the contract will soon enter force, putting the barges back to work, and he is currently negotiating to increase the size of the company's container barging business.

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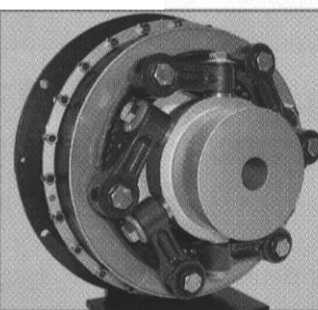


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SCI Dedicates Houston Facility

Seaman's Church Institute (SCI), recently opened a simulator training facility in Houston. SCI's third facility represents state-of-the-art technology as well as world-class instruction for professional mariners. After attending the Center's first training class in April, Kirby Instructor **John Moyle** said, "The simulation was so real that when they stopped the simulator, I actually lurched forward." Moyle has over 30 years of experience as a captain and is now an instructor.

"Training is more than increased efficiency. A well-trained crew saves lives and protects the environment," said Captain **Eric Larsson**, Director of the Center for Maritime Education that also includes SCI training facilities in New York City and Paducah, Ky. Thirteen leading maritime companies in the Gulf Region have already committed to more than 40 weeks of training over the next five years.

The training offers professional mariners an opportunity to refine their skills in an environment that simulates real life. The four bridges/wheelhouses are actual size, and the simulations are constructed from field research, including digital photography, to produce details such as shore-side landmarks. Set in 50-ft. diameter theaters, the screens offer peripheral as well as forward views. The simulation even includes the sounds and vibrations of the engine.

When the American Waterways Operators (AWO) instituted The Responsible Carrier Program in 1994, its goals included consistently reliable, always safe, and environmentally benign cargo transportation. The AWO realized that professional training was critical to reaching this goal. **Thomas Allegretti**, president of the American Waterways Operators, recalled, "That's when we witnessed what surely must have been Divine Intervention. A man with a collar and a vision emerged to present us with the gifts of these centers for maritime education. They give greater worth and professionalism to the men and women who navigate our vessels."

And "that priest and his organization" added more possibilities to this Center. "We can train crews from deep-sea, coastal and inland vessels that work the Gulf Region waterways. SCI did this database-driven simulation created in-house," said the Rev. Canon **Peter Larom**, SCI's Executive Director.

"SCI takes the mission of the Church into the heart of its very sophisticated training for mariners," said the Rt. Rev. E. **Don Taylor**, Vicar Bishop of New York City who blessed the facility.

The Episcopal Diocese of Texas also welcomed SCI with a Bible presented by the Rev. **Laurence Gipson**, Rector of St. Martin's Houston, the largest

Episcopal congregation in Texas.

Last year, over 6,800 ships and 158,000 barges traveled the challenging Houston Ship Channel. These vessels

navigated more than 30 miles through a narrow channel from Galveston Bay to the Port of Houston. Port of Houston Authority Chairman **Jim Edmonds** said, "This Center provides real life training in a risk free environment. We need this kind of ongoing training as we continue to grow."

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Eastern Europe

Gdansk Shipyard Leads With Myriad of Conversions/Repairs

Gdansk Shiprepair Yard Remontowa has expanded its formidable reputation with the completion of two RoRo to cableship conversions. Located in

Poland, the yard took on its premiere job within this niche in December 2000 when it converted the vessel Prerow, followed by Lodbrog in January 2001. The

sisterships, which measure 459 x 66 ft. (140 x 20 m), were built at BEB Mathias - Thesen - Werfit in Wiesmar, Germany in 1983 and 1985, respectively.

Presently Lodbrog is property of the Danish company, Alcatel Submarine Networks Marine, and Pretow to Lux-shipment Co., France. Both vessels will be delivered to the shipowner in October 2001, at which time they will conform their purpose, appearance and names; they will also be adapted to the inspection and repair of underwater telecommunications cables.

While the project of the conversion and part of the technical documentation were prepared by a Norwegian company, the remainder of the technical and most of the electrical documentation were prepared by Remontowa's Design office.

The converted vessels will house a special appliance for controlling the tension of the cables laid, their transportation and repair. The shipyard will also install four new electric generators — powered at 9 MW, that will supply (by a distributor of 6.6 kV and 380V) the cables devices and four tunnel thrusters on each vessel, which is an essential component during the dynamic positioning of ships at work.

In addition to installing new living and social quarters onboard, the shipyard plans to add new superstructures and navigation bridges to the vessel, as well as six special cable tanks.

Also occurring this summer at the yard was the modernization of the 259 x 45 ft. (78.9 x 13.6 m) St. Barbara. Owned by oil and gas search and exploration company Miliana Shipping Company, the vessel is used for research and geologic work, and drilling and diving.

St. Barbara's three main engines, gearing and assembly sets were repaired; two tailshafts with power propellers, two tubular thrusters and steering sets were disassembled and modernized. The vessels' moonpools were modified, and its Stern A-Frame for special research



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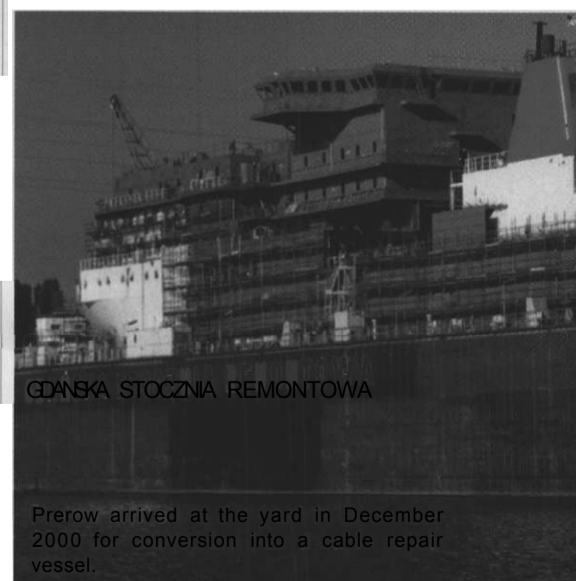
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Prerow arrived at the yard in December 2000 for conversion into a cable repair vessel.

Hyundai, MAN B&W Are At Top of Engine Power

By *David Tinsley*, technical editor

Rising Korean aspirations as to market influence and technological standing could alter the established order in an

important segment of the engine business. While MAN B&W announced opening contracts for its new L21/31

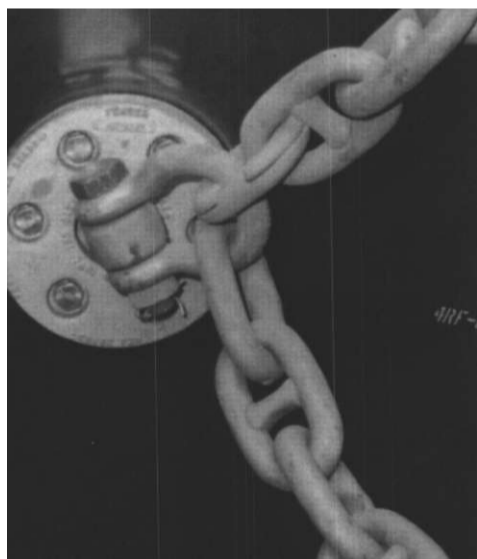
design as a marine auxiliary, Hyundai Heavy Industries was preparing to roll-out its first-ever, self-originated engine type targeted at a similar power range.

The H21/32 signals the emergence of Hyundai, the world's largest producer of marine diesels, as a designer in its own right. The company's development of the in-house Himsen brand denotes a move towards increased technological self-reliance, given the wholesale dependence up until now on manufacturing licenses from foreign engine firms.

The move has been many years in the planning and is underpinned as much by pure industrial will as by the physical capability to deliver 1.2 million-bhp (900,000-kW) or 500 sets of medium-speed engines every year, as well as 5 million-bhp (3.7 m-kW) or 150 two-stroke propulsion engines.

MAN B&W designs figure prominently in the output of both main and auxiliary plant from Hyundai's engine works at the Ulsan integrated shipbuilding complex, and the European company has sought to strengthen its position in the 950-1,800 kW band with the com-

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compact new L21/31. Initially slanted at marine genset drive applications, the type has made an auspicious commercial start through its nomination for the auxiliary installations in the exceptionally high capacity new breed of RoRo trailership contracted by DFDS for its North Sea services.

In the meantime, Hyundai is readying the first examples of its home-grown H21/32 medium-speed series for delivery to China as the auxiliary units in two 37,000-dwt ballast barges under construction at Shanhaiguan Shipyard. Each newbuild will be fitted with two six-cylinder models of the four-stroke design rated at 1,200-kW. The in-line H21/32 covers the 800-1,800 kW range, achieving 160-kW/cyl at a running speed of 720-rpm and 200-kW/cyl at 900-rpm.

While propulsion and gas engine versions are envisioned longer-term, the Hyundai design is targeted at marine genset and stationary power applications at the outset. Early market receptivity to the 210 mm-bore Himsen type was such that sales had reached about 30 sets by July, with the likelihood of steep growth in production on the back of HHI's considerable demand for auxiliary engines deriving from its shipbuilding activities at Ulsan. Of course, shipowners opting for Himsen engines

will be anxious to ensure that they have recourse to the requisite after-sales network.

The Himsen banner has also been raised over Hyundai's version of the more powerful medium-speed engine recently developed in collaboration with the Bergen arm of Rolls-Royce Marine.

Bearing the H25/33 designation, as the Korean equivalent to the Bergen C25:33, the series will initially be available in 5,6,8, and 9-cylinder versions at 720-750 and 900-rpm crankshaft speeds, spanning unit powers from 1,160 to 2,610-kW. Like the H21/32, the H25/33 has immediate relevance for

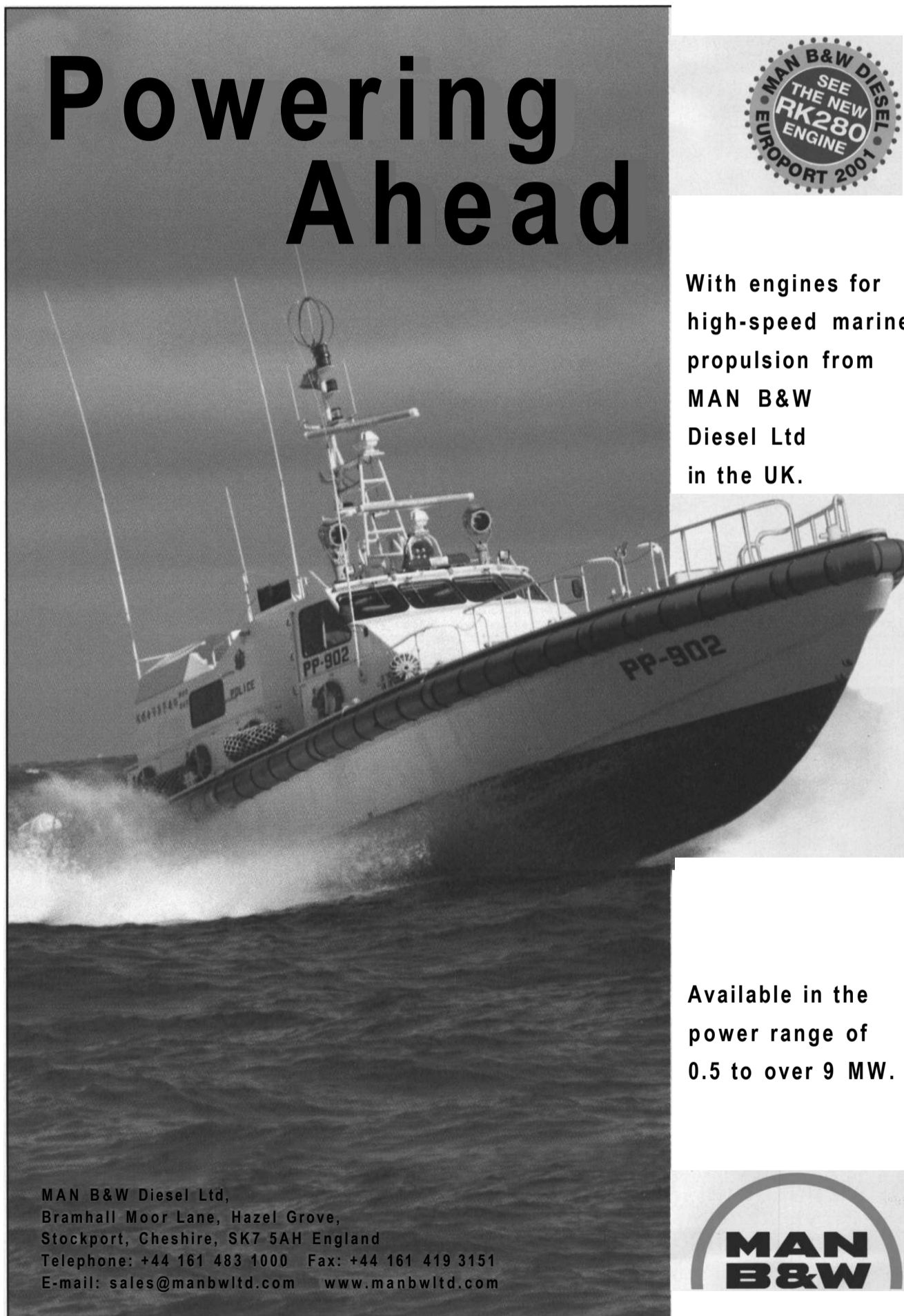
HHI as a genset drive. A six-cylinder H25/33 is under test at Ulsan, and there is every prospect that the 250 mm-bore type will soon join the H21/32 in expanding the indigenous component of engine production.

Application versatility was a key goal in the Norwegian-Korean technical

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Litton Avondale Industries, a subsidiary of Northrop Grumman, delivered Polar Endeavour on April 30, 2001. The vessel is the first of five Millennium-Class double-hull crude carriers built for Polar Tankers of Long Beach, Calif. It and its sister vessels will feature dual, separated engine compartments, in order to maintain power in the event of flooding or fire.

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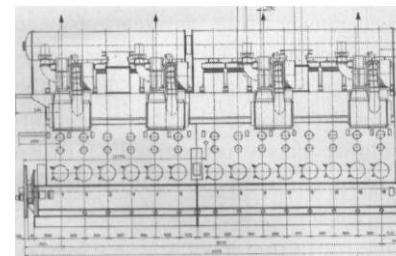
Marine Propulsion Annual

development pact, such that Rolls-Royce is promoting the C25:33 both as a heavy fuel oil (hfo)-compatible marine genset and as a propulsion engine, either as a prime mover in geared mechanical systems or in diesel-electric installations.

From the standpoint of the established Bergen range, the new C-engine offers a considerably higher power density at the same cylinder bore as the proven K-type, underscoring its compactness and relevance to the needs of owners, builders and designers of vessels faced

with, or requiring, limited machinery space. The design brief also included a requirement for a gas-fuelled variant for stationary power generation, with possible marine use.

The C25:33 will make its seagoing debut in a diesel-electric, multi-function



Side elevation of the 14-cyl. Sulzer RTA96C, which measures 89 ft. (27.3 m) overall to the flywheel, and 44 ft. (13.5 m) tall.

offshore support vessel under construction by west Norwegian builder Soviknes Verft to UT737 blueprints provided by one of Rolls-Royce's Norwegian design houses. Four such engines have been ordered by electrical system supplier ABB, which has opted for nine-cylinder models of 2,610-kW.

The project has added technical significance by virtue of the selection of new podded propulsor technology developed specifically for the small-ship market. Two ABB Compact Azipods will deliver the propulsive effect, while maneuvering and station-keeping will be assisted by two 883-kW tunnel thrusters and a swing-up azimuthing unit of the same power forward.

Incorporating a subsea work capability, the 305 ft. (93-m) vessel is due to be brought into commission next year under the ownership of Island Offshore, and in the service of support ship specialist Solstad Rederi. The build schedule calls for the set of C25:33 engines to be delivered from the Hordvikneset factory next spring, with the prospect of a repeat batch for a sistership at the same yard.

Surging investment in LNG carriers has prompted major new endeavors by diesel engine manufacturers to break into a market where the steam turbine has maintained its supremacy as the source of propulsive power. Besides the proven reliability and low maintenance needs of turbines, the possibility to use boil-off gas from the cargo tanks has been one of the key motivators for the use of the mode.

However, the high consumption of the combined boiler and steam turbine system is a drawback, while the refinement of LNG cargo containment design and tank insulation technology is reducing natural boil-off rates, calling for proportionally higher fuel oil usage or forced gas boil-off.

MAN B&W claims that operators could save up to \$2.5-million per year by installing heavy fuel-burning, two-stroke diesel machinery, in combination with a reliquefaction plant for the boil-off gas in a 135,000-cu m LNG carrier, rather than taking the conventional

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route of using a steam turbine in which boil-off is consumed.

"The reliquefaction of evaporated gas will increase the amount of LNG delivered to the customer, and the benefit from the sale of this reliquefied LNG will far exceed any difference in operating costs between a diesel engine with reliquefaction plant and steam turbine," observed the company.

MAN B&W considers that its S70MC-C and L70MC-C low-speed designs are especially well-suited to a twin diesel engine layout where the requirement is for a redundant installation, while the very wide, 900 mm-bore family would cover a single-engine specification. The single diesel engine solution could encompass back-up propulsion in the shape of retractable azimuth thrusters or the adoption of an electric motor acting on the shaftline.

Wartsila Corporation implemented work two years ago on the adaptation of its 32DF dual-fuel engine in response to prospects of demand for LNG as an alternative fuel in the offshore, ferry and coastal shipping markets. Development of the marine DF range, soon to be extended with a gas engine version of its powerful 46-series medium-speed diesel, has also been influenced by the need for a high-performance source of power using boil-off gas for LNG transport as well as production and storage.

Derived from the Wartsila 46, a six-cylinder 50DF engine was run on the laboratory testbed last year, and an 18-cylinder variant started an extended test program at the group's Italian factory in Trieste during May 2001. The first commercial pilot installation is expected to be in operation towards the end of this year, giving the concept its debut in the land-based power generation sector.

It is estimated that running costs for a large LNG carrier using the 50DF in a twin-engine plant could be some 20-30 percent less than with the conventional steam turbine solution. It is also claimed that newbuilding installation would be easier, offering potential savings in shipyard man-hours.

Wartsila's DF gas engine development makes it possible to utilize the boil-off gas efficiently, and dispenses with the need for a boiler. Although direct-drive is one option, Wartsila also advocates electric propulsion using the low-pressure dual-fuel DF gas engines as the prime movers in main gensets. High thermal efficiency, operating flexibility and safety are the main arguments in the comparison. The redundancy conferred by such an installation is as relevant to the pressing requirement for service dependability in the LNG supply chain as it is to safety.

DF engines can be run on gas or on

light fuel oil and heavy fuel oil. Instead of a spark plug for ignition, as normally used in lean-burn gas engines, the lean air-gas mixture is ignited by a small amount of diesel fuel injected into the combustion chamber. The relatively minute amount of diesel fuel injected, typically less than 1 percent at nominal

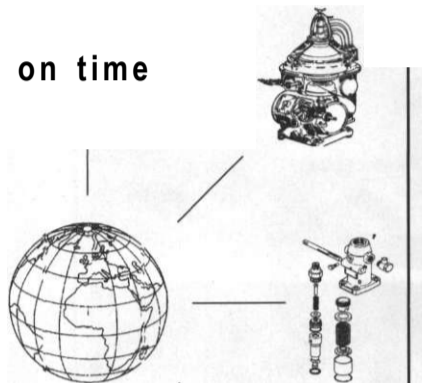
load, has considerable merit from an environmental as well as economic standpoint. It is reckoned that the NOx emissions of a DF engine are about one-tenth of those of a standard diesel engine.

The 50DF employs a wider bore and lower mean effective pressure than the

Wartsila 46 engine, but retains the same stroke and crankshaft speed. The DF type has an output of 950-kW per cylinder, compared to the maximum rating of about 1,150-kW/cyl attained with the latest D version of the 46 diesel. Since it will be made available as both an in-line and vee-form engine, the 50DF covers

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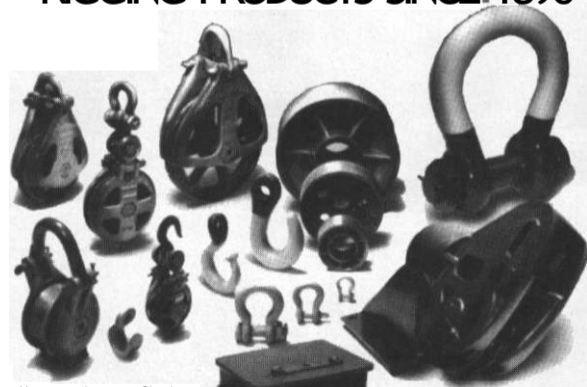


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the 5,700-17,100 kW unit power band.

A concerted drive is under way in Norway to use LNG as fuel in offshore support ships, ferries and other coastal vessels, prompted by a desire to broaden the use of Norwegian resources of gas on both national, economic and environmental grounds. Perceived as a 'clean'

fuel, LNG combustion results in considerably lower emissions of oxides of nitrogen (NOx) and particulates compared with conventional bunker fuels, and carbon dioxide release is also reduced.

Following the milestone adoption of a gas-electric propulsion system in the

312 ft. (95-m) double-ended fjord ferry Glutra, burning locally-derived LNG two new supply vessels to be built for operation in the Norwegian sector of the North Sea are to be equipped with main machinery adapted to run on LNG. It is estimated that NOx output from the ships' plant will be cut by 420-tons per

year as a consequence of using LNG fuel instead of diesel oil. The two ships are expected to be completed for Norwegian owners in 2003, and will bunker liquefied gas from the Coast Center Base at Aagotnes, near Bergen.

New generations of vessel introduced under the Celebrity Cruises and Royal Caribbean brands have given form to the concept of the combined gas turbine and steam turbine, integrated electric drive system (COGES), while gas turbines have been specified as part of the electrical power and propulsion system on a number of cruiseship newbuilds in conjunction with diesel-driven main gensets. Issues of design, operating flexibility, through-life costs and environmental compliance have colored the choice of such systems.

Now the MAN Group has broadened the range of solutions available to the cruiseship sector by offering combined diesel and gas turbine (CODAG)-based electric power installations. Drawing on the respective strengths of MAN B&W Diesel and MAN GHH Borsig, a variable number of diesel engines can be married with one or two gas turbines to provide a codag electric solution matching specific needs. The increasing influence of environmental constraints on cruiseship operations have provided the impulse for a rallying of forces within the MAN organization.


A CODAG configuration can better enable a vessel to economically meet varying environmental criteria without the whole system having to be engineered to the most extreme, local controls. For instance, low-speed cruising might be accomplished in ecologically fragile or sensitive areas using just the gas turbine component of a CODAG plant, by virtue of the turbine's considerably cleaner emissions performance relative to a diesel.


The CODAG approach also offers benefits from a ship design standpoint, given the high energy density encapsulated in compact turbine plant, with its favorable implications for weight and machinery location.

The MAN companies have teamed-up to provide cruiseship powering configurations spanning plant outputs from 30-MW to 120-MW. MAN B&W's indigenous medium-speed diesel portfolio extends to unit powers of nearly 19,000-kW, and potentially to 24,000-kW with the largest engine from the Pielstick stable, while two gas turbine models of 10,500 kW and 26,000-kW have been brought to the combined offering by MAN GHH Borsig.

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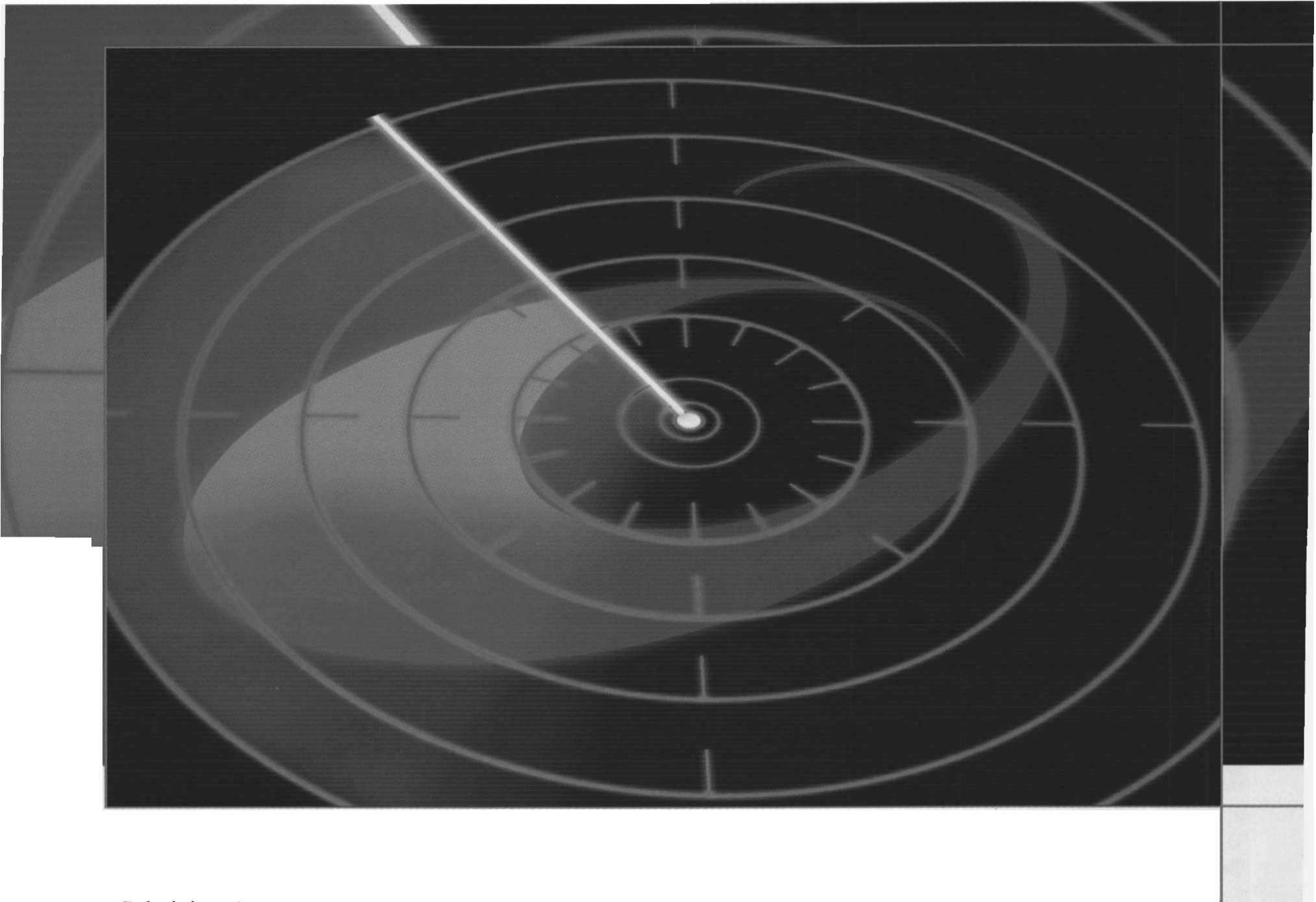
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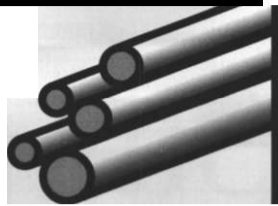
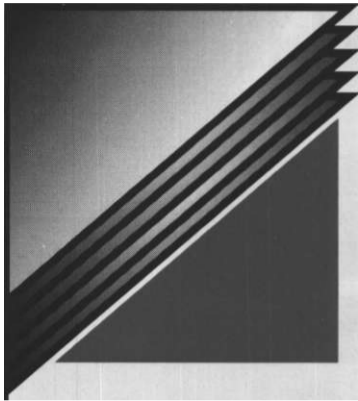
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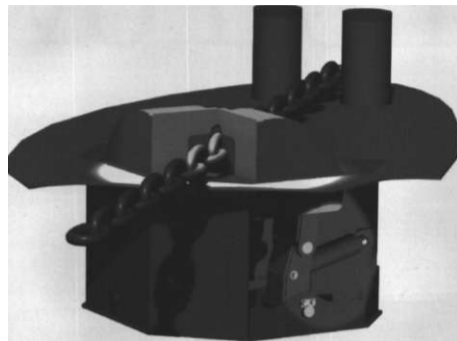
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The arrangements underline the suitability of the W64 for incorporating PTO(power take-off)/PTI (power take-in) systems. The latest project signified shipowners' willingness to consider alternatives to traditional two-stroke propulsion solutions for Handysize tankers. Recovery in the tanker markets, coupled with legislative developments fuelling the retonnaging process, offer prospects of a replacement need for some 500-600 products carriers and chemtankers up to 60,000-dwt in the five years to 2005. Wartsila has identified around 200 new-builds as possible candidates for the W64 engine.

Finnish electrical engineering specialist ABB Marine has advocated the use of podded electric propulsion in tandem with a conventional, direct-drive propeller as an efficient solution to the powering needs of the future breed of ultra-large container ships.

Spies Named New Managing Director of SCHOTTEL



On August 1, 2001, Dr.-Ing. **Peter Spies**, (right), joined the Board of Directors as the new Managing Director of SCHOTTEL GmbH & Co. KG in Spay/Rhine, Germany, the headquarters of a company with worldwide operations in the field of marine propulsion systems. He will initially share the top position with the Chairman, Dipl.-Kfm. **Dietrich W. Bork**, thus heading a group of companies whose main plant achieved sales of \$60.2 million in 2000 accounted for consolidated sales for the group of about \$71.8 million. As part of the transition plan, it is expected that Dr. Spies will take over as the sole MD at Schottel in 2002.

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Frontline's Goal: Zero Emissions

Frontline is now developing methods capable of reclaiming all polluting gases produced during sea transport. Its vessel Front Granite has successfully tested the new technology developed in co-operation with the small Norwegian firm VenturieAS. This new technology reportedly eliminates the problem with pollution gases during operation, and testing has been so positive that Frontline intends to install it on all its oil cargo ships. The technology developed is also promising for solving several other environmental problems both on land and at sea.

Castoldijet Offers New Drive

Italy's Castoldijet offers the new Turbo-drive 400. The model adds to the company's H.C. range of Castoldi waterjet units. H.C. denotes the units' hydraulic clutch, an advanced and exclusive feature of this range of drives. Turbodriven 400 H.C. weighs 480 kg and can be matched to

It has proposed a system for vessels of 9,000-TEU and above whereby a steerable Azipod unit would be mounted immediately abaft the standard propeller. Located on the same axis, but without any physical connection, the 'pulling' propeller of the pod would contra-rotate in relation to the shaft-driven main propeller.

In response to liner operators' clear preference for single-engine propulsion, major players in the low-speed diesel stakes have extended their two-stroke catalogs to bring power concentrations up to 80,080-kW (108,920-bhp) within the ambit of one direct-drive prime mover.

MAN B&W's current program advertises 13- and 14-cylinder models of the K98MC and K98MC-C designs, although it has repeatedly declared a readiness to provide the industry with two-stroke versions encompassing up to 18 cylinders, for power demands to 103,000-kW (139,000-bhp).

engines with outputs up to 1,200 hp. It is designed to be ideally suited to equip twin installation fast patrol vessels and sport boats in the 45 to 60 ft. (14 to 18 m), 16 to 26-ton range.

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Woodward Buys Diesel Fuel Injection Business

Woodward Governor Co. expanded its portfolio of fuel injection technologies for heavy industrial diesel engines with its acquisition of the Bryce fuel injection business of Delphi Automotive Systems. Through its fuel injection business based in Aken, Germany, Woodward has participated in a specialized niche of the diesel fuel injection markets.

B+B Delivers Shaft Components

Hyundai Heavy Industries is building four 7,500 TEU containerships — some of the biggest of this type — for Hapag Lloyd. B+B Industrietechnik (BVI) received the contract to deliver the Simplex-Compact shaft components, as well as Turbulobilge water separators.

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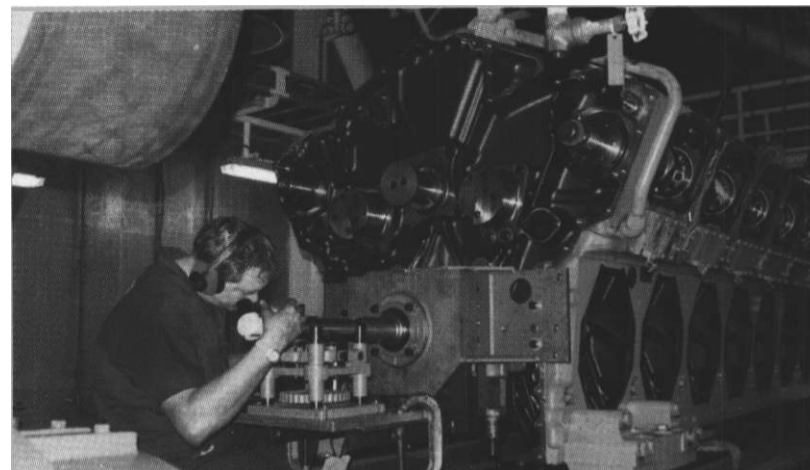
RoRo To Feature MAN B&W

MAN B&W Diesel A/S, Holeby Diesel, has been tapped to supply gensets for a new series of high-tech RoRo ships under construction at the Flensburger Schiffbau Gesellschaft yard. The new generation medium speed design from MAN B&W Diesel will debut in its 21 cm bore configuration for a new series of large RoRo vessels. The auxiliary power package for each vessel will consist of four Holeby gensets, type 7L12/31, with a total output of 5,600 kW. The first vessel is scheduled for delivery in September 2003.

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Marine Propulsion Annual

Axial Fans Improve Engine Performance

By installing axial fans from Delta T Systems, owners can ventilate an engine room with a steady supply of air. The Delta T axial fans mount in the vent system that connects the engine room to outside air. It provides high airflow rates and low sound pressure levels. Manufactured for marine environments, it has a lightweight, flanged housing, as well as patented hubs and airfoil blades. The fans range in size from nine in. models that move 490 cu. ft. of air per minute to 36 in. units that move more than 45,000 cu. ft. per minute. The fan motors are



Delta T Systems engine room ventilation components were used on the high-speed catamaran Flying Cloud built by Derecktor Shipyards.

Delta T was originally established in 1992 as Rolo International with the sole purpose of providing solutions to the age old problem of eliminating water and salt from the machinery space. The Delta T name emerged in 1995 due to the demand from many clients for a complete ventilation and engineering package. Today, the company is dedicated to providing clients with a low cost solution to machinery space ventilation problems. The company provides complete mechanical and electrical engineering with full naval architectural support for the design of any marine machinery space ventilation system, from inlet to outlet.

To date the company has more than 1,000 marine applications, ranging from small pleasure craft to oil field crew and supply boats to U.S. Coast Guard patrol vessels and large motor yachts.

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available for single- or three-phase AC power at 50 to 60 Hx, and for 12- or 24- volt DC power.

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Rolls-Royce Debuts New Thruster Range

Rolls-Royce has launched a new series of tunnel and azimuth thrusters to cover marine applications. Tunnel thrusters will be sold under the Kamewa Ulstein name, and will cover powers from 200 to 3,700 kW. Azimuth thrusters will carry the Ulstein Aquamaster name, and have ratings from 330 to 5,500 kW.

The new products are geared to streamline the burgeoning Rolls-Royce stable of technologically advanced marine propulsion products, as previously various companies which are now part of the Rolls-Royce group competed against each other with thruster ranges which many times overlapped. The streamlining was expected given the company's aggressive acquisition of companies in the past few years, and take full advantage of the deep R&D resources the company offers in its quest to dominate the marine propulsion market.

Tunnel Thrusters
 The new TT series Kamewa Ulstein

tunnel thrusters are available in 11 sizes, covering the power range from 200 to 3,700 kW, and available in CP and FP propeller versions. All models are available with different hydrostatic heads to cater for either deep or shallow draft vessels, and the manufacturing approach allows the company to be competitive on the specialized spec as well as the off-the-shelf markets.

Azimuth Thrusters
 Similar design principles have been used in the new Ulstein Aquamaster azimuth thrusters, a line which includes nine frame sizes and covers the power range from 330 to 5,500 kW, with the option for either CP or FP propellers. The options in this range are large to accommodate a number of design applications, including units, which retract into the hull, are underwater mountable and containerized types, deck mounted units and pulling thrusters.

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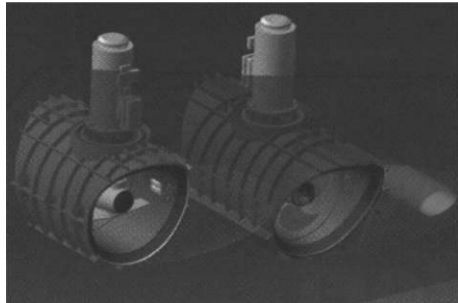
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Custom Thruster Solutions Help Save Time, Money

Brunvoll AS of Norway reports that demand for its new custom-built thrusters is running high. The company has a long history of building thruster units of all types for a wide range of vessels, from cruise ships to offshore ships and cable layers. Its line-up includes its renowned retractable tunnel thrusters, as well as combined tunnel and azimuthing units, various non-retractable azimuthing units, and low noise 'Super Silent' thrusters.

Recently the company identified a need for what it calls customized thrusters, units that are not only designed to meet the specific propulsion and maneuvering requirements of individual vessels, but housed in a purpose-built module to suit the hull structure of a ship, that reduce the time it takes to install the unit. Enabling a shipyard to order a complete thruster installation with all of the necessary steelwork surrounding it reduces construction time, thus reducing the time it takes to complete a newbuilding or retrofit.

However, as **Terje Dyrseth**, Brunvoll's Marketing Director explains, housing the units in a purpose built module — which Brunvoll constructs to the shipyard's specification — doesn't just save time at the yard when the unit is installed. Building the thruster and installing it in this manner also has a number of advantages for



owners and shipyard. "We deliver a complete turnkey package," explained Dyrseth. "Brunvoll not only undertakes to design and manufacture the unit, we also complete the design and construction of the module housing it, thus reducing the amount of fabrication work a yard needs to undertake. A yard building or refitting a ship no longer has to undertake the time consuming business of fabricating the housing for a complex thruster and installing the unit — they simply 'plug in' the module Brunvoll delivers."

On a larger vessel, which may have a suite of two or three bowthrusters and stern thrusters too, considerable savings can be achieved in terms of labor costs and fabrication work.

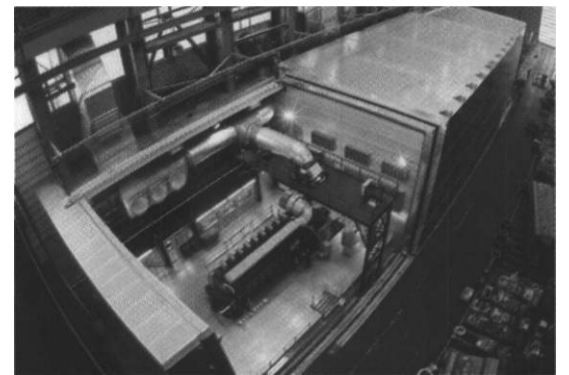
"In the same way that thrusters need to be designed to meet specific requirements for thrust, and should not therefore be regarded as standard products, so every installation is different from a structural and hydrodynamic point of view, and requires specialized skills to ensure that it is accomplished correctly."

Among the fully customized units that Brunvoll has built recently are thrusters for vessels as diverse as cruise ships, shuttle tankers and cable layers.

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M43 Production Under Full Production in Rostock

Following more than one year of renovation and extension of its test bed capacity, manufacture of the MaK M43 — currently the most powerful engine series in Caterpillar Motoren's production program — has been transferred to the Rostock facility from Kiel. As of June 2001, 26 M43s had been assembled



in Rostock, representing a cumulative 250,000 kW of output.

An additional 26 are expected to be produced by year's end. Currently 51 employees staff the Rostock plant, but an upswing in marine engine orders will help this number grow to more than 120 by the new year.

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Marine Training Via Simulation: As Real as it Gets




The abandonment of the concept of controlled simulation environment, as per the National Research Council's endorsed simulation classification

scheme, would constitute a significant step backwards for the quality and effectiveness of maritime training. Now is the time to re-evaluate the

proper role of CBT in training, and, in the process, re-visit training competency and learning proficiency support provided by all simulation technologies.

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Valid maritime simulation training requires different types of simulators, offering varied levels of accuracy and fidelity, which are then matched to the learning objectives of the training program. It is the level of control over the training environment that defines a simulator's performance envelope, and the subsequent classification and effectiveness the simulator provides to a training program.

Realism, Why Bother?

Here is a perspective regarding realism in simulation. A simulation student was complaining to his company office that the simulator he was working on that day was not very realistic. He went on to say that the ship drove too easily, the visual picture was phony, and that some of the bridge gear was not real equipment. The fellow from his office told him, "That's why they call it a simulator. If it were all real, they would have to call it a real-ator." Given that it is not feasible to create real-ators, only simulators, why does the maritime training industry care about simulation realism? Typically training attempts to prepare a person to apply the acquired training objectives on a real ship, and to tackle real problems in a realistic amount of time, with real consequences. Thus, if the training program can simulate realistic conditions, the objectives can be offered in a proper context, so that they best prepare the mariners for their real problems. Secondly, the recent training focus provided by the requirements of the Standards of Training and Certification of Watchkeepers (STCW-95), requiring assessed proof of competency during maritime training has required training facilities to take a new look at how tasks and training objectives are assessed and documented during simulation. It is only through control of the simulated environment, and by realistically matching the simulator performance to the training objectives that valid competency assessments may be conducted. From the pragmatic viewpoint, proper use of simulation in training, including the conscientious control of simulation environment, provides the best possible outcome for a given training investment.

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Training &

Using The Category 1 Simulator in Maritime Training

The Category 1 simulator is the Full Mission Ship Simulator (FMSS) that is used by every large maritime training institution across the country. FMSS systems are used for full immersion training with maximum possible control of the simulation environment.

Typically, FMSS systems have complete bridge systems installed in a bridge mock-up, including sound and realistic visuals. This highly controlled environment is designed to provide a dynamic setting for presenting program learning objectives in a realistic shipboard context. It is most appropriate for use in acquiring proficiency in teamwork, shiphandling and integrated watchstanding tasks. The Category 1 FMSS must be equipped with high fidelity ship and topological modeling, including interactions between all simulated entities within the six-degrees of freedom of ship motions. A simulator that lacks the high fidelity technical ability to replicate discrete ship motions interacting with other vessels and the environment will subsequently lack the ability to support training objectives in areas of ship-to-ship interaction, squat, control of bank cushion, suction and objectives oriented to the control of finite lateral ship motions associated with docking and tug assist work. Thus, the FMSS must be more than a pretty picture connected to a fully outfitted bridge, equipped with gear as per the Det Norske Veritas (DNV) Class A simulated bridge standard. It must be able to support the

Classifying Simulators

In 1996 the National Research Council (NRC) published a compilation of expert essays titled, "Simulated Voyages," in which the NRC provided a classification scheme for maritime simulators which was subsequently proposed to the International Maritime Organization (IMO).

NRC, *Simulated Voyages*, p.39, National Academy Press, 1996.

Category 1: Full Mission. Capable of simulating full visual navigation bridge operations, including capability for advanced maneuvering and pilotage training in restricted waterways.

Category 2: Multi-task. Capable of simulating full visual navigation bridge operations, as in Category 1, but excluding the capability for advanced restricted-water maneuvering.

Category 3: Limited Task. Capable of simulating, for example, an environment for limited (instrument or blind) navigation and collision avoidance.

Category 4: Special Task. Capable of simulating particular bridge instruments, or limited navigation maneuvering scenarios, but with the operator located outside of the environment (e.g. a desktop simulator using computer graphics to simulate a birds-eye view of the operating area).

fidelity and accuracy of close maneuvering ship behavior standards in order to be classified as NRC Category 1.

Simulators that lack the modeling fidelity and accuracy, but do have a full bridge environment and at least 240 degrees of visual field of view, are classified as Category 2, Multi-task simulators. Pragmatically, the training limitation of an FMSS system is that it can provide excessive stimulus and distractions for the mariner to adequately perform the program objective tasks. Additionally, given the variety of options and inputs available to a mariner in a FMSS system, it is difficult to assess the com-

petency of the mariner in using specific bridge systems, as they may be actually using other systems and environmental inputs to accomplish the task. For example, assessment of proficiency in collision avoidance using radar/ARPA is difficult to assess in a FMSS, when the mariner also has access to a visual scene or a bridge team, which they may be relying on for danger bearings and identification, instead of demonstrating proficiency with the radar/ARPA unit.

Thus, the FMSS is tailored for integrated assessments and teamwork performance using complex vessel and environmental models, and is not

designed for focused task proficiency training or general watchstanding team training.

Multi-Task Simulators

The Category 2, Multi-task maritime simulation trainers are designed to provide simulated training environments with accurate bridge equipment and high fidelity visual scenes without the large capital investment required for complex hydrodynamic vessel and topological modeling. The Category 2 trainer is designed to support training objectives for Bridge Resource Management, Team Dimensional Training, watch-

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Training &

keeping tasks, collision avoidance, communications, at-sea, deep-water maneuvering and other training that does not require highly refined ship models. These systems will typically employ simple 3 degree of freedom ship models, with little, if any, differences between the fidelity of the ownship models and the fidelity of the target ship models in the simulation.

These simple models display motions that rotate about the center of gravity, tipping center or turning center, but they do not display transverse motions representing physical displacement of the vessel's center of gravity. Essentially, these simple models can wobble the ship over one point, but they cannot slide the ship laterally away from a position, or bob it up and down as in a squat simulation. Simple three degree of freedom modeling is typically used in CBT simulators as well.

Limited Task Simulator in Maritime Training

The NRC Category 3 Limited Task trainer is a simulator designed to support training objectives for specific tasks and competencies, associated with equipment and limited underway operations that do not require a visual scene (blind bridge). The Category 3 simulator is used for radar, Automated Radar Plotting Aid (ARPA), Electronic Chart Display Information System (ECDIS), Automated Information Systems (AIS), Vessel Traffic Systems (VTS) and chartwork/pilotage training. The key differences between the Category 3 Limited Task simulator and the Category 4 Special Task simulation system are that the Category 3 system provides separate interaction between ownships, limited bridge settings and realistic equipment, interactive maritime based communications between vessels and physical separation between bridges, along with guided instruction from a simulation trained instructor. Category 3 simulators can employ simplistic modeling for the vessels and environment and use simulated bridge equipment rather than real hardware. The objective of the Category 3 system is to provide a limited underway setting, so that program objectives may be practiced and assessed within an appropriate context of realism. If the same objectives are assessed using the Category 4, Special Task systems, or CBT trainers, the objectives lose operational context and the resultant training and assessments can become contrived, computational routines, rather than maritime proficiency training.

The Role of the Category 4 Special Task Trainer

The evolution of higher fidelity, well crafted Com-



MITAGS is well equipped to handle any marine training and education need.

puter Based Training (CBT) tools is providing an opportunity to augment the assets used in support of training objectives. CBT training aids are NRC categorized as class IV Special Task simulators, capable of simulating specific instruments or limited navigation scenarios. CBT trainers are excellent tools for isolating specific narrow tasks, within narrow contexts for illustrating parameters and situations, which may be overlooked in a more dynamic environment. In this capacity, the CBT training aid excels, and it should be embraced as such. It would be an error to replace the Limited and Full Mission simulation task objectives with CBT, due to the lack of fidelity inherent in these devices. Recently, manufacturers of CBT equipment have volunteered that their equipment may be a suitable replacement for FMSS simulation in the area of shiphandling training. Shiphandling requires fundamental control of the complex, finite, lateral ship motions and interactions between vessel and topological features. Shiphandling is a blend of science and art, and shiphandling proficiency can only be developed through applying maneuvering methods using a real ship or a simulated environment that best approaches the behavior and setting of a real ship. The appropriate simulator for shiphandling training is a Category 1 Full Mission system (FMSS). Part-task understanding and limited, focused shiphandling competencies may be practiced on a CBT trainer, but proficiency will not

KMSS Supplies Unit To Lairdside Maritime Center

The only Full Mission simulator with a 360-degree visual bridge in the U.K. was constructed and installed by Kongsberg Maritime Ship Simulation (KMSS) at the Lairdside Maritime Center at Liverpool John Moores University.

The POLARIS simulator provided by KMSS includes three fully-equipped and integrated ship bridges, three instructor control stations, and GMDSS and VTS control stations. KMSS's powerful POLARIS software manages the simulation environment and allows different sea and weather conditions to be set to produce an extremely realistic training environment.

Lairdside Maritime Center provides training in ship-handling for ship owners and operators as well as port authorities.

The simulator installed by KMSS is being used by Lairdside Maritime Center for a wide range of training courses, from the introduction and practice of basic ship-handling to training in specific ship types including passenger vessels, container ships and offshore support craft.

"A modern KMSS simulator has enormous potential and can be used for as many scenarios and maritime training purposes as the mind can imagine," said Lairdside Maritime Center simulator manager **Joe Butler**. The KMSS simulator is readily configurable for specific ship types using ship modeling software, and bridge panels and units can be repositioned or replaced for specific ship type training.

"The 360-degree visual display has a variety of uses, particularly in pilotage exercises and training where visual references for ship positioning and maneuvering are essential," explains Butler. In tug control training the KMSS simulator enables difficult docking and undocking maneuvers to be tested and practiced in limiting weather conditions. He adds: "Providing pilotage training facilities maximizes the potential of the simulator where realistic and highly-detailed all-round views of locks and quaysides is essential using specialist 3D generating hardware."

Bridge-wing navigation can also be practiced thanks to specialist KMSS software that is used in addition to the all-round view to recreate key visual references such as ship-to-ship distance lines. This enables navigators to practice precise maneuvers in very realistic and testing conditions such as during replenishment at sea or when working in close proximity with other vessels.

"With the new generation of simulators, ship handling and tug maneuvering training has become as realistic as possible," says Butler. "Theory gets put into practice and the chosen response can be compared and contrasted with the actions of others during our comprehensive debrief sessions."

The KMSS simulator at Lairdside Maritime Center has accreditation from Det Norske Veritas for STCW95 training. Specific training courses are also approved to Flag State standard, which in the case of Lairdside Maritime Center is the UK MCA (Maritime and Coastguard Agency).

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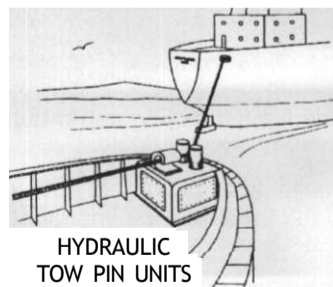
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Training & E

be achieved. Thus, the role of CBT should be to augment FMSS and Limited Task simulators, not to replace them. The CBT trainer, although a new technology, is functionally only a training tool, which has a specific role in the training cycle of providing focus on narrow tasks and objectives.

Matching Learning to Simulation

It is well understood that people learn best when many of their senses are used during a learning process. An unprepared student immersed in full mission maritime simulation can be easily overwhelmed by distractions, causing a loss of learning objective retention and gained proficiency. The simulation synergistic approach to creating an effective program requires the client to first clearly identify the outcome learning objectives and proficiencies required of their students. Next, the tasks in support of the identified objectives are listed and cross-referenced with possible learning aids and/or simulation tools. The curriculum design team then maps the learning load of the student with the progression of tasks demonstrated within the planned simulation. Adjustments are made to ensure that as much simulation and training variety is built into the program as possible, with the goal of reaching different learners from different perspectives. Lastly, the demonstration of program competencies are checked against the context they are performed in, to ensure that the measured outcomes are correct for the environment they are measured against.

Using Multiple Classes of Simulators to Support a Training Program

MITAGS provided a training solution to a major U.S. State Pilot Association that was purchasing and outfitting all of its 100 plus pilots with Portable Piloting Units (PPU). Given that the purchase of these units was a major investment, and that many of the pilots had little exposure with nautical computing tools, nor extensive experience with precise positioning systems using custom vector chart data, the standard of care for educating the pilot group was very high. To ensure that the pilots would have the highest proficiency possible, a synergistic blend of training was created that progressively encompassed the training objectives, through the use of scaled increases in classes of simulation.

The MITAGS-developed training began at their pilot station for on-site theory training and computing basics, which was reinforced in the first training simulation using their own pilot vessel as the simulation tool. Given that the pilot vessel was well known to the pilots, they encountered few distractions with the underway training environment

and were able to successfully demonstrate the covered theory elements in the provided simulation. The goal of using the pilot vessel was to simply, "put the software in motion," not to provide pilots with underway, conning experience with the PPU unit. That scaled,

higher level, conning task would evolve later in the training using more controllable simulation tools. Thus, the pilot vessel was being used as the simplest class of simulator, the Category 4 Special Task simulator. The objectives of this training phase could have also been

accomplished using a CBT trainer in a common computer lab.

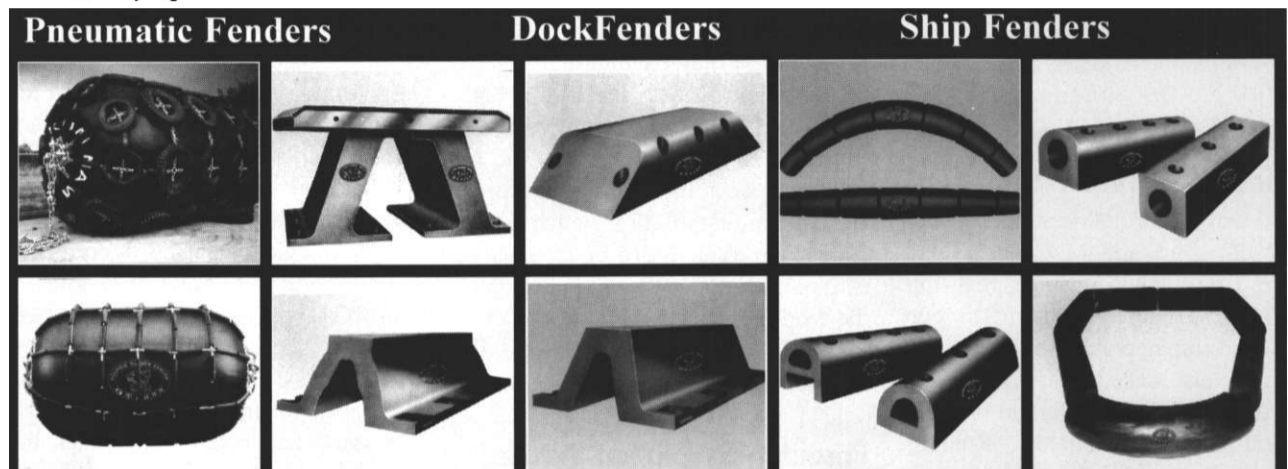
The next training phase for the pilots was to remove them from their local environment and move them to the

(Continued bottom next page)



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Training & Education

Transas ISS Featured At

Portsmouth Festival

Transas Marine Limited teamed up with the Merchant Navy Training Board to host interactive demonstrations of its PC based simulators at the third International Festival of the Sea. On show was a Navi-Trainer Expert shiphandling simulator, a GMDSS simulator incorporating 'real' consoles, as well as Liquid Cargo Handling and Engine Room simulator systems.

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HR Mardyn: Joint Venture

Provides Real-Time Navigation

HR Mardyn, a joint venture between HR Wallingford and McCallum Engineering Consultants, operates real-time and fast-time ship simulators for port design and ship operation investigations. Facilities are based at Wallingford, Oxfordshire, U.K. HR Mardyn operates two real-time ship simulators. Running these simultaneously allows two vessels to be controlled independently within the same simulation. This allows the representation of ship/ship interaction and the simulation of escort tugs and the main vessel. The simulator may be used at any stage of the port design procedure, allowing real-time ship simulation to be carried out under the control of the ship operator. It also provides effective training for pilots, tug masters and ship's officers in maneuvering procedures.

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MarineSafety ECDIS Course

Approved By USCG

The Electronic Chart & Display Information System (ECDIS) course presented by MarineSafety International at all three of its Centers was approved by the U.S. Coast Guard, effective May 1. The course, which complies with the applicable sections of the IMO's Standards of Training, Certification and Watchkeet-

ping (STCW) Code, will be offered at MSI Centers in Newport, R.I.; Norfolk, Va.; and San Diego, Calif. They have all been approved to issue a Certificate of Training, which will be recognized by the USCG Regional Exam Centers.

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STAR Center, Lockheed Martin

Provide Distance Learning

RTM Simulation, Training, Assessment and Research (STAR) Center and Lockheed Martin Training have teamed up to provide distance learning advancements that will bring commercial maritime to seafarers worldwide. The new program will incorporate Computer Based Training (CBT), which will be available via CD-ROM or Web, as well as on-site training locations throughout the world.

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Poseidon Simulation Installs

Premiere Fast Ferry Simulator

Tromsø Maritime Polytechnic, one of the leading maritime training institutions in Norway, has decided to branch out its activities into the advanced simulation of fast ferries. Poseidon Simulation has developed a complex fast ferry simulator, which has now been installed and fully operational in Tromsø. In order to maximize the full effect of realistic training, Poseidon Simulation allowed SSPA Sweden to develop a model for M/S Fjordkongen, one of TFDS' fast ferries, to be simulated. AutoSim in Tromsø has developed the visual solutions, thus allowing for realistic training in the corresponding waters.

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SCSS Boasts New Staff

Following the renewal of a joint venture cooperation between Star Cruises Ship Simulator (SCSS) and Danish Mar-

task demonstration in NRC category II and I simulation. Category II simulation allowed the pilots to demonstrate their proficiency with the actual PPU units in controlled, Full Mission, open water pilotage scenarios, whereby category I simulation offered pilotage in restricted waters, including emergency maneuvering.

In summary, the individual pilot participating in the program experienced on and off-site training in three different simulators, with ample review of tasks and objectives during progressively difficult simulations conducted in progressively higher fidelity simulators. This synergistic scaled approach provides

better student feedback on perceived gained proficiency as a result of the training, versus those who have only been exposed to traditional classroom lectures teamed with exclusive simulation in the FMSS alone. Not only are the perceived proficiencies higher, the simulation contact time increases dramatically per student, as they are not waiting to use a one-operator simulator (the FMSS) but, rather, are interactively using the category IV and III simulators in preparation for the higher fidelity and overall task load experienced in the FMSS. The future of the synergistic approach MITAGS envisions that many maritime training programs will gravi-

STN Atlas Simulators Train

Australian Marine Pilots

Star Cruises' \$4 million STN ATLAS Elektronik-designed full-mission simulator at its Port Klang headquarters, Malaysia, is being used to train Australian and New Zealand marine pilots. Exercises include competency audits involving video analysis of performance and according to Steve Pelecanos, vice president of the International Marine Pilots Association. Commissioned nearly two years ago, the Atlas system is designed for training Star Cruises' fleet masters and bridge personnel in all aspects of ship-handling and bridge management in addition to potential onboard emergency and safety procedures.

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FTL Develops Ship Evac Tool

FTL is currently developing a computer simulation tool for ship evacuation that will allow users to explore beyond the cases that can be examined in controlled evacuation trials. This model will allow comparison of evacuation arrangements at the ship design stage, and will assist with determining the optimum layout of facilities, location of lifeboat and crew/passenger ratios. In order to assess data on the mobility of people moving along typical ship's passageways and upstairs, on the level and at an angle of heel, FTL has built a test rig at its Kanata labs. The Ship Evacuation Behavior Assessment Facility — SHEBA — is comprised of a cabin, pas-

sageway and a stair mounted on hydraulic rams that can tilt the rig to modest angles.

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MITAGS Appoints Academic

Director of Training

Walter F. Megonigal, Jr. has been appointed to the newly created position of Academic Director of Training for the Maritime Institute of Technology and Graduate Studies (MITAGS). Megonigal will be responsible for the day-to-day activities of MITAGS' five academic departments; Marine Safety; Navigation/Shiphandling; Transportation Management; Offshore Sailing; License Advancement. He will also direct the Academic Division's two supporting departments; Systems Engineering; and Applied Research/Course Development.

Dur To Head Ship Sector

Northrop Grumman Corporation has appointed Philip A. Dur as corporate vice president and president of the company's Ship Systems sector — the largest builder of non-nuclear ships for the U.S. Navy. He will assume his new position on Oct. 1, succeeding Jerry St. Pe, who announced his decision to retire on Oct. 31 after 40 years with the company.

Dur, a former rear admiral of the U.S. Navy, currently serves as vice president of Program Operations at the Electronic Sensors and Systems Sector, the company's largest sector with annual revenues of approximately \$5 billion. He manages the sector's business operations, oversees program execution and acquisition, and alliance activities. Dur served in the Navy as assistant deputy chief of naval operations; director, Navy strategy division; commander, battle force Sixth Fleet; and commander, cruiser-destroyer group eight, where he was responsible for the combat readiness of 35 cruisers and destroyers, a battleship and 11,000 personnel.

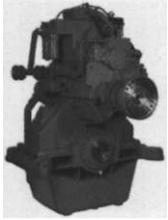
MITAGS facility for higher-level theory classroom elements. These objective tasks were demonstrated in the MITAGS All Weather Navigation (AWN), eight ship, interactive, blind bridge simulator. This NRC classified, Category 3 Limited Task simulator placed the pilots in a scene with limited instrument, navigation and collision avoidance features. The software element of the PPU was thoroughly exercised by the pilots in the fast paced, yet forgiving, environment of the blind bridge AWN simulation. The final phase in the training cycle built on the training synergy of the previous on and off-site work by moving to the Full Mission Simulation System (FMSS) for

tate to the use of scaled, objective based simulation in support of their programs, and endorses the classification of simulation tools as per the guidance of the National Research Council. The development of new technologies, such as CBT, is beneficial and these technologies are ready to augment the variety of training already in-place in the maritime training arena.

The future is here, and we are ready to simulate it.

by **George B. Burkley**, Department Head, MITAGS Applied Research Department

Ship's Store: Boatbuilder's Guidebook



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Netec Provides Lift & Pull

NETEC, a product line of Jered Industries, Inc. of Brunswick, Ga., has been a manufacturer of deck machinery for 75 years. Special service winches, anchor windlasses, mooring winches, towing winches and oceanographic winches are typical of the equipment, which NETEC has provided the marine industry. Providing equipment, which has been designed and constructed to the specific requirements of the operator, has been the hallmark of NETEC.

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Clear Vision

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thermal camera technology with the ease of joystick-operated pan and tilt positioning. As with all HOTEYE Thermal Cameras the 5 & 5c are great systems for location unlit channel markers, navigation in impaired light, floating debris and even saving lives. **Circle No. 126**

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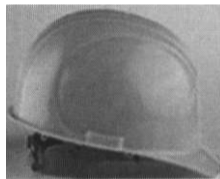
Kaplan & Associates, Inc. is a United States Manufacturer of Heavy-Duty Outboard Drive Marine Propulsion Systems and Tunnel (Bow) Thrusters. This includes Seal Kits, Gear Sets, Overhaul Kits, "Hard to Find Parts", New & Used Thruster, Prop Shafts and Marine Equipment as well.

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Ship's Store: Boatbuilder's Guidebook

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Walport Makes Emergencies Managable

The Maritime Medical Emergencies Joint Venture has released its video-based Onboard First Aid: Immediate Actions video training



course. It serves as a companion to the 10-tape Maritime Medical Emergencies Video Series, which demonstrates comprehensive treatment procedures and case management strategies for the injuries and illnesses that commonly occur at sea, and is intended for senior officers. **Circle No. 135**
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Hydoski Offers Innovative Design HydroSki International, Corp. is developing technology that, when fully completed, will enable the creation of a family of ocean-going vessels (called Kestrels) that will: carry heavier payloads for similar distances than aircraft, cruise at speeds similar to jet aircraft (up to 500 knots), have applications in freight, passenger and military configurations, and be environmentally friendly (lower emissions, less damage to marine life, etc.). **Circle No. 137**
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UHMW absorbs no water, is impervious to most chemicals, does not chip, peel, crack, rot or wear out. **Circle No. 139**
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Propulsion Systems' Drives Are "Trimmable"



Propulsion Systems Inc was founded in the late 1980's but the concept dated much earlier by the inventor, Harry L. Schoell.

Many years of trial and error, hard work and sweat went into the formulation of today's simple yet effective "trimmable surface drive" unit. The unique expertise of Harry Schoell is known industry wide. One and all come to him for his knowledge and recommendations. **Circle No. 140**
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Jets Leads The Way In Vacuum Sanitation



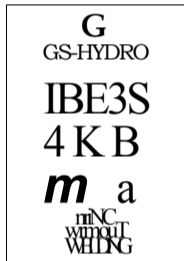
Jets has since the founding of the company in 1986 been the leading innovator in vacuum sanitation technology, regularly introducing new and advantageous solutions for the marine industry. Strong focus on reliability and low life cycle cost, simple and uncomplicated equipment is the basis in Jet design philosophy. A Jets system is available for any type or sizes of ship or boat-from the largest cruise liner to the smallest pleasure boat. **Circle No. 141**
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GS Hydro provides innovative solutions to high and low pressure pipe jointing problems, and is rightly known as the world's leading supplier of "piping without welding". GS Hydro provides substantial cost savings and other major benefits to clients around the world. GS piping systems are inherently clean, leading to reduced flushing costs and warranty claims. **Circle No. 143**
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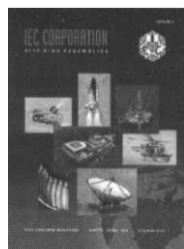


Norac Panels Save Weight, Space

Norac AS manufacture a complete interior paneling system for use onboard cruise ships, merchant fleet vessels, drilling rigs & offshore installations. The products are also well suited for onshore hotels, hospitals and industrial plants. Norac systems are available in standard modules, semi modular or tailor made systems. **Circle No. 144**
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world's only exclusive manufacturer of slip ring assemblies with over 40 years of experience. We manufacture assemblies for: Oceanographic Instrumentation, Oil Well Logging, Coil Tubing Reels, Strain Gauge, Thermocouple, RTD Signal Transfer and more. **Circle No. 145**
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In-depth Rolls-Royce: Integrated Ship System Solutions

1

Rolls-Royce's marine capabilities are organized into several market segments so that a customer's particular needs can be directly addressed by specialists teams in terms of vessel design, engines, propulsion equipment and deck machinery. A market-driven approach also benefits ship operators by offering dedicated solutions for integrated system packages and through-life product support. Rolls-Royce effectively becomes a customer's worldwide partner for its marine solutions, from concept to complete life-cycle support through the company's global service network. **Circle No. 146**
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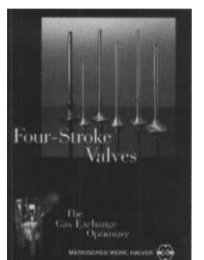
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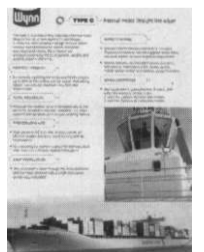
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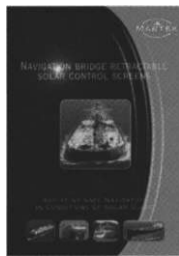


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Ship's Store: Boatbuilder's Guidebook



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People & Company

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Integrated Bridge System (IBS) and ECDIS systems now support C-MAP's CM-93/3 electronic chart database, which contains worldwide chart coverage in vector format.

C-MAP's CM-93/3 electronic charts are distributed in a highly compressed

format requiring only one CD for the entire world. This CD includes over 15,000 electronic charts for all ports, harbors and coastal areas. C-MAP designed CM-93/3 to be fully compliant with S-57 Edition 3.0, the international standard issued by the IHO (International Hydrographic Office) defining the

format and contents of electronic charts used with ECDIS. CM-93/3 is read directly by C-MAP compatible ECDIS, thus saving time and avoiding potential errors associated with onboard chart compilation of S-57 electronic charts.

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Soundcoat Appoints New CEO

The Soundcoat Company, manufacturer of noise and vibration products engineered has appointed **John Burke** as CEO.

In his new role, Burke, who will oversee the daily operations for Soundcoat's New York and California facilities, replaces **Philippe LaCarriere**, who has been the company's president for the last eight years. LaCarriere has been promoted to work within Recticel's European operation in Paris, France.

MTU Gets A New Identity

This past July, MTU's management introduced a new logo, which has become an essential aspect of the company's new image.

Two stylized flames — a blue one bearing the MTU name and

a red one — exude the combination of modern technology with emotions. The blue flame represents technological leadership and innovation, while the red flame symbolizes the values and qualities of MTU, which are passion, energy and creativity.

Already a well-established technological leader in the field of diesel engines and propulsion systems, MTU hopes to increase the emotional content of its presentation, beginning with the introduction of new engines throughout the last few months.

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G.T.R. Campbell, Algoship

Open New Headquarters

G.T.R. Campbell Marine Consultants and its associate company Algoship Designers, have officially opened a new joint headquarters in Nassau, Bahamas. The opening of this new office was further enhanced with the signing of the shipbuilding contracts for the first of a new class of standard ship — the 700-ton cargo/inter island passenger ferry Fiesta, which can accommodate 100 passengers. The order has been placed by FastMail Shipping and will be constructed by the Xinhe Shipyard in China. The vessel will operate between Florida and the Bahamas.

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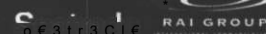
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Nautical Designs, Inc. 2101 S. Andrews Ave. Suite 202, Ft. Lauderdale FL 33316
M. Rosenblatt & Son, Inc., 2341 Jefferson Davis Hwy, Arlington, VA 22202
MH Systems 10951 Sorrento Valley Rd #2 San Diego CA 92121
Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
Sea School, 10812 Gandy Blvd. St. Petersburg, FL 33702
Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426;
George G. Sharp, Inc., 100 Church St., New York, NY 10007
MSCL Inc., 1452 Duke Street, Alexandria, VA 22304
Vibtech, Inc., Box 435, N. Kingston, RI 02852
Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544
NAV/COMM EQUIPMENT
C-Map/Commercial, 133 Falmouth Rd., Mashpee, MA 02649
C-Map, P.O. Box 212 4371 Egersund Norway
St. Johns, Newfoundland, Canada A1A 2G8
Electronic Marine Systems, 600 Fendale Pl., Rahway, N.J. 07065
Furuno USA, Inc., 4400 NW Pacific Rim Blvd., Camas, WA 98607
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27616-1851
Transas Marine USA, 19105 36th Ave. W. SL 101, Linwood, WA8036
Scandinavian Micro Systems P.O. Box 155, N-1411, Kolbotn, NORWAY
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
NAVCOM
Beier Radio 1990 Industrial Awe, Harvey LA 70058

NAVIGATION
Kongsberg Maritime Ship Systems AS, PO Box 1009 3194 Horten/Norway
Transas Marine USA 19105 36th Ave Wast Sta 101 Lynwood, WA 98036
NOISE FT VIBRATION
Soundcoat 1 Burt Dr., Deer Park, NY 11729
NOZZLES/NOZZLE SYSTEMS
Harrington Metals, 6720 124th Ave., Lennville, MI 49408
OFFSHORE MARINE CONSTRUCTION
Davie Industries 22 George D. Davie St, Levis QUEBEC Canada G6V 8V5
Amfels 5177 Richmond Ave Ste 1065 Houston TX 77056
OFFSHORE TOWING
Tidewater, 601 Poydras Street, New Orleans, Louisiana 70130
Oil—Marine—Additives—TESTING
Exxon Mobil Oil Corporation, 3225 Galloway Road, Fairfax, VA 22037-0001
OIL/WATER SEPARATORS
Sasakura Engineering, 7-32 Takeshima, 4-chomNishiyodogaw, KY, Osaka555, Japan
Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974-0556
MMC International, 60 Inip Dr, Inwood NY 11096
PAINTS/ANTI-FOUL ANTS
Jotun Paints Inc. 1401 Severn SL, Baltimore,MD 21230
Wasser High Tech Coatings, 8041 South 228th St., Kent, WA 98032
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Ultra Strip Systems 3515 SE Lionel Terrace Stuart, FL 34996
PARTS LOCATOR SERVICE
Inventory Locator Service 3965 Mendenhall Rd., Memphis TN 38115
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Datex, P.O. Box 1150, Kinder, LA 1064
PIPE FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS
Norma Products (U.S.) Inc. 31132 Century Drive, Wixom, MI 48393
Jesse Engineering, 5225 7th St, East, Tacoma, WA 98424
Neptune Research, 1685 Latham Rd., West Palm Beach, FL 33409
PIPE LEAK REPAIR
Indumar Products Inc 2500 Tanglewilde Suite 260 Houston TX 77063
PIPE LEAK REPAIR
CSD North America 880 Canada Rd, Manchester, NH 03109
PIPES FT VALVES
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POLLUTION CONTROL PRODUCTS
Enecon Corporation, 125 Baylis Rd., Melville, NY 11747-3800
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Americ Corp 1910 E. Devon Ave Elk Grove Village, IL 60007
PORT DEVELOPMENT
Sasakura Engineering, 7-32 Takeshima, 4-chome, Nishiyodogaw, KY, Osaka555, Japan
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Ronson Technical, 2146 B Flintstone Dr., Tucker, GA 30085
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Rice Propeller, Av Rios Espinoza No. 88, Col. Benito Juarez, Mazatlan, Sin, Mexico 82180
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Siemas Electric Ltd. 1180 Courtney Park Rd, Mississauga, Ontario Canada
Jan Verhaar Omega Thrusters 2340 AC Oegstgeest Holland ABB Drives Inc., P.O. Box 372, Milwaukee, WI 53201-0372, ABB Industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND ABB TURBOCHARGER, INC.,1460 Livingston Avenue, N. Brunswick, NJ 08902
Avtron Mig/7900 E Pleasant Valley Rd Independence OH 44131
Mathers Controls Inc., 675 Pease Rd., Burlington, WA 98232
Brunvoll A/S, P.O. Box 370, N-6401, Molde, Norway
ZF Marine Group 3131 SW 42nd St., Ft. Lauderdale, FL 33312
Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320
Centa Corp., 8185 Cass Ave., Darien, IL 60561
The Falk Corp., PO Box 492, Milwaukee, WI 53201-0492
Fincantieri, Diesel Engines Div—GMT, Bagnoli delta Rosandra 3334, Theste, ITALY
Jan Verhaar Omega Thrusters, P.O. Box 119, 2340 AC Oegstgeest, NETHERLANDS
Gottens Worldwide, 160 VanBrunt St., Brooklyn, NY 11231
Harbormaster Marine Inc., 31777 Industrial Rd., Ljvonia, MI 46150
Harrington Metal, 6720 124th Ave. Lennville, MI 49408
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Kaplan and Association, 30908 Crest Forest, Farmington MI 48331
Lo-Rez Vibration Control, 186 West 8th Ave., Vancouver, BC CANADA, V5Y 1N2
Mapeco , Inc., 91 Willenbrock Rd., Unit B4, Oxford CT 06478
Markisches Werk, P.O. Box 1442, D-8884 Halver GERMANY
MAN B&W Diesel, 17 State St., New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Holeyb, DENMARK
MAN BSW Diesel A/S, Alpha Diesel, Niets Jueis Vej 15, DK-6900 Frederikshavn, DENMARK
MAN B&W Diesel GmbH, Stadtbackstrasse 1, D-86153 Augsburg 1 GERMANY
Ornithruster Inc., 30555 Solon Ind. Pkwy., Cleveland, OH, 44139
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Karl Senner Inc, 25 W Third, Kenner LA 70062
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Propulsion Systems Inc 601 NE 26th Court, Pompano Beach, FL 33064
Rolls-Royce Commercial Marine Houston 10255 Richmond Ave Ste 101 Houston TX 77042
Schottel Inc, 500 Industrial Blvd., Sugar Land, TX 77478
Siemens Electric Ltd, 1180 Courtneypark Rd, Mississauga, ONTARIO
The Cincinnati Gear Company, 5657 Wooster Pike, Cincinnati, OH 45227
Voth Schneider America Inc, 121 Susquehanna Ave, Great Neck NY 11021
Schottel GmbH / Co, KG-Mainzer Strasse 99-D-56322-Spay GERMANY
Schottel Inc 500 Industrial Blvd, Sugarland, TX 77478
PUMP—Repair—Drives
Byrne Rice & Turner 1172 Camp St, New Orleans, LA 70130
Scardana Americas Bkg, 502 Empire St, Greefield Park, J4V1V7 Canada
Advanced Environmental Systems, 2 Sutton Rd, Webster, MA 01570
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Furuno USA, Inc. 4400 NW Pacific Rim Blvd., Camas, WA 98607
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L3 Communications PO Box 3041 Sarasota FL 34320-3041
N.Vancouver, BC CANADA V2P 3n4
Viking Life Saving, 1625 N. Miami Ave, Miami, FL 33136
New England Marine & Industrial, 200 Spaulding Turnpike, Portsmouth, NH 03801
Norwegian Maritime Equip. AS, Box 244, N0-5460 Husnes, Norway
Slipnot Safety Flooring WS Mohar Co. 2545 Beavfall St Detroit, MI 48207
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Byrne Rice & Turner 1172 Camp St New Orleans, LA 70130
Hydroxyl Systems Inc, 9800 McDonald Park Road, Sidney, BC V8L 3S8
Microphor, 452 E. Hill Rd, Willis, CA 95490
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Boatrats, Inc., 10675 Sorrento Valley Rd, Ste. 200, San Diego, CA 92121-1609
Furuno USA, Inc. 4400 N.W. Pacific Rim Blvd. Camas WA 98607
GEOLINK 34 Ave De Messine75008 Paris France
Mackay Communications, 2721 Discovery Dr, Raleigh, N.C. 27604-1851
Norwegian Telecom, Postboks 6701 St. Olavs Plass, N-0130, Oslo, Norway
Stratos, 150 Metcalfe St, Suite 1900, Ottawa, Ontario K2P 1P1 Canada
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Atlantic Marine, Inc.P.O. Box 3202, Mobile, AL 36652
Atlantic Marine, Inc., 8500 Heckscher Dr., Jacksonville, FL 32226
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Bender Shipbuilding & Repair, P.O. Box 42, Mobila AL 36601
Bisso Marine Co., P.O.Box 4113, New Orleans, LA 70178
Blount Marine, 461 Water St, Warren, RI, 02885
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Cascade General Inc, 5555 N. Channel Ave, Bid. 71, Portland,OR 97217
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Hike MetalBox 698, Wheatley, ON Canada N0P 2P0
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Atlantic Marine , 8500 Heckscher Dr., Jacksonville, FL 32226
Damen Shipyards, PO Box 1, 4200AA Gorinchen/Holland
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SlieX Inc 6659 Ordan Dr Mississauga, ON CANADA L5T 1K6
SIMULATION TRAINING
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SLIDING DOORS
Walz & Krenzer, 91 Willenbrock Rd. Unit 4, Oxford, CT. 06478
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Drew , One Drew Plaza Boonton, NJ 07005
IndustrialSoup.com 1875 Laws St Dallas, TX 75202
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Engine Monitor, Inc, 179 Hickory Ave, Harahan, LA 70123
Hallapa Uetersener Maschinenfabrik Tomescher WEG 5-7 D-25436 Uetersen, Germany
Summer Equipment, 24 West 4th Ave, Vancouver, B.C. V5Y1G3
Cunningham Marine Hydraulics 201 Harrison St, Hoboken NJ 07030
Kobelt Manufacturing Co, Ltd, 8238-129 street, Surrey, B.C. V3W0A
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Schmilz, P.O. Box 37, Fresno TX 77545
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SWIRL OFF SCARIFIER
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ERL Marine Products div, PO Box 1026, New Albany, IN 47151-1026
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Saab Marine Electronics AB, P.O. Box 13045, S-402 51 Goteborg SWEDEN
Technical Marine Service, 6040 North Cutter Circle, Portland, OR 97217
Electronic Marine Systems, 800 Fendale Pl, Rahway, N.J. 07065
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Istione Travel Tech, 3646 Greenbrier Dr, Houston TX 77098
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Delta T Systems, PO Box 9159, Jupiter, FL 33468
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LUDECA 1425 NW 88th Ave Miami FL 33172
Maritech, LLC, 100 Powdermill Rd, Acton, MA 01725
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VISCOMETERS
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Flow In'l, 23500 64th Ave.South Kent WA 98032
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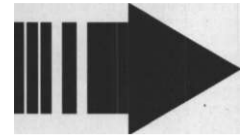
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Page	Advertiser	Product	R/S#	Page	Advertiser	Product	R/S#
6	ABB Turbo Systems AG	Turbochargers	200	3	Leica Navigation	Marine Navigation	247
36	ABB Turbocharger	Turbochargers	201	16	Loadmaster International	Software	248
18	Albacore Research	CAD/CAM	202	9	Lo-Rez Vibration	Vibration Control Prod.	249
10	Algae-X International	Fuel Filtration	203	41	MAN B&W Diesel	Diesel Engines	250
20	Americ Corp	Portable Ventilators	204	14	Marine Safety International	Simulation Training	251
19	American Teratec Inc.	Marine Equip & Services	205	2	MariTel Marine	Communications	252
33	American Vulkan	Couplings	206	7	Maritime Institute of Tech.	Simulator Training	254
59	Anchor Marine	Marine Equip & Supplies	207	44	Markisches Werk Halver	Engine Components	255
53	Aurand Manufacturing	Surface Prep Tools	208	16	Mascoat Products	Marine Insulation	256
33	Avtron Mfg.	Propulsion	209	27	McAllister Towing	Towing Services	257
9	Barkemeyer-Schifftechnik	Maneuvering Equipment	210	51	Military Sealift Command	Employment	258
4	Bollinger Shipyards	Shipyard	211	43	Motor Service AB	Propulsion	259
44	Brunvoll A/S	Marine Equipment	212	14	Motor Service Hugo Stamp	Diesel Engine Parts	232
24	Byrne, Rice & Turner	Marine Equipment	295	15	Norma Products Inc.	Pipe Fittings & Cuttings	260
11	Callenberg Engineering	Marine Electronics	213	34	Omnithruster Inc.	Thrusters	261
17	Carhartt Inc.	Marine Workwear	291	28	Orkot Inc.	Bearings	262
35	Centa Corporation	Propulsion Equipment	214	23	Plastic Pplings	Navigational Marker Pplings	263
42	Chris Marine	Diesel Engine Maintenance	215	16	Redland Genstar	Ballast Crete	264
38	Claremont	Insulation	293	10	Restomotive Laboratories	Protective Coatings	265
8	C-Map	Electronic Charts	216	46	Rice Propellers	Propellers & Nozzles	296
C2	Craft Bearings	Bearings	217	28	RTM Star Center	Training	266
37	Cummins Marine	Diesel Engines	218	30	Samson Rope Technologies	Rope	267
48	Damen Shipbuilding	Shipbuilder	219	59	Samson Rope Technologies	Mooring & Towing	299
49	Damen Shipbuilding	Shipbuilder	220	56	Seatrade	Trade Show	292
46	Diversified Metals	Metal Alloys	221	40	Seaward International	Fenders	268
53	Dolphin U.S.A.	Ship Fenders	246	57	Ship Tech A/S	Marine Consultant	269
29	Electronic Marine Systems	Sensors	222	47	Silex Inc.	Silencer/Expansion Joints	270
31	Electronic Marine Systems	Sensors	223	43	Skookum	Deck Machinery	271
33	Electronic Marine Systems	Sensors	224	46	Smith-Berger Marine	Deck Hardware	272
35	Electronic Marine Systems	Sensors	225	31	SMM	Trade Show	273
61	Europort 2001	Trade Show	226	16	Sohre Turbomachinery	Grounding Brushes	274
1	Exxon Mobil	Synthetic Lubricants	227	29	Superior Energies, Inc.	Insulation Manufacture	275
25	GE Marine	Engines	228	12	Tech Crane Int'l	Cranes	276
19	G.J. Wortelboer Jr. B.V	Chains	229	21	Thermax	Bulkhead Panels	277
9	Germanischer Lloyd	Classification Society	230	50	Thordon Bearings	Rudder Bearings	278
52	Global Supply Co.	Propulsion Equipment	231	59	Total Marine Solutions	Safety & Environment	304
43	Hornblower Marine	Consultants	233	C3	USMMA	Merchant Marine Academy	280
18	Houston Marine	Marine Training	234	13	Van Hall Health	Medical Management	281
47	In-Place Machining	Crankshaft Repair	235	51	Volmar	Ultrasonic Homogenizers	282
60	Inventory Locator Service	Parts & Locator Service	236	20	Walport	Safety Videos	297
39	IZAR	Shipyard	237	53	Walter Garschagen	Maritime Photography	283
10	Jastram Engineering	Steering Systems	238	45	Wartsila Corporation	Propulsion	284
20	Jeamar Winches	Winches & Sheaves	239	10	Waterman Supply	Marine Equipment	285
32	Jeffboat Incorporated	Drydocking	240	52	Western Machine Works	Tractor Pins	286
42	John Crane Lips	Propulsion Equipment	241	46	Westfalia	Separators	287
52	Kaplan & Associates	Propulsion Parts	242	35	Wynn Marine Ltd.	Wind Screen & Wipers	288
C4	Karl Senner Inc.	Propulsion Systems	243	13	Xantic	Satellite Communications	289
22	Kawasaki	Marine Equip & Supplies	244	5	ZF Marine Group	Propulsion Systems	290
34	King Engineering	Tank Leveling Gauges	245				
55	Kongsberg Systems	Ship Simulators	301				
21	Lehman & Michaels	Engine Analysis	294				

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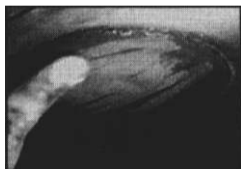
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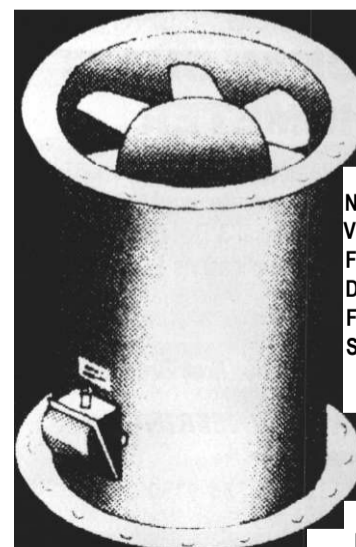
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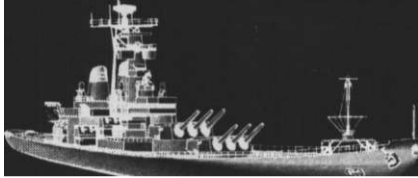
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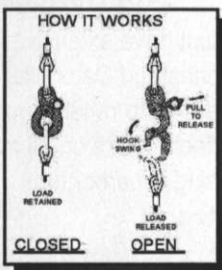
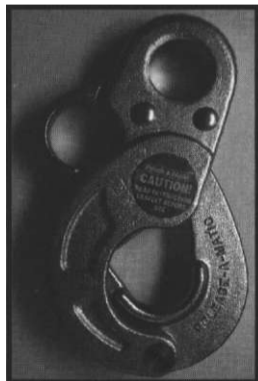
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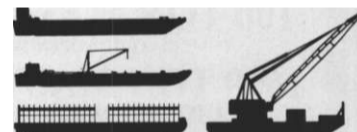
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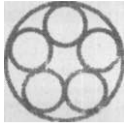


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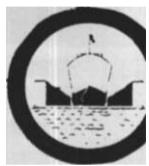
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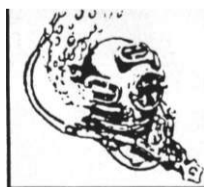
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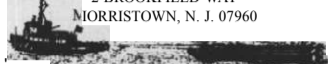
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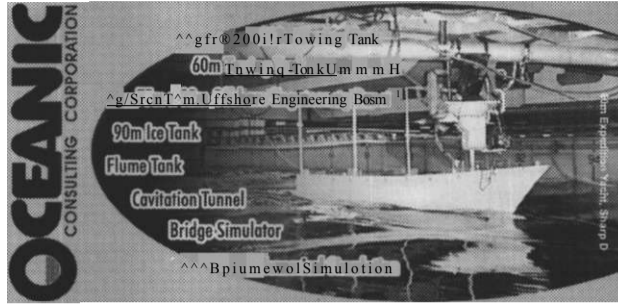
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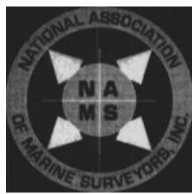
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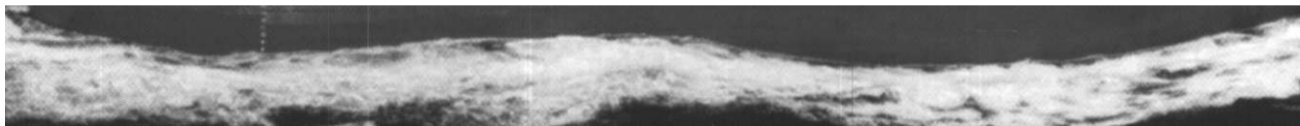
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