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AND  
ENGINEERING NEWS

**Focus On**  
**Safety**

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TECHNOLOGY  
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The Spanish Maritime Industry • Far East Update • AISE Exhibitor Profiles

APRIL 1996



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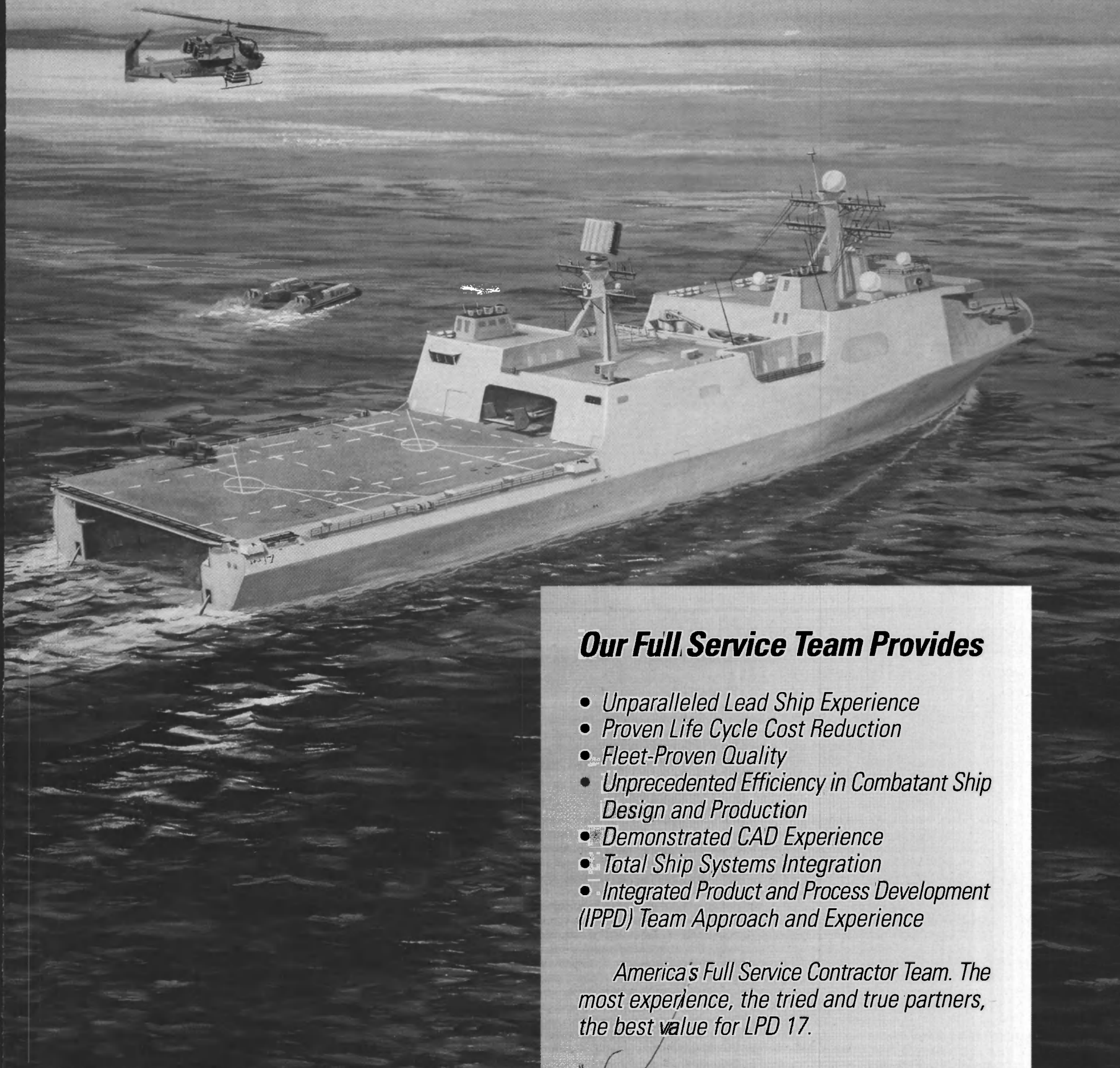
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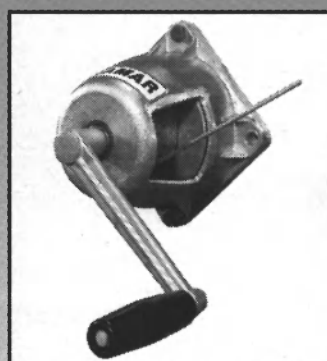
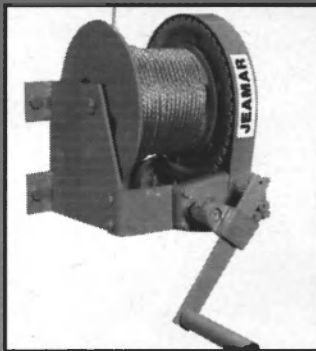
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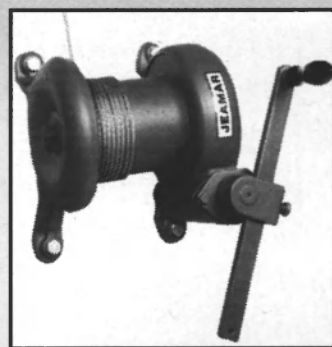


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## ON THE COVER

A RoRo evacuation demonstration using Solmatic Safety AS's (Norway) Twin-Chute Evacuation System. The SOLAS-compliant system is currently used onboard RoRoes, fast ferries and coastal ferries. Safety is a main focus of this issue. Coverage begins on page 68.

**36 \$546 Million Dues Out For Bids** International Editor Alan Thorne details shipbuilding and ship repair contracts in the Far East.

**68 Safety First** Issues of safety have infiltrated all aspects of the maritime industry. MR/EN's coverage includes reports on: the USCG's AMVER rescue system; safety-related products and news; revisions to SOLAS; how the Telecommunications Act affects GMDSS; and ISM Code implementation.

**80 Through The Air With The Greatest Of Ease** Inmarsat technology not only helps ships in distress, but is increasingly relied upon to help maximize vessel efficiency. **PLUS:** Satellite product and service provider reviews (pg. 85).

**90 The Spanish Maritime Industry** Despite political unrest and mounting international competition, the state-owned and private shipyards of Spain have maintained a healthy orderbook. **PLUS:** How specialization has led to export market growth.

### ALSO IN THIS ISSUE:

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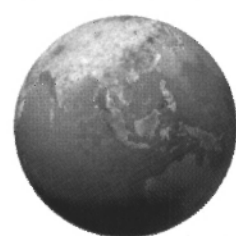
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## EDITOR'S NOTE

**S**afety issues have seemingly permeated every aspect of the maritime industry. Whether the discussion is with the owner of a cruise ship or a tanker; the builder of an LPG carrier or a woodchip carrier; the supplier of a diesel engine or a stair tread — the conversation undoubtedly will always get around to safety issues. This month's comprehensive coverage of safety topics starts on page 68.

The safety theme is carried over, naturally, into the editorial content of our standard-sized supplement Marine Technology International, which was mailed with this edition. Specifically, International Editor Alan Thorpe covers the much-scrutinized RoRo vessel segment, examining the legislative and equipment supply issues which are currently top-of-mind for everyone involved with this niche.

By the time this edition "hits the street," the marine industry will already be headlong into yet another busy exhibition and conference season. One of the more anticipated events this spring is the American International Shipbuilding Exhibition (AISE),



scheduled for April 11-13 in New Orleans. An impressive roster of exhibitors has been lined-up for the inaugural edition of this show, and anticipation is high as interest in the U.S. marine market continues to grow. An abbreviated exhibitor list, complete with short descriptions on what's new at AISE, starts on page 102.

Finally, the second installment of MR/EN's Far East Update starts on page 30. This column — which will appear six times a year — is dedicated to delivering the most recent shipbuilding and repair contract information from Asia. MR/EN participated in the Sea Japan '96 exhibition for the first time, and having enjoyed success in Yokohama, it will be particularly gratifying to watch the Far East Update grow. Anyone who is, or anyone who would like to be doing business in the Far East should make this a must read.

*Gregory R. Trauthwein*

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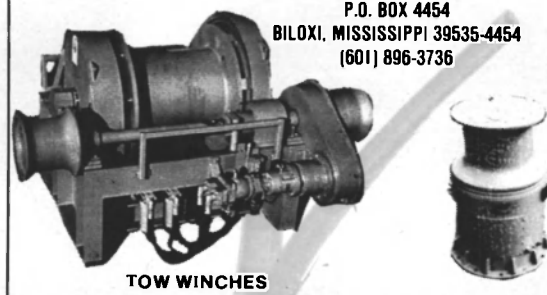
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**PUBLISHERS** Charles P. O'Malley  
John E. O'Malley  
John C. O'Malley

**EDITORIAL**  
Editorial Director: Charles P. O'Malley  
Editor: Gregory R. Trautwein  
Senior Editor: Dan Maniatis  
Associate Editor: Bridget A. Murphy  
Assistant Editor: Nina D. Miller  
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Andy Smith

**PRODUCTION**  
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**SALES**  
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**INTERNATIONAL SALES OFFICE**  
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AB Stephan R.G. Orn  
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Telefax: 46 411 10531

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Telefax: +441 444 417360

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France MR. DANIEL SOLINCA  
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### Atlantic Marine Delivers Passenger Ferry To Florida

Atlantic Marine, Inc., Jacksonville, Fla., recently delivered passenger/vehicle ferry *Jean Ribault* to the Florida state Department of Transportation. The 168 x 64-ft. (51.2 x 19.5-m) ferry is designed to carry 40 vehicles and 220 passengers, and is in operation between Mayport and Fort George Island on the St. John's River. *Jean Ribault* replaced the 45-year-old *Ferry Buccaneer*.

Designed by Cunningham and Walker Marine Consultants, Inc. of St. Augustine, Fla., the ferry is powered by two 975-hp EMD 645E6A main engines, each with Lufkin reduction gears driving 66-in. four-blade bronze propellers at each end. The vessel has two Detroit Diesel 60-kW, 1,200-rpm main generators, one 25-kW emergency generator set, and a maximum speed of 12 knots.

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For more information on Atlantic Marine  
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### Renard Named BV Chairman

On May 30, **Bernard Renard**, chairman of CGIP, is scheduled to take over the chairmanship of leading classification society Bureau Veritas (BV). At that time, **Frank Piedelievre**, chairman of Poincare Investments, will become vice chairman, and **Dannick**

**Rousseau** will assume the executive vice presidency. These appointments will follow the retirement of Chairman **Hugues Laurin**, who has served for 26 years, 16 of them as chairman. Reportedly, he will be named honorary president of the society.

For more information on Bureau Veritas  
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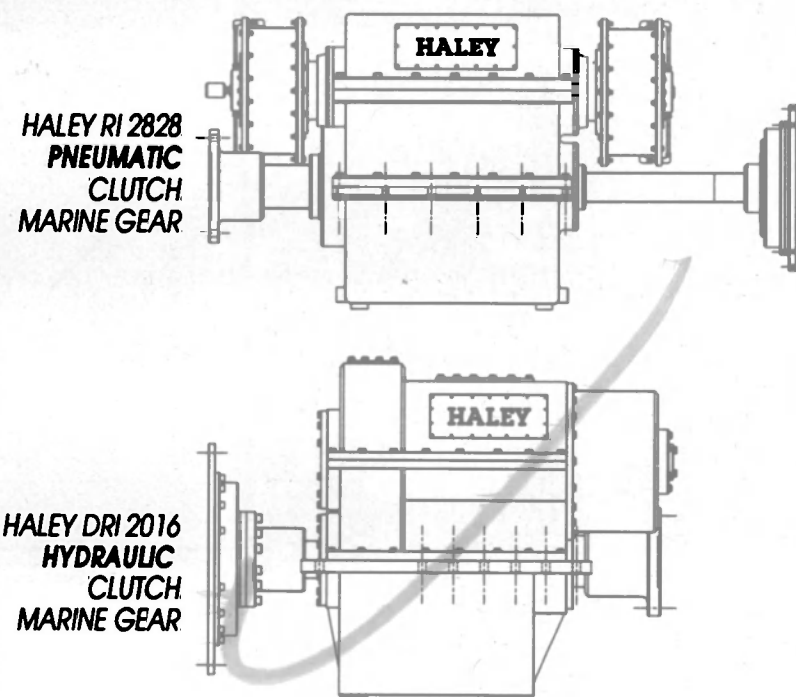
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### Tenneco Plans To Spin Off NNS

On March 21, Tenneco Chairman and CEO **Dana G. Mead** announced that the company's board of directors approved steps to accelerate Tenneco's transformation into a global manufacturing company, focused on its packaging and automotive parts businesses. These actions include: a tax-free spinoff of Newport News Shipbuilding (NNS) to Tenneco's shareholders; and the development of strategic options to separate Tenneco Energy from the packaging and automotive parts divisions, and to maximize shareowner value through a tax-free spinoff, sale, strategic alliance or other action. The development of these actions is expected to be completed during the second quarter.

"In four years, we have built tremendous value at Newport News Shipbuilding, strengthening its position to build nuclear-powered aircraft carriers and submarines, re-entering the market for commercial ships, and pursuing foreign sales of fast frigates," said Mr. Mead. "It has a seasoned and dynamic management team that has created a world class competitor fully capable of standing on its own and thriving as a public company."

For more information on NNS  
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### Kemp Joins BethShip Repair Team

**Joseph F. Kemp** has been named assistant operations manager at BethShip Sparrows Point Yard. Prior to this appointment, he served as general superintendent, responsible for all production activities, at Tampa Shipyards Inc., and in the past has also served as chief ship superintendent at Bethlehem Steel's Hoboken yard.

### Dresser-Rand Division Buys GE's Navy Steam Turbine Business

Dresser-Rand Co. and General Electric reached an agreement in December 1995 between GE Power Systems and the Steam Turbine Division of Dresser-Rand for the purchase of GE's steam turbine and steam turbine generator business for U.S. Navy applications. This agreement covers the manufacture of parts, field service, engineering services, field engineering and related repair, retrofit, overhaul replacement, and turnkey installation of GE's steam turbines and generators for past, present and future U.S. Navy applications.

During the transition period, the two companies are working cooperatively to ensure that customer needs are met and that existing contract obligations are fulfilled.

The Navy steam turbine services formerly performed by GE's Fitchburg, Mass., and Hampton, Va., offices will now be performed by Dresser-Rand Services Division's operations in Wellsville, N.Y. Dresser-Rand manufactures a comprehensive line of steam tur-

bines, with units ranging from 2 to 70,000 hp.

For more information on Dresser-Rand  
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### Marine Insurer Reports Excellent Renewals

The Strike Club, a large insurer in the marine market for risks

related to industrial unrest and restraint of labor, has reported excellent renewals for the 1996-97 underwriting year.

According to **Bill Milligan**, chief executive of the managers of the Club, "The Club put on over 700,000 gross tons at renewal on February 1, 1996." The club has more than 3,400 vessels, totalling in excess of 40 gt under 80 flags.

For more information on The Strike Club  
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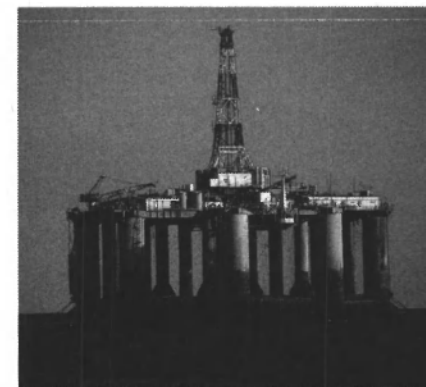
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## Singapore Technologies Delivers Container Vessel *Anan Bhum*

On February 4, Singapore Technologies Shipbuilding & Engineering (ST SE) delivered 482-ft. (147-m) *Anan Bhum* to Regional Container Lines Public Co., Ltd. The vessel is a single screw, diesel-driven cellular container-ship, with eight hatches, and deck space for containers between hatch number eight and the superstruc-

ture. It is the first in a series of four container vessels to be built by ST SE for the company, and has been constructed according to the rules of Lloyd's Register and the Thai Shipping Registry. The vessel engine room is designed for unmanned operation, and the vessel was built in compliance with SOLAS and MARPOL regulations.

Maneuvering capability is enhanced by a 600-kW bowthruster unit, equipped with a controllable pitch propeller. The hull design incorporates a well-faring stem with bulbous bow, and parallel midbody and streamlined rudder. The propulsion plant consists of one MAN B&W 8L 42MC engine

developing 7,960 kW at 179 rpm, and is designed for operation with heavy fuel oils.

For more information on Singapore Technologies Shipbuilding & Engineering Circle 133 on Reader Service Card

### *Anan Bhum* Particulars

Length	482 ft. (147 m)
Width	75.1 ft. (22.9 m)
Draft	27.2 ft. (8.3 m)
DWT	13,800
Service speed	17.4 knots
Container capacity	1,018 TEU

### *Anan Bhum* Equipment

Main engines	MAN B&W
Auxiliary diesel generator	Yanmar
Emergency diesel generator	Perkins
Pumps	Kvaerner
Bow tunnel thruster	Ukstein
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12

## MARINE BEARING ENVIRONMENTS DEMAND POLLUTION-FREE RELIABILITY



Working in the world's most ecologically sensitive environment, the Antarctic icebreaker and research vessel, *Nathaniel B. Palmer* relies on 640 mm (25") Thor-Lube stem tube bearings for pollution free reliability. The ship is also equipped with Thordon rudder and thruster bearing systems.

Today's environmental challenges and government regulation demand a move from traditional oil lubricated stem tube systems to pollution-free alternatives.

The Thor-Lube bearing system combines proven Thordon XL bearings with Thor-Lube; a water soluble, environmentally friendly lubricant to deliver pollution-free performance. Wear life is comparable to conventional oil-lubricated systems and the system is considered equivalent to oil-lubricated by most Classification Societies.

Higher operating efficiencies can be expected with the Thor-Lube system. Operating friction is lower, particularly at start-up and higher shaft speeds. Similar in size to oil-lubricated bearings,

Thor-Lube bearings can be easily integrated into conversion projects as new build.

For pollution-free reliability in your marine bearing application contact Thordon Bearings Inc. or your local Thordon distributor (located in over 55 countries around the world).



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Circle 330 on Reader Service Card

## Brady Wins ASNE Gold Medal Award

Carl Brady was presented with the distinguished Gold Medal Award from the American Society of Naval Engineers (ASNE) for being a technical driver for one



of the most successful naval machinery programs ever undertaken — the application of General Electric's LM2500 aeroderivative gas turbine to marine propulsion. This gas turbine is used in more than 350 ships of more than 40 different types. Mr. Brady is the manager of advanced marine programs for GE Marine & Industrial Engines. This GE division is a designer, developer and manufacturer of aeroderivative gas turbines for commercial and naval marine propulsion and industrial uses, and is part of GE Aircraft Engines, headquartered in Evendale, Ohio. For more information on General Electric Circle 129 on Reader Service Card

## Nobeltec In Agreement With Nautical Software

Marine software developer Nobeltec Corporation has announced an agreement with Nautical Software, Inc. Under the agreement, Nautical Software's Tides & Currents Lite will be packaged and sold with NavTrek 2.0. Tides & Currents predicts for thousands of locations in North America. NavTrek is available at selected marine dealers, as well as directly from Nobeltec.

For more information on Nobeltec Circle 140 on Reader Service Card

Maritime Reporter/Engineering News



Newport News Shipbuilding



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### Ninth Dock Landing Ship Christened At Avondale

LSD 52, the ninth Dock Landing Ship, and fourth LSD (CV) to be built for the U.S. Navy by Avondale Industries, Inc., was christened *Pearl Harbor* in ceremonies held at Avondale's Main Yard. The ship's sponsor was **Beverly Young**, spouse of the Honorable **C.W. Bill Young**, representative, 10th Con-

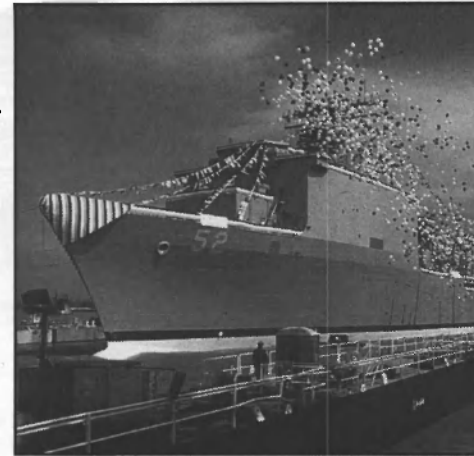
gressional District, State of Florida. Congressman **Young** was the principal speaker at the ceremony.

Also speaking at the ceremony were Admiral **Jeremy M. Boorda**, U.S. Navy, chief of Naval Operations, and Rear Admiral **Paul M. Robinson**, U.S. Navy, program executive officer for carriers, littoral warfare and auxiliary ships, Naval Sea Systems Command.

*Pearl Harbor* is 610 ft. (186 m) long, with a beam of 84 ft. (25.6 m)

and a full-load displacement of 16,400 long tons. The vessel is powered by four medium-speed diesel engines, and will achieve service speeds above 20 knots. The ship is scheduled for delivery to the Navy in early 1998.

Also participating in the christening ceremony were: **Albert L. Bossier, Jr.**, chairman, president and CEO, Avondale Industries, Inc.; and Captain **W. David Whiddon**, U.S. Navy, supervisor



of Shipbuilding, Conversion and Repair, New Orleans.

The CV designation stands for "Cargo Variant." *Pearl Harbor* is an upgraded version of the original LSD ships built at Avondale, but has a different cargo configuration.

Avondale Industries, Inc., headquartered in New Orleans, is a leading U.S. marine fabricator for both the Navy and commercial customers.

For more information on Avondale  
Circle 139 on Reader Service Card

### Caterpillar Offers Radiator-Cooled Engine Packages

Caterpillar Engine Division has announced the availability of prepackaged, radiator-cooled generator sets and auxiliary engines for on-deck marine applications. The packaged engine sets encompass both the 3300 and 3400 Cat engine families, with generator ratings of 65-550 kW and auxiliary engine ratings from 77-824 bhp. Radiator cooling allows the engines to be flexibly positioned outside engine rooms, without requiring long cooling water lines.

For gensets, deck-mounting reportedly provides reliable emergency power, without crowding the engine room. Smaller deck-mounted gen sets, seized to handle a vessel's hotel load while in harbor, reportedly help conserve fuel by allowing larger main generators to be shut down.

For more information on Caterpillar  
Circle 143 on Reader Service Card

### Bimco Repeats ISM Course

The first Residential Course on *The ISM Code Implementation in Practice — Corporate Risk*, organized by Bimco Publications AS in Copenhagen in September 1995, was reportedly a success, with 95 participants from 28 countries. The large number of participants emphasizes the need to start preparations for ISM Code certification and shipping companies' concerns regarding the implementation process.

Bimco has decided to stage a second Residential Course in Copenhagen from April 15-17, entitled *The ISM Code Implementation in Practice — Corporate Risk*, to clarify any confusion in connection with the implementation process. Additional information is available from Bimco Courses: tel: +45 4444 4500; fax: +45 4444 4450.

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### ACS Bulk Carrier Safety Update

The International Association of Classification Societies (IACS) is accelerating completion of the cargo hold element of its Enhanced Survey program. As a result, all pre-1987 bulk carriers of 492 ft. (150 m) in length or greater and classed by IACS members that have not been through an Enhanced Special Survey by January 1, 1997, will have to complete the cargo hold survey element of this survey before January 1, 1998. This deadline will ensure completion of IACS checks on all relevant vessels approximately 12 months earlier than expected, when the Enhanced Survey Program was implemented in 1993.

Acceleration of cargo hold surveys is one measure detailed by IACS in its extensive submission on bulk carrier safety initiatives to the May meeting of IMO's Maritime Safety Committee. Other unified requirements concerning bulkhead and double bottom strength in a hold flooded condition, hatchcover strength and side shell and frame construction are being evaluated.

For existing ships, IACS is also evaluating other options including possible upgrades based on new-building requirements, or an alternative of homogenous rather than alternate hold loading of heavy cargoes. Permanent Secretary **James Bell** said that IACS' main objective is to develop a "unified, comprehensive and realistic approach to improving structural survivability." He added that IACS is seeking practicable means for reduction of risk from structural failure to the existing bulk fleet, and setting high safety standards for the design of new bulk carriers.

### GHH Borsig Established

Following the approval of the German Federal Cartel Office, MAN GHH of Oberhausen and DBB of Berlin have established GHH Borsig. The new company encompasses the worldwide activities of both enterprises in the field of turbomachinery. Corporate leadership is with MAN GHH, who holds a majority share of 75.1 percent. The new company is part of the MAN Group, with a product range covering turbochargers, gas and steam turbines, turboexpanders and process-gas screw compressors.

For more information on GHH Borsig  
Circle 144 on Reader Service Card

### Hitachi Zosen Receives Orders For Two VLCCs

Hitachi Zosen Corporation has received orders for two 310,000-dwt VLCCs from Golden Ocean

Group, Channel Islands. To date, Hitachi Zosen has received a total of six orders for single hull VLCCs from Golden Ocean. These are the first two double hull VLCCs ordered by the group.

The newly ordered VLCCs are Hitachi Zosen standard type vessels, reportedly capable of carrying 2.2 million barrels of crude oil safely and economically. Hitachi MAN B&W 7S80MC type diesel engines will be used as their main engines. These VLCCs will be built at the

Ariake Works, which has built various types of vessels since it began operations in 1973, including a total of 31 VLCCs and ULCCs.

For more information on Hitachi Zosen  
Circle 145 on Reader Service Card

### Railko To Highlight Bearing Solutions At Show

Railko, manufacturer of compos-

ite marine bearings, is exhibiting at Posidonia in conjunction with its distributor Spanmarine of Piraeus. Railko's composite bearings are specific for rudder, stabilizer and steering gear applications, and in the stern/tube propeller shaft assemblies. The bearings are reportedly able to continue to work at full power in sea-water, in the event of a seal failure.

For more information on Railko  
Circle 137 on Reader Service Card



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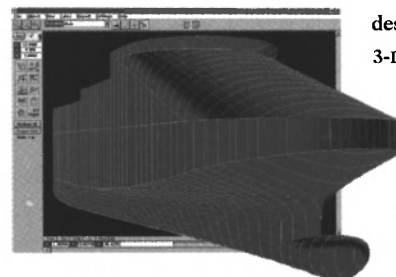
Next, we define all the tanks and compartments in **Autohydro**. Calculating volumes and balancing the ship is easy and quick, so we can spend more time to optimize the layout.

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Extension 1826

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Extension 1828

### Trinity Delivers Anchor Handling Tug To Egyptian Interest



Trinity's Moss Point Marine, Moss Point, Miss., has delivered *Petrojet 5*, a 114-ft. (34.7-m) anchor handling tug to Petroleum Projects & Technical Consultations, Co., in Cairo, Egypt. The tug, powered by two Deutz BV8M628 diesel engines driving 100-in. diameter bronze propellers in Kort nozzels through Reintjes WAF1961 reverse/reduction gears, is now operating out of Maadia Port. The vessel has a top speed of 13.5 knots and a normal operating speed of 11 knots. Electrical power is produced by two Volvo Penta driven Marathon 150 kW 380V, 50-Hertz, 3-phase generators. Steering is provided by an EMI electro-hydraulic system, maneuverability is aided by a Schottel bowthruster, and McElroy manufactured deck equipment on board includes a waterfall/anchor handling winch, an anchor windlass and tugger winch. The vessel has a 34-ft. (10.4-m) beam, and a draft of 14.5 ft. (4.4 m). It can carry 63,000 gallons of fuel and 11,500 gallons of potable water.

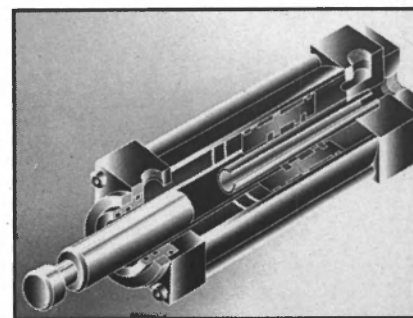
*Petrojet 5* made the approximately 5,600-mile trip from Trinity's Moss Point yard to Alexandria, Egypt, in 24 days, encountering no problems along the way.

The Trinity Marine Group includes 21 yards in Texas, Louisiana, Mississippi, Florida, Tennessee and Missouri.

For more information on Trinity Marine  
Circle 128 on Reader Service Card

### Hydro-Line Cylinders Designed For HP Conservation

Hydro-Line, Inc., Rockford, Ill., produces a cylinder designed to conserve horsepower during cylinder acceleration — the Rapid Advance Cylinder. This unit reportedly uses only a fraction of the flow required to extend a conventional cylinder of equal bore. The piston rod can be advanced to over 30-in./sec. for reduced cycle time, and full flow ports eliminate large flow losses and pressure drops. The gun-drilled piston rod reportedly decreases weight and enhances cycle rate performance. These cylinders are available in 8-in. bore and larger, and are made to order.



Hydro-Line rapid advance cylinder.

For more information on Hydro-Line, Inc.  
Circle 131 on Reader Service Card

### Recent Ship Sales

This report, compiled by Shipping Intelligence, Inc., a New York maritime consulting firm, tracks sale prices of secondhand bulk carriers and tankers. For more information, call (212) 997-0966.

Date reported	Vessel name	Vessel type	DWT	Year built	Sale price (\$M)
2/26/96	Egasco Marine	Bulker	10,178	75	\$2
2/26/96	Petraki	Bulker	15,107	74	\$1.5
3/4/96	William Shakespeare	Bulker	15,328	78	\$3.8
2/26/96	United Confidence	Bulker	17,693	77	\$3.5
3/4/96	Ocean Garuda	Bulker	17,727	81	\$4.4
2/23/96	Alabama Rainbow	Bulker	28,836	89	\$15.3
3/4/96	Eibe Oldendorff	Bulker	29,331	84	\$16.1
2/26/96	Hua Qiang	Bulker	31,217	85	\$12.5
2/23/96	Galea	Bulker	36,000	76	\$5.7
3/4/96	Tarpone Sealane	Bulker	37,446	73	\$2.8
2/26/96	Elegance	Bulker	40,900	83	\$11
3/11/96	Spring Stork	Bulker	41,545	84	\$13.1
2/19/96	Mitta	Bulker	46,650	85	\$16.5
2/23/96	Svea Trader	Bulker	50,550	74	\$4.2
3/11/96	Lucky Sailor	Bulker	61,393	81	\$11.5
3/4/96	Sunny Glorious	Bulker	65,029	83	\$14.3
3/11/96	Africa	Bulker	137,061	77	\$5.5
3/11/96	Kuaka	Tanker	25,097	75	\$3.7
3/4/96	Petrobulk Ruler	Tanker	29,951	83	\$8.3
2/26/96	Cercal	Tanker	87,435	80	\$12.5
2/26/96	Freja Svea	Tanker	97,197	89	\$30
3/11/96	Y Winner	Tanker	124,136	75	\$4.2
2/26/96	Lioness	Tanker	135,000	89	\$37
3/4/96	Promise	Tanker	268,038	78	\$16
2/26/96	Aesa Hull 72	Tanker	295,300	96	\$77



## MHI And Lister-Petter Initiate Manufacturing Partnership

On February 28, Mitsubishi Heavy Industries (MHI), Tokyo, Japan, and Lister-Petter Ltd., Gloucestershire, U.K., signed a partnership agreement that extends Lister-Petter's product range, while offering MHI access to state-of-the-art European manufacturing facilities for diesel engines.

In early 1997, Lister-Petter will begin production of MHI's S4S, 4-cylinder, indirect injection, naturally aspirated, 60-hp diesel engine, following an investment in capital equipment at its factory in Dursley,

Gloucestershire. Five thousand S4S engines produced annually by Lister-Petter will be used by MHI in its products. An additional quantity will be produced for sale under the Lister-Petter name. For Lister-Petter, the partnership means it can immediately respond to a marketplace opportunity for a higher output engine that is similar in technology to its Alpha series.

For more information on the partnership  
Circle 135 on Reader Service Card



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Circle 207 on Reader Service Card

## Conoco Takes Delivery Of First Of New Class Of Towboats From Trinity

Conoco Inc., Domestic Marine Operations, took delivery of M/V *Coushatta* (L. 348), one of three "spec" towboats — internally dubbed L. 347, 348 and 349 — built by the Trinity Marine Group's (TMG's) Halter Marine, Lockport, La.

The double-screw towboat is a result of a decision made by Trinity's management in 1995 to reverse a speculation building program. **John Dane III**, president of TMG, said, "As a designer and builder of thousands of barges and hundreds of towboats, we are in an excellent position to recognize developing trends. Currently, operators pushing two-piece, 20,000-barrel barges with towboats in the 800 to 1,000-hp range are now towing 30,000 barrel barges in faster running waters, with a resultant demand for higher horsepower." Trinity invested in the design and construction of three nearly identical 70.5 x 28-ft. (21.5 x 8.5-m) river towboats, but with different engines of 1,600 and 1,710-hp ratings, and one with different gearing. Design draft is 8 ft. (2.4 m), and eye level from the pilothouse is 26 ft. (8 m). L. 347 is powered by two Detroit Diesel 8V149 DDEC engines, developing 1,600 hp through Twin Disc 540 reverse/reduction gears. *Coushatta* is powered by two Cummins KT38 diesels, producing 1,600 hp with Twin Disc 540 gears. L. 349, scheduled for completion this month, has two Caterpillar 3508 diesels rated at a total of 1,710-hp with Reintjes WAP516 reverse/reduction gears. All three vessels are built in accordance with ABS rules.

For more information on Trinity  
Circle 142 on Reader Service Card



Pictured is M/V *Coushatta*, one of three higher hp towboats being built by Trinity.

Maritime Reporter/Engineering News

### Kvaerner Wins Amerada Hess Field Development Contract

Amerada Hess announced that it has awarded an EPIC contract to Kvaerner Stolt Alliance for the design, supply and installation of the flowlines and manifold systems for the Durward and Dauntless field development project in the U.K. sector of the North Sea. The Durward and Dauntless fields, which are situated 7.5 km apart in the central North Sea, are being developed together by means of a common FPSO and associated shuttle tanker offloading. Design engineering is to be carried out in the Kvaerner London offices, by the joint project team who will then move to Aberdeen for the construction phase.

The Kvaerner Stolt Alliance will use upgraded pipelay ship *Seaway Falcon* for the installation of 6, 8 and 10-in. diameter production and water injection lines. This will be the first time *Seaway Falcon* has laid rigid pipelines in U.K. waters. The majority of the work on the project will be carried out in the second half of 1996.

The Alliance was established by the Kvaerner Group and Stolt Comex Seaway in March 1995, to carry out subsea developments calling for a

complete EPIC contract. The Durward and Dauntless EPIC contract is reportedly the first of its type to be won by the Kvaerner Stolt Alliance in the U.K. sector of the North Sea. A contract for the abandonment and removal of the Elf North East Frigg installation in Norway was awarded to the Kvaerner Stolt Alliance in January 1996.

### Heading, Attitude And Positioning System Available From Seatex

Seatex AS offers the Seapath 400 heading, attitude and positioning system. Thirteen Seapath units are already being utilized in various applications throughout the world. The first unit was delivered to survey and research vessel *Polar Queen*, operated by Rieber Shipping AS in Bergen, Norway. Six units are being used in Asia for hydrographic survey. The Seapath 400 is specially designed for compensation of multi-beam echo sounders, acoustic positioning, ROV applications, dynamic positioning, dredging and calibration of gyro compasses.

For more information on Seatex  
Circle 146 on Reader Service Card

### Trade Consortium Established Between Far East, South Asia and Middle East

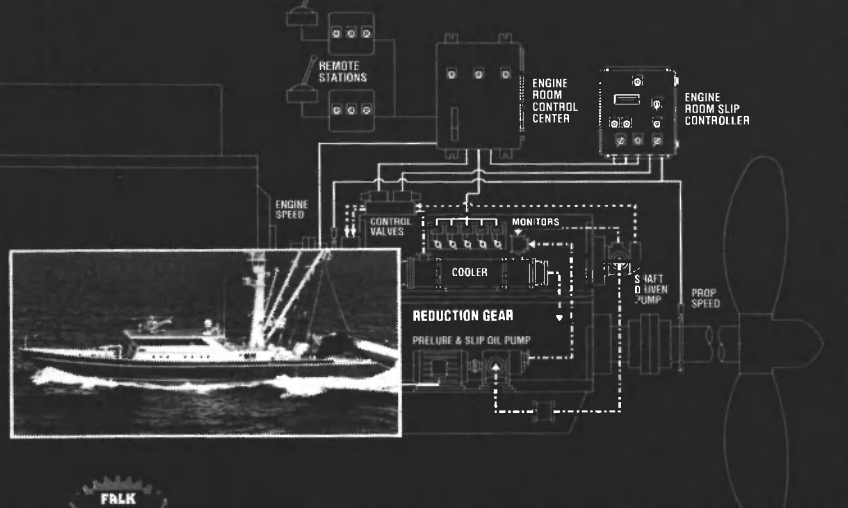
Peninsular and Oriental Steam Navigation Company (P&O containers), Nippon Yusen Kaisha (NYK) and Neptune Orient Lines (NOL) have reached an agreement to jointly operate a new consortium in the trade between the Far East, South Asia and Middle East. The new consortium will commence this May, and will consist of two separate express loop services, reportedly offering quality schedule integrity and good port coverage.

GKX (Gulf/Karachi Express) will be a weekly fixed schedule service, calling Singapore — Jebel Ali — Damman — Jebel Ali — Karachi — Colombo — Singapore. SAX (South Asia Express) will be a weekly fixed schedule service, calling Singapore — Colombo — Nhava Sheva — Colombo — Singapore.

Both the GKX and SAX services will be closely tailored to link into the grand alliance long haul network, which calls at Jebel Ali, Colombo and Singapore. This service network will facilitate relay connections, transits, port coverage and sailing frequency options for shippers and consignees.

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For more information about the Falk continuous slip marine control system, as well as any other Falk equipment, contact your local Falk distributor or call 1-800-545-5215, ext. 852.

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April, 1996

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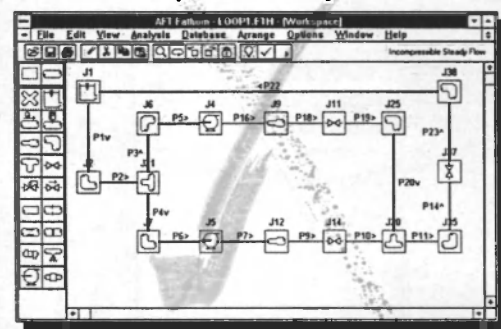
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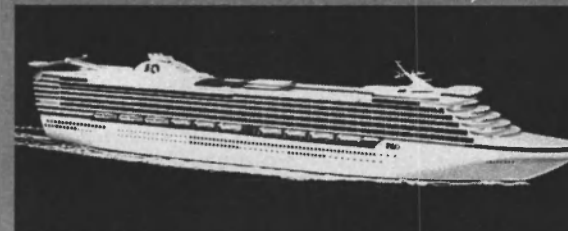
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## Construction Begins on Grand Princess



Pictured is *Grand Princess*, which features SIMOS IMAC 55.

Construction has begun on reportedly the largest ship in the history of cruising — Princess Cruises' *Grand Princess* — with the cutting of the vessel's first steel plates. The 104,000-ton ship will debut in early 1998.

Design highlights of the 2,600-passenger ship will include three state-of-the-art show lounges, each giving passengers a different after-dinner entertainment option; three separate main dining rooms; an entire deck of suites; 750 cabins with private balconies; a motion-based virtual reality theater; a nightclub; and a wedding chapel. Another feature of interest will be the "Blue Screen Room," where passengers can be filmed and then merged into pre-existing scenes.

*Grand Princess* is being built by Fincantieri shipyard, and is the third in the line's Grand Class of ships. Along with the earlier-introduced *Sun Princess* and *Dawn Princess*, the introduction of the \$400 million *Grand Princess* will position Princess Cruises as one of the leading Caribbean cruise operators, and will increase its overall capacity by 50 percent.

In addition, *Grand Princess* will feature SIMOS IMAC 55 integrated monitoring, alarm and control system, provided by Siemens Marine Engineering. SIMOS IMAC 55 is an automation system in which process control is assigned to small units which operate in a distributed manner, and are connected via local networks. The complete process sequence can be operated and monitored with 250 mimic diagrams from a total of 15 operator communication stations. The SIMAR drive synchro diesel-electric propulsion system supplied by Siemens is also integrated. SIMOS IMAC 55 monitors the propulsion system and displays all operating states.

For more information on Siemens  
Circle 141 on Reader Service Card

## MMS Names Hong Kong Agent

Marine Management Systems (MMS) Inc., Stamford, Conn., recently appointed STM Ltd. as its distributor of software, hardware and other products and services for the Hong Kong shipping market. STM Ltd. is the latest organization to join MMS' Global Agent Program, a network of certified agents offering MMS products to the marine industry. STM has been active in the Hong Kong marine industry for four years, supplying and supporting electronic and computer-based products from companies such as Kelvin Hughes, Trimble and Station 12. The company will expand its current product line with MMS' Fleet Manager Series.

MMS company reports indicate that the company currently supports more than 1,300 active system installations worldwide, at more than 500 ship and shore sites.

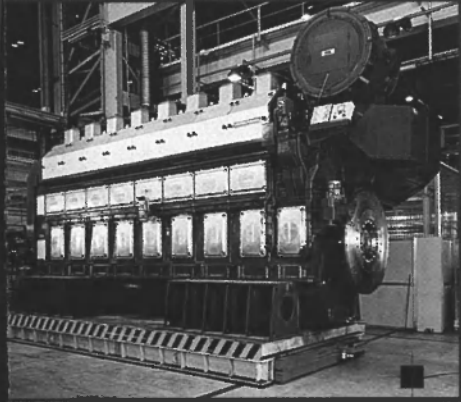
For more information on MMS  
Circle 123 on Reader Service Card

Maritime Reporter/Engineering News

**Wärtsilä Diesel Wins Engine Orders At Turku Works**

Wärtsilä Diesel has received orders for Wärtsilä 46 marine engines from customers in the U.S., Italy, the Netherlands and China. The orders reportedly have an aggregate value of more than \$22,870,000, and will be built at Wärtsilä Diesel's Turku factory in Finland, and shipped within the next year.

Alabama Shipyard has ordered two Wärtsilä 46 engines for installation in two 16,000 dwt chemical tankers currently under construction for a Danish shipping company (see related story, p. 24). Italian shipbuilder Grimaldi has ordered four Wärtsilä 46 engines which it will install in a RoRo vessel at the Apuani shipyard. Dutch shipowner Spliethoff has purchased three Wärtsilä 46 engines for three heavy-lift vessels being built at the Merwede shipyard. A fourth Wärtsilä 46 has been ordered by another Dutch company for a heavy lifting vessel being built by the Royal Schelden shipyard in the Netherlands. Graig Shipping in the U.K. has ordered four Wärtsilä



Wärtsilä 46 marine engine.

46 engines for multi-purpose vessels being built in China.

The Wärtsilä 46 is sold as a main engine for ships and as a power source for powerplants. The main powerplant markets are in Asia, whereas most marine engine customers are shipyards in Europe and the Mediterranean. Wärtsilä is a manufacturer of medium-speed diesel engines and a supplier of high-speed engines. The group has production plants in six European countries, as well as India and the U.S. Wärtsilä Diesel is a division of the Metra Group.

For more information on Wärtsilä  
Circle 35 on Reader Service Card

**For East Dredging Performs Major Marine Projects In Hong Kong**

Far East Dredging Ltd. (FED) is executing three major dredging and marine projects in Hong Kong. These projects are known as Central Reclamation Phase I, Strategic Sewage Disposal Scheme,

Stage I (Outfall) and the Tuen Mun Area 38 Special Industries Area Development, Stage I.

FED was awarded the sandfilling contract of Central Reclamation Phase I in May 1994. The project involves the reclamation of 20 hectares of land in two phases, reaching out 1,148.3 ft (350 m) and running 2,296.6 ft (700 m) along the existing waterfront of the central business district, Hong Kong

Island. The company completed a contract for the initial phase of the reclamation (East Bound) in August 1994. Krankeloon, FED's wholly-owned split trailing suction hopper dredger, pumped and dumped 900,000-cu.-m of sand. The second phase began in September 1995.

BELOW: Work on Central Reclamation Phase I is shown underway.



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Another 1.6 million-cu.-m. of sand was filled in the West Bound.

The Philipp Holzmann/Franki/Dredging International joint venture was awarded the contract for the Strategic Sewage Disposal Scheme (SSDS) Stage 1 (Outfall) by Hong Kong's Drainage Services Department in April 1995. The contract was part of an overall sewage treatment and disposal program for the major areas of Hong Kong Island and Kowloon.

Dredging work for the project was subcontracted to FED. *Krankeloon* and *Pacificque*, another FED-dredger, dredged approximately two million-cu.-m. of marine mud in a 4,265-ft. (1,300-m) long trench. A steel diffuser pipe was placed in this trench to form the outlet of treated sewage water into Victoria Harbor. The project also involved various marine works, including backfilling the trench with crushed gravel, plac-

ing 3,937-ft. (1,200-m) diffuser pipelines (with 28 specially designed diffuser outlets), and executing the final protection of the pipes with crushed rock.

The overall SSDS project calls for a 6,562-ft. (2,000-m) long tunnel at a depth of 328 ft. (100 m), utilizing a rock tunneling machine; and the drilling of two vertical 262.5-ft. (80-m) deep shafts in the sea bottom; and various civil works to connect the outfall to the main sewage

system. Work is scheduled for completion in June 1997.

In addition, FED also won the Tuen Mun Area 38 Special Industries Area Development State 1 contract. The project includes the reclamation of 28 hectares of foreshore and seabed, and the construction of 1,476.4 ft. (450 m) of vertical blockwork seawall, together with 3,280 ft. (1,000 m) of sloping rubble seawall. A total of two million-cu.-m. of sandfill is required for this project. FED will deploy the new trailer *River Bee* for the dredging and sandfilling.

Far East Dredging Ltd. is a joint venture established by Dredging International NV and Wai Kee Holdings Ltd. FED specializes in dredging and reclamation.

For more information on FED  
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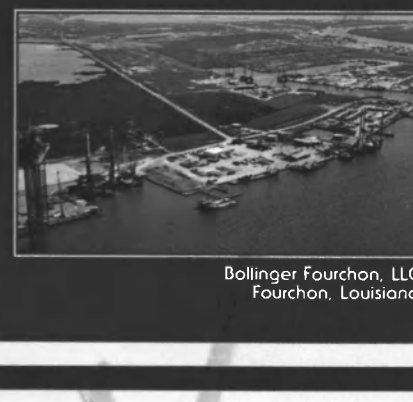
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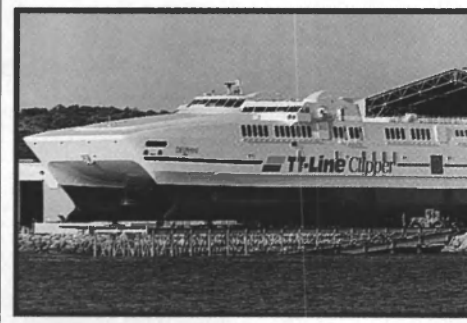


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## Austal Launches Fast Ferry



Delphin emerges from its construction cradle and onto the slipway for launching.

Austal Ships, in association with joint venture company Ferries Australia, has launched what is reported to be the largest ferry ever built in Australia. At \$50 million, the ferry *Delphin* was built for operation in the Baltic Sea for German ferry operator TT-Line. The vessel will service the route between the northern German ports of Rostock/Warnemunde and Trelleborg, Sweden. The Australian-built fast vehicle and passenger ferry will reportedly cut down previous journey time by more than half, completing the Baltic crossing in approximately three hours. With 600 passengers and 175 cars on board, *Delphin* will have a service speed of 36 knots, powered by four MTU diesel engines generating 24,000 kW.

*Delphin's* onboard facilities cater to the business people and tourists, with telephones, duty free shopping, bars and restaurant, audiovisual entertainment and poker machines. The vehicle deck has eight main deck and six mezzanine deck lanes, with loading and unloading via the stern door in a "U" shape drive-around fashion.

*Delphin* has an overall length of 270 ft. (82.3 m), a 7-ft. (2.3-m) beam, and a draft of 8.2 ft. (2.5 m). The vessel is scheduled to depart for delivery to Germany this month, upon completion of sea trials.

For more information on Austal Ships  
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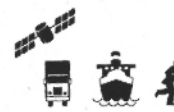


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Circle 310 on Reader Service Card



### Renk Supplies Gear Units For Canadian Ferries

The Canadian British Columbia Ferry Corporation has completed construction of three double hull ferries. The four independent propulsion trains of each vessel, comprising four MTU 20V 1163 TB 83 clutches and four KaMeWa waterjets, deliver an aggregate power output of 26,000 kW at 1,272/582 rpm. Maximum ship speed is approximately 68 km/h. The 12-gear units, with their horizontally offset drives and power take-off shafts, are of light-weight construction with an aluminum casing—a design required for fast vessels. The gear unit is joined to the ship's foundation through elastic elements. The gear units were equipped with electronic torque monitoring in order to avoid any possible damage to the waterjets from coastal flotsam. A measuring device attached to the gear drive shaft reportedly transmits the torque values continuously to an electronic data box developed by Renk. If limiting values are exceeded, the multi-plate clutch in the gear unit opens and the respective power take-off shaft is separated from its drive. Each of the three fast ferries is 393.7 ft. (120 m)

long and can accommodate up to 1,000 passengers and 250 cars. The ferries operate between Vancouver and Vancouver Island, and their high speed has reportedly reduced transit time by one third.

For more information on Renk  
Circle 11 on Reader Service Card

### Modifications Of *President* Completed At Trinity-Gulf Repair



Riverboat *President* is shown in drydock at Trinity-Gulf Repair.

Repairs and modifications to *M/V President*, a Davenport, Iowa, riverboat casino, have been completed at Trinity-Gulf Repair, New Orleans, a Trinity Marine Group shipyard. The 72-year-old vessel underwent a regular U.S. Coast Guard-required dry-docking and received new independent fuel tanks, new tank coatings, minor repairs and a new hull paint job.

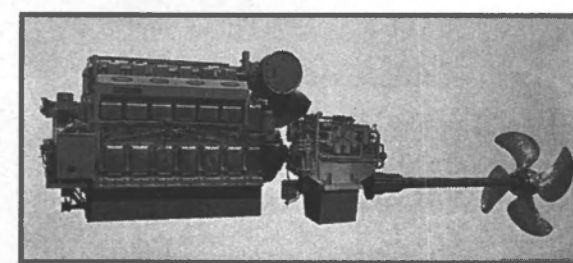
Built in 1924, as steamboat *Cincinnati*, *President* was bought by Streckfus excursion boat company which added a new steel deckhouse in 1931. Once billed as the world's largest excursion riverboat, it operated as an overnight packet boat traveling between St. Louis and New Orleans in the 1920s and 1930s. She then carried 3,000 passengers, had 152 stateroom, two suites, a parlor and also carried freight on her first deck. In the 1950s,

*President* wintered in New Orleans, where she was the site of big name entertainment shows and dances, and summered in St. Louis. In recent years, her steam engines were replaced with twin diesels. In 1989, after acquisition by President Riverboat Casinos, Inc., of St. Louis the vessel underwent a \$10 million conversion to a gaming boat.

The Trinity Marine Group, Gulfport, Miss., is owned by Trinity Industries, Inc., Dallas, Texas. The group includes 21 shipyards in Texas, Louisiana, Mississippi, Florida, Tennessee and Missouri.

For more information on Trinity  
Circle 13 on Reader Service Card

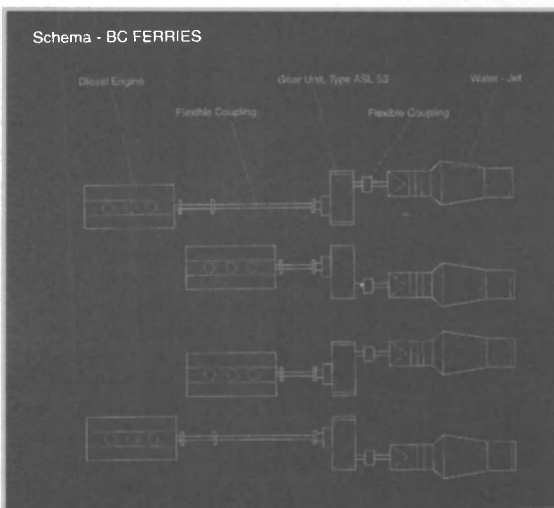
### Wärtsilä Wins Propulsion Order From Atlantic Marine



Wärtsilä Diesel's PROPAC.

Wärtsilä Diesel, Inc., of Annapolis, Md., has received an order from Atlantic Marine Inc.'s Alabama Division for complete propulsion systems for two 16,000 dwt chemical tankers. The vessels are being built for Dannebrog Rederi AS of Denmark under MarAd's Title XI loan guarantee program. Each ship will be equipped with a Wärtsilä 6L46A heavy fuel propulsion engine, all auxiliary equipment and a complete Wärtsilä Propulsion (Norway) drive system, including: a marine reduction gear; propulsion controls and a PTO/PTI emergency back-up propulsion system. Wärtsilä Propulsion of

(Continued on page 25)



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Continued from page 24)

way will also supply control-  
pitch propellers.  
While applications are at record  
els, in recent years, MarAd has  
ly approved one other project for  
le XI in which commercial,  
sangoing ships were built for for-  
n ownership. This is reportedly  
e first such shipbuilding project  
quiring medium-speed diesel  
gines.

For more information on Wartsila  
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### GE Marine Delivers Propulsion And Control System To China

GE Marine Systems has complet-  
ed the delivery of an integrated DC  
electric propulsion and ship service  
power distribution system for a  
vessel being built for Shengli Oil  
Shipping Company, Peoples  
Republic of China. The contract  
was signed in February 1995, and  
included a seven-month cycle to  
deliver the 3,000-hp propulsion  
system. The GE supplied equip-  
ment included the 600 VAC main  
switchboard for distribution and  
control of the generated AC power;  
three 1,000-hp, 750 VDC main  
propulsion DC2000 SCR power  
converters; three 1,000-hp, 900  
rpm DC electric motors; two step-  
down ship service transformers;  
and a 380 VAC ship service distri-  
bution switchboard/MCC. In addi-  
tion to the propulsion equipment,  
an automated monitoring alarm  
and machinery control system was  
supplied. This equipment included  
the main control console (EMC)  
and fore and aft pilothouse con-  
soles.

GE provided the complete electri-  
cal system integration engineering  
to ensure proper operation of the  
system, and provided systems  
operation and maintenance train-  
ing to vessels operators. The  
equipment delivered has been  
designed and built for a manned  
engine room class vessel and has  
been certified to the requirements  
of the China Classification Society  
(CCS).

The equipment was procured by  
Shandong International Develop-  
ment Company. The ship design  
was completed by the Department  
of Ocean Engineering and Naval  
Architecture at Tianjin, and will be  
constructed at Tianjin Xinhe ship-  
yard. Launching of the vessel and  
commissioning of the supplied  
propulsion and control system  
under the direction of GE engi-  
neers associated with the GE  
China Beijing office will be complet-  
ed later this year.

For more information on GE Marine  
Circle 9 on Reader Service Card

### TerraMar Completes Four Barge Projects

TerraMar Managers, Inc. has  
recently completed four projects

April, 1996

involving drydocks, repairs and  
upgrades to pipelay barges LB-278  
and DLB-323 (Sub Sea Inter-  
national), and Cherokee and Chick-  
asaw (Global Pipelines PLUS,  
Inc.). Services provided by Ter-  
raMar for these projects included  
on-site planning, cost tracking,  
audio-gauging and design support.

The Sub Sea International barges  
are currently laying a 20-ft. (6.1-m)  
pipeline for Chevron, USA. The  
pipehaul for this project is also  
being managed by TerraMar under  
a separate contract.

For more information on TerraMar  
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### Sotra Purchases Deck Machinery Supplier

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Circle 399 on Reader Service Card



cal workshop services and trading in used marine and offshore related equipment. Sotra, Norway, has recently focused on specialized chain, anchor and mooring equipment; and also on ship paints.

The acquisition of Eide reportedly makes Sotra able to offer a wider product range to both new and old customers. Sotra will continue to run Eide from the same location, with no change in product offerings. Eide Trading Ltd. will be run with new management. The takeover of Eide fits into Sotra's efforts to become involved in the field of trading and used equipment, as decommissioning of phased-out offshore installations picks up speed.

For more information  
Circle 20 on Reader Service Card

#### MHI Launches First U-Class Ship For Evergreen

*Ever Ultra*, the first of five U-class post-Panamax container vessels, has been launched at Mitsubishi Heavy Industries (MHI) in Kobe, Japan. The ship was christened by **Yung-fa Chang**, spouse of Dr. Chang, Evergreen Group chairman. *Ever Ultra*, to be delivered in May, and her sisterships have 5,364 TEU capacities, and are being built for Evergreen's transpacific service. Three of the vessels will reportedly be in operation sometime this year. The other two will be delivered in 1997.

At 24.5-knot service speed, the U-class vessels are reportedly expected to significantly reduce transit times in the carrier's transpacific trades. Each U-class vessel is fitted with 562 reefer plugs, increasing Evergreen's capacity for the carriage of temperature-controlled cargo.

In addition, Evergreen will also take delivery of three 1,162-TEU A-class containerships which will be used as feeder vessels in yet-announced trades. These are being built at Japan's Hayashikane shipyard. Evergreen affiliate Uniglor is also building 11 similar vessels, seven at Hayashikane and four at Taiwan's China Shipbuilding Corporation. Uniglor will use these ships on regional and long-haul routes.

For more information on Evergreen  
Circle 21 on Reader Service Card

#### Lykes' Year-End Financial Reports Show Excess In Total Cash Reserves

Lykes Bros. Steamship Co., Inc. has filed year-end 1995 financial reports with the Court of Tampa that show the company has in excess of \$11 million in total cash reserves, positive cash flow in December, and an upward trend in the company's receivables, which ended the year in excess of \$70 million. The reports are the first filed by Lykes with the Court since it filed for reorganization on October 11, 1995.

Lykes had previously distributed monthly operating reports, as required by the U.S. Trustee, to its banks, to the Unsecured Creditors Committee and to other parties who had signed a confidentiality agreement with the company.

The reports filed from Lykes reportedly confirm that the company is holding its own in the reorganization process. Data from these financial reports also reportedly confirm that vendors are extending trade credit to Lykes and show that the company has been paying its bills on time, including all vessel payments.

#### Furuno Radar Technology To Be Used By USCG

Furuno, a manufacturer of marine electronics for both commercial and recreational vessel applications, has announced it will supply radar components for the new Surface Sea Radar (SSR) program to be used by the U.S. Coast Guard (USCG). Furuno will provide shipboard radar receivers, transmitters, antennas to Hughes Naval and Marine Systems, which was awarded a multi-year contract by the USCG. Furuno is also responsible for the overall system integration of SSR.

SSR will be used onboard 14 ship classes, as well as with shoreboard traffic systems. Incorporating advanced digital technologies SSR will increase overall performance and ease of use of the USCG radar suite, reportedly allowing information to be integrated with other shipboard display and command and control systems. Multiple Furuno radars will integrate with a Fiber Distribution Data Interface (FDDI) fiber optic local area network (LAN).

For more information on Furuno  
Circle 23 on Reader Service Card

#### Unitech Acquires New Offshore Line

Unitech AS, a distributor of German company Walther Prezision's products, has added a new line of deepwater connectors for the offshore market.

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exico, these applications will become more essential to an efficient operation," said **Bernt Ellesoe**, president and head of Technology for Unitech Subsea of America, Inc., Houston. Products available from Unitech include connectors and interfaces for subsea remotely operated vehicles (ROVs) and designs for systems integration. Standard products in stock at the Houston warehouse include high-tensile steel and stainless steel products, in addition to seawater resistant materials. Unitech offers a hydraulic test facility and a "clean room" for flushing and protection of underwater umbilicals and subsea controls, which are now available to contractors or operators in the Houston region.

#### Steamship Authority Purchases Maverick Foam Vest System

The Woods Hole, Martha's Vineyard and Nantucket Steamship Authority has purchased the Maverick Foam Vest System (MFVS) from Derbyshire Foam Systems Products, Philadelphia, announced **Robert B. Derbyshire**, company president. The MFVS reportedly allows shipboard personnel to respond quickly and effectively to a fire onboard ship, with the added ability for the operator to switch from AR-ARFF Foam to seawater and back, as conditions warrant. The MFVS is ABS approved for SOLAS compliance and the MFVN BR-95 is UL Listed according to both American NFPA and British Standards.

As stated by Captain **John Crocker**, port captain of the authority, "We are very safety conscious and this equipment is very impressive for that purpose." The Steamship Authority operates seven passenger ferry RoRo

ships to the Massachusetts islands all year round.

#### Pan-American And Zim Announce Joint Service Agreement

Pan-American Independent Line and Zim Israel Navigation Company Ltd. have announced their entrance into a vessel sharing agreement. The joint service will deploy seven 1,400 TEU vessels with ample reefer capacity. The weekly service will operate between ports of the East and Gulf coasts of the U.S. and the East coast of South America, including the Caribbean. Both companies will continue to serve the U.S. East coast ports directly, and to serve the Gulf ports primarily with transshipment at Kingston.

#### ClassNK Launches PrimeShip Project; Announces New Appointments

International classification society Nippon Kaiji Kyokai (ClassNK) has launched PrimeShip, a fully comprehensive system for enhancing the overall integrity of a ship. The system reportedly provides shipowners and builders with an integrated program of services and software, designed to ensure the highest levels of structural integrity, as well as the safe and efficient operation of a vessel throughout its service life. The society's Executive Vice President **Masataka Hidaka** said: "It is essential that ship safety is considered in a balanced and overall fashion, encompassing all the key elements — design, construction, operation, management, maintenance and manning. Com-

prehensive improvements to ship safety can only be assured when these elements are taken into account in an interactive, consistent and harmonized manner."

In addition, **Tadashi Mano** has become chairman and president of ClassNK. He succeeds **Mitsuo Abe** who has assumed the role of honorary chairman. Mr. Mano has had a career in Japanese maritime administration, becoming director of the Japanese Ministry of Transport's Maritime Technology and Safety Bureau. He joined the board of ClassNK in 1994, as executive vice president.

ClassNK has also announced that two former managing directors, **Isao Takeuchi** and **Masataka Hidaka**, have been appointed executive vice presidents. Three new managing directors have also been appointed. They are: **Hiroshi Kume**, formerly regional manager of the Americas region, based in New York; **Kenji Murai**, formerly general manager of the Business Coordination department; and **Toru Terai**, formerly general manager of the General Affairs department.

#### Newport News Wins Contracts For Aircraft Carrier Work

Tenneco's Newport New Shipbuilding (NNS) announced that it has been awarded two planning contracts for upcoming work on the NNS-built aircraft carriers *USS Theodore Roosevelt* and *USS Enterprise*. *Enterprise* (CVN 65) is slated for arrival at NNS in January 1997, and is expected to remain at the yard for seven months. The shipyard was awarded a \$11.4 million contract for this work which will include selected repairs.

The award for *Roosevelt* (CVN 71) is valued at

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\$18.3 million. Work performed will also include selected repairs and the vessel will be in drydock for a portion of the work expected to last approximately one year. The carrier is projected to arrive at the shipyard in the summer of 1997. Both ships are homeported in Norfolk, Va.

For more information on NNS  
Circle 24 on Reader Service Card

### Southampton Container Terminal Prepares For Trade Expansion



A new containership is shown being loaded at Southampton Container Terminal.

The latest cranes to be commissioned for the U.K.'s Southampton Container Terminal were custom-built by Morris Cranes of Loughborough, Leicestershire. Designed for post-Panamax-sized vessels, the quayside cranes are reportedly among the fastest in operation at any U.K. terminal, with hoist speeds

up to 426 ft. (130 m) per minute and maximum trolley speeds of 492 ft. (150 m) per minute. Crane outreaches of more than 147.6 ft. (45 m) and backreaches extending to 52.5 ft. (16 m) have been achieved. Each new crane has a heavy lift capability of 67-tons under the hook beam. Onboard diagnostic equipment allow hundreds of operational points to be monitored via video displays in the terminal's control center so that faults can reportedly be spotted and rectified.

Southampton is undergoing a period of expansion, both in terms of passenger liner and freight traffic. Much of the increase in cargo is reportedly due to rising totals in Europe-Far Eastern traffic, with the terminal providing services for major shipping lines, including P&O, Maersk, Hapag Lloyd, NYK, Mitsui, OSK, Nelloyd, MISC, APL and OOCL.

For more information on  
Southampton Container Terminal  
Circle 46 on Reader Service Card

### Polar Kraft Offers Jet Drive-Powered Fiberglass Skiff



Polar Kraft 1780 Jet Polar Skiff.

Polar Kraft offers its 1780 Jet Polar Skiff as part of the company's saltwater series of fiberglass skiffs. This 17-ft. (5.2-m) boat features a

redesigned console with drink holders, rod holders, full instrumentation and room for mounting electronics. Its five-person interior also features an 80-ft. (24.4-m) beam, large fore and casting decks and lockable storage compartments.

The tunnel hull is built with a multi-section stringer system and monohull deck. The hull bottom has been modified to further improve pump performance, and recessed turning rai have been added to improve handling. The redesigned engine cover has been made into single piece and equipped with sound damping material to minimize engine noise. A coaming has been extended to reduce the possibility of wake water washing over the transom and supports for the coaming have been built into the transom, providing ideal locations for rod holders when trolling.

The skiff is powered by a Marine Power, Inc. 181 CID 140-hp engine linked to a Marine Power, Inc. X-Stream axial-flow jet drive. This package reportedly provides top speeds of 38 mph and allows the skiff to run in just 8 ft. (2.4 m) of water. A stringer link suspension system was developed by Polar Kraft and Marine Power, Inc. for engine placement in the 1780 Jet. It uses a four-point isolation system on the boat's stringers to provide stable engine support, and is reported to virtually eliminate engine vibration from the hull. Optional features include a windscreen, grab rail, T-top, bimini top, aerated baitwells and catchwells, rod holders and a poling platform.

For more information on Polar Kraft  
Circle 33 on Reader Service Card

### MAN B&W Offers Three Long Stroke Engine Types

MAN B&W has introduced the super-long-stroke S35MC, S42MC and S46MC engine types. More than 30 such engines are reportedly on order, and S35MC and S42MC types are already in service. The power range of the

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5MC is from 1,900 kW to 8,400 kW, with engine speeds ranging from 145 to 170 rpm. The power range of the S42MC is from 2,780 to 12,300 kW, with engine speeds ranging from 115 to 136 rpm. These engines are available in four or 12 cylinder configuration. The 46MC is initially available with four to eight cylinders, providing power from 6,550 to 10,840 kW at 109 to 129 rpm.

For more information on MAN B&W  
Circle 102 on Reader Service Card

electronic control. If the temperature deviates from the set temperature, a highly accurate temperature compensation is applied, which reportedly adjusts the data to account for the difference between the actual temperature and the 104 degree F reference temperature.

After the sample is thermally stabilized and any trapped air bubbles are vented, four independent measurements of viscosity are

made and their average is displayed. If the viscosity reading does not fall within the present maximum and minimum limits, a red warning light is lit and an audible alarm tone is initiated. After the measurement is taken, the sample is automatically ported out of a drain line, and the system is prepared for the next sample.

The shipboard viscometers are currently in use on surface fleet ships. CAS provides a complete

line of both process and laboratory viscometers and electronics. Since its formation in 1984, CAS has reportedly installed thousands of viscometers throughout the world for companies such as Allied Chemical, Kodak, 3M, Ford Motor Company, IBM, Colgate Palmolive and Procter & Gamble. The company is privately held and is headquartered in Medford, Mass.

For more information on CAS  
Circle 34 on Reader Service Card

### CAS Offers Shipboard Viscometers For 9250 And 2104 Lubricants



CAS TCV200 Shipboard Viscometer.

Cambridge Applied Systems (CAS), a provider of solutions for viscosity measurement and control, has announced the availability of its TCV200 and TCV214 shipboard viscometers. These microprocessor-based viscometers reportedly provide automated shipboard measurement of 9,250 and 2,104 lubricants.

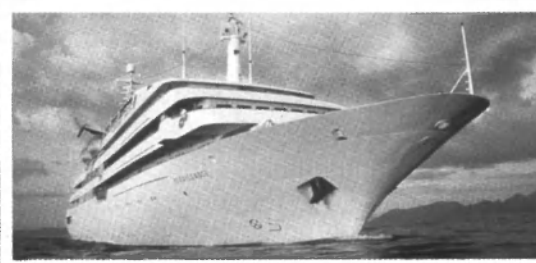
Based on CAS's patented technology, the TCV200 and TCV214 viscometers are distinguished by a single moving part — a stainless steel piston. Two electromagnetic coils drive the piston up and down inside a measurement chamber filled with test fluid. Magnetic force on the piston is resisted by viscous flow of the fluid around the piston. Round-trip piston travel time is used to accurately determine the fluid's absolute viscosity (centipoise). A density correction is then applied to the data to determine the kinematic viscosity (centistokes) which is visually displayed.

The measurement chamber reportedly requires only five milliliters of sample, most of which is used to flush out the previous sample prior to measurement, eliminating the need for solvent clean-up. After the sample is inserted into the sensor with a pipette, it is automatically pumped into the measurement chamber, stirred by the piston motion, and temperature stabilized to 104 +/- .2 degrees F using a resistance heater and

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## BP Presents Five Ship, \$540 Million Deal To Far Eastern Yards

By Alan Thorpe, international editor

Singapore's repair industry is busy trying to retain its world leadership, despite the attentions of mainland China and pressing competition from the Middle East.

The Singapore Government recently relaxed the ratio by which the repair yards could employ foreign workers, which has reduced Sembawang's worries about inadequate workforce availability.

Meanwhile, Jurong Shipyard Ltd. (JSL), Hitachi Zosen, Singapore Technologies and Pan United (all in the repair business) have combined to build a 3,000-capacity worker accommodations block. Current expansion plans at Sembawang include two overseas projects -- at Karimun in Indonesia and Bohai in mainland China.

Karimun, which is a 90-minute boat ride from Singapore, will acquire a 21,000-ton lifting capacity floating dock, which is currently being built at Sembawang Bethlehem (Sembeth). The dock, which will allow ships up to Panamax size to be drydocked, was scheduled for delivery this month.

There is also pier, crane and water depth available at Karimun for tankers up to 400,000 dwt to be repaired.

There are two new VLCC graving docks about to open in Singapore, and the new 400,000-dwt graving dock currently being built at the Tanjong Kling shipyard of JSL is almost complete. Its opening date is scheduled for the end of June. The program is designed to expand JSL's penetration of the newbuilding and offshore market. Meanwhile, the new 360,000-dwt graving dock at Keppel's Tuas shipyard is nearing completion, with the target date for opening projected for the middle of this year. This dock is intended to replace the repair facilities at Keppel's City Yard (pictured lower right), which will finally close this month.



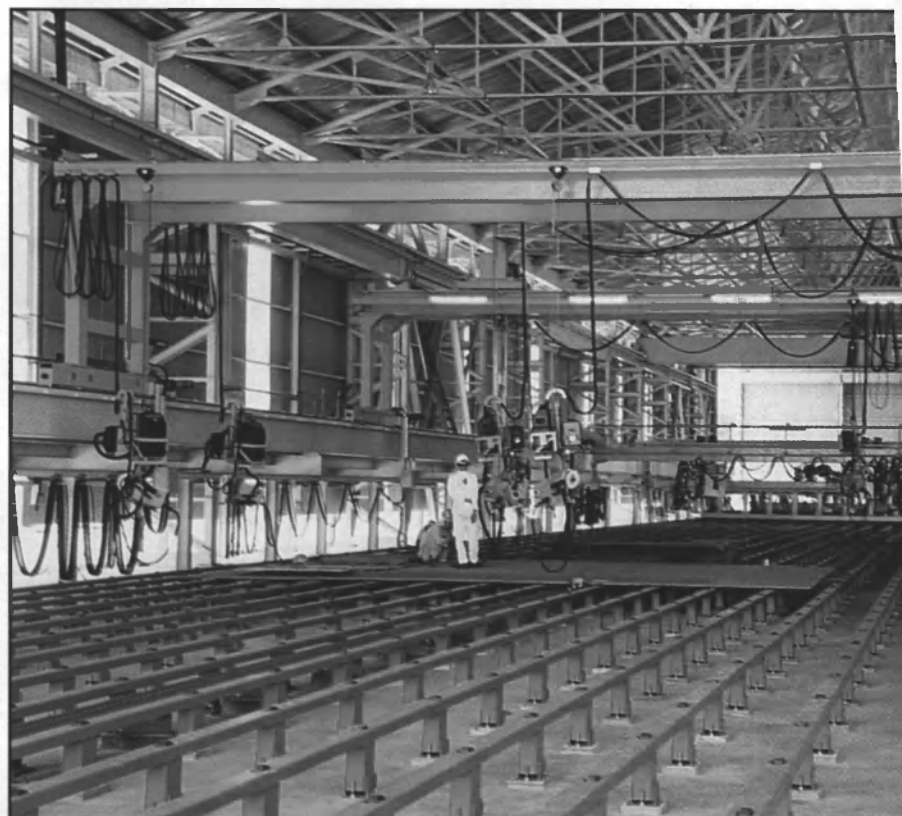
JSL is continuing with a block booking arrangement with U.S.

oil major Chevron. The deal includes the six tankers that underwent drydock last year, and the eight drydocks expected this year. The latest contract involves the 268,240-dwt, Liberian-registered VLCC *Chevron Copenhagen*, which is currently in the shipyard.

The next two tankers due in are 268,333-dwt, Bermudan-registered VLCC *Chevron Edinburgh* and 268,432-dwt, Liberian-registered VLCC *Chevron Feluy*. JSL also has a regular agreement with Singapore's Neptune Orient Lines (NOL). This deal involves six ships (tankers and containerships), which are expected to start arriving during the coming months.

On the conversion side, JSL has completed the conversion of *Nan Hai Sheng Li* from a VLCC to a FPSO. The FPSO will be based off the mainland Chinese coast for a joint venture between China National Oil & Offshore Co. (CNOOC) and Amoco. The contract was placed with JSL by Modec.

Pan-United will join the expansion game, and it announced the building of another floating dock for the yard's own use. The unit, whose



Sembawang's new panel line

construction will begin in May, is due for completion by March 1997, and will have a maximum lifting capacity of 17,800 tons, a length over keelblocks of 607 ft. (185 m), and an overall length of 640 ft. (195 m). Pan-United is also believed to be looking into the possibility of building a new ship repair yard in Batan, Indonesia, which is 30 minutes away from Singapore.

Malaysian Shipbuilding & Engineering (MSE), Pasir Gudang, is currently competitive with other ship repair yards in the Singapore area, largely because the Malaysian currency has a much better exchange rate against international currencies, compared with the very strong Singapore dollar. The yard has begun work on installing the large syncrolift shiplift system, which was purchased last year from Todd Shipyards in the U.S. It is expected that the system, which has a 20,000-ton lifting capacity, will be operational during March 1997. The system will be used by three divisions within MSE -- newbuilding, naval repair and commercial repair. The second floating dock, built by Singapore Technologies for the



LEFT: Sembawang



RIGHT: The old Keppel Shipyard, which is to close this month.



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yard's own use, is now fully operational.

The yard recently delivered *Alum Buhm*, the first in a series of four 1,000-TEU feeder containership for the world's largest feeder containership operator, Singapore's Regional Container Line (RCL).

Hitachi Zosen (Singapore) is yet another yard with plans to expand, as it looks towards building bigger ships.

Singapore's ship repair/conversion and shipbuilding specialist Far East Levingston Shipbuilding (FELS), which is part of the Keppel Corp., has been awarded a contract to convert a semi-submersible drilling rig to a semi-submersible floating production platform. Awarded by Brazil's state-owned oil company, Petroleo Brasileiro SA (Petrobras), under the name of Braspetro Oil Services (Brasoil), work onboard *Penrod 71* will include upgrading and modifying its existing hull, removing drilling equipment and installing process equipment.

With the new process equipment, the platform, which will be renamed *Petrobras P-27*, will have a production capacity of 40,000 bpd.

The \$100 million contract is scheduled to take 26 months to complete. FELS will partner with Odebrecht subsidiary Tenica Nacional de Engenharia SA (Tenege) for this contract.

Singapore's largest newbuilding yard is Sembeth, part of Singapore's Sembawang Corp. Presently the shipyard delivers four vessels each year, but its goals are to build as many as 10 vessels a year, weighing 10,000 dwt.

The ship types will be product carriers, coated chemical tankers, LPG vessels, containerships, reefers, smaller RoRo vessels and, eventually, stainless steel chemical tankers.

The yard recently announced that the option for a second 37,000-dwt open hatch bulk carrier from mainland Chinese owner China National Transportation Corp. (Sinotrans) has been received, increasing the yard's current orderbook to five bulk carriers and one 21,000-ton lifting capacity floating dock (for Sembawang Shipyard's Karimun Shipyard in Indonesia). The yard's other orders include a series of three 28,500-dwt high specification bulk carriers for European-based Suisse Atlantique.

The yard, located adjacent to Sembawang Shipyard's repair facility, is currently nearing completion of the second phase of a facility upgrading program, which includes a new panel line from TTS in Norway.

Another recent addition to the yard's design capability is a fully integrated Tribon system from Kockums Computer Systems (KCS), Sweden.

**Soliciting bids for \$540M Deal**

Japan's shipbuilding industry has had a good start this year, as a total of 23 ships (530,000 grt) was ordered from overseas owners during January. The yards also delivered a total of 21 ships during the

same period. This left approximately 370 ships (13.5 m grt) still on order at the end of January.

Adding to these numbers in February was an order from Taiwan's Golden Ocean Group, which placed an order for two 2.2

million-barrel (310,000 dwt) crude carriers from Hitachi Zosen. The two-ship order marks Japan's first large tanker order of this year.

Both ships are to be double-hulled, and market sources put the cost in the \$166-180 million range

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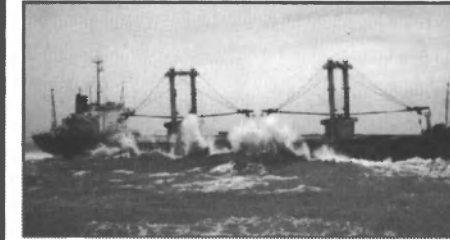
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Tanker Jupiter, Bay City, Michigan



Crane Barge BOS 400, Capetown, South Africa



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for the two ships. The largest VLCC project currently on the world market is from U.K.'s BP Shipping, which is putting together a \$540 deal for five such ships.

The owner has sent out details of the two million-barrel vessels to virtually all shipyards in Japan and South Korea.

An order for a ULCC was placed with South Korea's Phoenix Marine Shipholding, which turned to the newly-opened Samho Shipyard of Halla Engineering & Heavy Industries (HEHI) for two 2.1 million-barrel (300,000 dwt) crude carriers. The cost is believed to be \$88 million for each vessel.

On the containership market, the world is still waiting for P&O Containers' decision concerning which yard will build its series of 6,000-TEU ships. Meanwhile, Japan's NYK Line has ordered a series of five 5,700-TEU boxships from domestic yards; IHI and Mitsubishi are contracted to build two each, and Mitsui is contracted to build one.

Another Far Eastern shipowner building large post-Panamax containership is

Singapore's Neptune Orient Lines, which has confirmed an order for two 4,900-TEU vessels from Mitsubishi.

Taiwanese containership operator Evergreen is currently in the final stages of a \$20 million repair and modification program of its existing containership fleet, in order to ensure continued reliability of its L- and G-class vessels beyond the year 2000.

Evergreen's six 1,810-TEU L-class vessels, built during 1979-83, have had their ABB turbochargers refurbished, at a cost of approximately \$300,000 per vessel.

These vessels are *Ever Laurel*, *Ever Level*, *Ever Linking*, *Ever Living*, *Ever Loading* and *Ever Lyric*.

Meanwhile, Evergreen's 20, 2,728-TEU G-class ships have undergone major engine modifications, outfitted with new cylinder liners and improved lubrication systems for their Sulzer main engines, costing \$600,000 per vessel. To ensure the ships remain in top shape Evergreen said that these vessels will now be drydocked every two and a half years.

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**Racal-Decca Upgrades Navigation Software**



A software upgrade has been introduced by Racal-Decca Marine to benefit the users of its successful MNS 2000 multi-sensor marine navigation receiver. The MNS 2000 is reportedly used to provide continuous latitude and longitude positioning for vessels anywhere in the world by using Decca, Loran-C, Transit, Omega or GPS signals. The upgrade has been introduced to accommodate the reconfiguration/closure of Decca and Loran-C chains worldwide.

The software upgrade reportedly enables MNS 2000 users to navigate safely by providing required positioning accuracies in waters as far afield as the Middle East, Japan, Canada and India. The upgrade also includes a NELS chain option for use in northwestern European waters when these chains become fully operational.

The MNS 2000 receiver is equipped with an NMEA 0183 data port and can reportedly be interfaced with the Racal-Decca range of radars and electronic chart systems. It can also be used within the Racal-Decca MIRANS range of integrated bridge systems. The new upgrade kit is available through the Racal-Decca Marine worldwide distribution network.

For more information on Racal-Decca  
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calculating distance bearing between any two points; true motion; rain and sea clutter; IF rejection; target expansion; off-center position; and target alarm for targets entering or leaving the target zone. Positions from up to five individual navigators or position sensors, GPS, Loran and decca can reportedly be displayed and tracked simultaneously.

For more information on Simrad  
Circle 108 on Reader Service Card

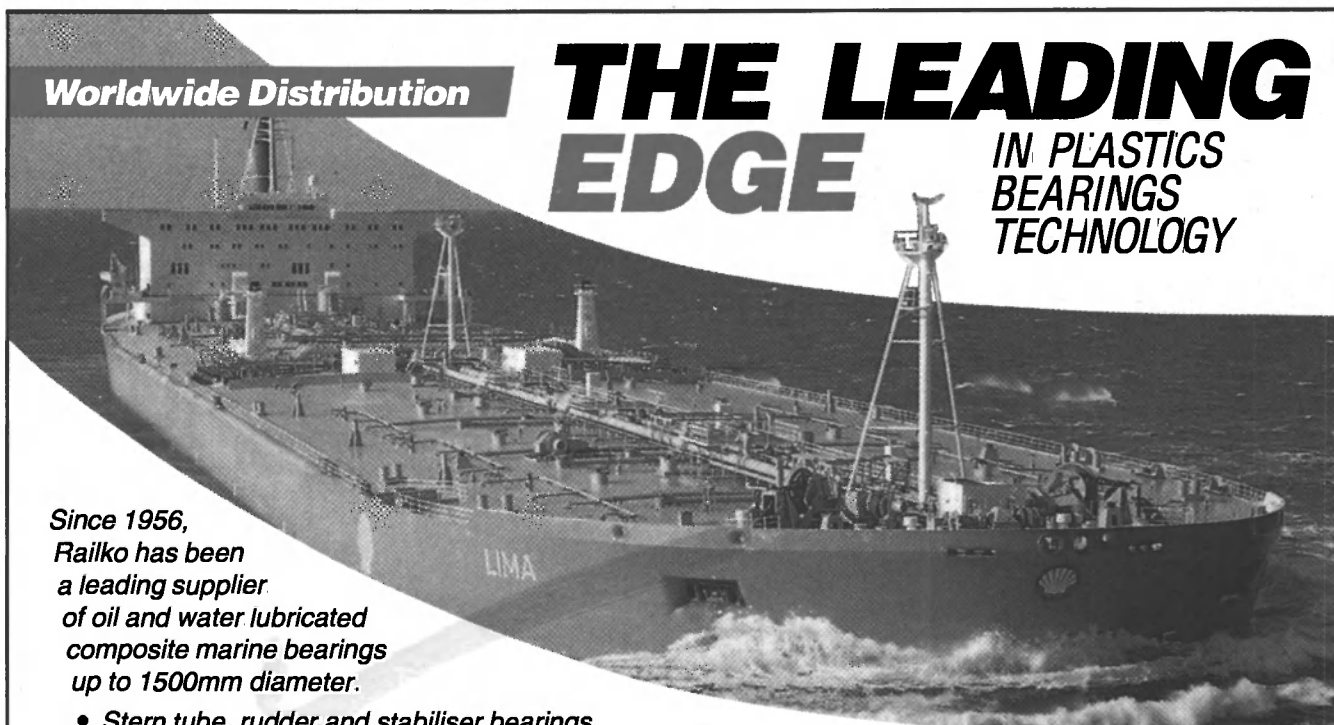
**Abejon Moves Ahead With \$4 Million Investment And Distribution Agreement**

Abejon Rotary Power, San Diego, Calif., announced it has invested \$4 million to acquire one million shares of the Common Stock of Rotary Power International, Inc. (RPI) of Wood-Ridge, N.J. In addition, RPI has

awarded Abejon exclusive rights for distribution of RPI's 580 series diesel marine engines throughout the U.S., the Pacific Canadian provinces and Baja California, Mexico. Abejon has placed an initial Purchase Order with RPI for nine, two-rotor and two, six-rotor marine engines totaling \$2,350,000, and has agreed to minimum order quantities of an additional 10 engines in 1997 and 100 engines in 1998. Ken Brody, presi-

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**Simrad Introduces Track Plotter With Radar Overlay**

Simrad Inc. has introduced the Shipmate 2800, its latest dedicated 15-in. high resolution color track-plotter. With a shock vibration resistant hard-disc, the 2800 reportedly has a memory capacity of 10 million plots, marks, lines and tracks.

The 2800 has a standard 3.5-in. floppy disk drive, and an optional CD-ROM drive can be added to use the advanced CM93 worldwide chart system from C-Map. More than 3,000 detailed charts are reportedly available on a single CD-Rom. The 2800 can be used in addition to an onboard radar display, or a user can control the scanner from the 2800 and use it as a stand-alone radar.

Standard features include EBL/VRM for



April, 1996

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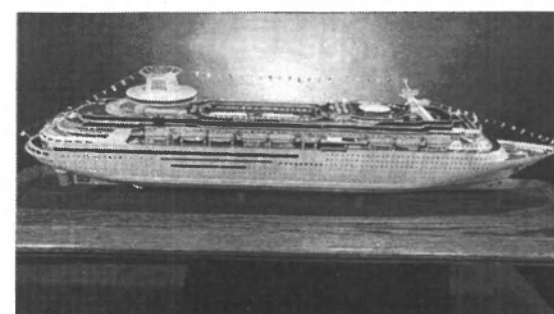
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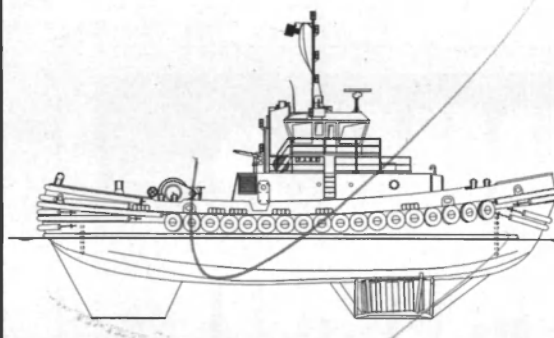


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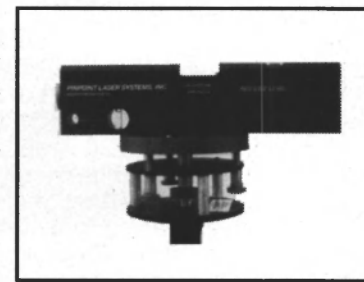
dent of Abejon, said: "Our intention is to distribute this engine into the rapidly growing fast ferry fleets and high performance motor yachts throughout the world."

For more information on Abejon  
Circle 109 on Reader Service Card

### Pinpoint Offers Laser Leveler For Industrial Alignment And Factory Improvements

Pinpoint Laser Systems offers the Leveler, an accessory designed to enhance the capabilities of the Red Line Laser Level. The leveler reportedly enables industrial workers to quickly complete measuring and alignment tasks with only one person. Typical applications include leveling, aligning, locating and quality control.

By adjusting precision screws on the Leveler, the user is reportedly insured a straight and level laser reference beam. A center column provides a precision rotating axis which supports the laser to keep it firmly attached to the tripod. The laser reference beam can then reportedly swing in any direction, while providing an accurate leveling reference. These adjustments can also be set to a precision angle for positioning machinery, conveyors and other systems. The Leveler is made of three solid aluminum plates, covered with a hard-coat, anodized finish and stainless steel hardware, providing wear resistance and adjustment capabilities.



For more information on Pinpoint Laser Systems  
Circle 107 on Reader Service Card

### Schuyler Awarded Fendering For Tug Conversion

Schuyler Rubber Co., Inc. of Woodinville, Wash., has completed a fendering application for tug conversion. Moran Towing Corp. contracted Schuyler to manufacture the fenders for the M/V *Sewells Point*. The tug was outfitted with the Schuyler model SR3D loop style fendering. This fendering reportedly allows the tug to push off the stern with maximum load deflection and energy absorption. The model SR3D loop style has been on the market for five years.

For more information on Schuyler  
Circle 110 on Reader Service Card

### Jamestown Metal Wins Contracts

Jamestown Metal Marine Sales, Inc. has been awarded two major contracts by Trinity Marine Group. Jamestown Metal will provide the complete interior joiner package for Alaska state's new ocean class RoRo passenger vessel, scheduled to be completed in the first quarter 1998. Alaska State Ferry is 380 ft. (116 m) long and 85 ft. (26 m) wide with a maximum speed of 16.75 knots. It will have 48 A-Class staterooms, 338 C-Class staterooms, plus 24 roomettes. The galley, food service and dining areas have seating for 300 people and the capacity to feed 500 people. The vessel is being constructed at Trinity's Halter Marine, Moss Point facility.

Jamestown has also been awarded a contract for complete joiner interiors and food service installation for two Barracks Craft (AOL 61/62) at Trinity Marine Group's Gulf Coast Fabrication

Maritime Reporter/Engineering News

yard. These berthing barges will accommodate 600 people, with locker and sanitary facilities and food service capability to serve over 3,000.

These vessels are 359.2 ft. (109.5 m) long and 95.1 ft. (29 m) wide. Additionally, Jamestown has completed the interior of the casino riverboat *City of Evansville*. This is reportedly the first licensed casino vessel for the state of Indiana. It was built by Jeffboat, with interior design work done by Morris Brown & Associates. It is 310 ft. (101.7 m) long, has three decks and can accommodate 2,800 passengers. The vessel is an addition to Jamestown's growing list of successfully completed interiors for various gambling vessels. To date, Jamestown has delivered nine riverboats since 1990.

#### New Joint Venture Between Zim Isreal And Maruba SCA

Zim Israel Navigation Company, Maruba SCA of Buenos Aires and Cia Paulista de Comercio Maritimo of Rio de Janeiro have entered into a joint venture agreement under the name SAMEX (South America-Mediterranean Express). The joint service will cover the trade between the East Coast of South American and the West Mediterranean. The service will reportedly operate six 1,000 TEU container vessels with ample reefer capacity, with a frequency of approximately eight days.

#### Intermarine USA Delivers Fourth Osprey Class Minehunter

Intermarine USA of Savannah, Ga., has delivered the fourth of eight contracted ships of the Osprey class Coastal Minehunter, *USS Black Hawk* (MHC 58) to the U.S. Navy. The ship is designed for minehunting under all environmental conditions, with a flexible and resilient hull, and is reportedly able to withstand the shock of a close mine explosion. *Black Hawk* and her sisterships are 188 ft. (57.3 m) in length, 890 metric tons in weight and are reportedly the world's largest ships to be constructed entirely of glass reinforced plastic (GRP).

Intermarine USA is a U.S. shipyard registered as a partnership in N.Y. The general partner, Intermarine SpA of Sarzana, Italy, is a member of the industrial conglomerate, Ferruzzi Group.

For more information on Intermarine Circle 112 on Reader Service Card

#### Maritime Overseas And Kent Line Retain ERST For Spill Management Services

Unocal Corporation's wholly-owned subsidiary ERST, Inc. (Emergency Response Strike

Team) announced that it has been retained by Maritime Overseas Corporations of N.Y. and Kent Line of New Brunswick, Canada, for emergency response and spill management services. The agreements with the two companies cover more than 45 tankers, ranging from medium-sized product carrier to large crude carriers (VLCCs).

ERST, Inc. is a recognized leader in emergency response, providing spill management, crisis

management and related consulting and training services to oil and chemical companies, other industrial firms and municipalities. In addition, ERST can reportedly provide spill management equipment including a 45 ft. (13.7 m) mobile command post, air deliverable command post modules, logistical support structures, base and portable radio communications networks (UHF/VHF), satellite communications, portable PBX

telephone system and a local area network computer system with spill management software.

For more information on ERST Circle 111 on Reader Service Card

#### EBDG Awarded Engineering Contract From Todd Pacific

Elliott Bay Design Group (EBDG) of Seattle has been awarded a contract by Todd Pacific

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In this case the 100 ton pneumatic hoists were used on site to level these 310 ton cranes. Incredible size and capacity ratio, precision engineering and construction, and their dependability on only 85 PSI compressed air operation made the JDN PROFI the perfect choice for the job.

But this hoist, and the rest of the world famous PROFI series, can operate at the same performance level mounted overhead on trolleys and in low overhead situations. They are unaffected by dampness, moisture, steam or heat, and the pneumatic operation makes them ideal for situations where sparks and electrical problems cannot be tolerated.

The ultra sensitive, pull cord speed regulation, built into every PROFI hoist, was key to this precision Navy operation. The ability of the hoists to be left running indefinitely without damage adds to the exceptional versatility of the PROFI Line.

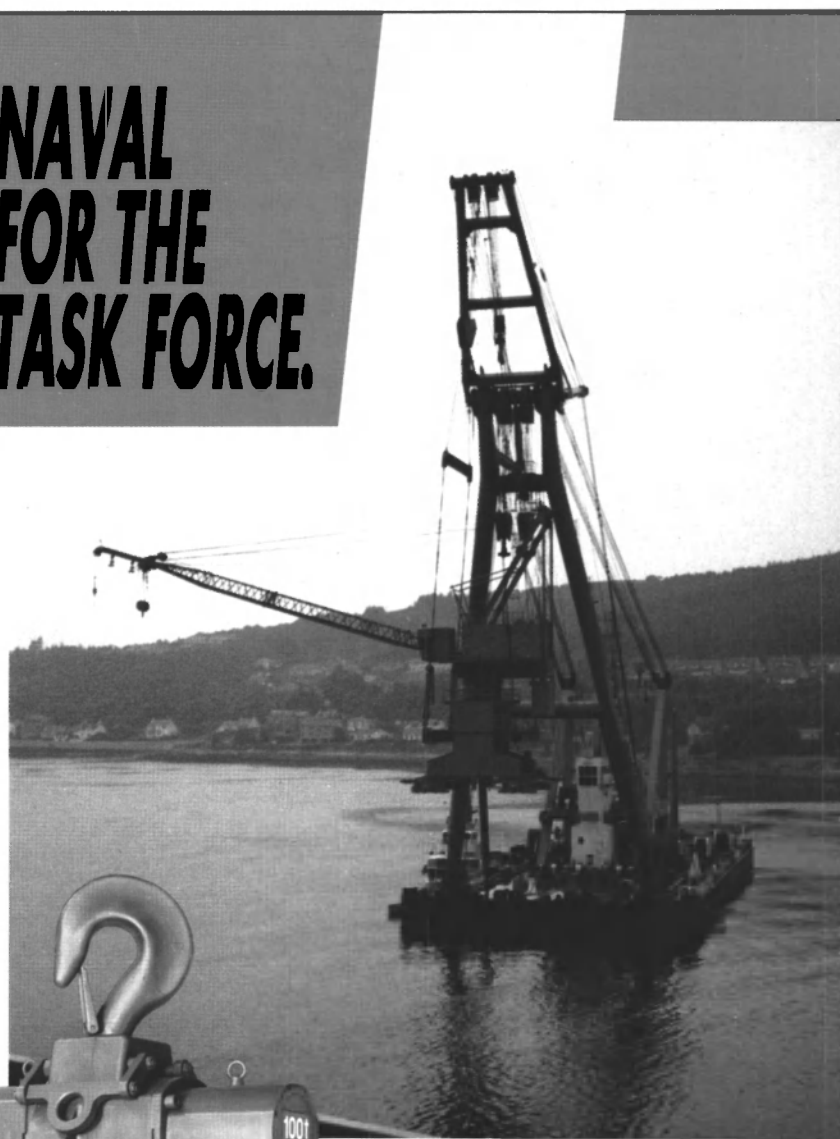
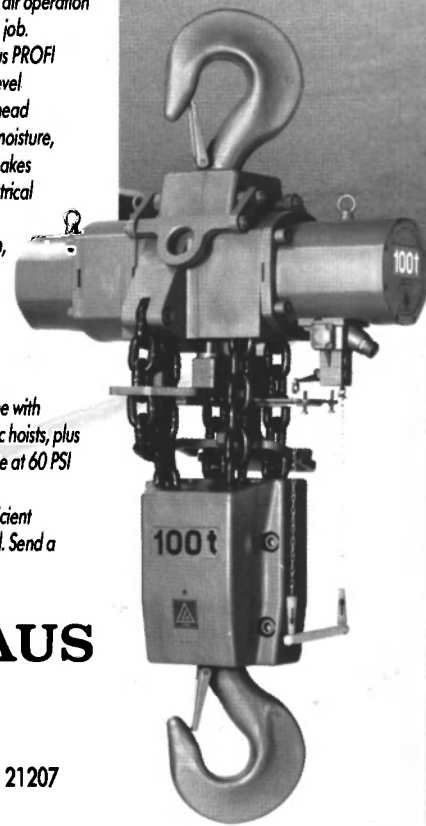
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DEPARTMENT OF THE NAVY  
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COMMUNICATIONS & CONTROL CENTER  
4200-1/2000  
Rev 11/17/14  
18 November 1997

To: Commander, Charleston Naval Shipyard  
J.D. NEUHAUS, Baltimore, MD 21207

Re: DELIVERY OF TWO 100 TON PNEUMATIC OPERATOR CRANE HOISTS  
ON CONTRACT NUMBER 47-751

Subj: (1) REQUEST FOR PHOTOGRAPH OF NEW AP88-7 Crane LIFT  
IN BALD LOCK (Inland) (2) Photos

1. The purpose of this letter is to commend your Mr. Ronald T. Plattenberg for his dedicated support and complete performance in the handling of many details for delivery of the two 100 ton crane hoists on our contract number 47-751. REQUEST Characterize appreciate the quick action and delivery to support our schedule for loading the two new port crane and shipment to BALD Lock.

2. Enclosure (1), shows the two (100 ton lift) cranes being moved in BALD Lock by JDN's INTERNATIONAL CRANE CRANE. The effort to be made by JDN, and JDN's (JDN), show the two pneumatic powered crane hoists are used to level the new port crane so that the cranes hoists will load on the BALD crane. The project was a great success as one new crane was loaded to the working and the other set in the afternoon.

3. Please present one of these photographs to Mr. Plattenberg with our sincere appreciation for a job well done.

*R. A. ...*  
R. A. ...  
Acting

Circle 290 on Reader Service Card



Shipyards to perform all engineering work for the yard's work on the car/passenger ferry *Taku*.

The ferry, operated by the Alaska Marine Highway System, is undergoing liferaft and car deck structural work, much of which is designed to comply with 1992 amendments to SOLAS '74 requirements.

Work on *Taku* includes upgrading the vessel's lifesaving, fire-

fighting and ingress/egress facilities. EBDG is responsible for providing complete production drawings and Excel material lists, all performed on AutoCad 12. The naval architecture and marine engineering firm also provides technical specifications, rip-out drawings, on-site support and coordination with vendors, including working with ABS and the U.S. Coast Guard for approvals. *Taku*,

originally built in 1963, has a capacity of 500 passengers and features RoRo side and stern doors for vehicle loading and unloading. She is 352 ft. (107.3 m) long, with a breadth of 73.8 ft. (22.4 m) and a draft of 15 ft. (4.6 m). The twin-screw vessel is powered by two 4,000-hp diesels, and has a gross tonnage of 2,624.

For more information on EBDG  
Circle 113 on Reader Service Card

## North Cape Spill Fuels NRDA Controversy

By Bridget A. Murphy, associate editor

Having been raked over coals by industry, government and environmental organizations for countless months, natural resource damage assessment (NRDA) might seem a tiresome subject to some, but controversy surrounding NOAA's guidelines continues to rage, fueled by *North Cape's* home heating oil spill, and accordingly, the first instance of guideline implementation.

**Richard Hobbie, III**, president of Water Quality Insurance Syndicate, the marine insurance agency retained by the *North Cape* party, was quick to point out that the implementation of NRDA guidelines went unchallenged at the Rhode Island spill site, although adding, "I think it's important to understand that there has been no agreement."

He went on to echo what is becoming a popular lament among some industry interests — that NRDA ignores the limitation of liability inherent in the guidelines of OPA. NOAA and U.S. government representatives responded to this claim by emphasizing that the guidelines are focused on restoring baseline conditions, not monetizing injured resources, and stressed that their motivation was to benefit society, not to make a profit. As explained by **Mark Barash** from the Department of the Interior's Solicitor General's office, "We have to triage resources and try to get our jobs done. NRDA is not designed to pick pockets, but to get something done."

With the final rule challenge date set for May, a significant portion of the industry seems to have strong objections, and guideline opponents are voicing concerns, using buzzwords such as "rebuttable assumption" and "double recovery," in reference to what they perceive as a general lack of standards, lack of a clear framework, and lack of accountability on the part of NOAA.

One particular note of contention is that R.P.s could end up paying damages to localized spill-area outfits such as fishing and lobster operations and restaurants under Section 1002 (loss of net rate capacity, loss of net profit), and that NOAA would not take these expenses into account when formulating restoration plans. As stated by Mr. Hobbie, "Where in the control, where in this process is it precluded or is NOAA obligated to take those costs into consideration when viewing the damages being done?" He continued, "We also see a terrible problem with the lack of federal preemption ... The act says under OPA that you can't have double recovery. But once you've paid under OPA, that doesn't mean the state couldn't come and grab you a second time."

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Atmospheric Administration officials are putting forth a more than reasonable effort to issue assurances that there are limits to its power as a trustee, and that it is required, and eager, to involve not only the public, but the R.P.s in the injury assessment process. As explained by NRDA proponents such as NOAA's General Counsel **Terry Garcia**, the idea that the NOAA's board of trustees or federal agencies are using the program as a backdoor method for funding other programs is not true. It was also stressed that passive use, contingency valuation and other economic methodologies are not used for calculating damages, but for the preparation and submission of restoration plans, adding that R.P.s only pay for the implementation of restoration plans — an important distinction between the new approach and what was valid under former NRDA guidelines.

In a similar attempt to stress the positive value of NRDA, **Pete Bontadelli**, administrator of the Office of Oil Spill Prevention and Response, California Department of Fish and Game, addressed habitat evaluation as a method of speeding pre-assessment periods and quelling post-spill controversy. Habitat valuation works by establishing pre-existing restoration plans for endangered species habitats in preparation for possible incidents, and has already been used for species such as

**"NRDA is not designed to pick pockets, but to get something done." — Mark Barash, Solicitor General's office, Department of the Interior**

California's brown pelican. It would appear that such pre-determined agreements, performed using joint surveys, could function in circumventing confusion surrounding establishing baseline conditions after spill incidents occur.

When queried as to whether he would support widespread habitat evaluation as described by Mr. **Bontadelli** as an alternative to post-spill contingency valuation, Mr. **Hobbie** responded: "In government testimony before the House this summer in July, a spill restoration program done in the Arthur Kill was shown. And they showed the before, the baseline, which in the government's own blown-up photograph showed a refrigerator and two tires sitting in the bog. They then showed the after-restoration photos which showed a very beautiful area, and the cynic would say, 'Well, shouldn't we have put the refrigerator and the two tires back to restore the baseline?' I don't think so. But I think that is going to be one of the industry's problems and is one of the intrinsic problems in the entire process — that we just don't have baseline in many areas."

April, 1996

### Hamworthy Marine Opens American Headquarters

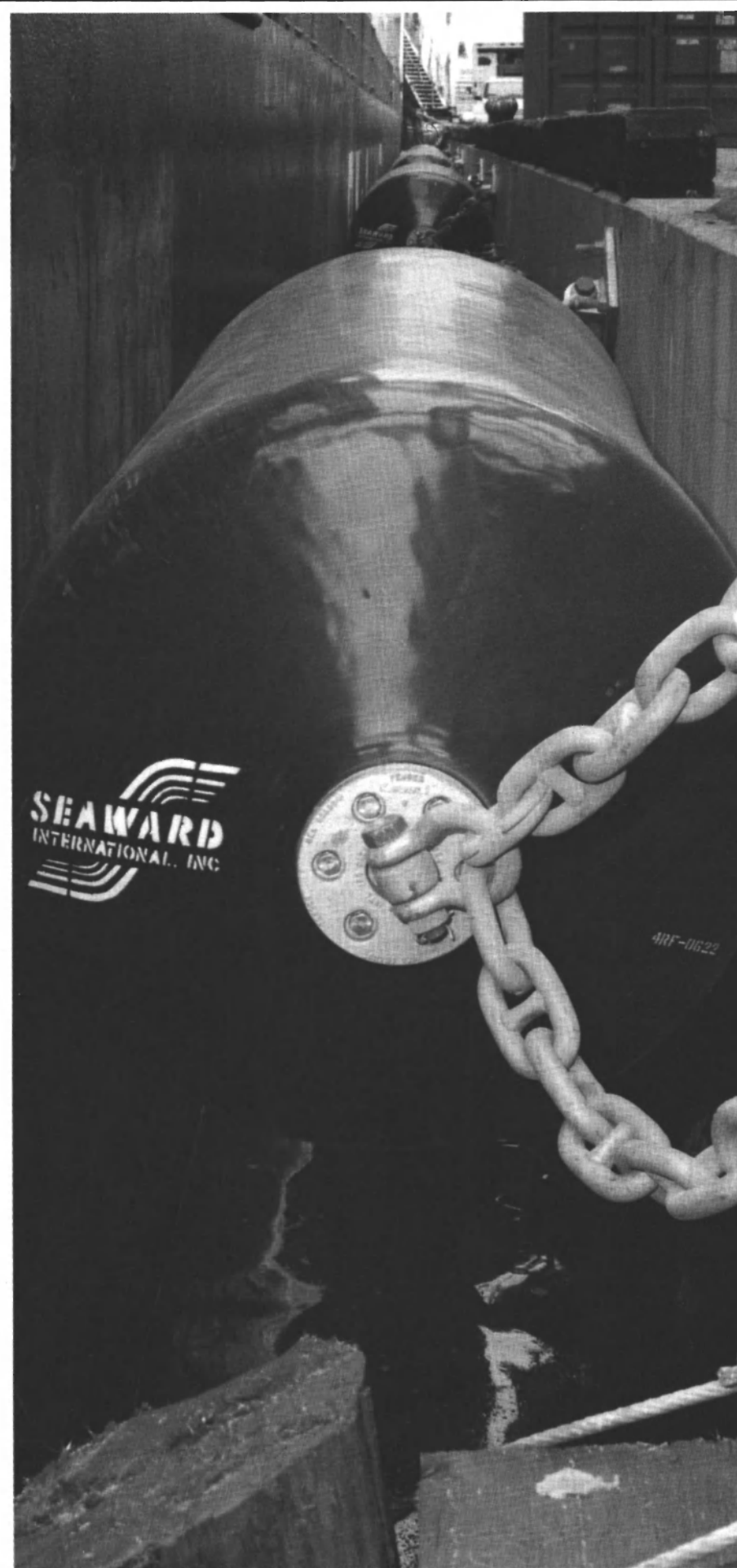
U.K.-based Hamworthy Marine Ltd., part of the Powell Duffryn group, has created a U.S. headquarters — Hamworthy Marine Inc. of Atlanta, Ga. The new U.S. company, headed by its President, **Peter Pilon**, plans to enhance Hamworthy Marine's presence in

the U.S. marine sector by becoming a leading supplier of engine room pumps, starting air compressors, deepwell cargo pumps and environmental protection systems, as well as rudder and maneuvering equipment/systems. The company will also offer offshore and seismic related equipment and services.

For more information on Hamworthy Marine  
Circle 114 on Reader Service Card

### Multibeam Contract Awarded To SeaBeam Instruments

SeaBeam Instruments, Inc. has been awarded a contract for the SEA BEAM 2100 Series multi-beam bathymetric survey sonar. The contract was awarded by Avondale Shipyards, Inc. for a SEA



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BEAM 2112 (12 kHz) multibeam bathymetric survey system with ice-hardened arrays. The system is scheduled for delivery in October 1996, and will be installed aboard the U.S. Coast Guard's (USCG) polar icebreaker, *USCGC Healy*. Underhull transducer arrays will be enclosed within ice-hardened acoustic windows. A SEA BEAM 2112 with an ice-hardened underhull configuration was previously

installed aboard the R/V *Nathaniel B. Palmer* in 1994. The vessel is chartered by Antarctic Support Associates on behalf of the National Science Foundation, and supports a range of scientific research activities in waters off Antarctica. The SEA BEAM 2100 Series is SeaBeam Instruments' latest-generation survey system. Series systems are reportedly capable of co-located, co-registered

and geometrically-correct bathymetry, sidescan and sub-bottom profiling data. All series models can reportedly be configured for multiple frequency operation.

For more information on SeaBeam  
Circle 115 on Reader Service Card

#### Hitec Awarded Contract

Transocean Ensign Drilling Technology (Tentech) has awarded

Hitec the contract for the integrated control system (man-machine computer), Cyberbase, and the hydraulic power unit for use on a new generation land rig designed to drill horizontal underbalanced wells. The contract, covering one unit, has an option for eight additional units over a period of three years. The work will partly be carried out by Hitec in Norway and partly by Hitec's subsidiary in Canada — Hitec Norway Ltd. Initially, the rigs will operate in Canada; however, they are designed to be able to operate all over North and South America. The first rig is scheduled to be operative by June 1996.

For more information on Hitec  
Circle 116 on Reader Service Card

#### Nuovi Cantieri Apuania Reports Busy Schedule

In late 1995, Nuovi Cantieri Apuania S.p.A. of Marina di Carrara, Italy, and Navigazione di Cabotaggio S.r.l., Cagliari, Italy, signed a contract for the construction of one 10,000-dwt product and (IMO II) chemical carrier, yard number C.1203. The construction of this tanker in the Marina di Carrara yard will follow the building of C.1201 — a 40,000 dwt product and IMO II chemical carrier for Finaval, of Palermo, Italy. Lay-down of C.1203 in the drydock is scheduled for this summer, with delivery projected for September 1997.

The vessel, designed by Nuovi Cantieri Apuania, will be constructed with a double hull and double bottom for cargo containment, and will comply with the latest rules for safety and anti-pollution. Propulsion will be by two medium-speed main engines connected via a reduction gear and shaft line to a controllable pitch propeller. Two shaft alternators, two auxiliary diesel generators and a bowthruster will be fitted. The cargo will be contained by 16 epoxy-coated cargo tanks, including two slop tanks, arranged in pairs with center, longitudinal bulkhead. Projected service speed for the 10,000 ton, 414.3 x 65.6-ft. (126.3 x 20-m) newbuilding is 14.5 knots.

The Italian yard is has also recently contracted to build a 613-ft. (187-m) product and chemical carrier for Finaval S.p.A. for delivery at the end of 1998, and a 7,300-dwt, 660-ft. (201.2-m) passenger RoRo for Grandi Traghetti S.p.A. (Grimaldi Group) for delivery in May 1998.

For more information  
Circle 117 on Reader Service Card

#### Naming Ceremony Held For Wave Piercing Catamaran

On February 24, Incat Australia Pty. Ltd., a Tasmanian builder of high speed passenger vessels, held a naming ceremony for its first 265.7-ft. (81-m) vessel at Hobart's

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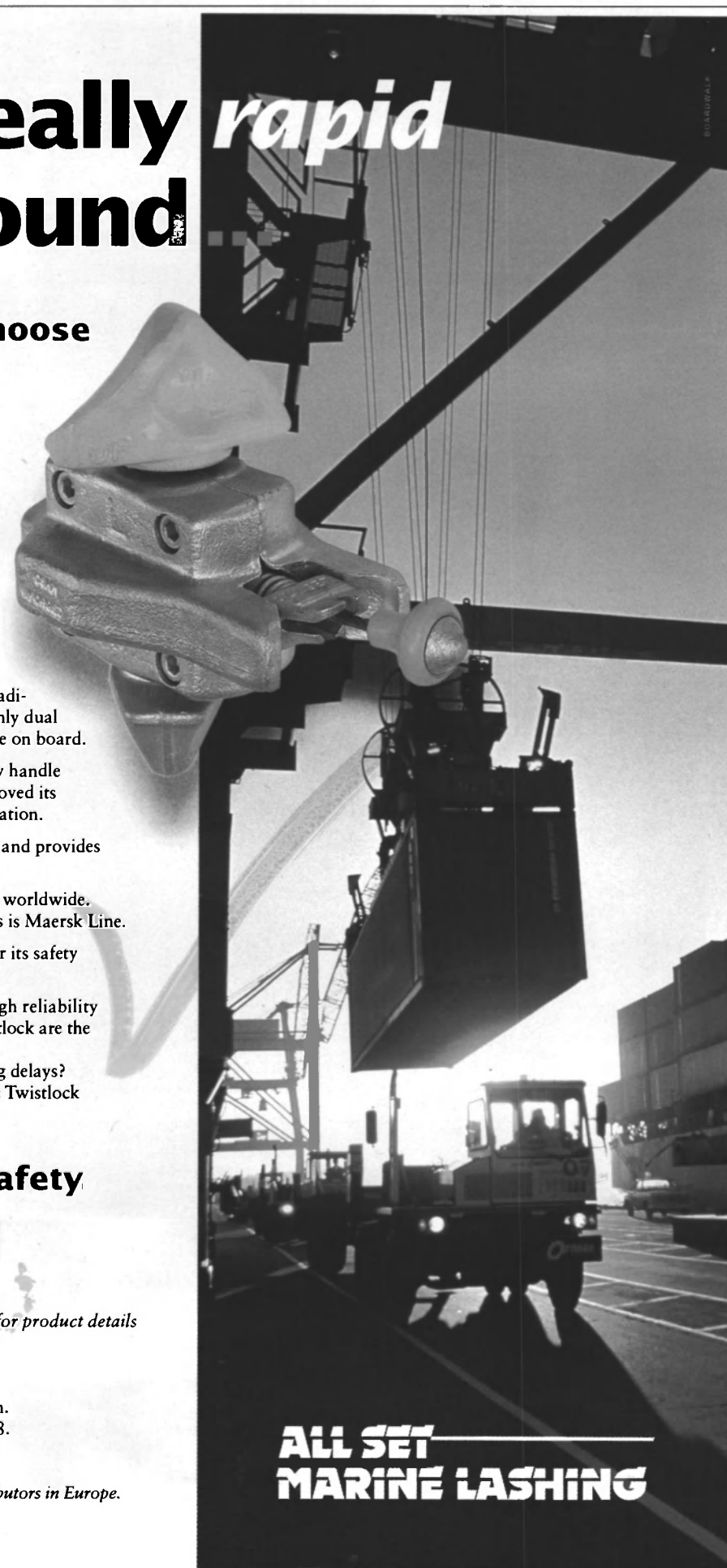
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Circle 20 on Reader Service Card

Elizabeth Street Pier. The vessel — dubbed Condor 12 — is the fifteenth fast ferry over 229 ft. (70 m) long to be produced by the builder since 1989, and was named by **Anne Holyman**, spouse of **Robin Holyman**, director of Holyman & Sons, the ferry's new owning company.

The \$45 million vessel will be initially deployed by Holyman's associate company, Condor Limited, in high speed service between the Channel Islands and the U.K. In October, Condor 12 will be replaced by a 281.2-ft. (86-m) Incat vessel currently under construction.

Reportedly, Holyman is Australia's only international high speed ferry operator. In addition to its interest in Condor, the company owns New York commuter ferry operation Express Navigation and 75 percent of Danish ferry operation Cat-Link AS.

Condor 12 is equipped with four advanced Marine Evacuation Systems (MES) supplied by Liferaft Systems Australia, reportedly ensuring that 700 people can be evacuated in less than 12 minutes, and structural fire protection systems by Colbeck and Gunton. Propulsion is accomplished by four Ruston 16 Rk270 MKII conventional medium speed diesel engines which develop 5,500 kW each, with each engine driving a transom-mounted Lips LJ135D waterjet through a Reintjes VLJ 4431 reduction gearbox with internal clutch. Two Caterpillar generators in each hull (4 x 165 kW total) feed associated independent main switchboards which are capable of disconnection in an emergency. Condor 12's built-in redundancy was designed to provide a high level of security for operation of safety services.

For more information on Incat  
Circle 118 on Reader Service Card

For more information on Holyman  
Circle 119 on Reader Service Card

#### Marine Purchasing Association Names New Leaders

The International Marine Purchasing Association (IMPA) has appointed **Bridget Hogan** to the position of executive officer, and **Stephen Kitchen** to the position of administration officer. Ms. **Hogan** has more than 20 years of experience in the shipping industry as a journalist and in operational roles in shipowning and ship management companies. Mr. **Kitchen's** background is in marketing, and he has been involved in IMPA activities in the past. IMPA has charged Ms. **Hogan** and Mr. **Kitchen** with the task of strengthening and increasing membership. This year's IMPA conference and exhibition is scheduled to be held at Kensington Town Hall in London on September 17-18.

April, 1996

#### Nautronix Selects New GM, Appoints New Board

Nautronix Inc. of San Diego, California, recently selected **Chuck J. Eberhardt** as general manager. Mr. **Eberhardt** brings more than 18 years of broad business experience combined with eight years of military service to the company. His multi-industry,

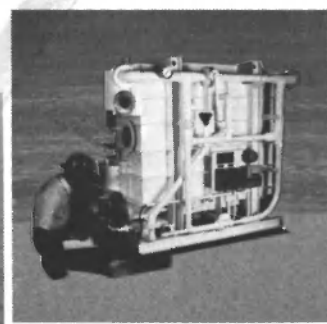
varied experience includes electronics engineering; designing and implementing organizational development programs; strategic planning; finance, accounting, control and treasury functions; corporate legal administration; and contract and risk management for companies such as Sachse Engineering Associates, Northrop Services, and Saturation Systems. **Ronald A. Walrod** has accepted an appointment to the Board of

Directors of Nautronix. Mr. **Walrod** brings more than 25 years of experience in undersea technology development involving AUV and ROV systems, undersea vehicle work packages and acoustic communication links for offshore and U.S. Navy applications. He has held management positions with General Dynamics, Applied Remote Technology, Hydro Products, and Litton's Advanced Marine Technology Division.

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## COMPANY & PEOPLE NEWS

### Schofield Named GM For Kelvin Hughes Division

Kelvin Hughes Ltd., a manufacturer of radar and navigation systems based in the U.K., has appointed **Alistair Schofield** to

the position of general manager for its charts and maritime supplies business — the portion of the company that is currently developing a new electronic chart display. He will replace **Keith Jones**, who has retired after 28 years with the company. Mr. **Schofield** was pre-

viously employed by Kelvin Hughes' parent company, Smiths Industries plc, where he was responsible for business development and a number of key acquisitions.

For more information on Kelvin Hughes  
Circle 42 on Reader Service Card

### Padgham Joins Leica As European Marketing Manager

**Ian Padgham** has been named the European marketing manager for Leica's Navigation and Positioning division. He will establish an office in Milton Keynes, England, in conjunction with Leica U.K. Ltd. Mr. **Padgham** was formerly regional sales manager of positioning services for Fugro Starfix, AS, of Oslo, where he was responsible for providing DGPS service to customers in Europe, Africa and the Middle East. He has also worked with Oilfield Hydrographic Projects, and the U.S. Defense Mapping Agency in Washington, D.C.

Leica's Navigation and Positioning division, based in Torrance, Calif., is involved in advanced satellite navigation technology, particularly the design and manufacture of professional products using GPS for marine and land-based applications.

For more information on Leica  
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### Salvage Association Announces Staff Changes

**Duncan Kent**, principal technical advisor in The Salvage Association's (SA) London office, has retired after 30 years of service, and **Fred Emond** has been named his successor. **Joe Tritschler** has transferred from Genoa to London as technical advisor. Other transfers include **Brian Docherty** from Dubai to Genoa, **Kevin Alcock** from Singapore to Dubai, and **Ken Wardle** from Piraeus to Hong Kong. Loss adjuster **Tom Boyd** has moved from Houston to the London office of Rush Johnson Assoc., a wholly-owned SA outfit, which serves the offshore industry.

The Salvage Association is reportedly the world's largest marine casualty surveying organization, employing 90 surveyors in offices worldwide.

### SeaArk Names McFalls Sales VP

SeaArk Marine, Inc., Monticello, Ark., announced that **Ken McFalls** has been named vice president of sales. Previously serving as corporate sales manager for the company, he will now oversee the sales



Ken McFalls

## COMPANY & PEOPLE NEWS

efforts of five in-house sales team members, seven regional sales managers, and numerous foreign sales agents. In addition, Mr. McFalls will be responsible for establishing corporate sales policies, negotiating government and commercial contracts and coordinating new product development.

SeaArk Marine, formerly MonArk Boat Co., builds aluminum workboats up to 90 ft. (27.4 m) in length, including patrol craft and excursion boats.

For more information on SeaArk Marine  
Circle 1 on Reader Service Card

### Shelby Williams Names Steinfeld Chairman



Paul Steinfeld

Shelby Williams Industries, Inc., a contract seating company headquartered in Chicago, announced that CEO Paul Steinfeld has been elected chairman of the board. He has served as the company's vice chairman since May 1990, and as CEO since May 1991. Prior to his post as CEO, Mr. Steinfeld was the executive vice president. Manfred Steinfeld, outgoing chairman and father of the new chairman, has been appointed chairman of the executive committee. The co-founder of Shelby Williams, he served as CEO of the company from its inception until May 1991.

### Hon Named Container Sales Director For Thermo King



Herman H.S. Hon

Thermo King Corporation, Minneapolis, Minn., has hired Herman H.S. Hon as director of container sales for the Asian Pacific region. The new position was created as part of Thermo King's expanding container sales efforts. Prior to joining the company, Mr. Hon was employed by MacGregor Ltd., and by Hagglunds Ltd., where he held the position of general manager for the marine and offshore division. He has also worked as an onboard engineer for Worldwide Shipping Agency Ltd.

Thermo King manufactures transport temperature control systems for a variety of mobile applications, including shipboard containers, railway cars, trailers and truck bodies.

For more information on Thermo King  
Circle 2 on Reader Service Card

### ASME Recognizes Kiang As Fellow

The Board of Governors of the American Society of Mechanical Engineers (ASME) recently elevated Robert L. Kiang to the rank of

Fellow for distinguished engineering achievement.

A mechanical engineer at the Naval Surface Warfare Center (NSWC) in Annapolis, Md., and long-time ASME member, Dr. Kiang earned this honor for his extensive contributions spanning a

wide range of technologies, including in transportation, wind and solar energies, nuclear safety, thermodynamic cycle optimiza-



Robert L. Kiang

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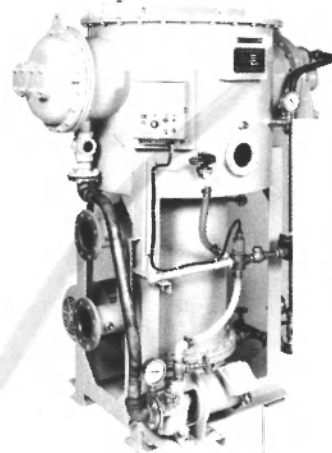
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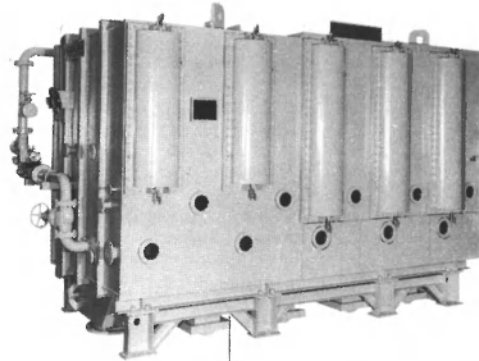
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## COMPANY & PEOPLE NEWS

tion and gas turbine engine development.

The Naval Surface Warfare Center provides research and development, testing and evaluation and fleet support in the areas of machinery and materials for U.S. Navy surface ships, submarines and advanced craft.

### Victaulic Names New CEO

Victaulic Company of America, Easton, Pa., has named **Joseph M. Trachtenberg** chairman, president and CEO. He succeeds **George F. Naumann**, who has retired as chairman and CEO, but will retain a seat on the company's

board of directors. Mr. **Trachtenberg** joined the company in 1974 as controller, and served as treasurer, vice president, and executive vice president before assuming the position of president and CEO in 1990. An ISO 9001-certified company, Victaulic manufactures mechanical piping compo-



Joseph M. Trachtenberg



George F. Naumann

nents, operating 20 branch warehouses throughout North America.

For more information on Victaulic  
Circle 3 on Reader Service Card

### R.K. Johns Names Dlugokecki Shipbuilding Marketing Manager

**Christopher Dlugokecki** has joined R.K. Johns & Associates (RKJ&A) as its shipbuilding marketing manager, in which capacity he will be responsible for promoting the products and services of company client Astilleros Espanoles S.A. Previous to his new appointment, Mr. **Dlugokecki** was with naval architecture firm Gibbs & Cox for four years.

RKJ&A is a New York-based marketing and management consulting firm serving shipbuilders, the transportation industry and port authorities. The firm is chaired by **R. Kenneth Johns**, former president of Sea-Land Service.

For more information on  
R.K. Johns & Associates  
Circle 5 on Reader Service Card

### Sonsub Consolidates International Operations With Name Change

Sonsub International Management Inc. has announced that, effective immediately, all of the company's worldwide facilities will operate under the name Sonsub International. According to **John Edwards**, senior vice president, commercial: "The new name, Sonsub International, more aptly describes the company's worldwide operations, capabilities and inter-regional cooperation. By consolidating our operations under one name, we aim to eliminate some of the confusion that has arisen in individual regional markets regarding the company's extensive international capabilities."

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For more information on  
Sonsub International  
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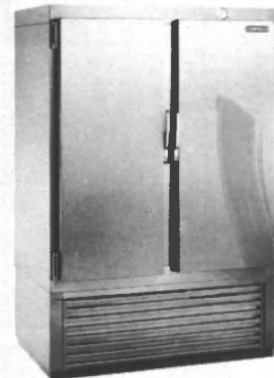
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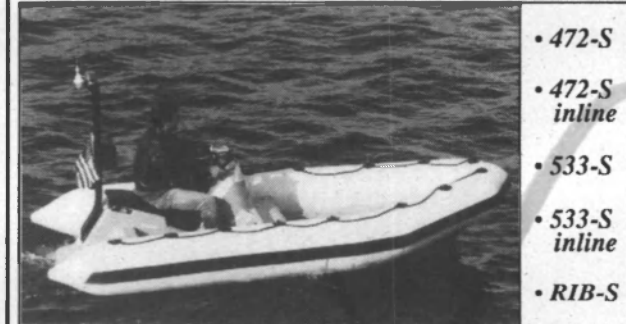
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## Exhibition Profiles

### Equiport '96 Scheduled for June

The Equiport '96 show, originally scheduled to be held on May 4-7, has been rescheduled for June 4-7, in Marseille, France. The event will feature participation of 300 exhibitors and an expected 9,000 delegates, and will offer seminars on intercontinental traffic, short sea shipping and logistics for hazardous cargo. Overall, Equiport will feature the themes of transport — with attention devoted to French and overseas ports; maritime carriers; containerization; logistics, road and rail transport; software; and training — and equipment — with attention given to port equipment; engineering; new technologies; terminal concepts; and handling equipment. For more information on the event, contact Edit Expo International 12, rue Vauvenargues 75018, Paris, France, tel: +33 (1) 42 23 13 56; fax: +33 (1) 42 23 13 07.

### Radio Technical Commission To Convene In San Diego

RTCM, the Radio Technical Commission for Maritime Services, has scheduled its annual show to be held on May 12-17 in San Diego, Calif. Topics scheduled for discussion include: VTS; GMDSS; satellite technology; IMO maritime electronics performance standards; GPS planning; and ECDIS standards. The event will coincide with a meeting of the U.S. National GMDSS Implementation Task Force and the U.S. SOLAS Working Group on Radiocommunications, and will also include roundtable workshops, including a session on National, Regional and International Legislation, Rule-making, Standards and Services Affecting the Maritime Community. Exhibitors scheduled to participate in RTCM '96 include: Raytheon Marine; American Mobile Satellite Corp.; Furuno; Trimble Navigation; Sperry Marine; IDB Mobile; Lockheed Martin; and COMSAT Mobile Communications. For more information, contact RTCM at 655 Fifteenth St., NW, Suite 300, Washington, D.C. 20005, tel: 202-639-4006.

### OTC Proceedings Available On CD ROM

The annual Offshore Technology Conference (OTC '96) is scheduled to take place on May 6-9 in Houston, Texas. This year's proceedings will include presentations on: floating production technology; subsea production systems; loading of offshore structures; safety and environmental quality; control systems; umbilicals and components; and ROV interfacing. Marlan W. Downey, executive

exploration advisor for Atlantic Richfield Co., will deliver the keynote speech on May 6 on the Impact of 3-D Seismic on Reservoir Characteristics. Antonio Agostini, a Petrobras S.A. director, will open the next day's technical session with a presentation on "Advances in Subsea Technology Offshore Brazil"; and Andy Hill, site

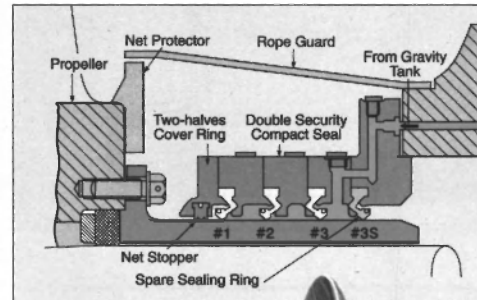
investigation specialist for BP Exploration Operation Co., Ltd. will lead off the last day's technical session with a presentation entitled "3-D Seismic and Other Exploration-Based Technologies for Geohazards Assessments." Conference organizers have also announced that OTC proceedings, referenced by paper title, author,

organization, source, year and text of the first page, for the years 1965 through this year's proceedings will be made available on CD ROM.

For more information on the show, contact the OTC Registration Department, P.O. Box 833868, Richardson, TX 75083-3868, fax: (214) 952-9328.

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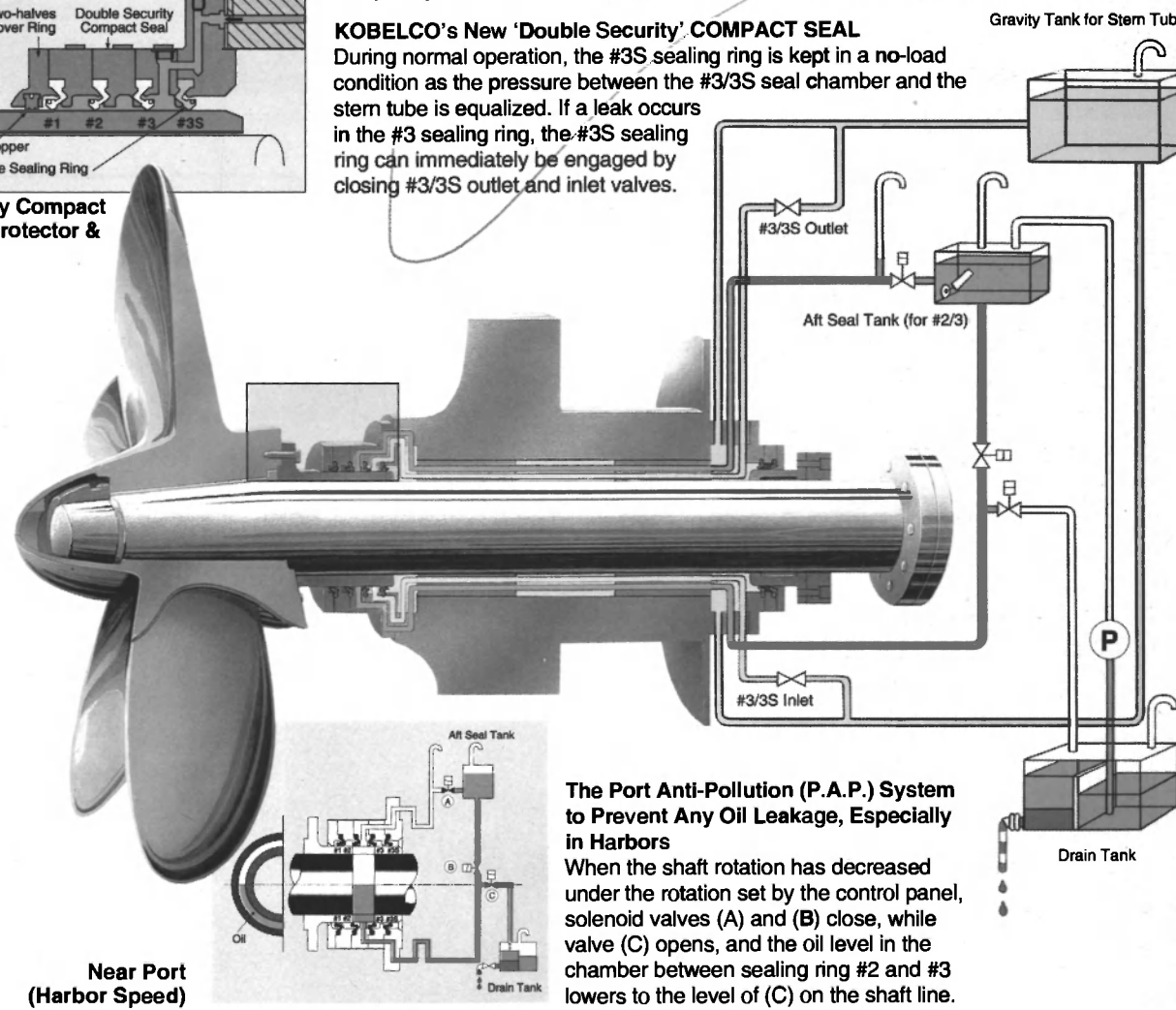
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Circle 369 on Reader Service Card



## Caterpillar Releases New Engine Monitoring System

Caterpillar Engine Division released its new Engine Vision System for monitoring electronically controlled marine engines. Engine Vision is compatible with Caterpillar electronically controlled 3176B, 3408C and 3500 Series B high performance engines, which offer ratings ranging from 450 to 3,000 bhp.

Engine Vision System capabilities include display of current engine and transmission data, vessel position and speed, trip data, historical data, maintenance intervals, diagnostics and troubleshooting information. It also interfaces with vessel global positioning systems for improved navigational monitoring.

A single Engine Vision System can monitor and display up to three engines simultaneously. All information is transferred between the Vision display and each individual engine's Electronic control module via the Caterpillar high-speed, two-wire data link. System power can be taken directly from the vessel's 24-volt DC battery.

The new system works from a PC platform, and the manufacturer touts it as easily expandable through future software enhancements. Touch screen technology

reportedly allows fast access to information, and a high-resolution, multi-colored LCD display offers good readability.

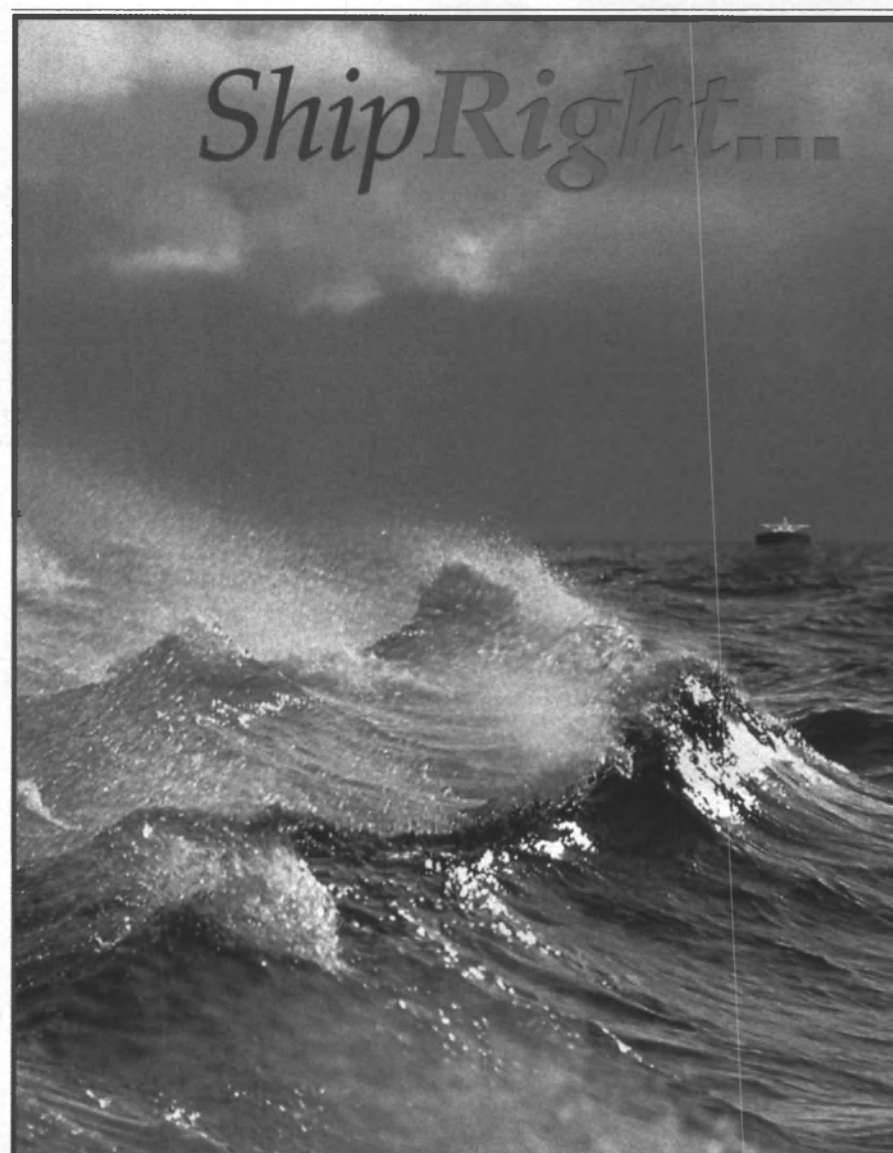
The system is capable of recording and updating engine historical data to improve the vessel operator's ability to monitor engine and

vessel performance. With the touch of an on-screen icon, the operator can see real-time data on total engine running hours, hours at idle, total fuel burned, fuel burned at idle and average load factor.

Engine Vision also expands maintenance and diagnostic information monitoring. Maintenance indicator icons flash at appropriate intervals to make the captain aware of needed preventative maintenance, such as oil and filter changes.

A diagnostic light indicates that a particular engine or transmission sensor has detected a fault situation, such as low oil pressure or high temperature. To turn off the flashing light, the captain must touch the screen to acknowledge the situation. At that point, the screen displays a code specifying the fault, number of occurrences, and when they occurred. By touching the code, the operator sees a third screen displaying three simple sentences that explain what the fault means, what might be experienced as a result of the fault and a recommended course of action.

For more information on Engine Vision  
Circle 88 on Reader Service Card



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## COMPANY & PEOPLE NEWS

### Hermont Offers Bilge Alarm Calibration

To satisfy the stringent 5ppm discharge limits imposed by the Canadian Coast Guard (CCG) in Canadian inland waters, Hermont Marine Inc., St.-Laurent, Quebec, offers repair and calibration services for bilge alarms and separators.

Bilge alarms for the Canadian laker fleet are tested on the company's bench, reconditioned and recalibrated during the winter lay-up. The units are then returned and installed, and the oily water separator/bilge alarm system undergoes a final check before the start of a new shipping season.

According to Hermont Marine, turnaround for a bilge alarm is typically one to two days in the laboratory. Hermont Marine Inc. reportedly services approximately 150 Canadian bilge water separator installations, for private shipowners and for government vessels.

For more information on Hermont Marine Inc.

Circle 37 on Reader Service Card

### ITW Adhesives Changes Company Name

ITW Adhesives, Danvers, Mass., has changed its company name to ITW Plexus. The company manufactures patented Plexus methacrylate adhesives, which serve as alternative structural bonding agents in the assembly of fiberglass boats. The two-component agents can be used in bonding engineered plastics, composites and metals.

The name change is being executed to help increase company recognition in the marketplace by capitalizing on the well-established Plexus trade name.

For more information on ITW Plexus

Circle 38 on Reader Service Card

### CMA Honors Sohmen With Commodore Award

The Connecticut Maritime Association (CMA) has announced that **Helmut Sohmen**, chairman of World-Wide Shipping Agency Ltd., Hong Kong, has agreed to be honored with its prestigious Commodore Award for 1996. Dr. **Sohmen** was scheduled to accept his award at CMA's annual conference, Shipping '96, which was slated to take place from March 18-20 in Stamford, Conn.

Dr. **Sohmen** joined World-Wide Shipping as a director in Hong Kong in 1970, and has held the

chairship of the company since 1986. World-Wide Shipping has one of the largest privately operated merchant fleets in the world, with large and medium-sized tankers and bulk carriers in excess of 7 million tons.

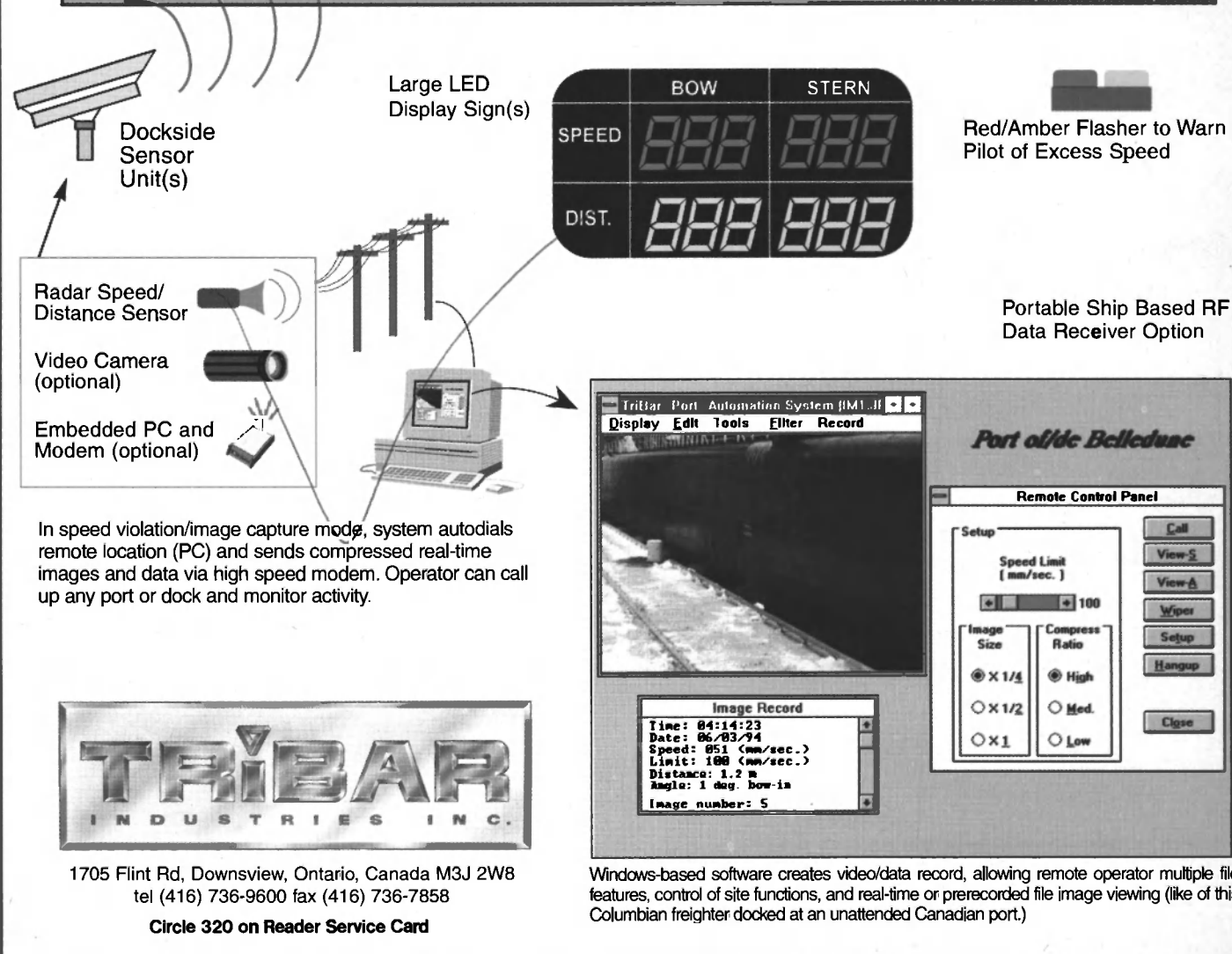
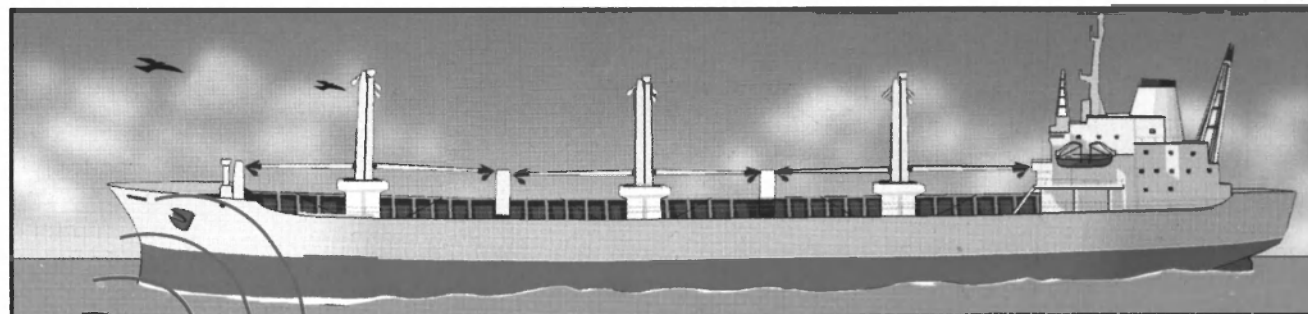
Dr. **Sohmen** has also held positions with Intertanko, the London Steamship and Britannia P & I Club Committees, Lloyd's Register of Shipping General Committee and the Chamber of Shipping General Council in London, the

Baltic and International Maritime Council, and the Hong Kong Shipowners Association.

Reportedly, Dr. **Sohmen** was also instrumental in the establishment of the Hong Kong Shipping Register.

## SENTINEL Automated Ship Docking Assist System

Tribar Industries, since 1964 a world leader in radar, digital and display system technologies, has created an **affordable** docking assist system to help reduce damage, liability and risk. **Sentinel** automatically detects an approaching vessel and accurately updates and displays velocity, distance and angle relative to the dock. Several system configurations are available, including a PC data and video record capture and real-time monitoring capability.



Circle 325 on Reader Service Card



## COMPANY & PEOPLE NEWS

### Swedish Club Opens Greek Training Center, Names Hong Kong Director

The Swedish Club, a Gothenburg-based marine insurance mu-

tual, opened a training center in Greece on February 8 in the presence of the Club's Greek members, the Swedish Embassy and classification societies. The modern facilities will host seminars, fire fighting and prevention courses, and Bridge Resource Management

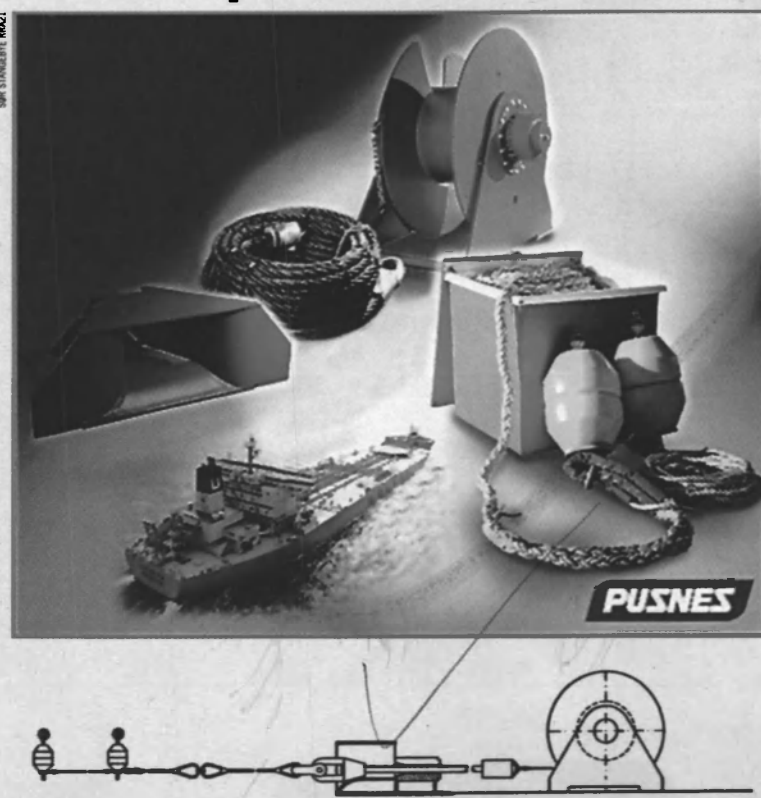
(BRM) courses. The BRM courses deal with human error in accidents and techniques for minimizing risks. The training center is equipped with the latest interactive, computer based training (CBT), which is used in the teaching of BRM courses, specifically in

an exercise involving a bridge mock-up. The course is available for Club members in Stockholm, Bombay, Manila and Piraeus.

In other Club news, **Rune Bagenholm** will assume the position of managing director of the Club's Service Centre in Hong Kong, as of April 1. At that time **Sven Erik Daal** will relocate to Club headquarters in Gothenburg. Mr. **Bagenholm** previously served as an underwriter in the Underwriting and Marketing Department in Gothenburg. **Tord Nilsson** joined the Club as assistant underwriter in February. He was previously employed by brokers Arvid Bergvall Insurance Brokers AB in Gothenburg.

For more information  
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### Micrologic Opens U.K. Office

Micrologic, a manufacturer of GPS and Loran consumer products headquartered in Chatsworth, Calif., announced the opening of a new U.K. office. The office is currently staffed by **Patrick Woolcocks**, sales and marketing engineer, and **Colin Saunders**, CEO for Europe, and located at: Unit 7, Minister Court, Tuscam Way, Camberley, Surrey, GU15 3YU.

Micrologic plans to debut a new set of GPS navigation products, its Millennium series, in late summer/early autumn of this year. The new products consist of the ML-150, a handheld GPS receiver; the ML-250, a fixed-mount GPS receiver; and the ML-350, a fixed-mount GPS receiver and chartplotter.

According to **Michael Deveso**, vice president of sales and marketing, the opening of the U.K. office is part of an expansion program targeted at marketing the company's products worldwide — an effort which began last October, with Singapore-based Vikay Industrial Ltd.'s acquisition of the company.

For more information on Micrologic  
Circle 39 on Reader Service Card

### NovAtel Welcomes New Dealer To Network

NovAtel Communications Ltd., a GPS manufacturer based in Calgary, Canada, has welcomed U.S.-based **Steve Lieber & Associates, Inc.** into its worldwide network of dealers. The company will reportedly play a leading role in the marketing and sales of NovAtel's OEM and survey products.

Steve Lieber & Assoc., located in Webster, Texas, offers a combination of sales, service, training and

Maritime Reporter/Engineering News

## COMPANY & PEOPLE NEWS

asing of products for navigation, positioning and wireless data telemetry. In addition, the company engages in the procurement and sales of equipment for Inmarsat satellite communications and geophysical exploration, including graphic recorders, sub-bottom chirp profilers, side scan sonars and marine and land magnetometers. NovAtel Communications develops and manufactures GPSCards, GPSAntennas and accessories.

For more information on  
NovAtel Communications  
Circle 7 on Reader Service Card

### Midland Marine Welcomes Affiliate L & R Chartering

**James A. McQuilling**, chairman of the board for Midland Marine Corporation, and **Paul S. Lewis** and **William C. Rocha**, senior officers of L & R Chartering, Inc., announced on January 31 that the two companies would join together in the operation of the chartering brokerage business previously operated by L & R.

Mr. **Lewis** has continued on as president, and Mr. **Rocha** remains executive vice president of L & R, which now operates as an affiliate of Midland Marine. **Thomas A. McQuilling II** has retained his presidency at Midland Marine, and **Dennis L. Kirwin** has continued to serve as vice president. This merging of operations was reportedly intended to foster a greater exchange of information, in an effort to expand market coverage and benefit charterers and owners serviced by both companies.

For more information on  
Midland Marine Corp.  
Circle 40 on Reader Service Card

### South Seas Steamship Appoints Southern California Agent

South Seas Steamship Co. Ltd. of San Francisco has named Sunrise Shipping Agency Inc. as its agent for the Los Angeles/Long Beach area. Sunrise Shipping currently handles all agency work for South Seas in the Pacific Northwest, and with the recent addition of

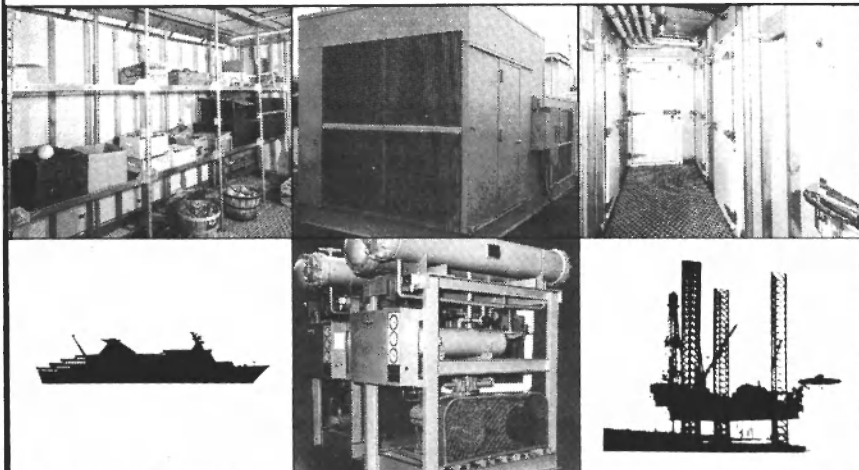
responsibilities, will provide the company with a fully integrated computer system in all the West coast ports. South Seas' multipurpose vessels carry dry, refrigerated, breakbulk and heavy lift cargo to ports along the West coast and in the South Pacific.

### Edgar Named VP At Southern Marine

**Jeffrey Dale Welsh**, president of Southern Marine, Inc. (SMD), announced that **David H. Edgar** will serve as the vice president of business development for the firm. In his new position, Mr. **Edgar** will implement and manage SMI's marketing and advertising programs, referral fee program, and independent representatives program — all of which have been designed to increase the company's share of the megayacht, commercial and government markets. SMI, located in Fort Lauderdale, Fla., represents owners' interests during new construction, conversions and refits and major repairs.

For more information on Southern Marine  
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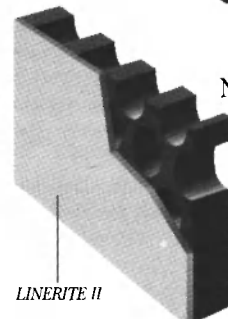


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April, 1996

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## COMPANY & PEOPLE NEWS

### "K" Line Makes Executive Appointments

"K" Line America, Inc. has announced a restructuring involving senior executive promotions

and the establishment of a national service center. **David N. Mills** has been promoted to the position of senior vice president. **Fumito Kawamata** will be in charge of the liner policy for North American trade as senior vice president-liner. **Theodore Prince** will serve as

senior vice president of operations. **Stephen W. Aldridge** and **Steven C. Taylor** have been named vice president of western sales, and vice president of eastern sales, respectively. The national service center will be located in Richmond, Va., and will reportedly boost the

line's North American business by expanding operation hours and consolidating service.

### Logan Forms Marine Consultancy

**John R. Logan**, former general sales manager of Bender Shipbuilding & Repair Co., Inc., has formed a marine consulting company, **John R. Logan & Associates, Inc.**

The firm is located in Mobile, Ala., at 6429 Magnolia Place Court N., tel: (334) 476-8411. In the past, Mr. Logan has held positions with Marco Seattle, Seawork Shipyard (Appledore Shipbuilders), and U.K. naval architecture firm Burness, Corlett & Partners.

### Nominations Solicited For Corrosion Industry Award



Pictured is the LaQue Award, which recognizes recipients for significant contributions in the study of corrosion.

In 1990, the LaQue Center for Corrosion Technology, located in Wrightsville Beach, N.C., established an award in memory of its founder, **Francis L. LaQue**, that recognizes significant contributions to the field of marine corrosion and corrosion prevention. The award will be presented during the 50th Sea Horse Institute meeting, to be held from August 5-8, at Wrightsville Beach. The judging panel is currently accepting award nominations, and applications can be obtained by contacting **Carolyn Bancroft**, LaQue Center, P.O. Box 656, Wrightsville Beach, N.C. 28480, tel: (910) 256-2271, fax: (910) 256-9816. All nominations must be received on or before June 1 for consideration.

### Coastal Technology Names Barry President

The Coastal Corporation's power subsidiary, Coastal Power Co., announced that **Mark P. Barry** will serve as president of subsidiary Coastal Technology, Inc., which provides operations and maintenance services and administrative and asset-management services to independent power and cogeneration projects. Mr. Barry also holds the position of vice president for asset management of Coastal Power, and in the past, has served in the capacity of project development vice president. The Coastal Corp. is a Houston-

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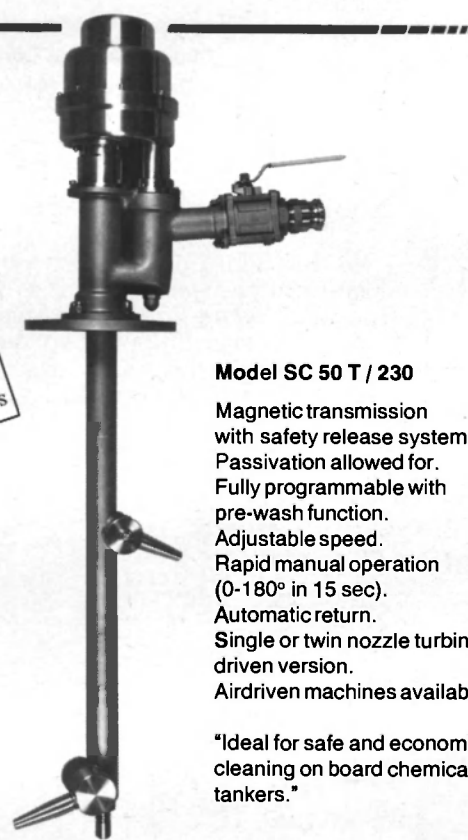
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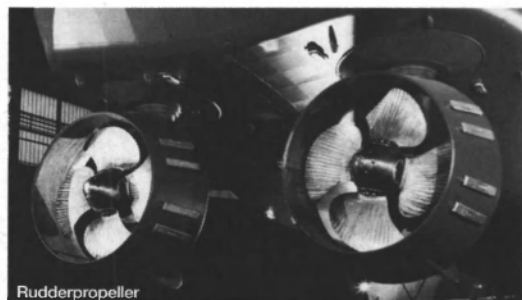
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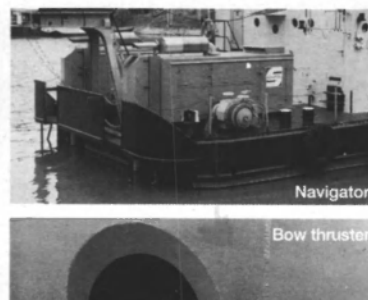
## Producing Thrust



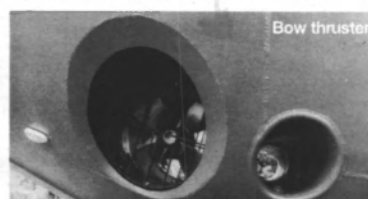
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## COMPANY & PEOPLE NEWS

based energy holding company, with consolidated assets reportedly totaling more than \$10 billion, and operations in natural gas marketing, transmission and storage, petroleum refining and marketing, oil and gas exploration and production, coal, chemicals and independent power production.

For more information on Coastal Technology, Inc. Circle 8 on Reader Service Card

### Blume Recognized By Engineers' Council Of California

Jeffrey L. Blume was recently awarded the Distinguished Engineering Achievement Award for 1996 by the Engineers' Council of California. The award recognizes his contributions to the fields of naval architecture and marine engineering, particularly his involvement in design of yachts, small craft, and high technology applications.

Mr. Blume has reportedly served as a consultant to major yacht manufacturers, international agencies and foreign governments, and recently published a paper on yacht hull performance. He maintains a private practice in Ventura, Calif.

### BSL Names Campbell Marketing Director



Jeffrey Campbell

Jeffrey Campbell has been named marketing director for Blue Star Line (BSL) in New York.

BSL provides shipping links to Australia, New Zealand and Fiji, and specializes in refrigerated cargo and the handling of breakbulk and heavy lift cargo shipments. Formerly corporate marketing and customer services manager, Mr. Campbell is now responsible for all marketing activities conducted by BSL in its East and West coast container services in North America.

BSL's West coast service links the Pacific Basin with western North America via ports in Seattle, Oakland and Los Angeles. The line provides similar service from the East coast ports of Philadelphia, Norfolk, Jacksonville and Houston.

BSL was recently accredited as an ISO 9002 company, reportedly the first containership operation serving the Australian market to be recognized as such.

### Nowakowski Named VP Of Orion

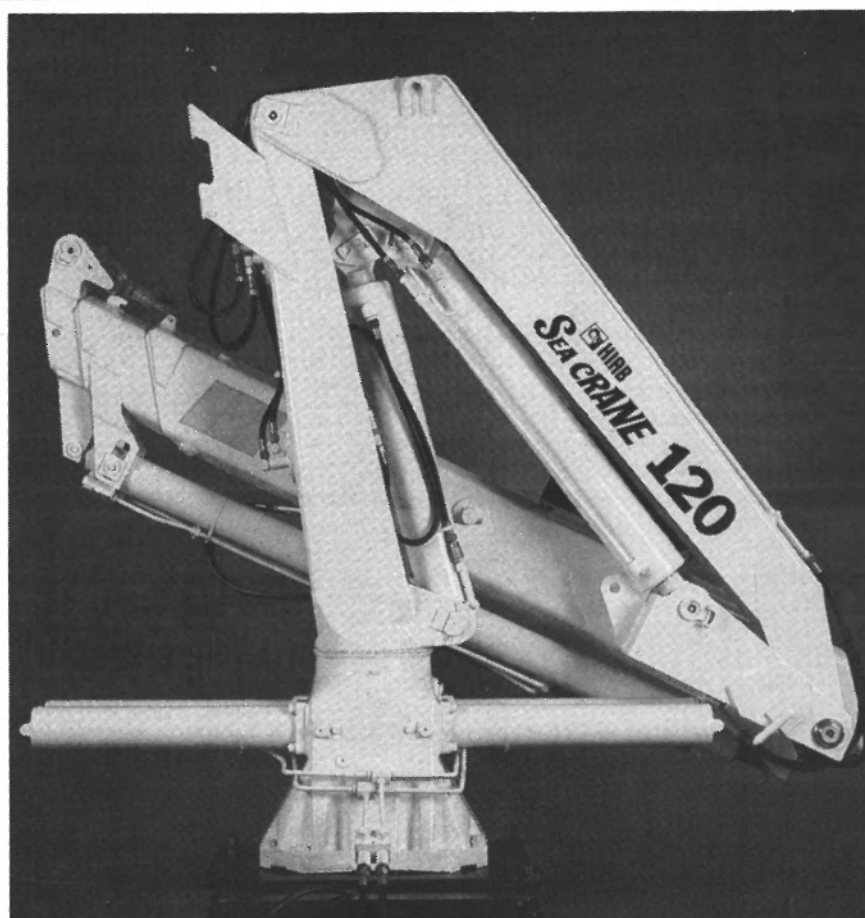
Robert J. Nowakowski has become executive vice president, sales and engineering, for Orion Corporation, Grafton, Wis., a man-

ufacturer of hydrodynamic bearings used in turbines, compressors, gear drives, motors, and generators. His responsibilities include worldwide sales and service, product design and development, engineering services and quality control for the Grafton and Columbus, Neb., divisions of the company.

For more information on Orion Circle 4 on Reader Service Card



Robert J. Nowakowski



## HIAB SEA CRANE

The HIAB Sea Crane has become something of a concept in marine lifting and cargo handling connections, since its unique versatility makes it much superior to conventional derricks and stiff-boom cranes. Thanks to its hydraulic operation and its telescopic and knuckle-boom function, HIAB Sea Crane is vastly superior to other cranes when lifting and handling makes big demands on manoeuvrability, speed and safety. HIAB Sea Crane is available in several models and capacity classes, from 2.3 to 80 tonne-metres with a reach of up to 25 metres. Despite these impressive lifting capabilities, only a minimum of deck space is required for installation and stowage. The HIAB Sea Crane is therefore the obvious crane to choose as a service or small-cargo handling crane for:

- \* Fishing boats
- \* Tug boats
- \* Supply and service vessels
- \* Offshore installations
- \* Ferries and cruising ships
- \* Bulk and general cargo ships
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## EUROPEAN UPDATE

# Bridge contract breeds versatile crane vessel

The *Rambiz* is a heavy lift vessel -- devised primarily to raise 2,200 ton bridge sections into position, 177 ft. (54 m) above the River Tagus in Portugal -- developed by a joint venture of Belgian and Dutch companies.

Built in Rotterdam, the purpose-built *Rambiz* nonetheless incorporates a number of innovative elements to provide considerable versatility, rendering it capable of undertaking a uniquely broad spectrum of salvage and construction tasks following the completion of the 17-month Portuguese bridge building contract.

The catamaran-type vessel uses two identical, existing 250.7 x 65.3-ft. (76.4 x 19.9-m) heavy lift pontoons, Ram and Bizon, for the twin hulls. These are joined amidships by a newly constructed link module, leaving a clearance between the hulls of approximately 90 ft. (27.5 m). This module is a pontoon vessel in its own right, which not only enhances stability but provides the wheelhouse/control room and crew accommodation. Mounted on each end of the link are two new Huisman cranes with a 269-ft. (82-m) main boom and a 177-ft. (54-m) back boom. Fly-jibs may be fitted to extend the maximum reach to 787 ft. (240 m).

Flexibility is the essence of the vessel's originality. The two cranes can be removed and used for heavy lift tasks ashore, and the twin hulls can be separated to create a pair of heavy lift/transport platforms, each with a 2,000-ton capacity and capable of fully independent operation.

All the constituent parts of *Rambiz* can be deployed for a variety of tasks simultaneously. For example, one hull could be used as a heavy lift pontoon for wreck removal, while the other is employed on a transport task and the link module utilized as a floating accommodation unit and command center.

The cranes break down into easily transportable sections, and the winches and power packs adapt to fit comfortably into containers. To provide exceptional strength at low weight, special steels have been used in the construction of the cranes.

*Rambiz* is fully certified for ocean passage with the cranes fully erected. For local operation it is propelled by four 750-hp, deck-mounted Schottel thruster propulsion units. Located at either end of each hull, this package provides a cruising speed of six knots and a maximum speed of 8.5 knots. For long ocean voyages the vessel would be towed. Tests carried out by the Marin Marine Institute, Wageningen, Holland, show that the design is able to withstand 26-ft. (8-m) wave heights.

The spacious wheelhouse (see picture, page 62) contains a special command panel for the four thrusters which may be controlled collectively or individually. In addition to the standard navigational aids -- Sercel DGPS, Raytheon R82 Radar and JRC echosounder -- precise positioning is achieved by a computer-based system which uses both satellite and radio beacon information to pinpoint the exact location to within 18 in. (0.5 m). The monitor

also displays water depth on a continuous basis. Crane and winch operation is also controlled from the wheelhouse.

*Rambiz* is jointly owned by Scaldis Salvage and Marine Contractors based in Antwerp,

(Continued on page 62)



## Scottish yard clinches \$600 M RN contract...

The Scottish yard Yarrow Shipbuilders, part of the GEC Marine group, has been successful in its bid for the Royal Navy's Type 23 frigate contract. The deal will earn the yard \$600 million for the construction of three vessels over the next four years.

Prime contender for the contract was the U.K.'s only other warship builder, the south coast yard Vosper Thornycroft (VT), which has been locked in competition with Yarrow for months. While Yarrow celebrated by setting to work immediately, VT announced that it would shed around 450 jobs.

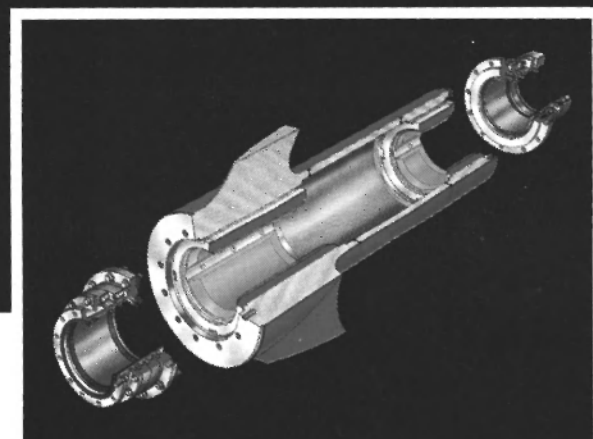
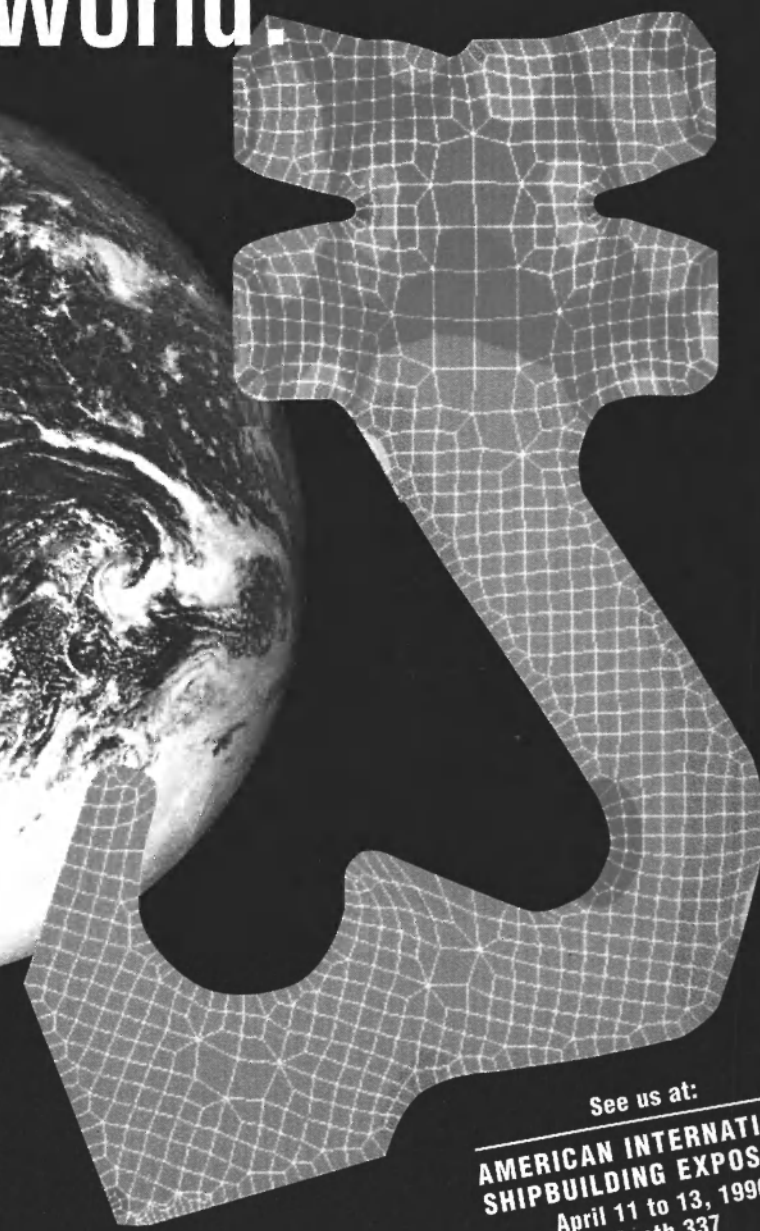
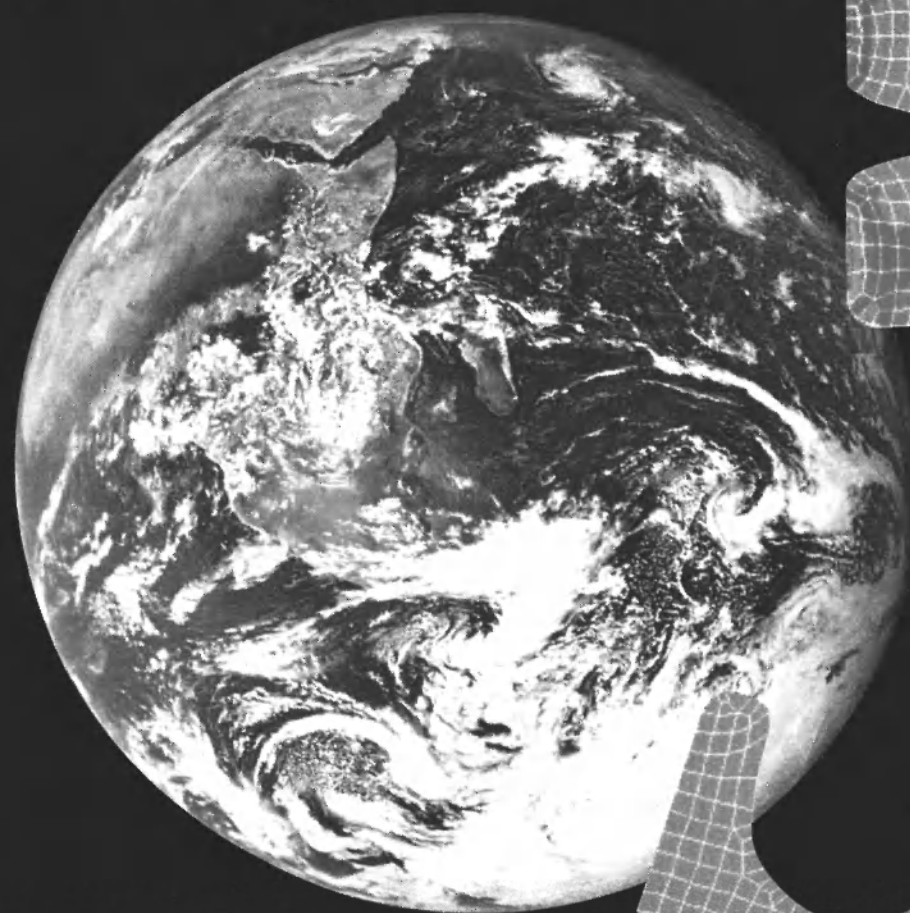
The deal for the Type 23s was announced by Defence Procurement Minister **James Arbuthnot**, who stressed that both yards had submitted quality tenders, but that north had beaten south by a substantial price margin. Companies local to the Clyde are also set to benefit from subcontract work.

Vosper Thornycroft, however will be forced to formulate a recovery from what managing director **Martin Jay** has described as a bitter blow. Not only will the company be forced to lay off almost a third of its workforce, it has also dashed hopes for extra employment opportunities. The only solution, according to **Mr. Jay**, is to win a substantial export order in the not too distant future, and to continue to concentrate on broadening the base of the yard's work.

## ...and another boosts orderbooks

While Yarrow is to be congratulated on winning the most prestigious U.K. contract of the year, Port Glasgow builder Ferguson has cause for misery and joy. Although it is currently coming to terms with modifications for the first of two tugs for Shetland Towing, following the vessel's rejection on sea trials due to insufficient bollard pull, the yard has made its mark in Europe in the first quarter of this year by winning two significant orders worth a total of \$50 million. The Scottish Fisheries Department's Marine Laboratory at Aberdeen will purchase a fishery research vessel to replace the 24-year-old FRV *Scotia*. Due to enter service in the fall 1997, the ship will be used for monitoring fish and shellfish stocks, and for keeping a watchful eye on the marine environment in general. Ferguson has also demonstrated portfolio flexibility and the capacity to fend off stiff European competition by securing the \$14 million deal for a 322 x 59-ft. (98 x 18-m) suction hopper dredger for Associated British Ports. The vessel, capable of dredging down to 92-ft. (28-m) depths, and with a hopper capacity of 3,900-cu-m., will service five ports in South Wales.

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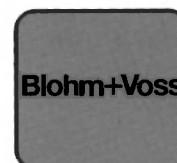
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## Empress oil leak prompts all-around criticism

The grounding of the oil tanker *Sea Empress* off the U.K.'s Pembrokeshire coast has prompted environmentalists to hurl criticism at both national government and local authorities for cavalier attitudes and lack of emergency

response planning. Concern that a 147,000-dwt, single-skin vessel, carrying 130,000 tons of light crude oil should have been allowed to enter Milford Haven's ecologically sensitive waters in stormy weather without an escort tug or

powerful standby rescue tug present is paramount. The tanker's disastrous clash with rocks — for reasons which will hopefully be explained in the findings of a Marine Accident Investigation Branch Inquiry set up by

Transport Secretary, Sir **George Young** — led to little short of a battle for salvors and, despite efforts, nearly half of the tanker's load leaked into the sea.

*Sea Empress* now takes her place amidst the worst international oil disasters, joining the ranks of *Valdez*, *Torrey Canyon*, *Cadiz* and *Braer*. Damage to the environment is feared to be extensive, and a massive operation to save oiled seabirds and other wildlife is well under way in Britain's only coastal national park where some of the finest marine wildlife in Europe lives.

The horror of the pollution, coupled with the devastation of the local fishing industry and fears that tourism prospects will prove bleak for years, has unleashed suggestions that the salvage operation conducted by Smit Tak of Holland and U.K. companies Cory Towage and Klyne Tugs was inept. But the salvors, confidently shrugging off criticism when scrutinized by the Inquiry, maintain that everything possible was done as expeditiously as possible, and that sufficient horsepower was applied to the task. Long hours in the bitter cold characterized the four-day struggle to rescue *Sea Empress* after she hit a sandbank and rocks in the waters around St. Anne's Head, while en route to the Texaco oil refinery on February 15. Within two hours she was refloated, but 2,000 tons of oil had gushed into the sea. Force 8 gales the next day caused salvage operations to be postponed, but on February 17 she was turned by tugs to face 10 ft. (3 m) waves and 35 knot winds. A sudden 60-mph gust caused the lines to snap and the tanker to run aground once again, leaking more oil. Worsening weather made further salvage attempts impossible, even when Chinese tug *De Yue* (the seventh most powerful in the world) braced herself for action on February 18. With broken shackles she retired from the scene and *Sea Empress* was adrift, running aground once more just 300 yards from the headland.

The final and successful attempt involved a fleet of 12 tugs including the last-minute addition of 211.7-ft. (64.5-m), 130-ton bollard pull *Arild Viking*. Seven Cory tugs and the chartered *Tito Neri* added an additional 424 tons, Smit supplied Vikingbank with 61.5 tons, and Klyne's vessels *Anglian Earl* and *Anglian Duke* contributed another 184 tons for a total combined pull in excess of 750 tons. Tanker owners Acomarit have expressed satisfaction that sufficient horsepower was garnered for the rescue attempt.

The Inquiry is certain to lead to resumed discussions on the double hull/single skin debate for tankers in ecologically sensitive waters. Another tanker grounded three and a half months ago in Milford

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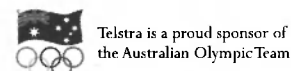
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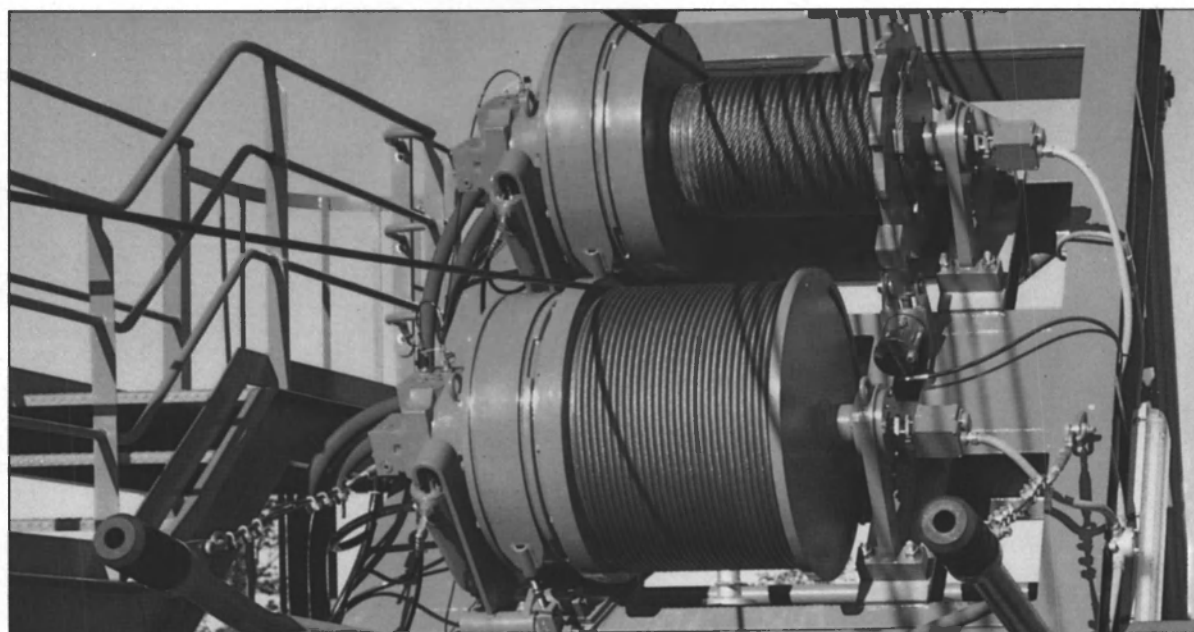
MR/0396





Haven but good weather and a double hull enabled a straight forward rescue effort and easy disaster aversion. Pilots will also be under investigation, and particular emphasis may be placed upon recent cutbacks which have allowed pilots to join tankers when they are further along their course. The pilot responsible for guiding Sea Empress has denied being intoxicated at the time of the grounding, and has not been available for comment, other than to maintain that he believes the tanker had a propulsion/steering problem. Acomarit, however, is adamant that Sea was in sound condition, and predicts that blame will be found to lie with the pilot and the captain of the Russian crewed tanker.

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### Busy Year For Ulstein

Five ships booked for 1996 delivery + order for 1997 delivery

Ulstein Verft is preparing to deliver five vessels of various types by January 1997. Offshore design deliveries began with Solstad Shipping's UT740 heavy-duty anchor-handling vessel in February. Currently, a UT745 supply vessel for S'vik Supply is set for delivery in May, along with AP Moller's specialist UT756 vessel in July. A UT723 seismic research vessel is scheduled for delivery in December to the Korea Institute of Geology, Mining and Materials in South Korea (KIGAM). Finally, TFDS's 11,500-gt Hurtigruten ferry *Polarlys*, which was floated a month ahead of schedule in early November, is booked for delivery this month.

The advanced UT756 offshore vessel for AP Moller is an unusual design in that it will have a secondary capability in addition to being arranged for traditional offshore duties.

The UT756's overall length is 314.9 ft. (96m), with a deadweight of 8,000 tons. Propulsion power will be provided by a twin-engine installation with an output totalling 7,000 kW (9,500 bhp).

Ulstein Verft has also won a contract worth \$48 million for a very large, multi-purpose support vessel, designated UT736, from the Dutch subsidiary of the international Care Offshore group, scheduled for delivery in January 1997. An option for a sister vessel is expected to be exercised soon.

### Ulstein Offers New Service Station In Rotterdam

In other company news, Ulstein's Dutch operation, Ulstein Rekab, has confirmed the opening of a new service station in the Port of Rotterdam. The new operation will carry a large stock of spares for Ulstein Bergen propulsion engines and generating sets, plus other products supplied by the Ulstein Propeller, Deck Machinery and Steering Gear divisions.

### First Orders For New Winches

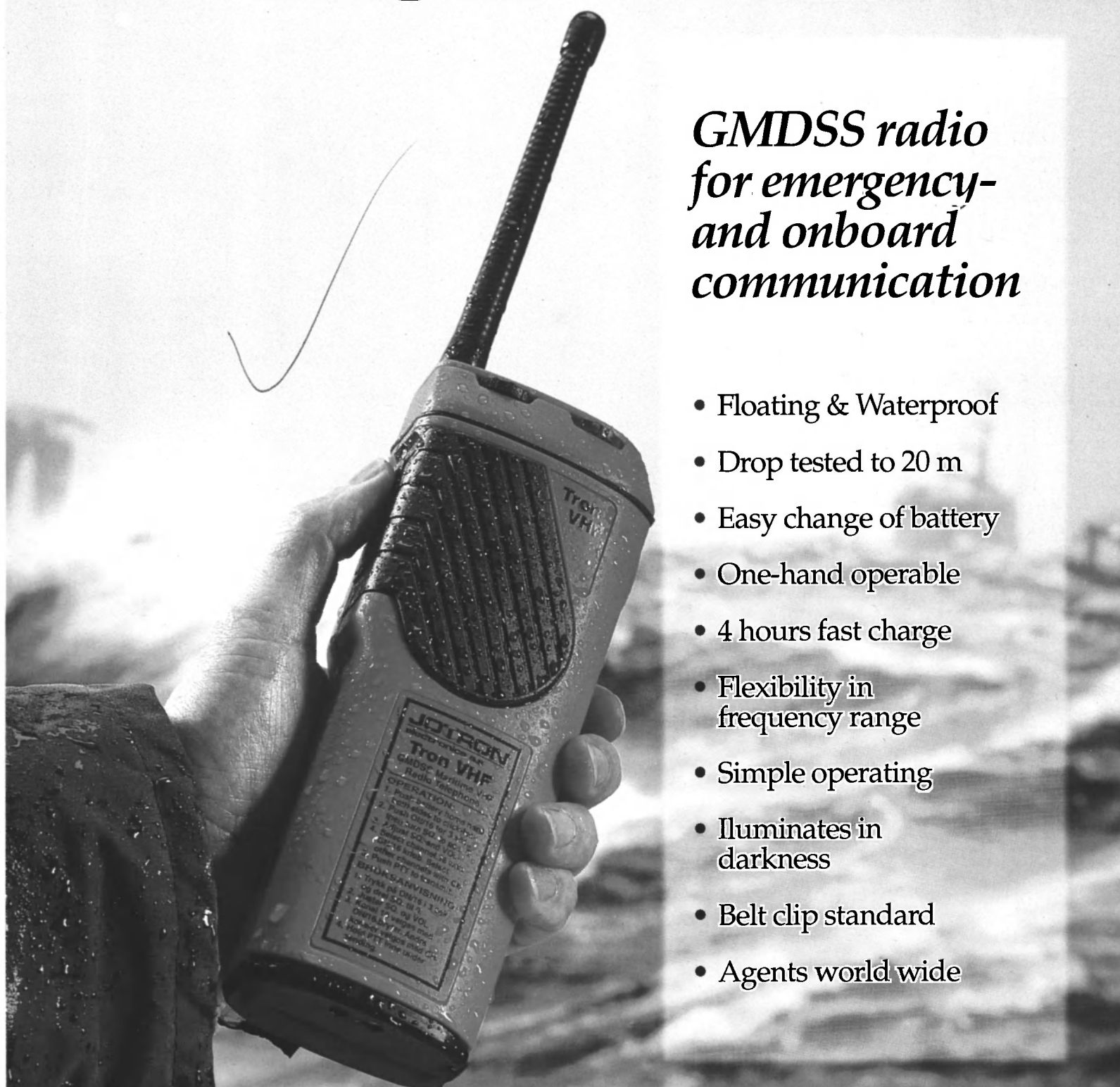
Contracts to supply new generation winches to ships building in

(Continued on page 60)

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Arne Berdal



### Cougar Catamarans Wins Fast Fishing Vessel Contract

North Lily Mining Company (NLMC) announced that Cougar Catamarans of Southport Queensland — the Australian fast ferry catamaran company it is buying as part of its acquisition of Tamarine Ventures Ltd. — has won a contract to build an advanced 62-ft. (20-m) fast catamaran fishing vessel.

The contract is worth more than \$1.5 million and brings Cougar's orders and work-in-hand at this early stage of the year to more than \$3 million. The "jumbo" catamaran, which has a broad 12-m beam, will have on-board processing capability for high value-added seafood. The craft will have an air conditioned shelterdeck for rapid chilling and processing of high volume catches which are available in Australian and Asian fishing waters.

### BP, Andersen Consulting Strike Accord

British Petroleum (BP) announced an agreement with Andersen Consulting to provide financial administrative services in the U.S. BP estimated the outsourcing contract at approximately \$120 million over 10 years. The agreement covers five major BP businesses in the U.S.: BP Exploration, BP Oil, BP

Chemicals, Air BP and BP Marine. The functions included in the scope of the services to be provided by Andersen Consulting will vary according to each business unit's requirements.

"This builds on a similar successful arrangement between Andersen Consulting and BP Exploration in the U.K. which has generated a 30 percent reduction in cost. It is also part of a worldwide initiative designed to enable concentration on our core business and increase the efficiency of standardized financial services while providing significant cost savings," said Alan Eilles, vice president, business development with BP Exploration, Houston.

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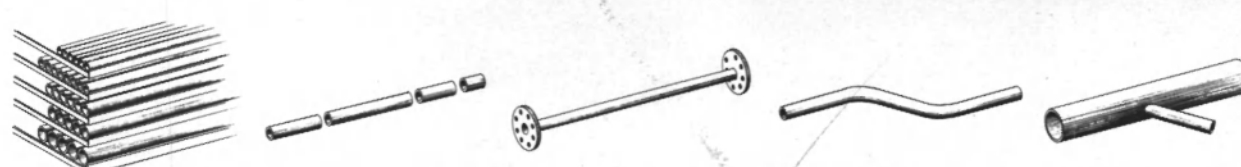
A number of major marine electronics manufacturers have selected C-MAP CM93 digital charts for their ECDIS systems. If you are planning to invest in safety and efficiency by installing an ECDIS system, contact your system supplier or call us to check that your system can use C-MAP's unique database.



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### Celebrity To Name Its Newest Luxury Vessel Mercury

Celebrity Cruises will name its newest luxury vessel *Mercury*. Construction of the 74,000-ton ship has begun at Meyer Werft in Papenburg, Germany, and delivery is planned for fall 1997.

The introduction of *Mercury*, third in the cruise line's series of technologically advanced ships, will bring the total capacity of Celebrity Cruises' fleet to more than 9,000 berths.

"Mercury joins her sisterships *Century* and *Galaxy* in a continuing tradition of luxury and innovative design," stated Richard E. Sasso, president of Celebrity Cruises. "*Mercury* will not only feature Celebrity's signature AquaSpa, high-technology Celebrity theater and an advanced interactive communications system, but also will provide passengers with the uncompromising levels of cruising and service excellence for which Celebrity has earned its outstanding five-star reputation."

### Unitor Announces 1995 Financial Results

Unitor's pre-tax profit for 1995 has been calculated at NOK 125 million, as compared with NOK 211 million in 1994. This represents an earnings per share of NOK 4.43, and the proposed dividend of NOK 3.00 per share is consistent with last year. The company reported that nevertheless, the year was a successful one, with significant volume growth within the primary areas of activity, namely, marine chemicals and fire fighting systems. Unitor's net positive cash flow for 1996 has been calculated at \$75 million. The start of the year marked the final stage of the integration and restructuring process that began with the acquisition of other companies in recent years.

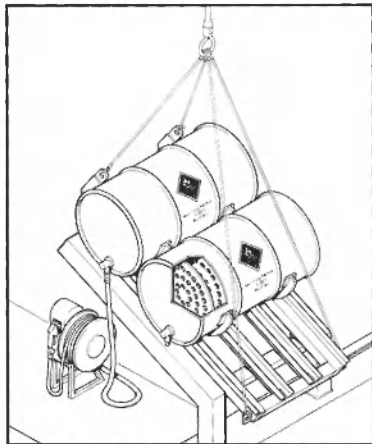
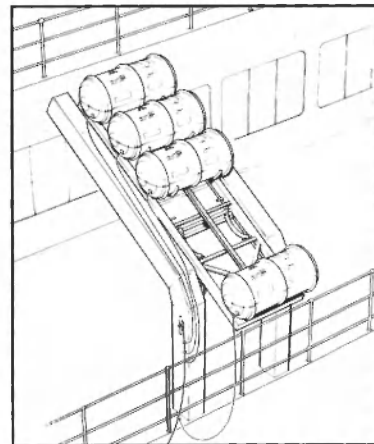
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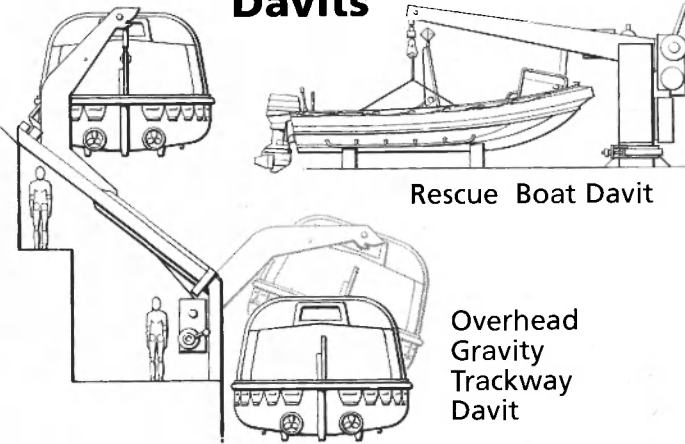


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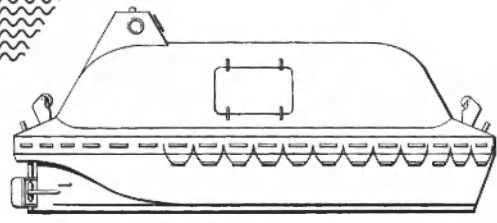
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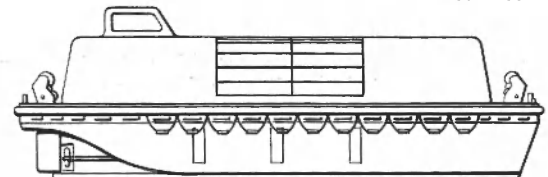


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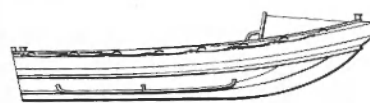


Neptune

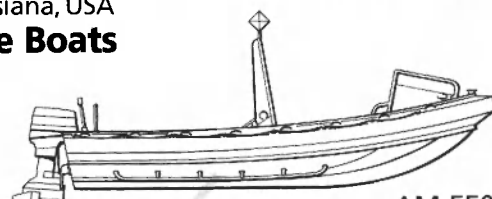


Lafayette, Louisiana, USA

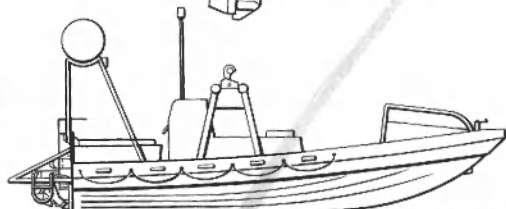
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Japan, South Korea, Spain, Turkey and Sweden are providing valuable references for Ulstein Deck Machinery's latest winch technology. Ulstein Deck Machinery's anchor winch is a completely new design, whereas its mooring winch is a refined version incorporating substantial improvements.

The new winches are the result of the combined design and engineering effort of both Brattvaag

and Norwinch in the creation of a new range of mooring and anchor-handling deck machinery.

Ulstein reports that the new winch is easier to manufacture, making delivery times shorter.

In creating the new design, greater emphasis was placed on the refinement of material content.

Less steel is now used to create a stronger but lighter and more compact overall design. According to

Eirik Naess, Ulstein Deck Machinery's development manager at the Norwinch Division, the compact dimensions of the new design have a number of advantages when applied to restricted fore-decks such as on containerships. In the past, minimal deck space on such vessels very often limited the possibilities of getting a good arrangement with the earlier design winches and windlasses.

With more compact dimensions, the new design offers significant layout benefits.

In Spain, shipsets comprising 100-mm anchor windlasses and 20-ton mooring winches are to be supplied to Astilleros Espanoles' Puerto Real shipyard for installation on a pair of 160,000-dwt bulk carriers being built for U.S. owner Cargill.

In the South Korean yard of Hyundai, Ulstein has contracted for the supply of deck machinery for three 161,000-dwt bulk carriers building for the U.S. company Maritime Overseas Corporation (MOC), and for a 220,000-dwt ore carrier for Norwegian shipowner Bergesen.

#### South Korea orders seismic research vessel

Ulstein Industrier's design department and Ulstein Verft secured a contract to build a specialist seismic research vessel (type UT723) for KIGAM.

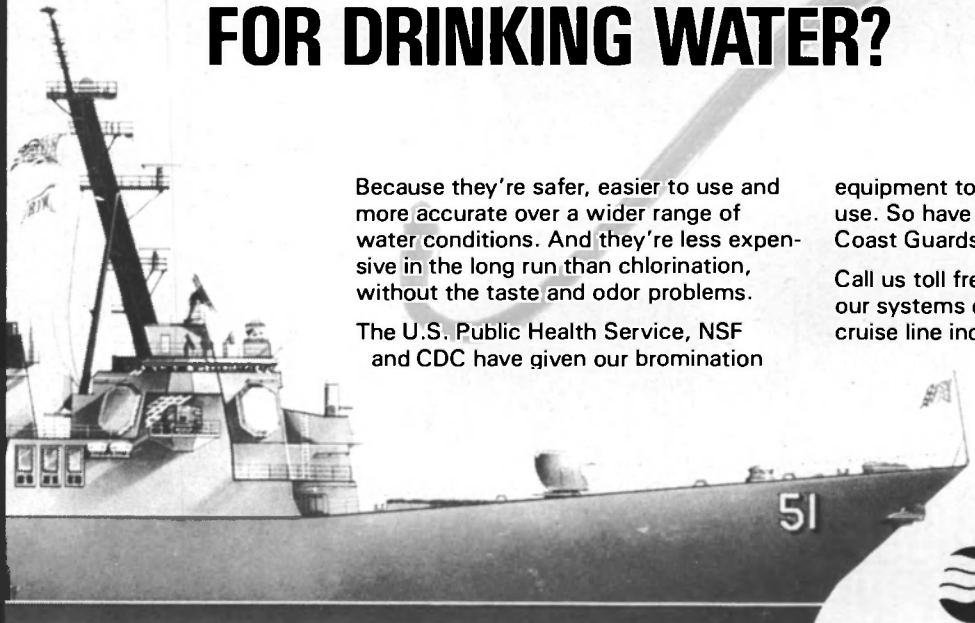
The UT723 will feature a very high degree of noise and vibration suppression. The hull lines are appropriately adapted for the vessel with the addition of a bulbous bow.

According to Ulstein's ship designer, Kjetil Leine, the bulbous bow will effectively increase the waterline length, reducing resistance for additional speed gain, and assisting in ensuring an optimum seakeeping performance.

The UT723 is designed to tow two streamers. The 2,200-gt vessel will be powered by two Ulstein Bergen eight-cylinder KRM engines, rated at 1,620 kW at 750 rpm.

For more information on Ulstein  
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UT 723 Principal Particulars	
Length, o.a.	211.2 ft. (64.4 m)
Breadth, mid.	49.2 ft. (15 m)
Depth to main deck	21.3 ft. (6.5 m)
Design draft	14.7 ft. (4.5 m)
Gross tonnage	2,000
Propulsion	Ulstein Bergen
Speed	14.5 knots
Design pull at 5 knots	15 ton
Ballast water	620 cu. m.
Fresh water	140 cu. m.
Fuel oil	800 cu. m.
Working deck area	430 sq. m.
Laboratory and tape store	125 sq. m.
Accommodation	40

#### Alfa Laval Increases Separators' Capacities

At Sea Japan '96 Alfa Laval announced the introduction of 14 new, high-performance separators for fuel and lube oil cleaning. By utilizing advanced fluid dynamics to improve the disc stacks, Alfa

Laval claims to have substantially increased the separation efficiency and throughput capacities of the separators in its current range. The result is a whole new generation of separators with significantly higher maximum recommended flow rates, including the popular Alcap series.

Seven of the new machines are ready for immediate delivery, while the remainder will be available before the end of 1996.

For more information on Alfa Laval  
Circle 90 on Reader Service Card

### Sperry Features Universal Chart Manager At Sea Japan

Sperry Marine expanded its Universal Chart Manager so that it now reads Japanese Hydrographic Office charts as well as British Admiralty, NOAA and Canadian Hydrographic charts. It also incorporates an ECDIS module that is fully compliant with IMO, IHO and IEC regulations.

Sperry has also reported market success with its Automatic Navigation and Track Keeping System (ANTS), which has DNV Watch-1 certification.

For more information on Sperry  
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### Stolt Names First Ship In Innovation Class

Stolt Parcel Tankers Inc. named the first ship in its series of 10 Innovation class 37,000-dwt chemical parcel tankers at a ceremony held at the Danyard shipyard in Frederikshaven, Denmark.

The new ship is reportedly one of the most sophisticated chemical parcel tankers ever built, and incorporates innovative cargo tank layout, cargo-handling equipment and propulsion system design features.

The ship was christened M/T *Stolt Innovation* by **Nadia Stolt-Nielsen**, spouse of **Jacob Stolt-Nielsen, Jr.**, chairman of Stolt-Nielsen SA.

The Stolt Innovation class has between 42 and 47 integral cargo tanks and four deck tanks, all constructed of solid, duplex stainless steel fitted with a separate pump and pipeline system, and reportedly capable of handling hazardous and corrosive cargoes for which IMO Type 1 ships are required.

*Stolt Innovation* is scheduled for delivery this month, after completion of final fitting-out work. The ship is the first of seven such tankers from Danyard, with the other six scheduled to be handed over at four-month intervals

through 1998.

The remaining three of the 10-ship Innovation-class series are being built at the Societe Nouvelle des Ateliers et Chantiers de l'Atlantique du Havre (SNACH) shipyard in Le Havre, France, and will be delivered in 1997 and 1998.

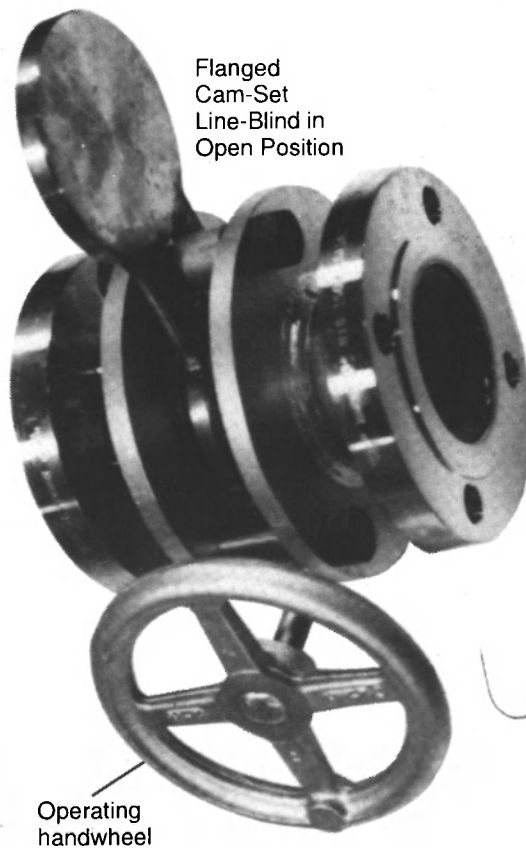
The 10 tankers cost approximately \$70 million each, and the Danyard share of the package

reportedly represents one of the biggest export orders ever won by Danish industry.

Stolt-Nielsen SA is one of the world's leading providers of transportation services for bulk liquid chemicals, edible oils, acids and other specialty liquids. The company -- through its parcel tanker, tank container, terminal, rail and barge services -- provides integrat-

ed transportation for its customers.

The company also owns 70 percent of Stolt Comex Seaway SA (SCS), which is among the largest subsea services in the world. SCS specializes in providing engineering, flowline lay, construction, inspection and maintenance services to the offshore oil and gas industry.



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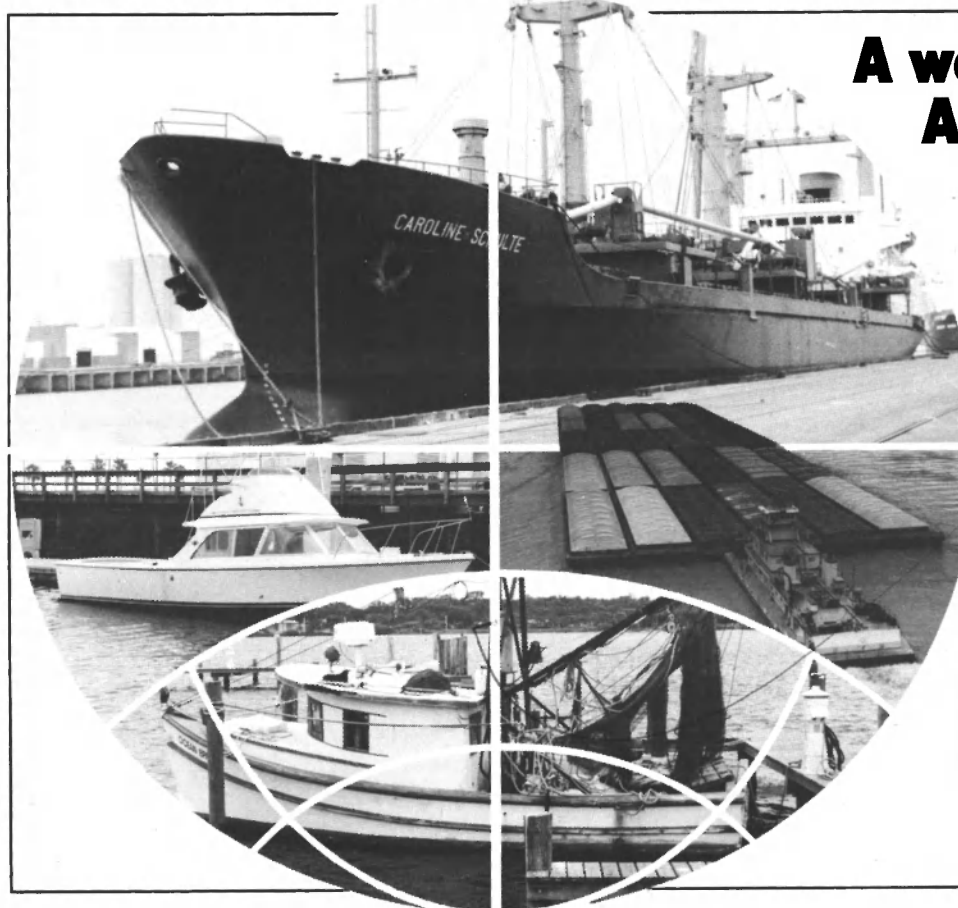
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## Bridge contract breeds versatile crane vessel

(Continued from page 52)

Belgium, and Dutch heavy lift specialist Van Seumeren. Scaldis, itself, is a consortium of four Belgian marine contractors with a track record of successful assignments, including the salvage of the

vessel *Mount Louis* and its hazardous cargo, the refloating of *Herald of Free Enterprise* and the clearance of the wreck of jack-up rig *West Gamma*.

The company is led by former

ISU President **Klaas Reinegert**.

With subsidiaries worldwide, Van Seumeren has more than 200 large cranes and will take delivery in September this year of the world's largest crawler crane. The

two companies formed their joint venture specifically to bid for the Tagus bridge project marine services contract from the main contractor consortium, Agruamento Complementor de Empresas.

The joint owners are already looking at the future of *Rambiz* beyond the initial contract. **Frans van Seumeren** said: "This highly flexible heavy lift system will find many applications in a wide variety of markets worldwide. There are obvious opportunities in the offshore industry with its growing requirement for cost-effective dismantling of oil and gas platforms. The 88.6-ft. (27-m) spacing between the catamaran's floaters allows the *Rambiz* to position itself to lift heavy topsides with relative ease. In addition, the maximum lifting height of 787.4-ft. (240-m) should be of interest to those responsible for new construction projects around the world."

Construction of *Rambiz* commenced by Dutch turnkey lift system specialists Huisman-Itrec in June 1995, and the vessel was officially named, following successful sea trials, in February 1996.

### Building the Tagus bridge

The Vasco de Gama Bridge is reportedly the largest transport related civil engineering project in Europe after the Channel Tunnel, and comprises an eight-mile concrete box girder bridge across the River Tagus near Lisbon, Portugal's capital. Almost the entire length will cross water -- opening up a route to ease the city's traffic congestion, and forming a new link with the site of EXPO '98 which is being hosted by Lisbon.

The lifting program calls for the positioning of 150 girders each 262 x 52.5-ft. (80 x 16-m) and weighing up to 2,200 tons. *Rambiz* will also place eight 1,200-ton hammerhead pier top sections and perform a variety of other heavy lifts. Each 262-ft. (80-m) span consists of two girders placed side by side to create a 111.5-ft. (34-m) wide bridge deck. On completion, the Vasco de Gama Bridge will soar 177-ft. (54-m) over the busy navigation channel of the Tagus.

When the lifting devices are attached, the beam is raised sufficiently to clear the jetty support structure and the vessel winched into the channel. The beam is lowered onto a support system fitted to the foredeck before the vessel moves off into the Canal de Barreiro, under thruster power, to begin its journey to the bridge site. An hour long passage through the canal will bring it to one of three designated holding points to await the next opportunity to enter the river's dredged navigation channel -- which must be entered on a rising tide.



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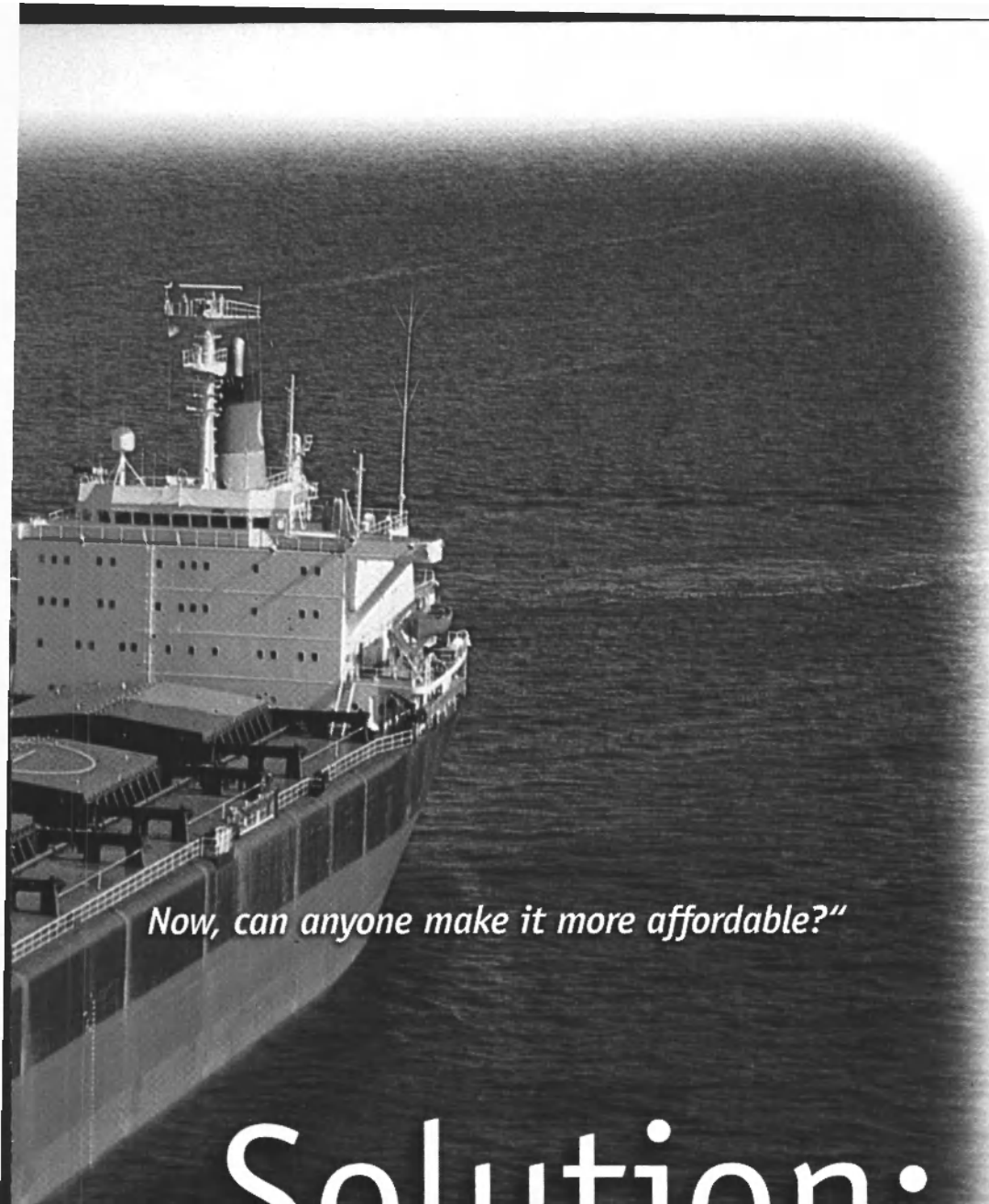
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## Cegelec Wins Power Management System Contract

The Marine Systems Division of Cegelec Projects has won a contract for the supply of a state-of-the-art power management system (PMS) for the Britannia gas condensate field.

Britannia, a joint venture of Chevron and Conoco, is one of the largest gas discoveries in the U.K. sector of the North Sea. The development will comprise a steel drilling, production and accommodation platform, in addition to onshore processing.

Located 130 miles northeast of Aberdeen, Scotland, the field will play a key role in meeting the U.K.'s future need for primary indigenous sources -- with a peak production capacity of 740 million standard cu.-ft. of gas and 70,000 barrels of condensate.

The PMS is designed to monitor and control generator sets and main switchboard loads. All the

equipment for the platform has also been designed to help maintain North Sea safety standards.

Additional functions provided by the PMS are: load shedding plans for 11 loads and five generators; asymmetric load sharing of active/reactive power; and drive start inhibit software and alarms.

The operator interface is via a 20-in., high-resolution monitor, control actions are performed using a mouse and GR Fanuc Cimplicity graphics are used. Also included in the equipment is an alarm printer and a laptop PC with a 90-70 programming package. The system has been designed to integrate with the GE-Fanuc-based PCS system, and consists of two 90-70 PLCs running in hot standby mode, and a 90-30 PLC to do the fast loadshed.

For more information on Cegelec  
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## Kvaerner Delivers Carnival Inspiration

M/S *Inspiration*, the sixth superliner ordered from Kvaerner Masa-Yards by Carnival Corp., was delivered to the owner on February 22. The 853-ft. (260.6 m) vessel left Helsinki on February 23 for Miami via Brixham, U.K. The vessel will sail weekly cruises in the Caribbean. *Inspiration* has a gross tonnage of 70,367, and a passenger capacity of 2,600. The vessel has a diesel-electric AC-AC powerplant consisting of six diesel generators and two cycloconverter-controlled electrical propulsion motors. The total onboard power developed is 42,240 (57,400 hp).

For more information on Kvaerner Masa-Yards  
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## Safety At Sea • AMVER

Automated Mutual-Assistance Vessel Rescue:

### "That No Call For Help Goes Unanswered"

A father and son attempting to cross the North Pacific Ocean en route to Vancouver, British Columbia, from New Zealand encounter a devastating storm with 50-ft. (15.2-m) waves and high winds. Their 27-ft. (8.2-m) sailboat is severely battered and flips over, seriously injuring the father. The sailboat begins to sink. The son struggles to get the liferaft over the side and in the process it capsizes, dumping almost all of their supplies into the turbulent waters. With the injured father finally hauled onto the raft, the two sailors are adrift in the frigid waters of the North Pacific.

With the ocean constantly spilling into the raft and the severity of the weather growing more fierce and threatening, the situation becomes critical. Fortunately, one piece of equipment the raft does have is an emergency radio beacon that, when activated, transmits the position of the craft by satellite to U.S. Coast Guard (USCG) Rescue Coordination Centers (RCCs).

After four days afloat in the icy North Pacific, the sailors hear the mechanical hum of an approaching USCG C-130 aircraft which confirms the distress to the RCC. Fortunately for the father and son, a Korean tanker is identified approximately 100 miles away from the raft. The RCC in Long Beach, Calif., asks the tanker to divert from its course to save the sailors. In extremely high seas, the crew of the Korean ship manages to bring the two on board safely.

Despite the drama of this scenario, it is a



The AMVER Pennant has been hoisted all over the world to reflect a pride that is unique among mariners and shipowners alike.

true account of a recent rescue. Obviously, the tanker could not possibly have known the plight of the two sailors if the ship's radio watch had not been informed of the situation. If the ship had not been located and contacted, this situation could have had a much more tragic outcome.

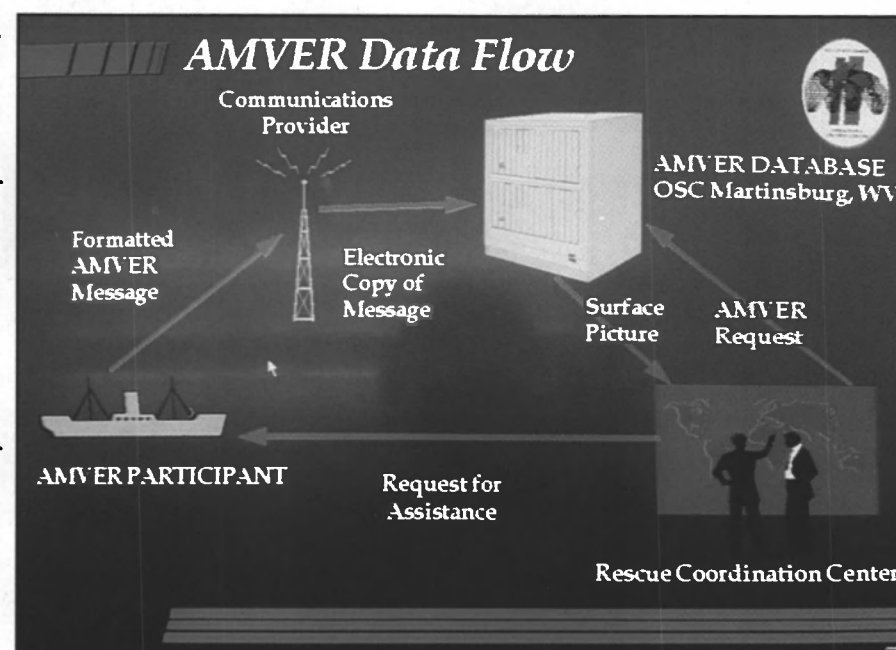
The ravages of nature on the high seas have demonstrated the need for an effective way of coordinating search and rescue efforts. For more than 38 years, this coordination has been the job of the USCG's Automated Mutual-Assistance Vessel Rescue (AMVER) system.

AMVER is a unique search and rescue tool, using modern computer and satellite technology to relay critical distress information to rescue authorities. The voyages of merchant vessels around the world are plotted in a state-of-the-art computer system. When the position report data is processed at the AMVER computer center at the USCG's Operations System Center in Martinsburg, W.V., an electronically generated surface picture (SURPIC) of an area of the ocean can be called up. The AMVER system is the only system of its kind encompassing the globe, and can be used to save lives and protect mariners in any ocean.

The SURPIC is a computer display that gives a bird's-eye view of the vessels in the immediate area that are available to render assistance to maritime disaster victims. Information such as vessel type, size and speed, number of crew members and whether or not trained medical personnel are onboard is displayed to rescue coordination personnel so a determination regarding emergency assistance can be made. The number of SURPICs generated by the Martinsburg computer center in 1994 alone was more than 4,500. On average, 2,700 vessels are reported on a daily plot.

Countless rescue scenarios have been played out over the years through the use of AMVER. Since its beginning in 1958, thousands of lives and millions of dollars worth of property have been saved. Although computer technology has progressed over the years, the concept behind the AMVER program has not changed. The slogan, "that no call for help goes unanswered," has been put to the test on numerous occasions.

Naturally, the more vessels that join the AMVER Safety Network, the more effective the lifesaving system becomes. Vessels from all nations over the world are eligible to participate. Presently, membership in AMVER includes 12,000 vessels, or a reported 40 percent of the world's merchant fleet. With 561 more vessels joining the ever-growing ranks of



The AMVER search and rescue process involves many high-tech steps designed to relay information to the proper rescue authorities.

the program in 1995, the concept of safety in numbers has never been more valid when it comes to maritime search and rescue. Most recently, ships of the People's Republic of China joined the AMVER ranks with participation by China Ocean Shipping Company (COSCO National Fleet).

Other notable rescues of recent years include the six AMVER ships that assisted in recovering 504 of the 976 survivors from the burning *Achille Lauro* passenger liner, which went up in flames off the coast of Somalia in the Indian Ocean, and the rescue mission for the victims of the sinking of bulk carrier *Salvador Allende* in December 1994. This mission marked the largest single AMVER operation in the program's history, in which a flotilla of 41 ships from 18 nations converged on the rescue area over a six-day period to find only two survivors from a crew of 31.

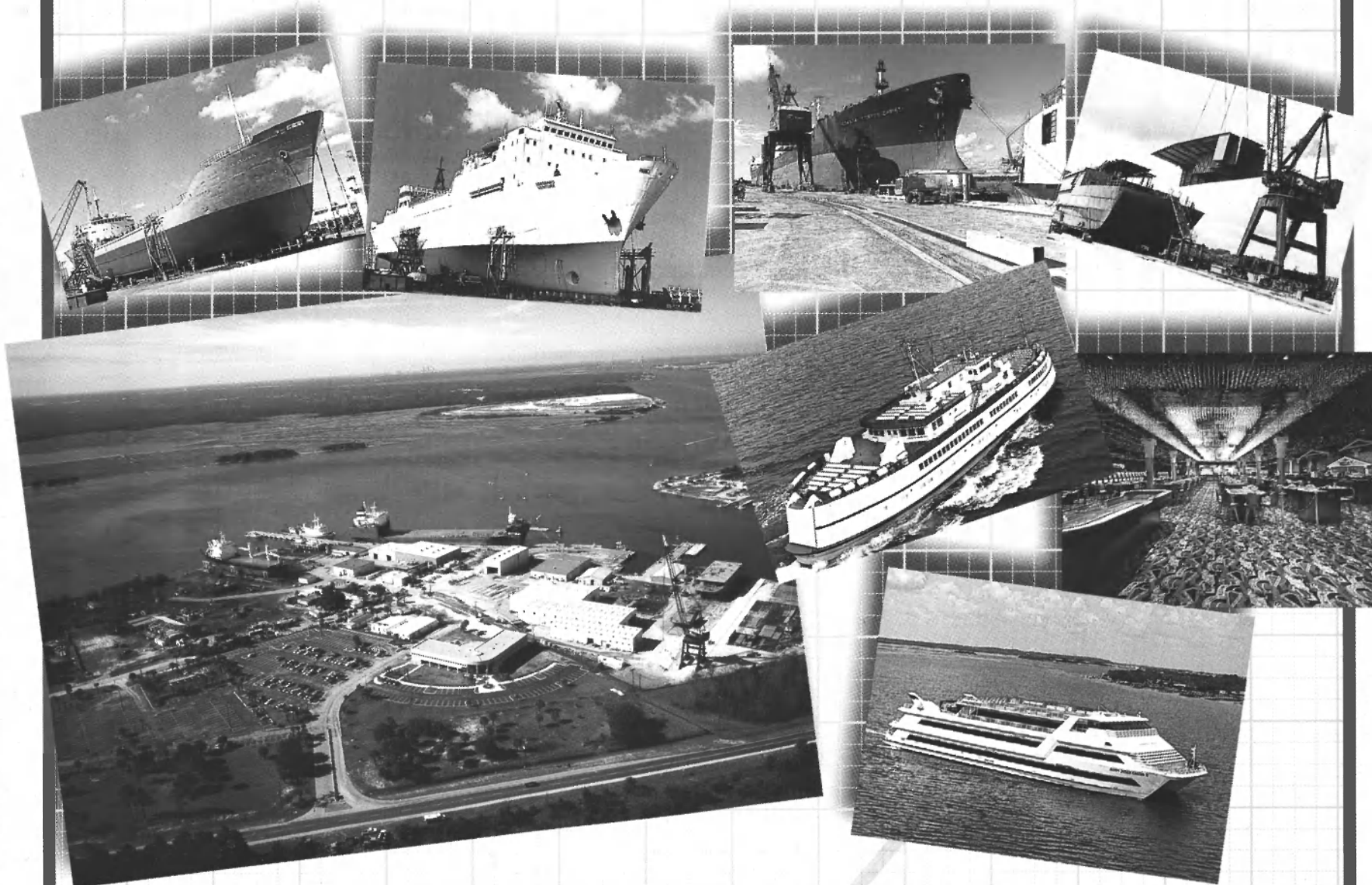
From the recovery of a father and son to a massive search and rescue effort like this one, AMVER has provided lifesaving service to a wide variety of vessels and people over the years. As it is impossible to put a price tag on human life, the cost effectiveness of AMVER's performance has been priceless.

As AMVER approaches the 21st century, even more demands will be put on the computerized search and rescue system. A 1999 deadline has been set for most merchant vessels to completely change over to the fully automated GMDSS (Global Maritime Distress and Safety System). This new rescue system replaces the now outdated Morse Code. Together, AMVER will complement GMDSS to lead search and rescue into a new era of electronic global networking and response.

This article was submitted by USCG's AMVER Maritime Relations Office, which is located on Governor's Island in New York Harbor. It was written for MR/EN by Chris Logston.

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# New Codes And Regulatory Concerns Force Industry To Take Notice

by Bridget A. Murphy, associate editor

In recent times, in light of environmental disasters caused by several infamous ship casualties, government and industry forces have begun to align, establishing codes and examining training standards, in an effort to protect the common ocean resource and the lives of seafarers. The new IMO SOLAS amendments have blazed a trail, serving to tighten and standardize international safety requirements, specifically by mandating enhanced inspections for bulkers and tankers; and the adoption of ship reporting systems for tracking vessel passages; emergency towing arrangements for tankers 20,000 dwt and above; special training requirements for tanker personnel under STCW; and port state control measures, which permit detailed ship inspections if vessel certificates are invalid or "when there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the safety of ships."

The safety issue has occupied the spotlight lately, and is not only affecting changes in technology, shipboard practices and legislation, but has itself evolved, with a new emphasis on accident prevention replacing the traditional stress on post-incident response. The U.S. Coast Guard's (USCG) Office of Marine Safety, Security and Environmental Protection has introduced its Prevention Through People (PTP) program, which sets forth non-regulatory guidelines for decreasing risks associated with human error. And in an unprecedented move, the Washington state Office of Marine Safety has enacted its own ship risk regulations, sending a literal message to a profit-controlled industry to shape up its act in state waters, or ship out.

### The Challenge Of Risk Management

At a recent New York conference, Rear Admiral James C. Card, chief, U.S. Coast Guard (USCG) Office of Marine Safety, Security and Environmental Protection (OMS), reminded the industry that 80 percent of maritime accidents occur as a result of human error, and spoke about the grounding of *Sea Empress* as a "toe stubbing," saying that accidents usually occur after repeated mistakes. "A lot of tankers have been in and out of Milford Haven ... There's no such thing as a risk-free environment. We have to be able to respond properly to these actions," said RADM. Card.

"It's not sufficient to write the regulations," he continued, and added that the USCG would lead the effort to put safety standards into practice, particularly through its Prevention Through People initiative. The program is intended to set up a means of preventing casualties throughout the maritime environment, including vessels and shoreside facilities, by looking for corrective actions in the human element of safety, and addressing the issue from an overall systems prospective.

The PTP strategy involves four basic ele-

ments: collaboration; risk management; human error detection; and improvement of investigations. Risk management specifically involves training USCG inspectors to recognize casualties before they occur, and includes provisions for collecting better data on near misses. As explained by USCG Commander John Grenier, vessel operators can now file PTP forms in order to identify potential navigation disasters, an aspect of the program currently being exercised by barge fleet owners and riverboat owners on the inland waterways through USCG partnerships with the American Waterways Operators (AWO) and Passenger Vessel Association (PVA). "Owners will be able to come together and create a set of actions that will keep these (incidents) from ever occurring," said Commander Grenier.

### Creating Appeal For An Incentive-Based Industry

PTP is currently in its infancy stage, and USCG is seeking industry input, in order to work with companies to fashion implementation of program goals. One of the aspects of the program most appealing to industry is USCG's offer to create incentives for companies that have adopted quality management systems. As explained by Joseph J. Angelo, director of standards, OMS, at a recent BIMCO (The Baltic and International Maritime Council) gathering, the Streamline Inspection Program currently carried out in two districts in Louisiana and Seattle, is one program that operates on an incentive basis. Operators in these districts avoid "laborious inspections" by the USCG by implementing pre-approved quality programs onboard their ships. He suggested that this program could become more widespread under PTP if industry expressed a desire to work with the Coast Guard.

RADM. Card has stressed that PTP will not be successful unless it is embraced by industry, and in another delivery at Shipping '96, he emphasized that the program is the Coast Guard's way of seeking a non-regulatory solution to the safety problem. He said that risk assessment surveys should be deployed in every port, and added that the industry has to cultivate an understanding of the human element and its role in marine operations through continued research and understanding. He suggested that "near misses," be viewed in a positive light, namely as "good catches," and advocated sharing information within the maritime community. RADM. Card also expressed the need to streamline regulations, through the use of plain language, and said that business practices of the industry should be altered, specifically by improving the level of communications between industry and government.

### Taking Substandard Operators To Task

In 1991, the legislature of the state of

Washington's interpretation of the public outcry following the *Valdez* disaster and other spills led to the drafting of the Washington Oil Spill Response and Prevention Act of 1991, and the establishment of the state's Office of Marine Safety (OMS). On April 1, 1996, this office was scheduled to adopt its own set of pro-active safety regulations intended to block the operation of substandard vessels in state waters. These "ship risk" regulations set forth a vigorous boarding and inspection program for vessels predicted to pose substantial risks, and use "screening matrix" tools to assign vessel risk scores, a method similar to that used in USCG's port state control program.

According to Stan Norman, program director of the office's Policy and Planning division, the regulations are intended to send a message to the maritime industry, namely, that anyone operating below standards is not welcome. "We don't mind them gambling with their money, but we don't want them gambling with our environment," he said.

According to the new regulations, ships entering Washington waters that are perceived to pose substantial risks are evaluated in 11 categories, including age, flag, class society, vessel type and violation history. The higher the ship scores, the more likely state OSM officials will board the vessel. Although USCG has not expressed support for the program, it thus far has done nothing to put a stop to it, and according to Mr. Norman, "We contact the USCG at the field level every morning in an effort not to duplicate boardings."

Mr. Norman further explained that the regulations are designed to fill gaps in safety requirements, adding, "Nothing is required by these regulations that is not mandated by federal or international law." For example, STCW standards are part of the "accepted industry standards" that Washington considers in its risk assessments, even though U.S. action on the matter has been stalled. The state office is also furthering the cause of safety by conducting studies on Bridge Resource Management.

Mr. Norman said that the new regulations, scheduled to go into effect on May 1, will not result in loss of business for the state's ports. "I think they'll cause some concern for the few substandard operators, (but) I think the predicted growth in trade will continue." He further stated, "I think the more pro-active industry elements will applaud what we're doing ... If other states would follow a similar approach, there would be no serious problems."

### Polarized Forces Plead Common Objective

Ideally, safety at sea should involve a cooperative effort by industry and government agencies to provide a battery of standards that set forth training and shipboard requirements, and a means for enforcing these standards such as

(Continued on page 76)

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## Safety At Sea • Products & News

### Interpro Offers Victim Retrieval Platform

Interpro, Inc., Haverhill, Mass., has manufactured a new water emergency retrieval platform that

allows victims to extract themselves from the ocean.

Dubbed Easy Out, this piece of equipment was designed with the latest RF technology for sealing its urethane coated nylon material, and when inflated by carbon dioxide pump, can support eight people

in the water.

When returning to the assisting craft, with the included 150-ft. (45.7-m) towline, the ladder configuration allows the victims to simply climb out.

For more information on Interpro, Inc. Circle 78 on Reader Service Card

### ACR Introduces Miniature Strobe Light

ACR Electronics, Inc., Fort Lauderdale, Fla., has introduced C-Strobe -- a miniature flashing signal light for use on lifejackets.

The product features a light which is reportedly visible up to two miles away, depending upon conditions. The light is USCG-approved for SOLAS, and is encased in a waterproof, lightweight unit.

For more information on ACR Electronics Circle 77 on Reader Service Card

### Hiller Offers Fire Protection Equipment

Hiller Systems, Inc., Mobile, Ala., manufactures several series of safety equipment, including marine fire suppression equipment fitting commercial and military specifications. The company provides an in-house engineering, design and surveying service to address clients' full fire protection requirements.

For more information on Hiller Systems Circle 79 on Reader Service Card

### Mustang Survival Contracts With NASA

Mustang Survival, British Columbia-based developer and manufacturer of high performance protection and floatation survival gear for the maritime industry, was recently selected from a field of suppliers to co-develop and manufacture new, inflatable lifejackets for U.S. Space Shuttle astronauts.

The company's floatation and hypothermia survival gear is made at Mustang's 75,000 -sq. -ft. Canadian facility, which is ISO 9001-certified.

For more information Circle 83 on Reader Service Card

### Beaufort Debuts Evacuation Slide System

Dunlop Beaufort Canada Ltd. has introduced an addition to its safety products line -- the Evacuation Slide System (ESS) -- which is designed to operate as a rapid passenger evacuation system for vessels in a situation where the liferaft embarkation station is within eight ft. (2.5 m) of the waterline. According to the company, before EES was marketed, passengers aboard low freeboard vessels in an emergency evacuation were required to jump from several meter heights into awaiting liferafts or platforms. This method presents unacceptable safety risks. EES reportedly facilitates safe and rapid, dry-shod transfer of passengers into the attached platform in minutes.

Maritime Reporter/Engineering News

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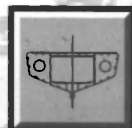
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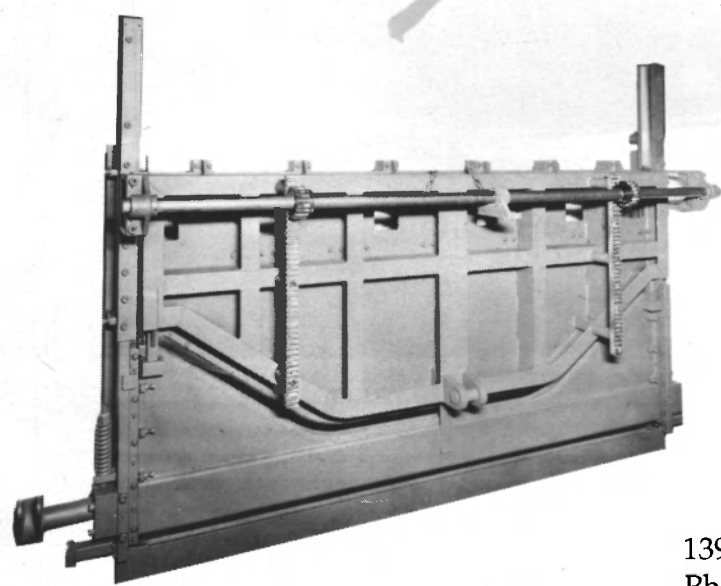
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The capacity filled platform is then easily released from either the bottom or top of the slide and marshaled away to safety.

For more information on Dunlop Beaufort Canada Ltd. Circle 84 on Reader Service Card

### Viking Offers Range of Lifesaving Equipment

Danish manufacturer Viking Life-Saving Equipment AS has supplied the maritime industry with personal protective equipment for more than 35 years. The ISO 9001-certified company offers a wide range of rescue equipment for marine applications, including: liferafts; rigid, fiberglass rescue boats; marine evacuation systems; inflatable lifejackets; immersion suits; fire-protective clothing; and sewage suits. Viking provides personnel training courses, and inspection and maintenance of products.

The company's specialists often work directly with shipowners, yards, operators, and approving authorities to ensure success of manufacture, installation and testing of equipment.

One of Viking's latest releases -- its MES, or marine evacuation system -- incorporates dry-shod evacuation systems particularly suited to high-density passenger vessels for vessels such as fast ferries.

For more information on Viking Life-Saving Equipment Circle 85 on Reader Service Card

### Show Preview

#### SASMEX '96 Features Change Of Venue

The SASMEX (Safety Of Life At Sea) International '96 show, organized with the cooperation of IMO, and scheduled to take place at the Brighton Metropole Hotel in Brighton, U.K., from April 30-May 2, has undergone a change of venue.

This year, in addition to traditional marine safety lectures and exhibitions, an Electronic Chart Technology Conference will enter the fold.

The conference program for this part of the event will contain presentations on several vital topics, with the following themes serving as a guide: EDCID -- Vision or Reality; Solutions for Broken Expectations -- The Way Ahead; and International Rules and Regulations/Database.

Themes for the safety portion of the conference program are:

Developing a Marine Safety Culture; Sea Safety and Survival - The Way Forward; Regional Strategies To Improve Maritime Safety; and ECDIS - Vision or Reality.

As apparent, several themes overlap, which will enhance the event's overall purpose: to integrate the theme of safety with technological developments. According to event coordinators,

the keynote address will be delivered by Rt. Hon. Sir George Young, secretary of state for Transport, U.K. Dept. of Transport.

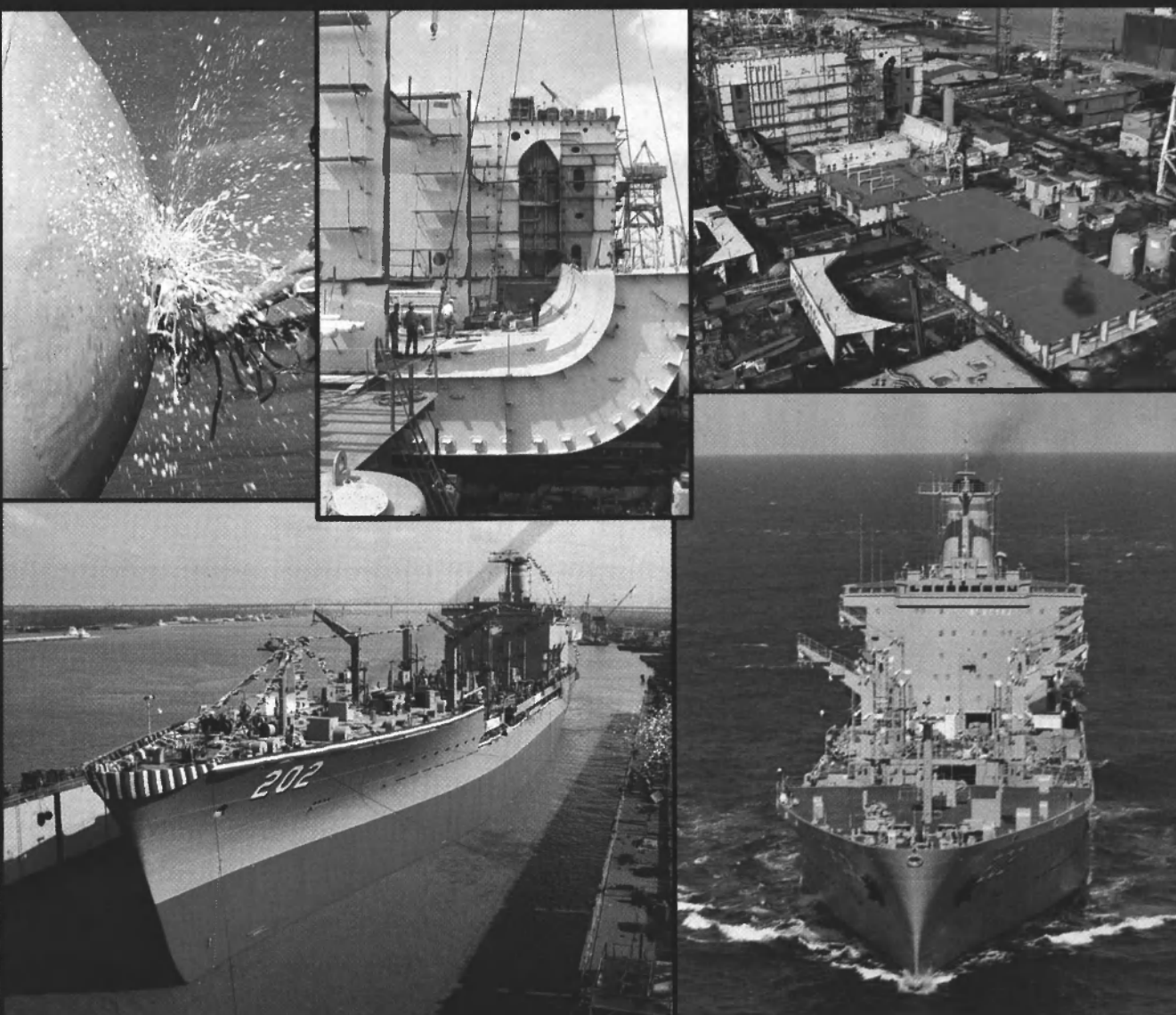
For a full conference schedule and for registration information, contact Gillian Jones, SASMEX International '96, Queensway House, Redhill, Surrey RH1 1QS, U.K., tel: +44 1737 768611; fax: +44 1737 760564.

### RoRo Safety...

International Editor Alan Thorpe files a special report on the latest developments, starting on page 30 of the Marine Technology International supplement

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## Safety At Sea • Legislation

### Telecommunications Act Clears Way For GMDSS Implementation

On February 8, U.S. President **Bill Clinton** signed the Telecommunications Act, which provides for a broad deregulation

of telephone and cable television services. A less publicized provision of the act also resolves an impasse which

has placed U.S.-flag commercial vessels at a competitive disadvantage relative to foreign counterparts.

The IMO has implemented a major upgrade to the radiocommunications provisions of the Safety Of Life At Sea (SOLAS) Convention referred to as the Global Maritime Distress and Safety System (GMDSS), which discontinues the use of manual Morse radiotelegraphy and instead relies on systems such as Inmarsat maritime satellite systems, and provides for modernization -- including automation -- of existing medium frequency (MF), high frequency (HF) and very high frequency (VHF) services used in maritime service.

GMDSS has been in effect since 1992, under a transitional period during which time ships may utilize either system.

While the compliance deadline for oceangoing ships over 300 tons is May 1999, many GMDSS ships of other nations have been sailing since 1992 without the radiotelegraphy facilities of the earlier SOLAS treaty.

U.S.-flag ships, on the other hand, have been granted only near-coastal exemptions from the radiotelegraphy requirements since the FCC could not waive those provisions of the Communications Act of 1934.

For this reason, there has been no economic incentive for early conversion, and few U.S. ships have outfitted for GMDSS operation.

According to USCG sources, the new Telecommunications Act states that U.S. ships operating in accordance with the GMDSS "shall not be required to be equipped with a radio telegraphy station operated by one or more radio officers or operators."

This is expected to resolve the impasse and enable U.S. ships to operate on the same basis as the rest of the world fleet. The procedures for providing this relief have not yet been announced, but ships cannot discontinue radiotelegraphy services until the FCC has amended Part 80 of its rules, or until receiving individual exemptions.

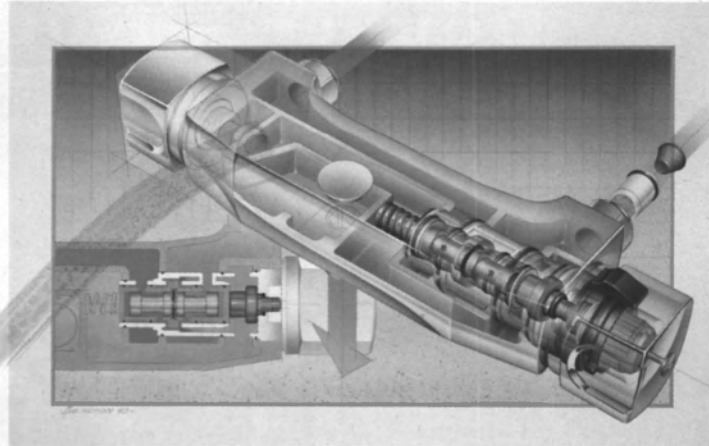
The USCG has formed a GMDSS Implementation Task Force in order to accelerate domestic outfitting of the communications systems, and has addressed issues such as operator training, commercial vessel outfitting, recreational vessel awareness, and the needs of service agents and equipment manufacturers.

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For information on the task force, contact Executive Director Captain **John C. Fuechsel**, USCG (ret.), at 7425 Elgar St., Springfield, Va. 22151, tel: (703) 941-1935; fax: (703) 941-6154.

Maritime Reporter/Engineering News

## Safety At Sea • ISM Code Implementation

### Beyond Implementation of the ISM Code: The Rewards Of An Active Safety Management System

The requirement for implementation of the International Safety Management (ISM) Code by July of 1998 is by this time a familiar topic. Many shipping companies have begun the process of educating themselves to this new approach for operating their respective vessels and offices. Initially, most operators have been slightly less than enthusiastic to embrace this latest resolution from the IMO, but as with individual involvement with the ISM Code, the benefits of incorporating such a system within any shipping company's infrastructure gradually become apparent. The Code hasn't been drafted with the intention to completely change the way shipping companies operate today, but rather to allow individual companies to develop their own systems with the intention of promoting continual improvement within the entire industry over time. While developing a Safety Management System (SMS), it is perhaps most crucial that companies evaluate their efforts in terms of what effects their decisions today will have tomorrow.


The most meaningful initial consideration prior to implementation of the Code, is the determination by senior management of the level to which their company will comply with the Code. Degrees of compliance may vary from the most basic satisfaction of Code requirements, to a genuine internalization of its most central tenet -- the perpetuation of continuous improvement within the SMS. While the decision to meet the barest of minimum requirements may result in receiving initial certification, Classification Society Registrars expect the SMS to provide objective evidence of improvement from year to year during the life of the certificate. To date, most shipping companies throughout the world already possess management systems which incorporate a number of the Code's basic principles. The items typically not addressed within most existing systems are precisely those which stimulate positive changes. The Code provides a variety of measures to promote improvement through active employment of the following principles: Reporting of Nonconformances and Near-Accidents; Procedures for the Implementation of Corrective Action; Master's Management Review; Internal Audits; and Management Review.

These principles, which contribute to the living nature of an effective SMS, produce the benefit of assisting operators in maximizing returns on the investment of time, human resources and money within the company's management system. The greatest returns will be realized in a reduction of acci-

dents and an eventual increase in efficiency as participation within the safety culture continues. By controlling the way a company per-

forms a variety of functions and critical shipboard operations, the SMS will, by extension, provide for a large measure of Quality Control

as well. Since the Code was borne out of accepted international Quality Standards, it should be of little surprise that this additional





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benefit really lies at the core of any effectively administered SMS. In this sense, the SMS achieves safety through quality management principles.

When considering how the Code will assist their respective operations, shipping companies must direct their focus beyond the implementation phase to truly appreciate how the active principles of the Code will channel

efforts toward continual improvement. Positive changes within an organization are rarely the result of spontaneous luck. It is through the methodical and routine monitoring and objective self-assessment of various activities that continual improvement is effected.

Compared to the cost of an accident, implementing an SMS is relatively inexpensive. By now this rationalization for

implementing the Code seems a bit jaded. Since it isn't simply a matter of acceptance or approval of the code any longer, this slogan might best be replaced by one of the most direct expressions of the necessity for continual improvement in an increasingly competitive global market.

By maximizing their efforts to produce truly active Safety Management Systems within their

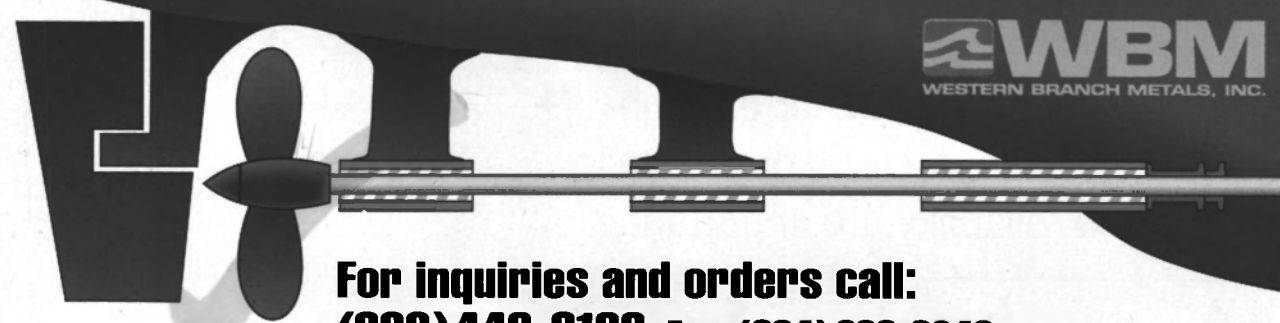
organizations, shipping companies will not only be prepared to meet the requirements of the Code, but also appreciate positive growth individually and as a collective movement within the marine transportation business.

*William R. Mahoney is an associate consultant with P and H Marine Associates, Inc., a marine consultancy firm based in Wolfeboro, N.H. Mr. Mahoney is a licensed deck officer in the U.S. Merchant Marine who has been involved in developing Safety Management Systems and training programs for various clients.*

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### New Codes And Regulatory Concerns Force Industry To Take Notice

(Continued from page 70)

regulations or incentive programs. However, this challenge is significant, as illustrated by the state of Washington and the USCG's similar missions and separate approaches to a common problem. As stated by Mr. Norman, "We hope that they (USCG) will recognize the value of our programs and implement many of them on a national basis ... Research has indicated that they are in line with what is coming down the pike for the entire industry. We'd like to see these rules take effect as soon as possible to protect natural resources."

In a recent interview with MR/EN, Radm. Card reacted to Washington state's actions: "We think states have a role. We think the federal government has a role. We would not like the states to pick up what we should be doing." While he conceded, "anything they can do to add value is helpful," he said that he has gone on record with **Barbara Herman** (Washington state marine safety director) expressing his disapproval. "I'm a little concerned with some of the things they're doing. I would like for the states to be able to rely on the Coast Guard to do what we have to do."

So far, the evolution of safety at sea has progressed from a concentration on correction to an emphasis on prevention. This issue will undoubtedly remain in the spotlight for the next few years, during which time government and industrial interests will decide the most effective manner for preserving lives and resources.

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## Union Disputes Drive Crowley Out Of San Francisco Bay Market

by Nina D. Miller, assistant editor

Crowley Maritime Corporation is pulling out of the San Francisco Bay market. Although the company has proven itself to be an industry leader in both the west coast escort and assist markets — generating \$16 million in the West Coast ship assist market in 1995, according to TM Marketing's 1996 West Coast Tanker Escort & Ship Assist Review — ongoing union disputes have driven the company away, as of April 1. According to **Richard Simpson**, vice president of Public Relations at Crowley, after 10 years of unresolved quarrels, the company has simply given up. Crowley feels that the unions are asking for higher than competitive labor costs, while in the unions' opinion, Crowley has been trying to reduce the work force and its benefits. The conflict of interest is that, "... competitive labor costs, i.e., crew, size of crew, overtime pay, flexible work rules and guaranteed pay, were significantly higher than competition's labor agreement with the Master, Mates and Pilots unions. Our contract was with the Inland Boatman's Union (IBU) and the Marine Engineers Beneficial Association (MEBA)," said Mr. Simpson.

Representing the IBU, **Jay Secombe**, the union's regional director, said, "The company (Crowley) submitted a contract proposal to the Union on February 22, 1996, that would have completely gut the conditions that the IBU members at Harbor Tug & Barge have fought for over the last 20 years. They proposed: elimination of one deckhand job off each boat, which would be a 50 percent reduction in the work force elimination of guarantees; watch schedules; a two year wage freeze; 80 to 160 hours a month for full health and welfare contribution; no casual health and welfare; and reduction in sick leave from 80 to 50 hours a year. The company stated that we either take this agreement or they would go out of business. We are still willing to negotiate a settlement that will give them relief." He added, "The reason for job loss

is the company wants to combine a job aboard the boats by taking the engineer, who is covered by another union, and make him an engineer/deckhand, which causes a crossing of jurisdictional lines." The cessation of service in this one area will not bring any serious repercussions for Crowley. "The four tugs (out of 100 in Crowley's services in other markets) assigned to the Bay Area represent a very small portion of Crowley's overall marine capacity, and will have no negative impact on Crowley's business," said Mr. Simpson. Crowley plans to move the four tugs into a more profitable market.

TM Marketing's new 1996 West Coast Tanker Escort & Ship Assist Review looks at the major petroleum companies operating in the U.S., and examines their worldwide revenues, exploration activities, proven reserves and regulatory compliance costs, in addition to environmentalism in America today.

The review also features chapters on Alaska, Washington and California environmental legislation. Also included is a detailed analysis of tanker activities and escort costs for Port Valdez, Puget Sound, San Francisco Bay and Los Angeles/Long Beach harbor activities. **To order call: (415) 721-1797**

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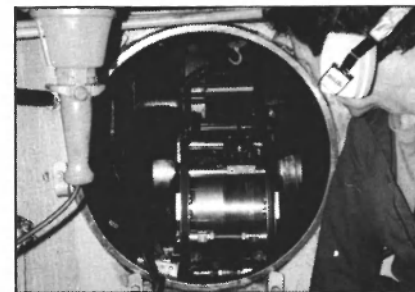
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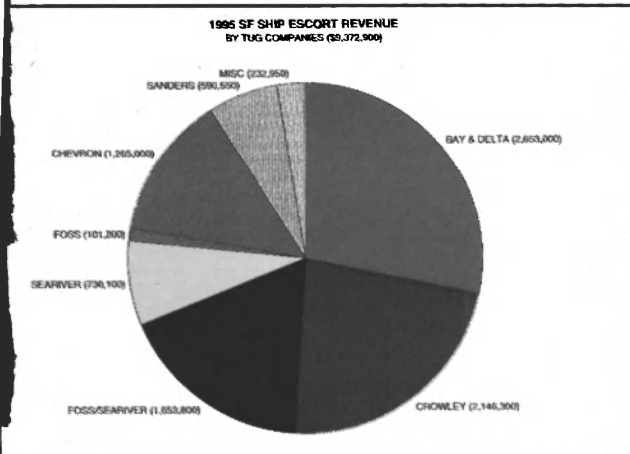
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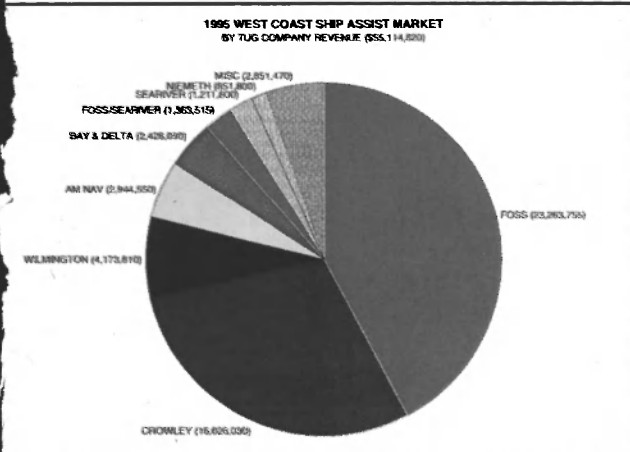
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ABOVE: 1995 San Francisco Ship Escort Revenue.  
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April, 1996



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### Unitor Wins Oil Bag Orders From Egyptian And Japanese Interests

Norwegian international ship supply specialist Unitor manufactures a compact, collapsible, towable, temporary storage container for containing oil spills. This product -- the UOB, or Unitor Oil Bag -- is available in standard sizes from 10-cu.-m. to 1,000-cu.-m., and is manufactured from a durable, coated fabric. The composite material reportedly has high mechanical properties, and provides protection from seawater, oil and ultraviolet light degradation.

Egypt's Petrojet took delivery of two, 500-cu.-m. UOBs for use onboard its fleet of offshore supply vessels based in Alexandria in February. This fleet provides oil spill response coverage in the Mediterranean, Gulf of Suez and Red Sea. In the Gulf of Aquaba, seven UOBs are part of the front line of defense for Jordan's oil spill response plans -- an order which was placed by Japanese trading house Marubeni Corp., on behalf of the Japanese government, who is sponsoring increased awareness in spill response measures with countries bordering the Gulf of Aqaba. New orders from Egyptian and Japanese interests brings the total number of units sold to 47, with a total capacity of 5.9 million tons. According to Unitor, UOBs are

providing spill response services in other locations, including the U.S., Canada, Sweden, Norway, Taiwan, Singapore and Malaysia.

For more information on Unitor AS  
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### Night Vision Enhances Crew Safety

Aerojet, a segment of GenCorp, Azusa, Calif., has developed a technology that could bring important improvements to the safety and surveillance sectors of the maritime and petroleum industries. The product -- Aerojet Night Vision Camera (ANVC) -- operates in three to five micron infrared band, and can reportedly provide 24-hour, high performance safety and surveillance capability to users requiring long range and high resolution. ANVC is a thermal imaging camera contained in an explosion-proof enclosure, designed to withstand extreme conditions including marine environments with high humidity. According to the company, ANVC has been demonstrated on both military and commercial ships, and has been used as an aid to ship navigation systems, as a man overboard locator, for port security and detection, and for identification of all types of surface and airborne craft and objects.

For more information on ANVC  
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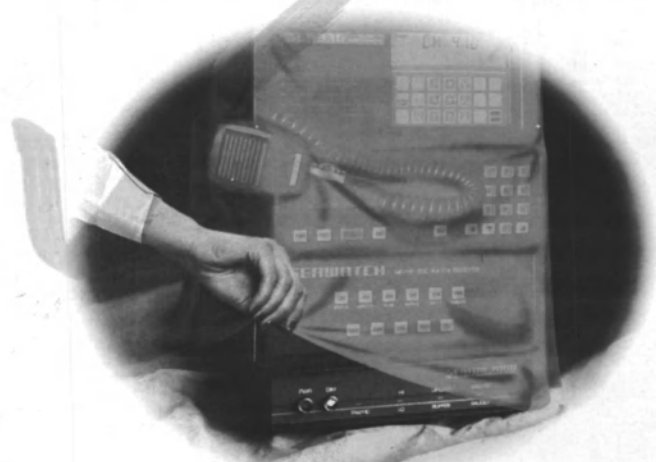
### RINA Mounts Competition Directed At Safer Ship Designs

The Royal Institute of Naval Architect (RINA) recently announced that in the interests of promoting study into the development of safer ships, it has mounted a competition for the concept design of a ship incorporating novel and effective safety features.

The subject for 1996 is a RoRo passenger ferry for travel on the English Channel routes. The competition will offer prize money, made possible by contributions from the Marine Safety Agency. Prize winners will be given the opportunity to undertake a presentation of the winning designs at a RINA event towards the end of the year. Reportedly, interest in the competition has come from sectors worldwide, including interests in Australia, Norway, Sweden, Poland and the U.K. Members of the judging panel include: Commodore **A.D. Barrett**, chairman, Ferry and Passenger section, Chamber of Shipping; **Robin Bradley**, chief executive, Marine Safety Agency, U.K.; and **A.W. Gilfillan**, technical director, RINA Safety Committee.

For more information on RINA  
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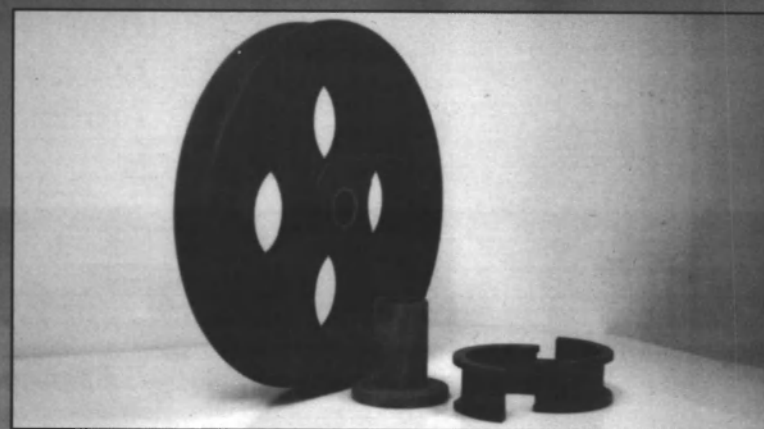
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### CS Marine Safety Program Well On Track

Reports of the recent council meeting of the International Association of Classification Societies (IACS) noted that implementation across the membership of IACS' new Marine Safety Initiatives program, announced in mid-1995, is already well on track. The seven initiatives show IACS' determination to sustain clear leadership in technical areas of maritime safety and pollution prevention, by restricting the operations of shipping that fail to meet the organization's standards. Formally implemented on January 1, the program includes further tightening of the IACS Transfer of Class Agreement (TOCA), greater transparency of class and statutory information, and automatic suspension of class under specific circumstances. The program additionally covers the employment, control, qualification/certification and training of surveyors; surveyor activity and performance monitoring; and commitment to positive relations with Port State control authorities.

### SEA Introduces New GMDSS Console

SEA Inc., a manufacturer of GMDSS product lines, will release the SEA 400-A3 GMDSS Console this month. The company has reportedly been selling VHF and SSB/HF communications products to the high seas, workboat and large yacht marketplaces for more than 20 years. SEA has also announced the establishment of a worldwide network of service stations as part of its effort to become a systems provider for oceangoing vessels. The company expects that this new product will position it as a turnkey communications systems solution provider, and will reflect its presence in the 220 MHz land-mobile service.

For more information on SEA  
Circle 86 on Reader Service Card

### Lifejacket For High Speed Ferries

Danish lifesaving equipment wholesaler Uni-Safe and German lifejacket manufacturer Secumar have teamed up to introduce a new type of inflatable lifejacket. Secumar HSC-Ferry is the name of the ultra-compact, lightweight, inflatable jacket, tailor-made for high speed ferries. The product is a twin-chamber lifejacket with two separate inflation systems, and is approved by the Danish Maritime Authority. One chamber is fitted with a fully automatic inflation mechanism which is activated when the lifejacket is lowered into water. The second chamber is a

April, 1996

manually operated system which was created for emergency situations.

Both chambers are inflated by a carbon dioxide cylinder, and the inflation systems are equipped with fail-safe mechanisms designed to eliminate operational errors.

For more information on Secumar  
Circle 75 on Reader Service Card

### SEA-KURE-TY Offers Extinguishing Systems

Sea-Kure-Ty AB's Ultra Fog high pressure water mist sprinkler system is a fire extinguishing system that reportedly uses an extremely small amount of water to quell flames. Present SOLAS regulations call for activation of

sprinkler systems through the use of glass bulbs, which individually burst by the heat. According to the manufacturer, a Stena ferry with the system installed as part of its safety system has passed IMO inspection. The company also offers frying oil extinguishing systems.

For more information on SEA-KURE-TY  
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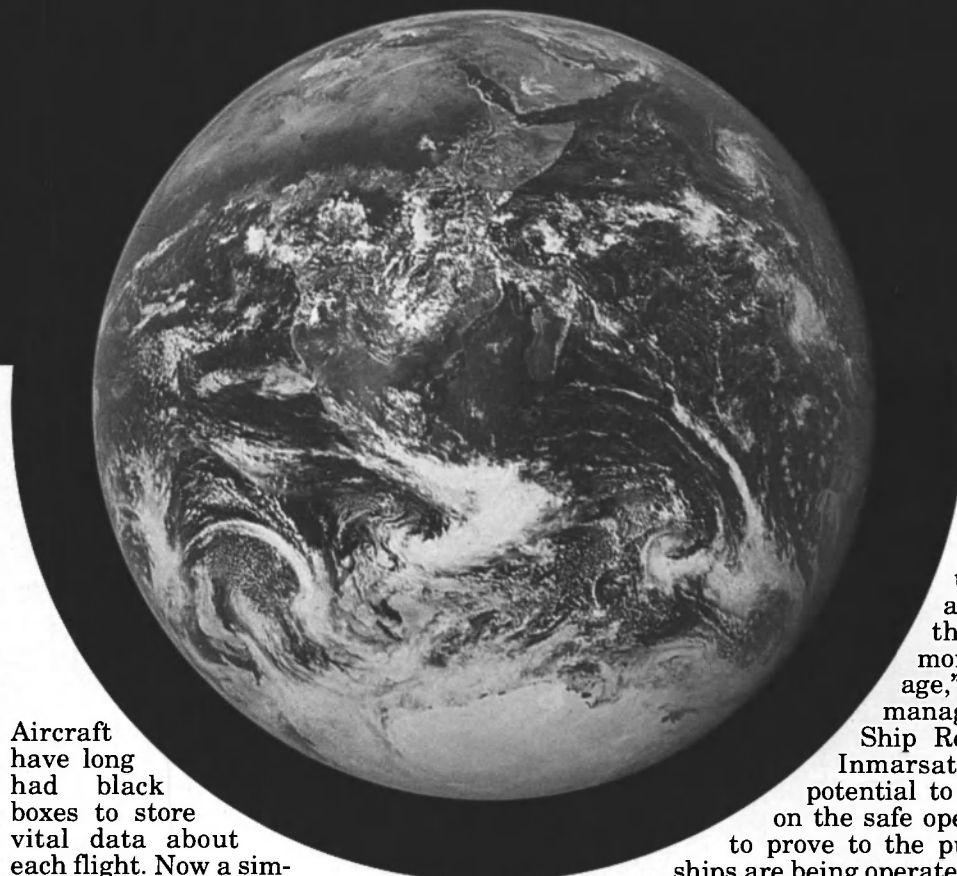
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CWF 0943



# EYE IN THE SKY

Around the world, shipping companies are using satellite communications for a variety of applications, from speeding up time spent in port to sending a distress message.



Aircraft have long had black boxes to store vital data about each flight. Now a similar device is available for the maritime industry which can monitor and store information regarding the condition and safety of ships at sea, automatically alerting authorities in case of an accident and generally acting as a floating "black box."

The device is a buoy which is operated by satellite communications using the Inmarsat network of satellites. Communications via Inmarsat are well established, on land and in the air as well as at sea, and include voice telephone and data messaging services.

The buoy is part of the Status Recording (Starec) system. Using it, ships' owners can monitor the safe operation of their ships, and flag or port states are able to conduct random checks on ships under their jurisdiction.

In the event of a disaster, key data on ship status is available immediately without physical buoy recovery, saving valuable time and resources.

The Starec buoy was jointly developed by Inmarsat, Linkcom and the Japan Radio Company. The buoy can remotely monitor critical parameters such as position, course, speed, excess water in the bilge, status of bow and stern doors and hull stresses. An Inmarsat-C communications terminal inside the buoy transmits the data messages through an Inmarsat geostationary satellite 36,000 km above earth, to a coast earth station (CES), which then forwards the message to an appropriate authority on shore via the normal terrestrial telecommunications network. Inmarsat operates four satellites over four different ocean regions, providing near global coverage.

The buoy will store up to 24 hours of data and can be programmed to send reports at regular intervals. Should a ship sink, the buoy will float free and send a distress message to a predetermined point on shore. The shore authority can then command the buoy to transmit all the recorded data in its memory, providing immediate information about what might have gone

wrong. "The ability to send data automatically from ship to shore, at any time from anywhere in the world, and under any conditions, means that ship integrity monitoring has come of age," said **Andy Fuller**, manager of Broadcast and Ship Reporting Services at Inmarsat. "Starec has the potential to make a real impact on the safe operations of ships and to prove to the public that individual ships are being operated to the highest standards."

The Inmarsat-C satellite communications system provides two-way store-and-forward telex or data-messaging communications virtually anywhere on earth, using simple terminals that are small enough to be fitted to any vehicle or vessel, or even be carried by hand. Anything that can be expressed as data can be transmitted via Inmarsat-C. Transmissions operate at a data rate of 600 bits per second.

## International ship management

A data communications system works to the advantage of shipowners and managers in many ways — whether they are operating at sea, in coastal waters or on inland waterways.

The Inmarsat-C text-messaging system can be used by a vessel to report its position to its shipping company, agent or anyone else who has to make decisions with regard to its whereabouts, replacing guesswork with accurate arrival times.

The flow of goods from one country to another can be made significantly more efficient by automating customs procedures. An Inmarsat-C terminal aboard a vessel permits the transfer of cargo manifests and other necessary customs documentation in order to obtain clearance for cargo before the vessel carrying it crosses a national border.

Time spent in a port unloading and loading cargo is critical to the overall efficiency of a vessel. The larger it is, the more complex this operation tends to be. Container vessels, for example, spend hours delivering containers to different destinations while taking others on board. Advance planning means less downtime, and is the key to the success of these operations, and means less down-time. Inmarsat-C permits vessels to send and receive loading plans so that time spent in port is minimized, allowing more time to move cargo to its destination. Using Inmarsat-C also allows an inland waterways shipper to receive proposals from his regular

customers, agent or even the shipping job exchange.

Most countries have regulations requiring that the position of hazardous cargo be reported regularly to authorities. Linked to a global positioning system (GPS), Inmarsat-C makes it possible to automate this service. Furthermore, it enables authorities to poll vessels carrying hazardous cargoes so that their current positions can be established at any time.

Another application is service broadcasts and navigation notices. When groups of vessels need information such as the positions of obstructions, Inmarsat-C can act as a tool to broadcast that information, either to a fleet as a whole using the FleetNETTM service, or selectively by geographical position, using the International SafetyNETTM service. Shipping companies can also broadcast messages to their vessels as a group. Other data prime for distribution by service broadcasts includes any changes in customs procedures and port information. Even meteorologists can find their skills enhanced by satellite communications. With the Inmarsat-C Enhanced Group Call (EGC) capability, weather analyses and predictions can be sent to ships using SafetyNETTM or FleetNETTM. Inmarsat-C is also used to inform ships on the ocean about stream patterns — that is, to reroute tankers crossing the ocean to divert upstream rather than downstream, for example, in order to benefit from lower fuel consumption in the less strong stream.

A very important area in which satcoms are employed is the Global Maritime Distress and Safety System (GMDSS) which gives ships the capability to transmit a distress alert to shore-based authorities. GMDSS, which will be gradually implemented by 1999, integrates terrestrial and satellite communications for greater maritime safety. The satcoms element of GMDSS is provided by Inmarsat, and it is expected that most vessels will eventually switch to satcoms as an alternative to commercial HF radio.

An Inmarsat-C terminal can be linked or integrated with a wide variety of navigation systems to provide a highly reliable, round-the-clock global positioning reporting capability. Being compact and inexpensive, it is an ideal communication tool for oceangoing ships. Available from a range of electronics manufacturers around the world, the terminals weigh just a few pounds and are equipped with omnidirectional antennas. As of March (the last month for which figures were available), more than 14,000 such terminals were in use in the maritime sector.

*(Continued on page 82)*



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# EYE IN THE SKY

(Continued from page 80)

## A portfolio of satcom services

Inmarsat-C is just one of several satellite communication services offered by Inmarsat. Established in 1979, to serve the maritime community, the international mobile satellite organization has 79 member countries and is headquartered in London. It now has approximately 60,000 different mobile terminals registered in the network worldwide.

Depending on the terminals used, the services available through the Inmarsat satellite network include direct-dial telephone, data, facsimile, telex, electronic mail, data connections, high quality audio, compressed video and still video pictures, telephoto and slow-scan television.

The first mobile satcoms system to be introduced was Inmarsat-A, which can support two-way, high-quality direct-dial telephone, telex, facsimile, electronic mail and data communications. There are more than 25,000 Inmarsat-A registered terminals worldwide.

Inmarsat-C was the second system to become available. There are presently some 23,000 terminals commissioned for use with Inmarsat-C, typically by railways, road transport, news media, medical rescue and disaster relief teams and the maritime sector, and for remote monitoring, control and data collection.

## M and B: the rising stars

Inmarsat-M, which was introduced at the beginning of 1993, offers all-digital telephony, data and facsimile services for land mobile and maritime applications in a small package. The terminals are the size of an ordinary, compact briefcase, and are touted for low power consumption and low operating costs. In March, the total number of commissioned Inmarsat-M terminals was nearly 9,000 (nearly 2,000 of which were maritime installations).

Digital technology is used to ensure that Inmarsat-M provides good quality voice telephony and low-speed facsimile services. It is an instant and reliable connection operating through the public telephone and data networks. Inmarsat-M's all-digital telephony at 4.8 kilobits per second appeals to maritime customers in applications where voice communications is important. M also supports data transmission at 2.4 kbit/s.

While the Inmarsat-M system has been designed chiefly for new users, the original maritime customers have not been ignored. Inmarsat-M is not, however, designed for use with the new Global Maritime Distress and Safety System (GMDSS).

Inmarsat-M uses equipment which is half the size and one-third the weight of Inmarsat-A equipment. Maritime versions can be installed in power and sailing yachts as small as 40 ft. (12.1 m) in length.

Inmarsat-B was also introduced in 1993. It is a digital version of Inmarsat-A, and offering cheaper transmissions and greater system capacity than its predecessor. It was designed to eventually replace the A system, though the two services will continue to coexist for many years. Inmarsat-B's full portfolio of services will eventually comprise automatic direct-dial telephone, telex, fax, data and high speed data. From the outset, Inmarsat-B was designed to comply with the requirements of GMDSS. It now boasts nearly 2,000 commissioned terminals.

The Inmarsat-B system is designed to achieve a high degree of commonality with the

Inmarsat-M system in order to minimize mobile equipment costs, and to maximize efficiency of satellite channel resources and coast earth station (CES) hardware. As a consequence, all the CESs planned for either system have been specified to support both Inmarsat-M and Inmarsat-B.

Equally, ship earth stations (SEEs) are available at prices similar to the lowest available for Inmarsat-A, mostly in the range \$25,000 to \$40,000. Multi-channel terminals are also available. Global coverage is available for Inmarsat-B services through a variety of CESs in each ocean region.

Inmarsat-B is showing itself to appeal particularly to existing high volume users of Inmarsat-A and to users who are planning new facilities. In the maritime environment, these include the offshore exploration industry and the cruise market. There are presently nearly 2,000 commissioned Inmarsat-B terminals, of which approximately 800 are maritime installations.

While Inmarsat-C has always been the most popular service for maritime uses, the future looks bright for Inmarsat-M and B. "By the turn of the century, there should be some 6,000 Inmarsat-M SEEs installed on vessels," said Rob Levey, maritime business planning manager at Inmarsat. "And, over the next five to 10 years, we expect many of our present Inmarsat-A customers will switch over to Inmarsat-B," he added. "In addition, the majority of new ships being launched are expected to install Inmarsat-B. As a result, by the turn of the century, some 7,000 to 9,000 Inmarsat-B SEEs are expected to have been installed on vessels."

BT Inmarsat has recently introduced two new services aimed at improving from-shore access to Inmarsat-B and M. B-Club and M-Club membership allows BT customers to dial directly to mobiles from anywhere in the world. They dial a U.K. telephone number and follow a short series of message prompts. Calls are routed via BT's U.K. earth station at Goonhilly, Cornwall, to any Inmarsat-B or Inmarsat-M equipped mobile in the Atlantic east or west ocean regions, or via BT's partners Telenor in Norway and Singapore Telecom to the Indian ocean and Pacific ocean regions.

## Coast earth station facilities

To cater to the new portfolio of services, particularly Inmarsat-M and B, a number of new CESs are being built. They offer commercial service and worldwide coverage for Inmarsat-M and B with at least two CESs in each of Inmarsat's four coverage areas, providing the customer with a choice of service provider.

Service for the Atlantic Ocean Region, East and West (AOR-E/W), is offered by Goonhilly, Cornwall, U.K. (BT); by Laurentides, Canada (Teleglobe Canada/Hong Kong Telecom/Morsvazspuznik); Station 12 (formerly Burum), Netherlands (PTT Telecom/KDD); Eik, Norway (Telenor) and Southbury in the U.S. (Comsat). Coverage for the AOR-E is also provided by Aussaguel (France Telecom) and Raisting, Germany (DBP Telecom).

Stations which plan to offer M/B coverage in the AOR-E in the future are Fucino (Telecom Italia), Thermopylae, Greece (OTE) and Jeddah (Saudi Arabia). There are no CESs planned for the AOR-W at present.

In the Indian Ocean Region (IOR), M/B CESs

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Phone: (07) 5514900 Fax: (07) 5512963
- TANZANIA**  
The Old East African Trading Co. (T) Ltd.  
Dar es Salaam  
Phone: (051) 327448 Fax: (051) 322520
- TUNISIA**  
Accatib - Tunis 1080 Tunis Cedex  
Phone: (1) 717177 Fax: (1) 719688
- TURKEY**  
Muharrem H. Inal Bilgili Co. (Inalbil) - Istanbul  
Phone: (010) 240 4030 Fax: (010) 244 3726  
Elektronik San. ve Tic. (Sirtel) - Istanbul  
Phone: (010) 292 7729 Fax: (010) 292 8016
- UNITED ARAB EMIRATES**  
Eikon International - Dubai  
Phone: (04) 342332 Fax: (04) 342465
- UNITED KINGDOM**  
Ship Electronic Services Ltd. - Greenhithe  
Kent DA16 3JG  
Phone: (0322) 365053 Fax: (0322) 387087
- URUGUAY**  
Electronica Uruguay Ltda. - Montevideo  
Phone: (02) 947139 Fax: (02) 947138
- USA**  
Radio Holland USA B.V. - Houston, Texas  
Phone: (713) 943 3325 Fax: (713) 943 3802
- VENEZUELA**  
Radio Holland De Venezuela S.A. - Maracaibo  
Phone: (01) 987811 Fax: (01) 915587

and their service providers are: Yamaguchi (KDD); Perth, Australia (Telstra); Station 12 (PTT Telecom); Aussuguel (France Telecom); Eik (Telenor); Cape D'Aguilar (Hong Kong Telecom); Kuantan (Malaysia Telecom); Comsat Eurasia (Comsat); Sentosa (Singapore Telecom); Towi Al Saman, UAE (ETISALAT);

Raisting, Germany (DBP Telecom); Jatiluhur (Indosat) and Arvi, India (VSNL).

Stations planning to offer M/B coverage in the IOR in the near future are: Fucino (Telecom Italia), to be followed by Nonthaburi (PTT, Thailand); Thermopylae (OTE); Jeddah (Saudi Arabia); and Beijing

(China).

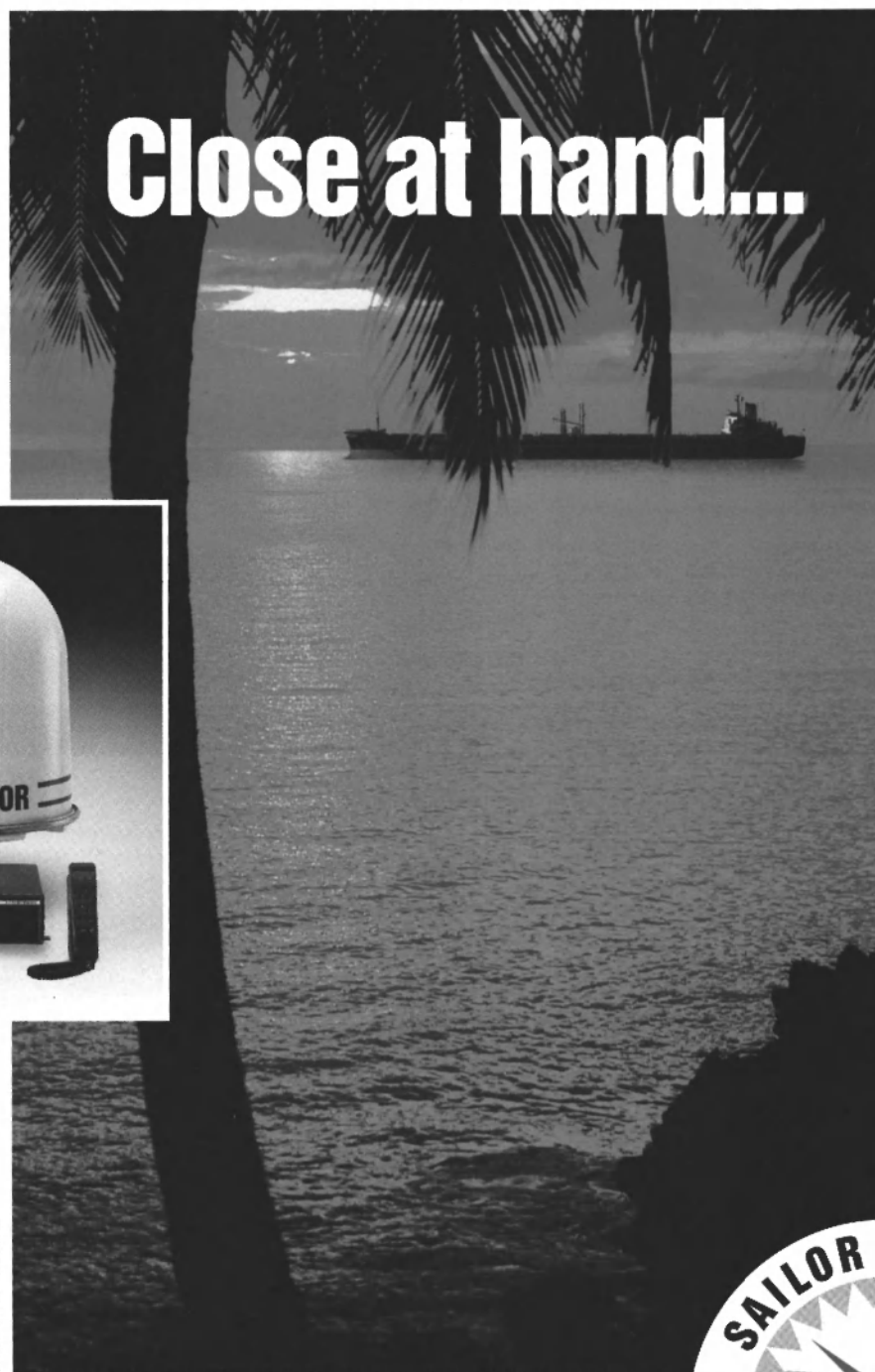
In the Pacific Ocean Region (POR), coverage is provided by Santa Paula (Comsat); Yamaguchi (KDD/PTT Telecom); Perth (Telstra/Morsviavspuznik/Teleglobe Canada); Cape D'Aguilar (Hong Kong Telecom); Sentosa (Singapore Telecom); and a CES planned in Beijing, China.

#### Satellites power the information supersearoute

The information superhighway, despite its name, is far from being land-based. If there is such a thing as the information supersearoute, it is powered by satellite communications such as those provided by Inmarsat.

This has been acknowledged by a spokesperson for Marinet, a Liverpool-based specialist in data communications and remote e-mail. A store-and-forward data transmission and messaging switching system, Marinet is specially designed and optimized for use over Inmarsat-A or M satellite voice circuits, primarily for maritime applications. It is used extensively by maritime organizations involved in ship management, shipping and cruise ship operators, oil tankers and specialist cargo carriers, container ships, research vessels, and cable and pipe layers.

Ships' operations are rapidly reaching the point where the use of information technology is a key factor in maintaining a competitive edge," said Alan Leach, sales manager for Marinet. "The emerging demand for quality and cost-efficient satellite communications links with true global coverage are being met by Inmarsat partners in all these areas. Inmarsat and its service providers are the catalysts for enabling technology so that maritime companies can take advantage of new technologies and globally integrated communication networks, and at ever lower cost."



SAILOR SAT-B  
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The SAILOR GMDSS CERTIFIED SERVICE concept has been developed to ensure the shipping industry a uniform level of service covering specific requirements for spare parts, replacement units and technical manuals, all supported by annual technical training of service personnel.



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Circle 22 on Reader Service Card

#### Following is the list of the SES Manufacturers from Inmarsat.

Anritsu Corporation  
5-10-27 Minami-Azabu, Minato Ku, Tokyo 106, Japan  
Tel: +81 3 34 46 11 11; Fax: +81 3 34 48 80 47  
A, B, C

Atlas Elektronik GmbH  
Sebaldsbrucker Hoerstrasse 235, D-2800 Bremen 44  
Postfach/POB 44 85 45, Germany  
Tel: +49 421 457 30 15; Fax: +49 421 457 39 35  
M

Bennex AS  
P.O. Box 1992, Nordnes, N-5024, Bergen, Norway  
Tel: +47 55 902520; Fax: +47 55 902212  
C

DMT Marintechnik GmbH  
STN Systemtechnik Nord  
Fischgebiet, Behlingsstrasse 120, D-2000 Hamburg, Germany  
Tel: +49 4088 2522845; Fax: +49 4088 254105  
C

Dornier System GmbH  
Postfach 1360, 7990 Friedrichshafen 1, Germany  
Tel: +49 7545 84235; Fax: +49 7545 84411  
A

Furuno Electric Co. Ltd.  
9-52 Ashihara-Cho, Nishinomiya City 662, Japan  
Tel: +81 798 65 21 11; Fax: +81 798 66 46 22  
A, B  
GEC Marconi Marine Co. Ltd.



Eltra House, Westway, Chelmsford, Essex CM1 3BH, U.K.  
Tel: +44 245 353221; Fax: +44 245 358776  
A,B,M

Glacom Inc.  
1803 Research Blvd., Suite 401, Rockville, Md. 20850  
Tel: (301) 309-1940; Fax: (301) 309-1932  
M

Hogenuk GmbH  
Westring 431, D-23000 Keil 1, Germany  
Tel: +49 431 88 184242; Fax: +49 431 88 18306  
C,M

IN-SHEC  
2 rue de Caen, BP-7, 14740 Bretteville L'orgueilleuse  
France  
Tel: +33 31 80 71 22; Fax: +33 31 80 65 49  
B,C,M

International Telecom Industries AS (ITI)  
Laurids Bings Alle 16,  
2000 Frederiksberg, Denmark  
Tel: +45 38 88 66 10; Fax: +45 38 88 66 08  
C  
Japan Radio Company (JRC)

5-1-1 Shimorenjaku, Mitaka-Si, Tokyo 181, Japan  
Tel: +81 335 848756; Fax: +81 335 848891  
A,B,C,M

Koden Electronics Co. Ltd.  
10-45 Kami-Osaki 2-Chome Shingawa-ku, Tokyo 141, Japan  
Tel: +81 3 3440 3864; Fax: +44 81 559 8522  
C

Magnovox  
2829 Morikopa Street, Torrance, Calif. 90274  
Tel: (310) 618-1200; Fax: (310) 618 7001, A,M  
MAN Technologie AG

Bauschingerstrasse 20, D-8000 Munich 50, Germany  
Tel: +49 8131 907690; Fax: +49 8131 907686  
C

Marine Technology International Ltd.  
50 Barwell Business Park, Leatherhead Road  
Chessington, Surrey KT9 2NY  
Tel: +44 181 391 5535; Fax: +44 181 391 9225  
A,C

Mobile Telesystems Inc. (MTI)  
300 Professional Drive, Gaithersburg, Md. 20879  
Tel: (301) 590-8500; Fax: (301) 590-8558  
A,C,M

Musson Radio Corporation  
29 Vakulenchuka Street, Sevastopol 335053, Ukraine  
Tel: +7 0690 244260; Fax: +7 0690 238081  
A

Nero AS  
Marine Dept., P.O. Box 91, N 1361, Billingstadsletta, Norway  
Tel: +47 66 884 47 00; Fax: +47 66 84 46 21  
A,B,C,M

Philips Radio Communications Systems  
Jenegade 22  
P.O. Box 1818, DK-2300, Copenhagen S, Denmark  
Tel: +45 32 88 3793; Fax: +45 32 88 3930  
C

Radar Devices Inc.  
2955 Merced Street, San Leandro, Calif. 94577  
Tel: (415) 483-1953; Fax: (415) 351-7413  
A

Sail Marine n.v.  
Herentalsebaan 55, B-2100 Durne, Antwerp, Belgium  
Tel: +32 3 320 1711; Fax: +32 3 366 2470  
A,C

Scientific Atlanta Inc.  
1650 International Court, Norcross, Ga. 30093  
Tel: (770) 903-6395; Fax: (770) 903-6388  
C,M

Shijiazhuang Communications Laboratories  
P.O. Box 174, Shijiazhuang, Hebei, People's Republic of China  
Tel: +86 311 333320  
A

Skanit AS  
Kirke Vaerloesevej 34, DK-3500 Vaerloese, Denmark  
Tel: +45 42 48 25 44; Fax: +45 42 48 53 53  
C,M

Sperry Marine Inc.  
1070 Seminole Trail, Charlottesville, Va. 22901  
Tel: (804) 974-2000; Fax: (804) 974-6529  
A,C

SP Radio AS  
Porsvej 2, DK-9200 Aalborg SV, Denmark  
Tel: +45 98 18 09 99; Fax: +45 98 18 67 17  
C,M

Throne & Throne AS  
Tobaksvejen 23, DK-2840 Soborg, Denmark  
Tel: +45 3156 4111; Fax: +45 3156 2140  
C,M

Toshiba Corporation  
1 Toshiba-Cho, Kurumai, Saiwai-Ku, Kawasaki 210, Japan  
Tel: +81 44 548 5053; Fax: +81 44 541 3651  
A,B,C,M

Trimble Navigation Ltd.  
645 Worth Mary Avenue, P.O. Box 3642, Sunnyvale, Calif. 94086  
Tel: (408) 481-7718; Fax: (408) 737-6057  
C

VisSat Technology Corporation  
55 Commerce Drive, Hauppauge, N.Y. 11788  
Tel: (516) 273-4455; Fax: (516) 273-4583  
A

**Q:** Why do Norwegians  
always insist on being first with  
the latest Inmarsat technology?



**A:** Because unlike  
Columbus we're not happy  
being second.

There are still people who don't know that Leiv Eiriksson discovered America 500 years before the more famous Columbus accidentally ran into it on his way to India. But it is not important. Our point is that Norwegians since the age of the Vikings have been a pioneering seagoing nation, always dependent on having the best possible means of communication.

When Inmarsat was introduced in 1982, we built the world's first automatic land earth station for the Inmarsat system, EIK - which is still second to none.

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At EIK our one and only concern is to provide our clients with a 24 hour personal service and everything the Inmarsat technology has to offer.

Naturally we want to be first. Few number 2's get to be famous like Christofer Columbus.

**EIK**  
LAND EARTH STATION  
FOR INMARSAT

For more information please contact Telenor Satellite Services AS,  
P.O. Box 5914 St. Olavs Plass, N-0130 Oslo, Norway.  
Tel: +47 22 77 79 50. Telefax: +47 22 77 71 78. Telex: 56 72 666.

 **Telenor**

## SATELLITE COMMUNICATIONS PRODUCT & SERVICE PROVIDERS REVIEW

The following section is devoted to company news and information from leading satellite communications product and service providers. To ensure your company is viewed in the "SATELLITE COMMUNICATIONS PRODUCT & SERVICE DIRECTORY" — to be published in the July 1996 edition of MR/EN — contact the editor at: fax: +212-254-6271 or e-mail: hipedit@ix.netcom.com for details.

### ORBCOMM

ORBCOMM Global, L.P. has begun commercial service as of February 1, 1996, using the ORBCOMM low-Earth orbit satellite constellation. ORBCOMM is reportedly the first commercial satellite-based, two-way global messaging and position system. ORBCOMM is a joint venture of Orbital Sciences Corporation and Teleglobe Inc.

For more information  
Circle 49 on Reader Service Card

### Scientific-Atlanta

Scientific-Atlanta's MariStar Multi-M provides passengers and crew members with two-way international voice and fax services. To accommodate higher data rates and large volume fax requirements, Scientific-Atlanta has developed a hybrid MariStar system that integrates Inmarsat-M and A. With the increasing demand for the Inmarsat-B system and HSD, Scientific-Atlanta is developing a new hybrid system that will integrate an Inmarsat-B terminal with the MariStar-M systems. The company is also developing a "mini" Multi-M system for smaller vessels (i.e., ferries, frigates, small cruise ships) that incorporates three M channels and a 3.3 ft. (one-m) antenna.

For more information  
Circle 50 on Reader Service Card

### OGM Communications

OGM Communications was created to provide solutions for the growing satellite communications market. OGM offers a wide range of mobile satellite communications hardware, including Inmarsat and terrestrial communications equipment, as well as complete licensing, commissioning and billing services. Inmarsat M, B and A services are provided with worldwide coverage.

For more information  
Circle 51 on Reader Service Card

### OSN

As a manufacturer, O' Gara Satellite Networks (OSN) has introduced products such as the Compact-M Mercury 2000 and the VOYAGER I.M. As a system integrator, the company provides complete solutions with Inmarsat Systems, terrestrial communications, navigations equipment, other peripheral devices, commissioning, installation and after sales service. Through its alliance with OGM Communications, OSN is qualified as a major reseller of inmarsat time and can keep costs down to a minimum for Inmarsat M, B and A services worldwide.

For more information  
Circle 52 on Reader Service Card

### Philips Navigation AS

Philips offers marine and land-based satellite communications systems. The Safecom CMX and CM2 use Inmarsat C satellites and comply fully with GMDSS requirements. The briefcase-sized Safecom MP uses Inmarsat M for voice, data and fax. The antenna can be sited 328 ft. (100 m) from the telephone unit and optional built-in bat-

tery provides 40 minutes talk-time or six hours standby when mains power is unavailable.

For more information  
Circle 53 on Reader Service Card

### Telstra

Telstra Mobile Satellite & Radio Services offers Inmarsat services through the Perth land earth station (LES). Satcom-A provides coverage to the IOR and POR. Satcom-M now offers the full spectrum of services including voice, fax and data. Satcom-B also provides a global service, operating by voice, fax and telex. A data service at 9,600 bps will be available in May 1996, and 56/64 kbps HSD service

is set to operate third quarter 1996.

For more information  
Circle 54 on Reader Service Card

### IDB Mobile Communications

IDB Mobile Communications is a global provider of Inmarsat-A, B and C voice, fax, data and telex services. IDB has introduced a new pricing program, where, in the case of voice services, landline charges are included in the rates to any destination worldwide. New services offered include Inmarsat-B high-speed data and STUIII services.

For more information  
Circle 55 on Reader Service Card

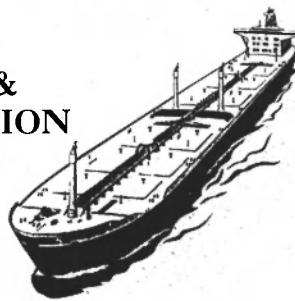
### HILLER SYSTEMS, INC.

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## SATELLITE COMMUNICATIONS PRODUCT & SERVICE PROVIDERS REVIEW

### Teleglobe

Teleglobe has decided to regroup its Inmarsat activities and has reached an agreement in principle with NewEast Wireless Technologies Inc. for the formation of a new company. The new entity will be solely dedicated to the provision of mobile satellite communications. Teleglobe and NewEast believe that centralizing their respective mobile satellite products and services in one company will make it possible to provide mobile Satcom satellite equipment, network services and applications, as well as handle queries, billing and call routing.

For more information  
Circle 56 on Reader Service Card

### British Telecom

BT Inmarsat provides satellite communications coverage for the Atlantic Ocean region. BT has joined forces with Norway's Telenor and Singapore Telecom, creating an alliance which offers direct dial telephony, fax and data services to more than 200 countries worldwide. BT SatMail is a new managed mailbox service which gives ships access to the Internet and X400 networks for e-mail messaging and other information services. Other BT Inmarsat Services include: BT Inmarsat-A; BT Inmarsat-A High Speed Data; BT B-Sat; BT M-Sat; and BT C-SAT.

For more information  
Circle 64 on Reader Service Card

### Singapore Telecom

Singapore Sentosa Land Earth Station provide the full range of Inmarsat-A, B, C and M services in the Pacific Ocean Region (POR) and Indian Ocean Region (IOR). New services available include Sentosa Mail-65, a global electronic mail system for both ship-to-shore and shore-to-ship communications. Sentosa Mail-65 users are able to send and receive files and messages via Internet mail X.400 mail and telex. Messages from ships can also be forwarded as fax messages. The Intouch card is a prepaid calling card service which can reportedly be used to call via any Inmarsat-A, B, M telephone to any destination worldwide via Sentosa LES. C-Plus services is a full range of enhanced Inmarsat-C services which include messaging, mailbox service, polling and data reporting, FleetNET and SafetyNET.

For more information  
Circle 65 on Reader Service Card

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Sea-Quencher™ series offer a complete line of systems, from the compact, economical Aegean model, and the high-output, modular Baltic system, to the commercial-duty Caspian models and custom-designed plants that can produce over a million gallons a day.

All Sea-Quencher™ systems come complete with top-of-the-line components, parts and features. When you compare our features, quality, service and price you'll see why we are the leader in the industry since 1978. For complete information see your dealer or contact us for specifications and the dealer in your area.



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Circle 390 on Reader Service Card

### Commercial Satellite Systems Inc.

Commercial Satellite Systems Inc. (CSSI) is the North American distributor for STN Atlas Elektronik's product line of Inmarsat-M Terminals. These products include the SP1600B Briefcase Terminal, SP1600M Maritime Terminal, SP1600T Fixed Terminal and a new SP1600L Vehicular Terminal. The Atlas terminals are provided with voice, facsimile and data transmission capability as standard features. Atlas has obtained Inmarsat Type Approval for the data service. A recent product introduction is the CSS200 Transportable C/Ku-Band Communications system.

For more information  
Circle 66 on Reader Service Card

### Saudi Telecom International

Under Telephone Expansion Project-6 (TEP 6), Saudi Arabia has awarded NERA (a subcontractor of AT&T) the upgrading of the existing Inmarsat land earth station, operating in IOR and implementation of a new Inmarsat land earth station in AOR-E region for the introduction of Inmarsat Standard A, B, C, M and Mini-M services in the fourth quarter of 1996.

For more information  
Circle 67 on Reader Service Card

### Telecom Italia

Telecom Italia, operating in the national and international markets, is controlled by STET, which is IRI's telecommunications holding company. A division of Telecom Italia is the licensee of the Italian Ministry of Post and Telecommunications for handling maritime communications, including installation, operation and maintenance of radiotelephonic and radiotelegraphic radio stations on board.

For more information  
Circle 68 on Reader Service Card

### BIMCOM

BIMCOM's founding organization is BIMCO — the Baltic & International Maritime Council — which represents more than 60 percent of the world's gross tonnage. BIMCOM, with Mercury Communications Ltd., provides telecommunications and messaging services to the maritime industry.

For more information  
Circle 69 on Reader Service Card

### CP Communications, Inc.

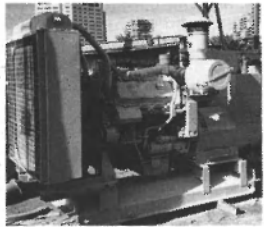
CP Communications Inc. (CPCI), a division of

(Continued on page 88)

Maritime Reporter/Engineering News

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HP: 400 RPM:1800 Generator:Bemac II  
KW: 250 Ph: 3 Cycles: 60  
Volt:208/240/416/480. 467 hrs since NEW  
Our Price: \$19,750

**(2) B & W 1008 KW GENERATOR SETS**

Diesel Engine: B & W 826 MTBH-40  
HP: 1400 RPM:600 Generator: Nebb  
KW: 1008 Ph: 3 Cycles: 60  
Volt: 460.

Used in **Excellent Condition**  
Close Out at **\$14,950 / each**

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Diesel Engine: Detroit Diesel 6-71  
HP: 225 Brushless Generator  
KW: 150 Ph: 3 Cycles: 60 Volt: 440  
As is: **\$7,500**, REBUILT: **\$12,000**

**DIESEL PARTS AVAILABLE FOR:**

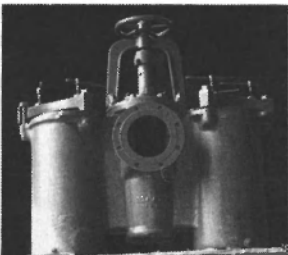
Alco, B&W Man, Caterpillar, Cleveland,  
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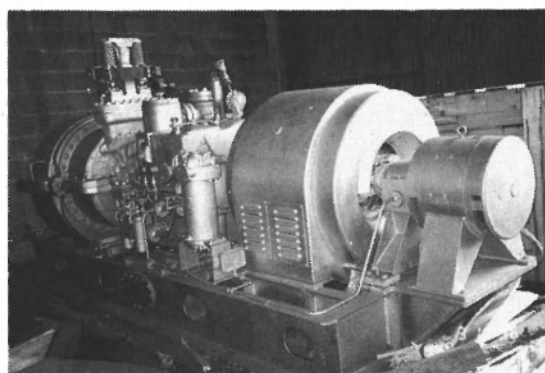
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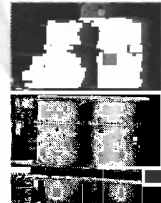
(2) Rebuilt Equal-to-New General Electric  
**1000 KW** Turbogenerators  
Steam:440# Exhaust: 27" Volt: 440

(2) **NEW** Westinghouse  
**500 KW** Turbogenerators  
Steam: 385# Volt: 440

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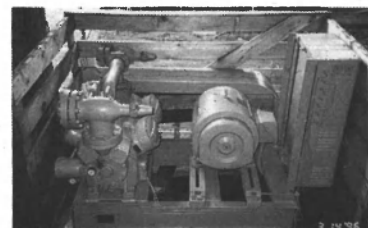


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**SATELLITE COMMUNICATIONS PRODUCT & SERVICE PROVIDERS REVIEW**

CruisePhone, a provider of in-cabin cruise ship communications services, is a full-service mobile satellite communications company  
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**BOATRACS**  
 BOATRACS, Inc. is the U.S. marine market distributor of the OmniTRACS System, a satellite-based communications and tracking system manufactured by QUALCOMM Inc. The system provides two-way communications between vessels at sea and base stations.  
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**Trimble**  
 Trimble is a leader in the emerging commercial markets for GPS satellite-based navigation, positioning and communication data products. The company holds patents on many GPS technologies.  
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**Furuno**  
 Furuno's new Felcom 80 Satcom-B system was developed for commercial and larger private vessels, meeting stringent Class I requirements of GMDSS, as well as the Class II requirements for minimum phone and fax services at sea.  
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**Skanti AS**  
 Skanti has introduced the Inmarsat-M Scansat-M, consisting of an antenna unit, an electronic transceiver unit and a user-friendly, mobile-radio-like handset.  
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**AMSC**  
 In addition to standard satellite telephone service, American Mobile Satellite Corp. (AMSC) also offers SKYCELL Satellite

Dispatch Service — a satellite-delivered digit voice dispatch service. Customers can reportedly create multiple talk groups within any one of the SKYCELL Service ultra-wide area talk zones.  
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**IN-SNEC**  
 IN-SNEC is a designer and supplier of Inmarsat Satellite communications terminals for both land and sea applications.  
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**KDD**  
 KDD will complete its global coverage of total Inmarsat services by the end of 1996, when its Inmarsat-A and C services are scheduled to be available in all four ocean regions. Customers will reportedly be able to access KDD's land earth station anywhere on the world's oceans by entering ID number "03" for Inmarsat-A service.  
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**Magnovox**  
 Magnovox will be offering an Inmarsat-B conversion program for the MX2400 marine Inmarsat-A terminal. The MX 2464 is a complete retrofit kit which includes all of the components necessary to convert the MX2400 into an Inmarsat-B satellite ship terminal.  
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**PTT Telecom**  
 Station 12 is the global marine satellite communications provider of PTT Telecom Netherlands. Its portfolio consists of the Inmarsat-A,B,C,D and M services, as well as the radio services of Scheveningen Radio.  
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**AT&T**  
 AT&T offers a complete line of mobile satellite services, including Inmarsat-A,B,M or High Seas Direct.  
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**Maritime Cellular Network**  
 MarineSat is a mobile telecommunications satellite service. This product offers fully digital satellite communications and provides full duplex transmission.  
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**SAT 100**  
 Abask Marketing sells the SAT 100 automatic stabilized tracking satellite television system based on the RCA 18-in. disk. Systems have been sold to sailboats, power boats, luxury charter boats, cruise ships, casino boats and oil rigs.  
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**COMSAT**  
 COMSAT Mobile Communications (CMC) provides a variety of mobile communications services to the maritime, aeronautical and land mobile industries. CMC provides voice, facsimile, data and telex services to ships at sea, emergency response teams, news gathering organizations, natural resource exploration companies, international travelers and airline passengers through the Inmarsat satellite system. CMC provides global coverage using its four land earth stations located around the world. The Land earth stations, are located in California, Connecticut, Turkey and Malaysia.  
 CMC is the U.S. Signatory to Inmarsat.  
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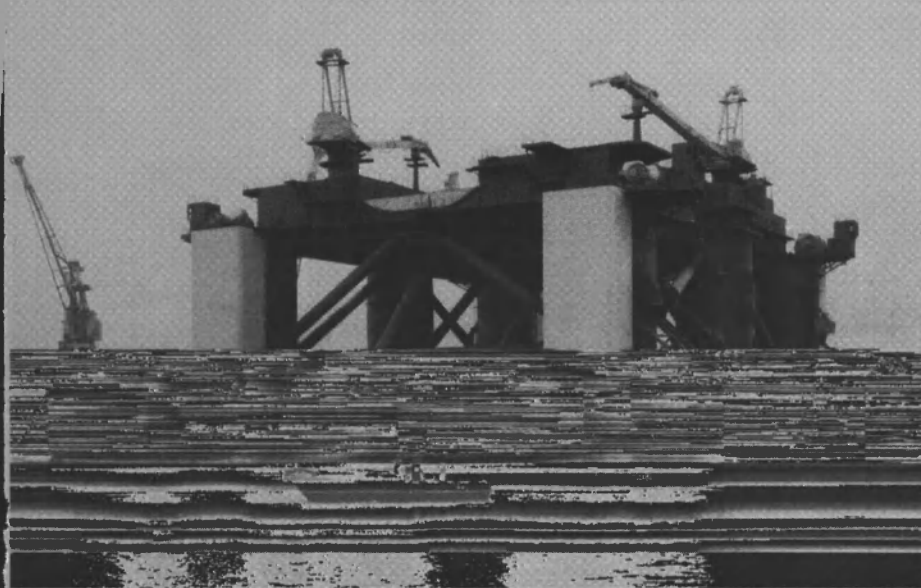
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## Increase to 350,000 bhp expected in Marlim Field, Brazil

Cádiz yard is actually converting a semisubmersible rig into the Floating Production

System P-26, and the VLCC Cairú into the Floating Production, Storage and Offloading Unit P-32 for Brasoil, for the giant Marlim Field, offshore Brazil. These orders underscore Astilleros' strong position in conversion of offshore units.



## Two of four containerships handed over ahead of schedule

Container ships are currently featuring in the Juliana yard's output. The yard is actually involved in a four-in-a-row newbuilding operation for Malaysian International

Shipping Corp (MISC). The first two vessels were handed over ahead of schedule. This Far East operation may be a good case for actual European worldwide competitiveness.

## Product tanker Lista, one of twelve outstanding ships of the year, as selected by American Maritime Reporter

Lista, is a 33,000-cu.-m product tanker built for Mowinkel Kysttanker AS at Seville yard. The vessel is a new type of oil

tanker designed to meet the most rigid standards of safety, ecological criteria and low consumption.

Maritime Reporter  
& Engineering News

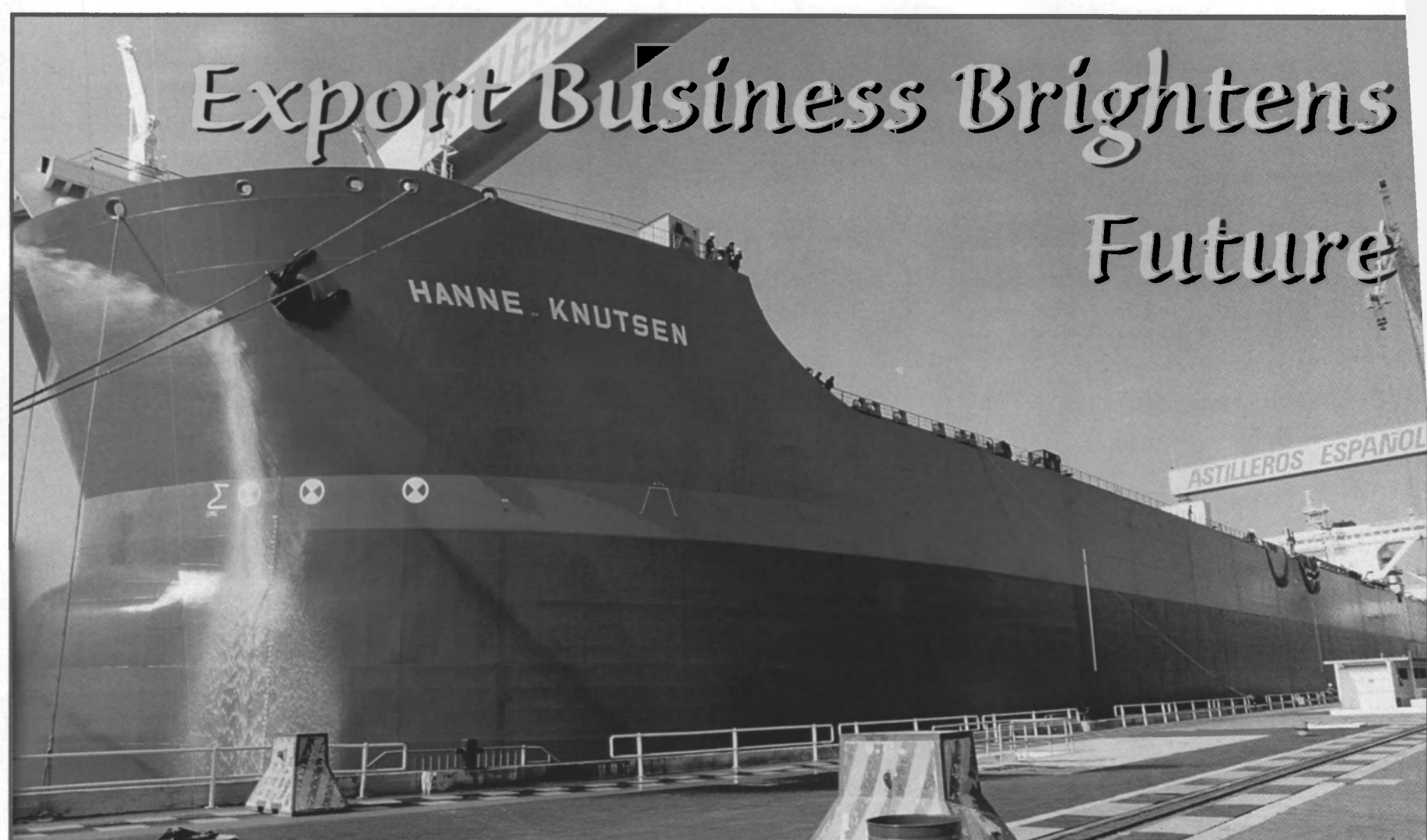
**Great  
ships  
of 1995**

AESA in Sestao, Seville, Cádiz and Puerto Real; ASTANO in Ferrol; ASTANDER in Santander; JULIANA in Gijón; BARRERAS in Vigo and MDE in Manises

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## Spanish Maritime Industry



# Export Business Brightens Future

Overall, Spain continues to have a thriving business community in spite of its recent political uncertainties. As the country continues its monetary integration within the European Union (EU) — which will ensure it a full role in the world's major trading block — investment continues and the peseta remains relatively strong.

The future for Spain's shipyards looks increasingly brighter, and several shipyards have positioned themselves for success in the changing market conditions.

The orderbook for the Spanish shipbuilding sector as a whole is relatively healthy, due in large part to strong export drives by Astilleros Espanoles in the large ship segment and E.N. Bazan in the fast ferry niche. Meanwhile, the small and medium-sized shipyards — which comprise two associations, Construnaves and Asega — are also seeing an upturn in business.

### Shipbuilding Activities

#### ASTILLEROS ESPAÑOLES, S.A.

The principal shipbuilding group in Spain is Astilleros Espanoles, S.A. (AESAs). Its eight

shipyards of varying sizes are capable of building a range of ships, from fishing vessels to VLCCs. AESA's group size affords it the luxury of offering a wide range of vessels, with each of its shipyards increasing its technology, knowledge and skills, and specializing in the production of one or two vessel types. It is also a majority shareholder in engine manufacturer Manises Diesel Engine Co. Until recently, the engine plant was a sole division of AESA, but now MAN B&W has a 20 percent stake.

Most of AESA's contracts have been for export. Of the 66 major ships built or converted in AESA's shipyards in the past six years, less than 15 have been for domestic accounts. Its reputation for building floating storage units (FSU) and shuttle tankers has been illustrated by a consistent outpouring of such projects in the past few years. The vessels have been mainly for Norwegian owners, with Texaco U.K.'s order for a 550,000-barrel FSU and an 80,000-dwt shuttle tanker for use in Texaco's North Sea fields ranking among exceptions.

There are three main geographical areas for both shipbuilders and ship repair companies. In the North, Sestao — near Bilbao — is

dedicated to ship construction and had seven ships on order at the end of 1995. The smaller shipyard Astander, in Santander, is devoted solely to ship repair.

In the northwest, both the Juliana C. Gijonesa yard (Gijon) and the H.J. Barreras yard (Vigo) are devoted to newbuild production. Each had four ships on order at the end of 1995. Astano, in Ferrol, is devoted to repairs and conversions as well as offshore constructions.

In the South, AESA's largest newbuilding facility, the Puerto Real shipyard, had five ships on order at the end of 1995. The Sevilla shipyard, with three ships on order, also concentrates on newbuildings. Repair work is carried out at the Cadiz shipyard.

Over the next two or three years, the company intends to implement a strategic plan that covers several main areas, including its commercial activities and its product line. Both the company and the country as a whole will focus on financing, particularly on methods of attracting new investments.

In early October of last year, AESA, shipyard unions and the government reached an agreement over implementation of AESA's three-year strategic competition

plan. Initially, the plan proposed privatizing three shipyards in the North — Juliana, Barreras and Astander — and closing two in the South — Sevilla and Cadiz. But all of them will now remain within the group and be kept open. Shipyard activities will remain unchanged and newbuildings will continue at Sestao, Puerto Real, Juliana, Barreras and Sevilla. Repairs and conversions at Cadiz and Astander, and offshore constructions and conversions will likewise continue at Astano.

The competitiveness strategy was devised by AESA in response to low ship prices, due in large part to an increase in world shipbuilding capacity.

An active participant in the trend of forging cooperations with other countries' yards, AESA has recently reached an agreement with Ishikawajima-Harima Heavy Industries (IHI). The agreement is structured to allow the shipyards to complement each other's strengths and to provide the advantages associated with information sharing. There is also a similar cooperative agreement between AESA and Avondale Shipyards in Louisiana.

AESA remains a leading international shipbuilder, and its recent deliveries and current orders

## Spanish Maritime Industry

reveal an interesting portfolio, as evidenced by the newly contracted order for a multi-purpose ferry for weFerry. Even though passenger ships have been an unsuccessful target for the AESA group for some years, the Puerto Real shipyard now has the opportunity to boost its passenger ship credentials with its first ferry newbuilding order. The 7,290-dwt multi-purpose vessel measures 656 ft. (200 m), and is designed to carry 600 passengers, and trains, cars, buses and trailers.

During 1995, AESA secured orders (conversions included) totaling \$834 million, a record for the company. There were a total of 12 ships contracted in 1995, 10 for export. Among them, the Puerto Real shipyard delivered two 130,865-dwt shuttle tankers ordered by the Norwegian operator Knutsen OAS Shipping, although their charterer, Norwegian state-owned oil company Statoil, exercised an option to buy them on delivery. These ships were designed to serve the Heidrun field in the North Sea. A 280,000-dwt tanker was also delivered last year to Panama-based Tajomar Ship Corp.

Shuttle tankers have proved a successful niche for AESA, and it has delivered eight such vessels so far, including conversions, most of them resulting from its association with Knutsen OAS. AESA has also built all the product and chemical carriers that have entered the Norwegian company's fleet since 1989. The last 130,000-dwt shuttle tanker order is another for Knutsen OAS, contracted in July, for delivery from Sestao in 1997.

In March of last year Sestao won an order from Texaco for an 80,000-dwt bow-loading shuttle tanker, scheduled for delivery in November of this year and slated for operation in the Texaco's Captain field in the North Sea. The vessel will load from a 550,000-bbl FPSO unit which is on order at Astano, AESA's specialist offshore shipyard, which is also well into a 300,000-bbl FPSO for Golar Nor.

In February 1996, Statoil placed an order for a 125,000-dwt shuttle tanker, with options for another three vessels, for delivery from Sestao in January 1998.

In May 1995 the H.J. Barreras shipyard in Vigo delivered the first of a pair of 3,600-dwt ferries ordered by Naviera Armas Curbelo for operation in the Canary Islands. Delivery of its sisterships followed in October. The ferries carry 250 passengers each (with cabin accommodations for 76) and freight vehicles, with the dimensions of 200.1 x 52.4 ft. (61 x 16 m) on three decks. The Vigo yard has also recently won orders for four purse-seiner tuna vessels, which AESA claims will be the largest of

their type. Two of these vessels have been ordered by Spanish owners, and the other two by French operator Saupiquet. The series is distinguished by a 6,200-kW diesel-electric powerplant,

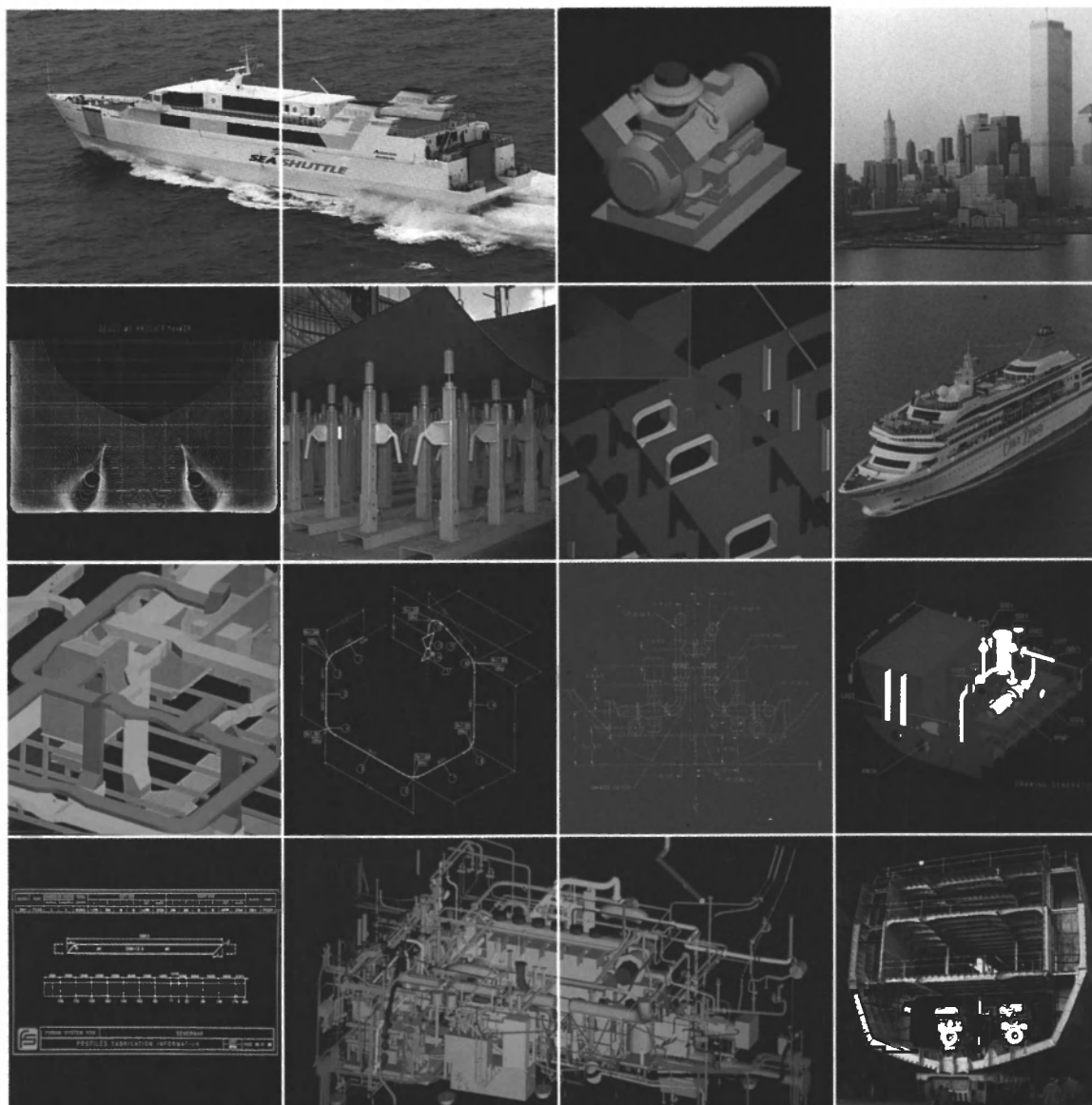
which will provide the energy needed for freezing processes as well as for the main propulsion power to sustain a service speed of 19 knots. The first of the four ships was delivered last December

to the Spanish company Naviera Albacora.

Last year, the Sestao shipyard delivered a 46,500-dwt product tanker to Liberia-based Naviera Castellana, and currently has on

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# Spanish Maritime Industry

## SPANISH BUILDERS

### ORDERBOOK BY SHIPYARD AT THE END OF 1995

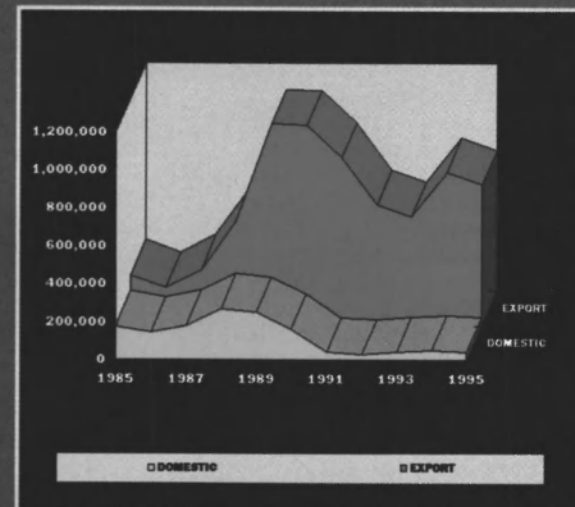
SHIPYARD	N°	GT	EGG	TPM
A. Armon	9	3,139	14,306	2,155
A. Espanoles Puerto Real	5	274,600	162,140	274,920
A. Espanoles Sestao	7	258,571	165,571	448,100
A. Espanoles Sevilla	3	54,000	56,700	27,600
A. Gondan	3	1,532	7,162	
A. Huelva	7	35,105	44,185	40,750
A. Murueta	3	12,352	15,909	14,860
A. Zamacana	9	3,786	13,654	4,068
C.N. PFreire	6	21,279	34,233	23,180
C.N. Santodomingo	5	3,600	13,550	2,154
F. Vulcano	1	678	2,712	583
F.N. Marin	1	260	1,040	150
H.J. Barreras	4	15,270	40,932	12,256
Juliana C. Gijonesa	4	44,135	47,553	66,990
Naval Gijon	1	12,020	12,621	19,000
U.N. Levante (Valencia)	8	40,886	74,974	34,235
<b>TOTAL</b>	<b>76</b>	<b>781,213</b>	<b>707,242</b>	<b>971,001</b>

### 1995 NEW CONTRACTS BY SHIPYARD

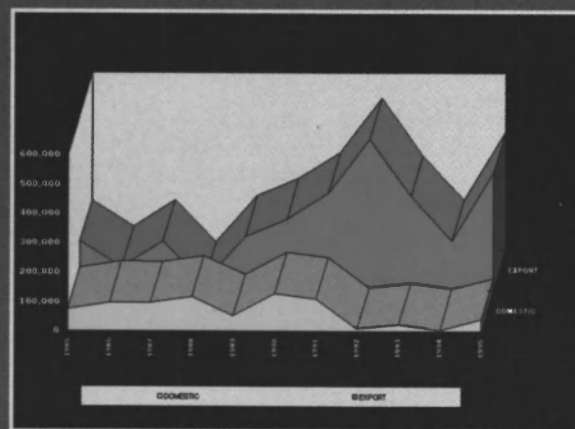
SHIPYARD	N°	GT	EGG	TPM
A. Armon	10	3,221	13,934	2,025
A. Espanoles Puerto Real	3	104,600	94,140	21,920
A. Espanoles Sestao	2	117,955	53,079	214,000
A. Gondan	3	1,532	7,162	
A. Huelva	6	30,200	36,092	33,800
A. Murueta	1	4,445	6,001	7,000
A. Zamacana	3	1,623	4,659	3,000
C.N. Santodomingo	2	824	4,120	350
F.N. Marin	2	520	2,080	306
H.J. Barreras	4	15,270	40,932	12,256
Juliana C. Gijonesa	3	36,060	37,863	57,000
Naval Gijon	1	12,020	12,621	19,000
U.N. Levante (Valencia)	6	22,224	37,798	32,773
<b>TOTAL</b>	<b>46</b>	<b>350,494</b>	<b>350,481</b>	<b>403,430</b>

### 1995 DELIVERIES BY SHIPYARD

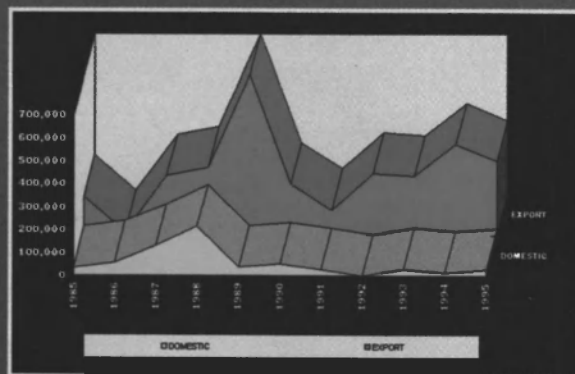
SHIPYARD	N°	GT	EGG	TPM
A. Armon	6	1,592	6,959	922
A. Espanoles Puerto Real	3	306,900	114,216	533,000
A. Espanoles Sestao	1	28,260	22,608	46,500
A. Espanoles Sevilla	1	17,750	18,637	26,700
A. Huelva	1	8,851	14,604	6,950
A. Mallorca	1	217	1,302	47
A. y T. Ferrolanas	1	209	836	142
A. Zamacana	7	2,592	12,778	1,526
A.J. Valina	2	542	2,168	334
Balenciaga	1	1,059	3,177	742
C.N. PFreire	3	812	3,248	440
C.N. Santodomingo	4	972	3,888	516
F.N. Marin	3	759	3,036	420
H.J. Barreras	2	19,474	32,132	7,826
Juliana C. Gijonesa	3	24,225	29,070	29,970
U.N. Levante (Valencia)	3	29,176	32,675	17,698
<b>TOTAL</b>	<b>42</b>	<b>443,390</b>	<b>301,334</b>	<b>673,733</b>



ORDERBOOK



NEW ORDERS



DELIVERIES

ABOVE: Spanish shipbuilders' activity over the past decade, presented in terms of (TOP) current orderbook, (MIDDLE) new orders, and (BOTTOM) deliveries.

LEFT: The year 1995, represented in terms of orderbook, presented in the same manner: current orderbook, then new orders, then deliveries.

## Spanish Maritime Industry

order a total of seven ships. Four 47,000-dwt product tankers were contracted by Venezuela-based P.D.V. Marina S.A. A 46,100-dwt product tanker is for Liberia, a 126,500-dwt tanker is for Norwegian company Knutsen O.A.S. Shipping AS, and a 87,500-dwt tanker for a Panamanian company.

The Sevilla shipyard delivered a 26,700-dwt product tanker in 1995 for the Norwegian operator Knutsen O.A.S. Shipping A/S, and at the end of the year had on order three RoRo ships for Isle of Man.

Also at the end of the year, Juliana Constructora Gijonesa shipyard had four ships on order and had delivered three ships. The ships on order are three product tankers for Ireland and a container ship for Malaysia. The three ships delivered were container ships for the Malaysian International Shipping Corp.

### E.N. BAZAN

State-owned Empresa Nacional Bazan group has mirrored the recent trend of defense builders by turning to the commercial market in the face of reduced military spending. The group has three shipyards, with the largest in Ferrol, where an aircraft carrier for the Thai Navy was launched in January, and frigates for the Spanish Navy are under construction. In the past, the shipyard has also built VLCCs.

The Cartagena shipyard is situated on the southern coast of Spain and concentrates on smaller craft such as corvettes, submarines and minesweepers for navies, and oceanographic craft and surface effect ships for civilian use.

The third shipyard, located in San Fernando close to the Straits of Gibraltar, is where Bazan's moves into merchant shipbuilding are most dramatic. It is here that the successful Mestral class fast ferry is being built. The first of this class, *Albayzin*, was delivered in October 1994 to the Argentina-based Buquebus, and went into service in New Zealand last December. In May of last year the shipyard delivered a similar ferry *Alcantara*, to Spanish company Trasmediterranea. This year Trasmediterranea will take delivery of its second Mestral. Last summer work started on the fourth ferry, *Alhambra*, scheduled for delivery to Buquebus in October this year. The *Alhambra* is derived from a Mestral hull form, although it is much larger. In contrast to the Mestral's overall length of 312 ft. (95 m), and 450-passenger and a 76-car capacity, the *Alhambra*'s overall length is 409 ft. (124.7 m), with space for 1,250 passengers and 244 cars. When designing the *Alhambra* hull form, Bazan took

the Mestral as a starting point, to profit from its speed and seakeeping characteristics. However, the company decided to optimize the hull lines due to changes in dimensional ratios.

### Private Shipyards

Most private shipyards in Spain have completed restructuring processes involving workforce reduc-

tions, and have invested in equipment to improve productivity.

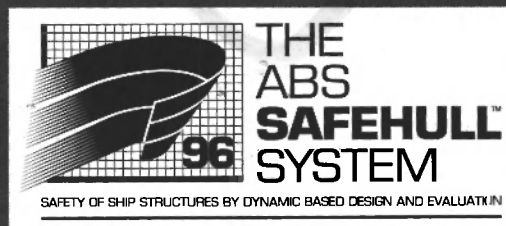
Yard financing problems have recently been helped by an agreement reached at government level concerning a guarantee fund.

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## Spain

Financing difficulties, it is believed, had been the primary reason why the Spanish orderbook had not been keeping pace with European countries.

There are two main associations of private shipyards: Construnaves CNE, S.A. and ASEGA.

### CONSTRUNAVES CNE, S.A.

Construnaves experienced was in financial difficulties in 1993 and closed temporarily. As six of the smaller shipyards decided that they were unable to individually face the market, Construnaves was reformed as a limited company for marketing activities, and renamed Construnaves CNE, S.A. Each of the 10 members holding equal shares in Construnaves CNE, S.A. are: Astilleros Armon, S.A.; Astilleros Balenciaga, S.A.; Astilleros Gondan, S.A.; Astilleros de Huelva, S.A.; Astilleros de Murueta, S.A.; Astilleros Reunidos del Nervion, S.A.; Astilleros Zamacona, S.A.; Construcciones Navales P. Freire, S.A.; Naval Gijon, S.A.; and Union Naval de Levante, S.A.

All Construnaves yards differ in size, with the largest being Union Naval de Levante (UNL), in Valencia, which also has a repair yard in Barcelona. UNL delivered three ships last year, two of them product tankers for Spanish owners and the other a ferry for Argelia. This yard also had a healthy orderbook of eight ships at the end of 1995, totaling 34,235 dwt and 40,886 gt.

Astilleros de Huelva, located on the southern coast, has seven ships on order (35,105 gt; 40,750 dwt). The Galician shipyard Construcciones Navales P. Freire, has five ships on order (21,279 gt; 23,180 dwt), and launched a reefer ship for Spanish owner Maritima del Norte in February 1995.

Even the smaller shipyards are winning contracts at a healthy pace; Astilleros Armon has nine ships on order (3,139 gt); Astilleros Gondan has three ships on order (1,532 gt); and Astilleros Zamacona has nine ships on order (3,786 gt). These three yards are also sharing an order for seven tugs for the Boluda Group.

In the past, fishing vessels have represented around half of Construnaves' members' activities but this has decreased, and auxiliary vessels are being targeted, particularly high added-value supply vessels. A variety of cargo vessels are on order, as well as RoRos and reefer ships. For example, the Murueta shipyard is building a 5,140-dwt RoRo for Spanish owner Flota Suardiaz, and has a total of three ships on order.

Construcciones Navales P. Freire has on order three 253,000-cu.-ft. reefer ships and two fishing vessels, which completes its orderbook up to December 1997.

Union Naval de Levante (UNL), Spain's largest private shipbuilder, is currently targeting two types of high-value-added vessels at its Valencia newbuilding shipyard — passenger ships and chemical carriers with stainless steel tanks. Valencia has two building berths and its plan is to devote one to each type of ship. On the tanker side, the yard has seven orders. Since the beginning of 1995, UNL has been running two major R&D projects on its preferred ship types. These projects are intended to last two years and are in the prelimi-

Maritime Reporter/Engineering News

## Spanish Maritime Industry

nary stages of defining optimum vessel characteristics. The first one involves developing an intelligent cruise ship. The second one is addressing the development of a chemical tanker with diesel-electric propulsion.

### ASEGA

Asega is the other Spanish association of private shipyards, and is made up of six yards, all located in Galicia, Spain. The present members of Asega are: Astafersa, Astilleros Jose Valina, S.A.; Construcciones Navales P. Freire, S.A.; Construcciones Navales Santodomingo, S.A.; Factoría Naval de Marín, S.A.; and Factorías Vulcano, S.A. (The seventh was Orge Leiros.)

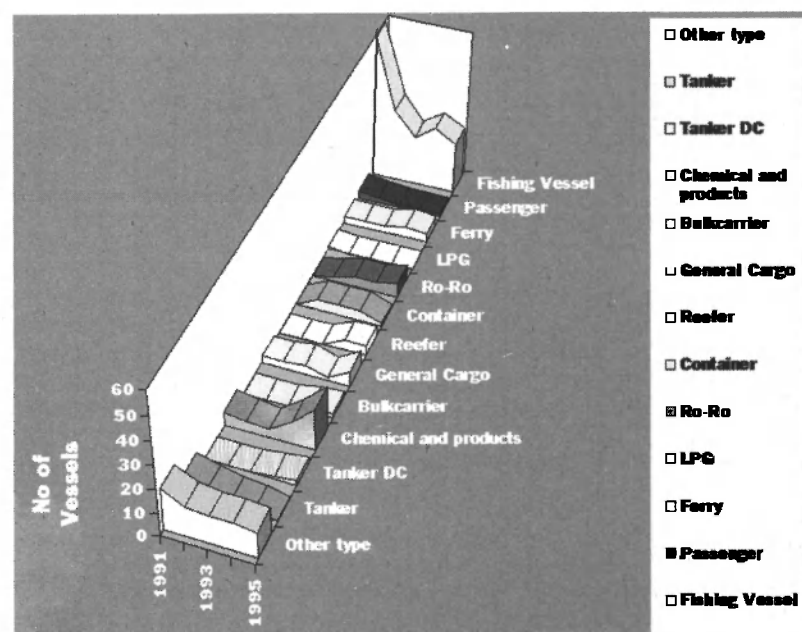
Construcciones Navales P. Freire is also a member of the Construnaves CNE, S.A. group. The main activity of the ASEGA shipyards is fishing vessel



construction.

### Ship Repair And Conversion Activities

One of the most prosperous ship repair shipyards in Spain is the Canary Islands-based Astican, which reported improved performances since 1994, the year it gained ISO 9002 certification. Astican has also benefited from better trading conditions, especially in the latter part of 1994. The number of drydockings in 1995 was the same as in 1994, but the amount of work being done on each occasion was less. The yard, which handles about

**RIGHT: Evolution of the Spanish orderbook by vessel type.**



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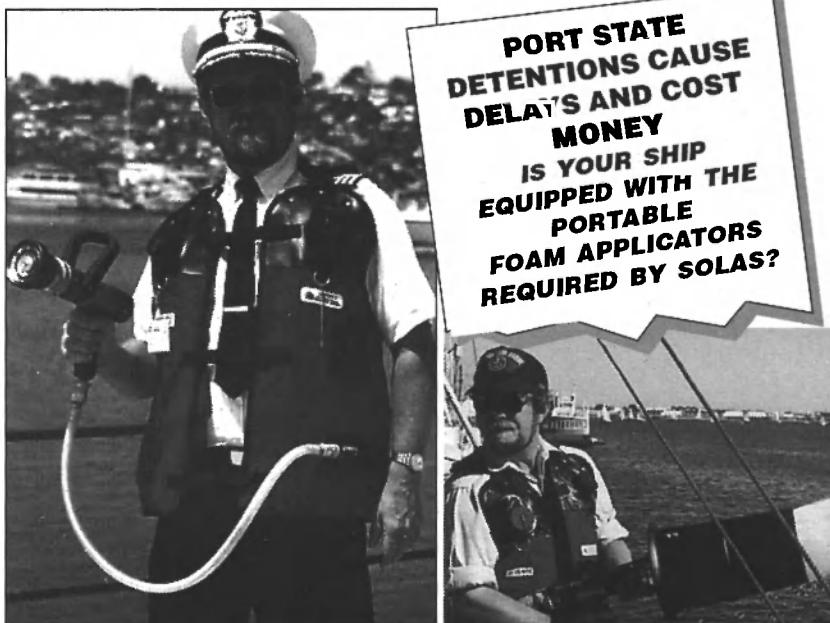
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95



## Spanish Maritime Industry

250 ships per year, had dealt with around 200 by the end of October 1995.

While the shipyard had taken orders from Norway, Denmark, Holland, Greece and Cyprus, it

was Spanish business which stood out.

The shipyard has about 200 full-time workers and subcontracts when necessary. Among 1995's more significant jobs were:

- a bulk carrier repair for Columbia Ship Management, involving replacement of more than 200 tons of bottom steel after the vessel went aground;
- a tank coating job for a Danish

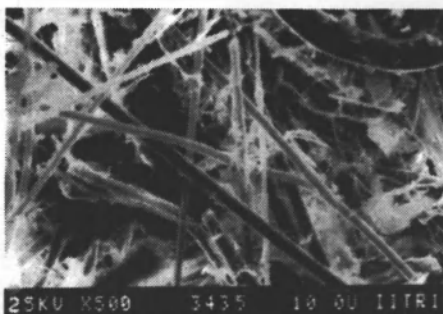
chemical tanker; and  
 • general repair work and outfitting of new stabilizers for a Fred Olsen passenger vessel.

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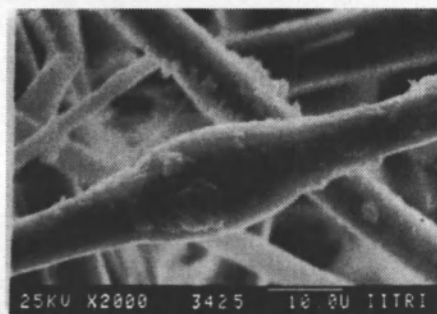
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These are difficult times for the ship repair business, however Astican is well equipped to survive and even prosper with its favorable geographical position and flexible and readily available workforce.

Astilleros Espanoles in Cadiz is wholly committed to repair and conversion of ships, having an excellent location and climate for such work. Presently, it is working at about 90 percent capacity, demonstrating a competitive stance in the repair scene. A total of 67 ships were repaired last year, most of them tankers.

Docking facilities for vessels up to 400,000 dwt are available, with full dockside and workshop services now concentrated adjacent to the docks and fitting out quays. Wet quays up to 3 km and cranes up to 100 tons lift complement the graving and floating dock facilities. The Puerto Real facilities are also available to assist at peaks of steel fabrication, with a lifting capacity of 1,200 tons.

As of late, Astilleros Espanoles in Cadiz has specialized in the conversion of tankers into STL, SDS and BLS vessels, and FSO and FPSO units. Typical of this work was the *Dirch Maersk* project, awarded from the Dutch owner Bluewater and renamed *Uisge Gorm* after the conversion from a motor tanker into a FPSO unit in March 1995. Basic conversion work included fitting a turret mooring system, new forward deckhouse, two new cranes, new stern thruster, offloading cargo system, shuttle tanker mooring system, two new fire pumps, turbo alternator, adaptation of the boiler to gas burning, power utility module, and an increase in personnel accommodation.

Another large project accomplished was the conversion of the oil tanker *Polysaga* into a floating storage unit (FSU). Main work included installation of a sub-merged turret loading system and an offloading system. The owner is Norwegian operator Rasmussen Management.

Passenger ship conversions are also sought, although the last one performed in the Cadiz yard was on *Princesse Ragnhild* in 1992, when the vessel was lengthened and its beam increased.

The latest contracts won by the Cadiz shipyard have been two FPSO conversions. The first one is the conversion, won this February 1996, of 282,750-dwt *Cairu* into the FPSO *Petrobras 32*, for operation in the Marlim field off Brazil. The *Petrobras 32* is to be anchored in a depth of 558 ft. (170 m) and

Maritime Reporter/Engineering News

## Spanish Maritime Industry

will process 100,000 bpd of oil for an operational life of 20 years. The contract is estimated to be worth around \$160 million and delivery is scheduled for the end of 1997.

In January, the Cadiz shipyard won the order for conversion of the semi-submersible rig *Iliad* into a floating production system, to be known as *Petrobras 26*.

A total of 83 ships were repaired during 1995 among the three shipyards in Cartagena, Ferrol and San Fernando.

Bazan Carenas in El Ferrol, Galicia, northwest Spain, has a similar background to Bazan's Cartagena shipyard in that it was originally a naval construction shipyard, which diversified into building merchant ships and only ceased this activity in 1981. The yard is split into three separate cost divisions: new naval buildings; turbine and boiler construction, and ship repairs.

Among recent ships in El Ferrol were the Algerian LNG carrier *Bachir Chihani*, for dry-docking and general repairs; and the tanker

*Pioneer* for afloat repairs and hydrojetting of ballast tanks. While recent work has been concentrated on survey and repair of ships, Bazan is keen to obtain orders for conversion work, particularly tanker conversions and cruise liner and ferry projects.

The repair and conversion division of Bazan has created Bazan Offshore, a new platform repair and conversion division which won its first contract at the end of last year. Agreement was reached with Houston-based Diamond Offshore to dock semi-submersible rig *Ocean Princess* for the installation of additional vertical stability tanks on the lower corners of its four columns, and also to bring the platform into line with the latest U.K. regulations, prior to being located in the North Sea.

Specialist ship repair yard Union Naval de Levante (UNL), situated in Barcelona, was recently awarded ISO 9002 certification. The yard recently announced a new Express Docking Service which offers immediate docking at short notice, and round-the-clock service.

This means that in four days a vessel could be back at sea, depending on the complexity of the repair.

At the end of last year there were four vessels in UNL — a bulkcarrier owned by Torvald Klaveness of Norway (in for cargo equipment modifications), a general cargo carrier owned by Daelmar of Greece (in for drydock work and rudder repairs), a containership owned by H Buss of Germany (in for drydocking work and general ship repair); and a RoRo owned by CNAN of Algeria (in for afloat repairs). The yard has an impressive workload, aided by the fact that the Port of Barcelona is currently enjoying a period of record cargo operations. A total of 62 ships were repaired during 1995, and 22 of them were for domestic accounts.

Astano is the third major repair shipyard in the Astilleros Espanoles group, and is presently engaged in repairs and conversions. Its most important project is the conversion of *Petrojarl IV*, a vessel built in Finland. The vessel's bow and stern are being removed, upgraded, and

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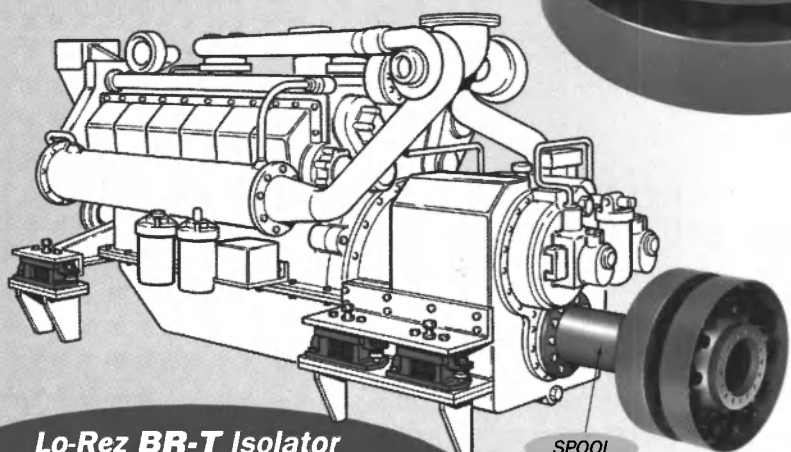
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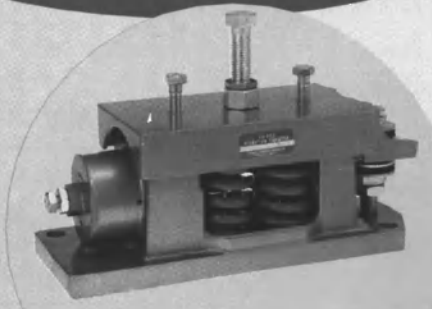
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## Spanish Maritime Industry

joined to a new mid-section of double skin construction, increasing its length to 787 ft. (240 m).

Astander is known within the Astilleros Espanoles group for sophisticated conversions and

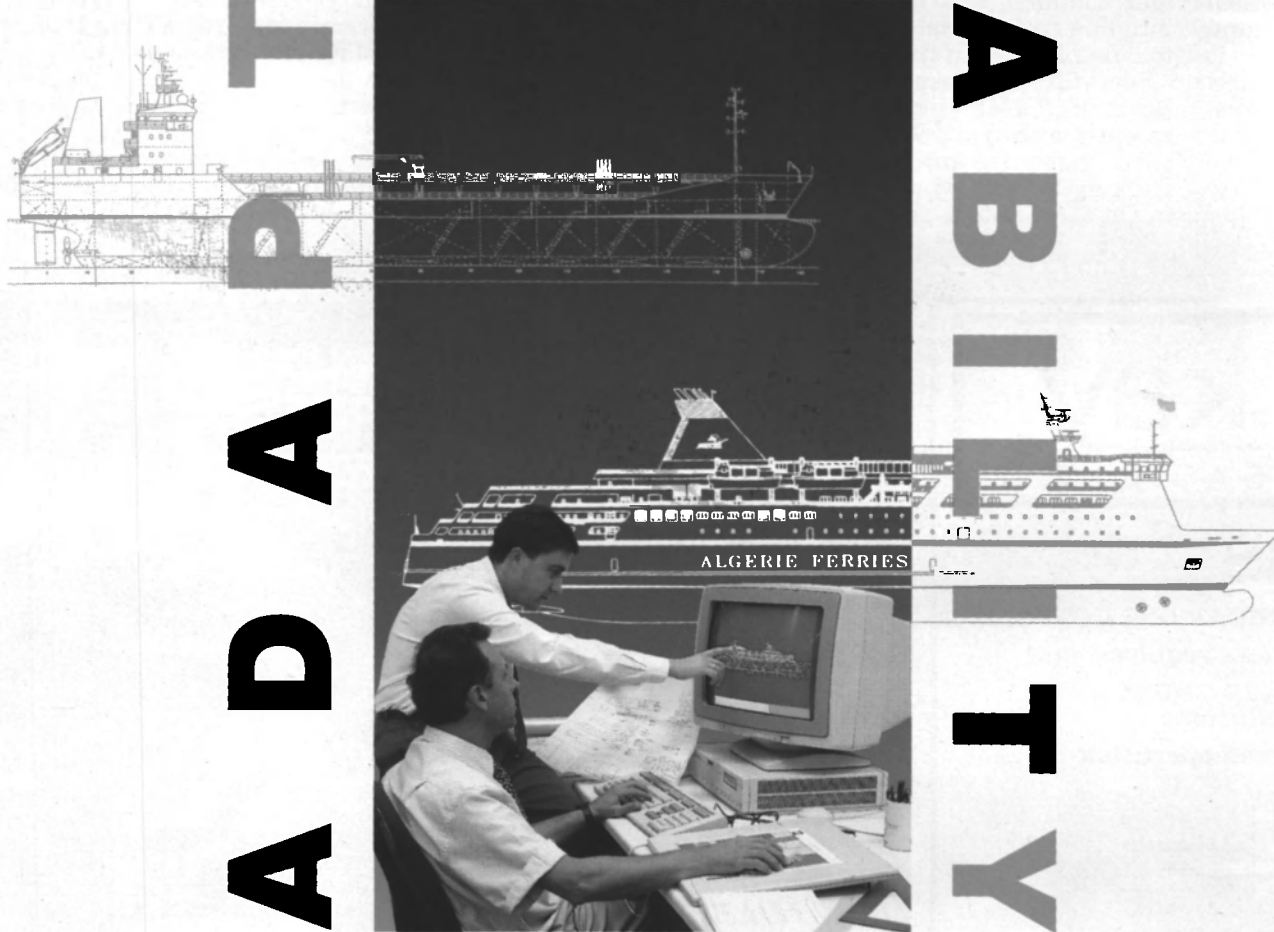
major repairs to all ship types. Major conversion carried out during 1995 included equipping *Dana Maxima*, a DFDS RoRo vessel, for new trading routes. Vessel length was increased, existing trailer lifts

were removed and two fixed ramps between upper levels, and one hoistable ramp between lower trailer deck and hold were fitted.

Astander also specializes in surface preparation and tank coating.

A contract for 35,000-cu.-m. of tank coating was recently completed on 28,085-dwt chemical tanker *Bow Sky*, a contract awarded by Norwegian owner Storli. As a consequence of this work, three new contracts were awarded for similar repairs on *Bow Spring*, *Bow Star* and *Bow Fortune*.

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### Engine Construction

The Spanish shipbuilding industry is a remarkable force in the building of propulsion and auxiliary engines.

Manises Diesel Engine Co. (MDE) builds low-speed engines of 500 mm bore and upwards, including the largest designs. MDE is trying to ensure its future by investing in its facilities with new equipment including a laser alignment rig and an upgrading of its planimeter.

The other big company dedicated to the manufacture of engines is Bazan's engine division in Cartagena, Bazan Motores, which is working on a joint venture program with Caterpillar for a fast ferry version of the U.S. company's 3600 Series medium-speed diesel engines. The company produces medium and high-speed four-stroke engines. The last two engines delivered by Bazan Motores were a 16-cylinder 3616 engine with a total output of 29,488 bhp for the four units installed; and an eight-cylinder 20/27 engine with a total output of 4,352 bhp for its four units.

### Computer Design Senermar

Apart from its shipbuilders and owners, Spain has a number of equipment firms in the marine sector that control a significant slice of the international marketplace.

One such firm is Sener, whose marine division, Senermar, has been producing its Foran software for CAD/CAM systems for 30 years. Foran is a completely integrated system covering all aspects of design and production. Senermar is organized into two production departments — ship engineering and computer systems.

Advanced ship design is also provided by Senermar. Currently, it is involved in FPSO work in conjunction with Astano. Work is also being done on a chemical tanker for the French shipyard Ateliers et Chantiers du Havre.

Senermar's first U.S. license con-

(Continued on bottom of next page)

### Matson And Intercoastal Trade Form Alliance At Port Of Seattle

Matson Intermodal System (MIS) and Intercoastal Trade and Transportation, Inc. (ITTI) have formed an alliance — dubbed the Northwest Connection — to provide customers in the Northwest community with intermodal distribution and less than truckload services, replicating services currently provided by the Port of Seattle. The Northwest Connection also reportedly provides services similar to the Port of Seattle's programs, such as the Seattle Rail Program (SRP), Seattle Truck Contact Program (STCP), and Seattle Truck Export Program (STEP).

"Since 1966, the Port of Seattle has acted as a shipper's agent, sharing its transportation experience and knowledge to develop total logistical packages, custom-designed to meet customer needs," said **Mike Dinsmore**, executive director, Port of Seattle. "The programs developed by the Port of Seattle evolved to where such services are more effectively provided by the private sector."

According to **Michael Checchi**, general manager, MIS: "The combined marketing and operations strengths of ITTI and MIS will assure Port of Seattle customers of reliable, on-time, competitive transportation services. Customers will continue to enjoy personal attention through ITTI's local Seattle presence, and will be able to benefit from Matson's extensive rail and motor carrier business relationships."

MIS, a subsidiary of Matson Navigation Company, is headquartered in San Francisco, Calif. ITTI, based in Seattle, provides import and export transportation services.

### The Spanish Industry

(continued from previous page)

tract was signed last year with Alabama Shipyard. The company believes that more licenses in the U.S. will follow in the short and medium-term.

The latest technical advances on the Foran CAD/CAM system included a number of improvements, particularly in the hull production subsystem. Senermar has developed a new module that is devoted to the modeling and positioning of general outfitting structures such as foundations and support systems. The design is carried out in a fully interactive 3-D graphic environment.

April, 1996

### Electronic Tank Gauging Technology Introduced In The U.S.

Dive Time Systems, Ltd., located in the U.K., has introduced the MALIN TGS, a tank gauging system, to the U.S. Dive Time has served the marine market for many years with products such as

the MALIN 3000 — portable precision diesel engine analyzer, and MALIN CDM crankshaft deflection meter. These analyzers are reportedly in use on more than 350 vessels.

The MALIN TGS measures and monitors the levels in multiple tank installations and reportedly provides updated data and alarm status at remote display units or PCs. This system reportedly uses

accurate (+/- .25 percent of full scale) and rugged electronic sensors to provide a color display of all tank fluids, such as fuel/lube oil and salt/fresh water. All of the ship's tanks are displayed on an "easy-to-use" software package which runs on Windows software.

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## CALENDAR OF EVENTS

**AAPA's Spring Conference and Annual Washington People's Lunch:** April 1-3, Park Hyatt, Washington, D.C.  
Contact: **Caren Coffenberry**, American Association of Port Authorities (AAPA), 1010 Duke St., Alexandria, Va. 22314, tel: (703) 684-5700; fax: (703) 684-6321.

**China International Boat Show:** April 8-11, Shanghai.  
Contact: **Prashow**, 16a Chelsea Wharf, Lats Rd., London, SW10 0QJ, U.K., tel: +44 171 376 7777; fax: +44 171 352 0818.

**INEC '96: The Institute of Marine Engineers' Third International Naval Engineering Conference:** April 10-12, The Royal Netherlands Naval College, the Netherlands.  
Contact: **Kathleen Ford**, conference organizer, The Institute of Marine Engineers, The Memorial Building, 76 Mark Lane, London EC3R 7JN, U.K., tel: +44 (0) 171 481 8493; fax: +44 (0) 171 488 1854.

**AWO Annual Meeting:** April 11, Ritz Carlton, Washington, D.C.  
Contact: **American Waterways Operators**, 1600 Wilson Blvd., Ste. 1000, Arlington, Va. 22209, tel: (703) 841-9300; fax: (703) 841-0389.

**American International Shipbuilding Exposition:** April 11-13, New Orleans, La.  
Contact: **Bruce J. Cole**, president and sales manager, American International Shipbuilding Exposition, P.O. Box 418, 34 Spruce St., Rockport, Maine 04856, tel: (207) 236-6196; fax: (207) 236-0369.

**American Association of Port Authorities (AAPA) Finance Seminar:** April 15-17, Radisson Plaza Hotel Admiral, Toronto, Ontario.  
Contact: **AAPA**, 1010 Duke St., Alexandria, Va. 22314, tel: (703) 684-5700; fax: (703) 684-6321.

**Marine Terminal Management Training Program:** April 15-19, Maritime Institute of Technology and Graduate Studies.  
Contact: **Brenda Cox**, American Association of Port Authorities (AAPA), 1010 Duke St., Alexandria, Va. 22314, tel: (703) 684-5700; fax: (703) 684-6321.

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**Maritime Vietnam '96:** April 17-19, Ho Chi Minh International Exhibition & Convention Centre, Ho Chi Minh City, Vietnam.

Contact: **RAI Exhibitions London Ltd.**, Glen House, 200/208 Tottenham Court Rd., London W1P 9LA, U.K., tel: +44 171 436 9774; fax: +44 272 436 5694.

**20th International Marine/Offshore Industry Outlook Conference:** April 18, Holiday Inn Select, Houston Greenway Plaza, Houston, Texas.  
Contact: **Dewayne Hollin**, conference coordinator, Sea Grant College Program, Texas A&M University, 1716 Briarcrest Dr., Ste. 702, Bryan, Texas 77802, tel: (409) 845-3857; fax: (409) 845-7525.

**ASNE Professional Development And Systems Engineering Workshop:** April 24, Crystal City, Va.  
Contact: **Whitney Emerson**, American Society of Naval Engineers (ASNE), 1452 Duke St., Alexandria, Va. 22314-3458, tel: (703) 836-6727; fax: (703) 836-7491.

**Developing the Port for the 21st Century: Contemporary Port Planning Tools:** April 24-26, Wyndham Harbour Island, Tampa, Fla.  
Contact: **American Association of Port Authorities**, 1010 Duke St., Alexandria, Va. 22314, tel: (703) 684-5700; fax: (703) 684-6321.

**Economics and Operations of Bunkers and Marine Lubricants:** April 29-May 3, London, U.K.  
Contact: **Fleur Hoagy**, The Institute of Marine Engineers, The Memorial Building, 76 Mark Lane, London EC3R 7JN, U.K., tel: +44 171 481 8493; fax: +44 171 488 1854.

**Eighth International Sanremo Yacht Meeting:** April 29-May 3, Sanremo, Italy.  
Contact: **Missy Harvey**, chairwoman, Yachts Charters Unlimited, P.O. Box 49, Rowayton, Conn. 06853, tel: (203) 853-9662; fax: (203) 853-3202.

**Sasmex International 1996:** April 30-May 2, Brighton Metropole Hotel, Brighton, U.K.

Contact: **Gillian Jones**, Sasmex '96, Queensway House, 2 Queensway, Redhill, Surrey, RH1 1QS, U.K., tel: +44 1737 768611; fax: +44 1737 760564.

### MAY 1996

**Equiport '96:** May 4-7, Marseille, France.

**Offshore Technology Conference and Exhibition:** May 6-9, 1996, Astrodomo, Houston, Texas.  
Contact: **Society of Naval Architects and Marine Engineers (SNAMe)**, 601 Pavonia Ave., Jersey City, N.J. 07306, fax: (201) 798-4975.

**ASNE Mechanicsburg Section Tenth Annual Logistics Symposium:** May 7-9, Harrisburg Hilton, Harrisburg, Pa.

Contact: **Whitney Emerson**, American Society of Naval Engineers (ASNE), 1452 Duke St., Alexandria, Va. 22314-3458, tel: (703) 836-6727; fax: (703) 836-7491.

**Marforum '96: Market Mechanisms For Safer Shipping and Cleaner Oceans:** May 8-10, Erasmus University, Rotterdam, the Netherlands.  
Contact: **Erasmus Forum**, I. Kostoulas, managing director, P.O. Box 1738, 3000 DR Rotterdam, the Netherlands, tel: +31 10 408 1098; fax: +31 10 453 0784.

**A Crisis Planning, Management and Communications Workshop for Business Communicators:** May 9-10, The Westin Hotel, Denver, Colo.  
Contact: **Strategic Research Institute**, 500 Fifth Ave., New York, N.Y. 10110-0192, tel: (212) 302-1800; fax: (212) 302-9855.

**The Ship As Link In The Transport Chain:** May 9-11, Mercator University, Duisburg, Germany.  
Contact: **I. Schüller or A. Wittfeld**, Institute of Ship Technology Duisburg (ISD), Mercator University Duisburg Bismarckstr. 69, D-47057 Duisburg, Germany, tel: +49 203 379 2779; fax: +49 203 379 2779.

**Radio Technical Commission For Maritime Services Conference (RTCM):** May 12-17, San Diego, Calif.  
Contact: **RTCM**, 655 Fifteenth St. N.W., Washington, D.C. 20005, tel: 202-639-4006.

**SHIPUKRAINA '96: Shipping, Shipbuilding, Harbour and Offshore Industries:** May 13-17, Kiev, Ukraine.  
Contact: **Hans Jirgen Stöting**, Messe- und Ausstellungs-gesellschaft Ost-Handel Consulting mbH, Friedrich-Bergius-Straße 7, D-41516 Grevenbroich, Germany, tel: +49 2181 720 11 13; fax: +49 2181 722 77.

**Third International Summit On Safety At Sea:** May 14-15, Holmenkollen Park Hotel Rica, Oslo, Norway.  
Contact: **Conference Secretariat**, Norwegian Petroleum Society, Oslo, Norway, tel: +47 22 43 00 50; fax: +47 22 55 46 30.

**New Regulations Affecting Ship Operations: Drug Testing, Benzene Testing & Other Regulations:** May 15, SUNY Maritime College, Fort Schuyler, N.Y.  
Contact: **The Nautical Institute**, Box 581, Center Moriches, N.Y. 11934, tel: (516) 773-5447; fax: (516) 773-5529.

**Small Craft Marine Engineering, Resistance and Propulsion Symposium:** May 15-17, Radisson Golf and Conference Center, Ypsilanti, Mich.  
Contact: **Kathl Compton**, tel: (313) 747-0042.

**RoRo '96:** May 21-23, Lübeck Congress & Exhibition Center, Germany.  
Contact: **John Gwynn-Jones**, RoRo secretariat, 2 Station Rd., Rickmansworth, Herts WS3 1QP, U.K., tel: +44 1923 776363; fax: +44 1923 777206.

**The Maritime Business Development Conference & Exposition:** May 23-24, Navy Pier, Chicago, Ill.  
Contact: **Brahl & Co.**, 75 Frederick Ave., Clifton, N.J. 07013, tel: (201) 345-7813; fax: (201) 345-5207.

**International Deep-Ocean Technology Symposium 1996 (ISOPE):** May 31-June 1, Marriott Hotel, Los Angeles, Calif.



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## CALENDAR OF EVENTS

Contact: **Prof. Jin S. Chung**, ISOPE chairman, P.O. Box 1107, Golden, Colo. 80402-1107, tel: (303) 273-3673; fax: (303) 420-3760.

### JUNE 1996

**Posidonia '96**: June 3-7, Port of Piraeus Authority Exhibition Centre, Piraeus, Greece.  
Contact: **Maria Karamida or Foti Katsibra**, Posidonia Exhibitions S.A., 4-6 Eflipis St., 185 37 Piraeus, Greece, tel: +30 (1) 4283608; fax: +30 (1) 4283610.

**ASME Turbo Expo '96**: June 10-13, Birmingham, U.K.  
Contact: **Marina Stenos**, Public Information, American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y. 10017, tel: (212) 705-7738.

**Goteborg Shipping Week**: June 11-13, Swedish Exhibition & Congress Centre, Goteborg, Sweden.  
Contact: **Dan Agren**, project manager, The Swedish Exhibition & Congress Centre, Box 5222, S-402 24 Goteborg, Sweden, tel: +46 31 708 80 70; fax: +46 31 16 03 30.

**Seventh International Conference on Marine Engineering Systems (ICMEC): Safe and Efficient Ships**: June 13-14, Trondheim, Norway.

Contact: **Kathleen Ford**, conference organizer, The Institute of Marine Engineers, 76 Mark Lane, London EC3R 7JN, U.K., tel: +44 171 481 8493; fax: +44 171 488 1854.

**11th International Harbour Congress**: June 17-21, Antwerpen, Belgium.  
Contact: **Rita Peys**, conference secretariat, Desguinlei 214, B-2018 Antwerpen, Belgium, tel: +32 3 216 09 96; fax: +32 3 216 06 89.

**European Workboat Exhibition '96**: June 18-20, Pt. Solent, U.K.  
Contact: In U.S. and Canada, **Jerry Martin**, Box 360, Gurnee, Ill. 60031, fax: (847) 336-7126, or National Boat Shows Ltd., Meadlake Pl., Thorpe Lea Rd., Egham, Surrey TW20 8HE, U.K., tel: +44 (0) 1784 473377; fax: +44 (0) 1784 439678.

**MARI-TECH '96**: June 19-21, Quebec Hilton Hotel, Canada.  
Contact: **Steve Kuck**, Canadian Institute of Marine Engineering - St. Lawrence Branch, 22 George D. Davie St., Levis, Quebec G6V 6N7, Canada, tel: (418) 837-5841, ext. 2264; fax: (418) 838-0184.

**ASME Flagship Section Conference on Modeling, Simulation and Virtual Prototyping**: June 24-26, Hyatt Regency Hotel, Crystal City, Va.  
Contact: **Whitney Emerson**, American Society of Naval Engineers (ASNE), 1452 Duke St., Alexandria, Va. 22314-3458, tel: (703) 836-6727; fax: (703) 836-7491.

**USMSA 7th Annual Safety Seminar**: June 24-26, Kodiak Island, Alaska.  
Contact: **Shannon K. Coghlan**, U.S. Marine Safety Association Management Office, 1900 Arch St., Philadelphia, Pa. 19103-1498, tel: (215) 564-3484; fax: (215) 963-9785.

### AUGUST 1996

**Coastal Environment '96**: August 7-9, Federal University of Rio de Janeiro, Brazil.  
Contact: **Sue Owen**, conference secretariat, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton SO40 7AA, U.K., tel: +44 1703 293 223; fax: +44 1703 292 853.

**Nor-Fishing '96**: August 14-17, Trondheim, Norway.

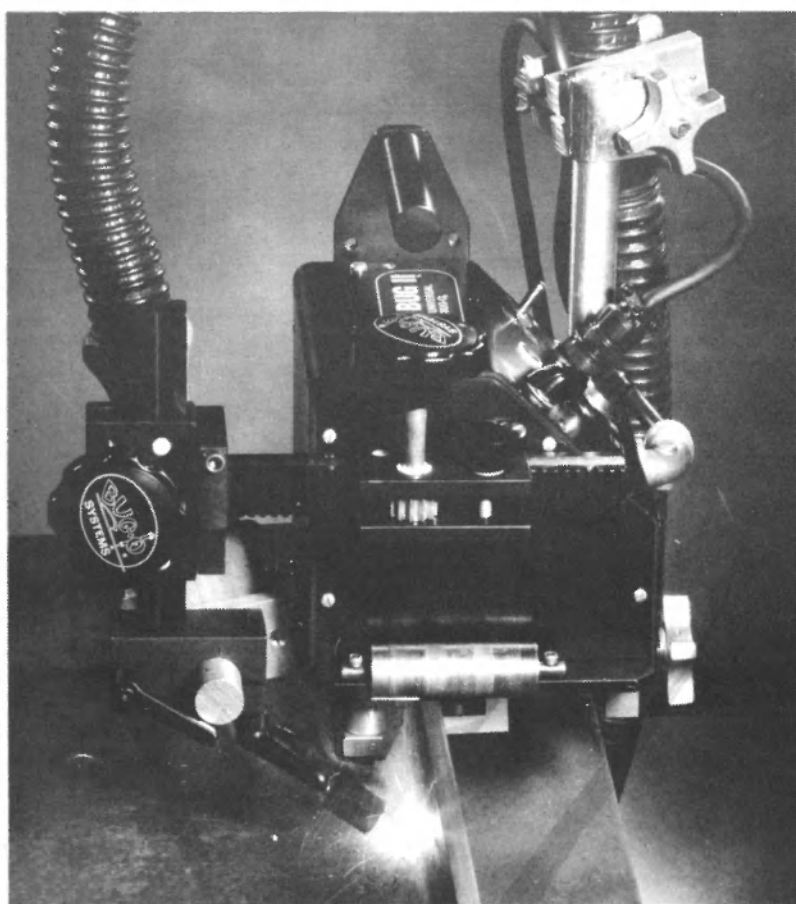
Contact: **Liv Sagen**, senior project coordinator, The Nor-Fishing Foundation, Nidrehallene, N-7030 Trondheim, Norway, tel: +47 73 92 93 40; fax: +47 73 51 61 35.

**Offshore Northern Seas '96**: August 27-30, Stavanger, Norway  
Contact: **Hamburg Messe und Congress GmbH**, Postfach 30 24 80, 203308 Hamburg/Jungiusstrasse 13, Germany, tel: +49 040 3569 2190; fax: +40 040 3569 2187.

### SEPTEMBER 1996

**8th International Maritime Exhibition BaltExpo '96**: September 3-6, Gdansk, Poland.  
Contact: **Agpol Promotion Ltd.**, 00-654 Warszawa, ul.Sniadeckich 17, Poland.

**1996 Naval Warfare Exposition & Symposium**: September 4-5, Virginia Beach Convention Center, Virginia Beach, Va.  
Contact: **J. Spargo & Associates, Inc.**, 4400 Fair Lakes Ct., Fairfax, Va. 22033, tel: (800) 336-4583, ext. 6200; fax: (703) 631-6200; e-mail: jspargo@aol.com.



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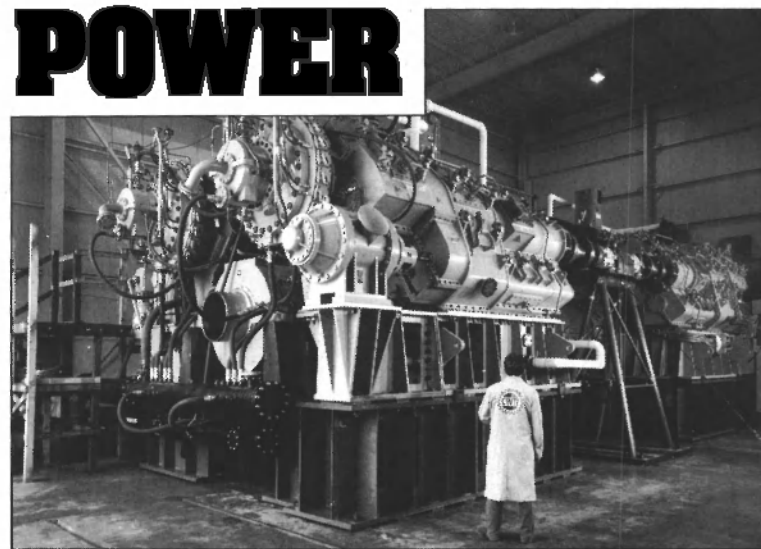
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## AISE '96 Exhibitor Profiles

The American International Shipbuilding Exhibition, set for April 11-13 in New Orleans, has attracted a wide array of international exhibitors. The following is an abbreviated guide to exhibitors scheduled to display their wares at the inaugural exhibition.

### A & J Manufacturing Company - Booth # 912

This company provides ruggedized enclosures for electronic equipment for shipboard and other military applications. The enclosures are designed to accommodate a variety of custom equipment configurations.

### ABB Marine - Booth # 536

This company supplies electric propulsion and thruster drives, electric pump and compressor drives, power generation and distribution systems, and marine and offshore automation systems.

### ABB Turbocharger Co. - Booth # 537

This company provides turbocharger application engineering for engines above 300 kW, 24-hour field and shop service, computerized rotor balancing, turbine blade remanufacturing, shaft metallizing, reconditioned bearing assemblies and lubrication pumps.

### Airchime Manufacturing Co. Ltd. - Booth # 740

Airchime supplies marine whistles and controls.

### Alfa Laval Marine & Power - Booth # 342

This company provides engine room auxiliary equipment, including advanced centrifugal separators for fuel and lube oils, self-cleaning filters, watermakers, plate heat exchangers and fuel conditioning systems.

### Allied Marine Services, Inc. - Booth # 301

Allied Marine is a technology company offering diesel engines, turbochargers, bearings, oil mist detectors, control and monitoring systems, compressors, vent valves, doors, hatches, windows and diesel injection pipe assemblies.

### Amclean Ultra Strip Systems - Booth # 1201, 1203, 1205

This company manufactures high production, ultra-high pressure, robotic water-jetting equipment for shipyards.

### American BOA, Inc. - Booth # 713

American BOA manufactures rubber and metal expansion joints and metal hose. The company reports that it pioneered the manufacture of multiple bellows, used in dampening exhaust vibration.

### American Bureau of Shipping - Booth # 238

ABS establishes and administers standards for the design, construction and operational maintenance of ships and marine structures, in order to promote the safety of life, property and the environment.

### American Vulkan Corp. - Booth # 529

American Vulkan offers a complete line of drive couplings used in marine propulsion and power generation.

### Appleton Marine, Inc. - Booth # 321

Appleton Marine manufactures marine deck machinery, including anchor windlasses, winches and capstans. Marine pedestal cranes include tapered box, telescopic, knuckle or articulated and folding boom styles.

### Aries Marine - Booth # 248/250

This company supplies Gems liquid level indicators and high level alarms, Lang galley cooking equipment, Philadelphia Resins chockfast coatings and repair compounds, and Vapor boilers, tank vents and strainers.

### Autoship Systems Corporation - Booth # 840, 842

This company develops CAD/CAM marine design software. Its program suite includes programs for hull design; damage and stability; power prediction; internal structural modeling; torch, laser cutting, nesting and milling; and onboard loading and stability — all of which run in Windows.

### Avondale Industries, Inc. - Booth # 729

Avondale is a full-service newbuilding and repair yard, which will display a model of its OPA-compliant, 42,000 dwt double-hulled product carrier at the show.

### Beaird Industries, Inc. - Booth # 846

This company will feature information on in-house fabrication capabilities, and MAXIM evaporator and silencer products, including seawater desalination equipment, custom heat exchangers, silencers for dry or wet engine exhaust systems.



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tems, waste heat recovery systems and catalytic.

**Bird-Johnson Company - Booth # 928**  
Bird-Johnson will feature controllable and fixed pitch propellers, as well as its new ship propulsion products/services, namely: waterjets; control systems; dynamic analysis; systems engineering; and related software development.

**Blohm + Voss/Simplex-Turmar, Inc. - Booth # 337**  
Blohm + Voss manufactures marine engineering components, including simplex-compact sterntube seals, oily water separators, accommodation systems and fin stabilizers. Simplex-Turmar is the U.S. representative for the company.

**Boll Filter Corporation - Booth # 126, 128**  
Boll & Kirch's filtration technology reportedly achieves high safety and reliability standards for ship engines.

**Bollinger Shipyards, Inc. - Booth # 3, 237, 239, 241,**  
Bollinger operates out of six locations, featuring new construction and repair and conversion capabilities, as illustrated by its four machine shops, propulsion manufacturing and repair, and armature/electrical shops.

**B.W. Elliott Manufacturing Co., Ltd. - Booth # 954**  
This company manufactures remote operating gears for mechanical actuation of valves, and will exhibit flex shaft, rigid rod and "Uniflex" systems, and vapor tight operators at the show.

**Cegelec - Booth # 801**  
Cegelec manufactures diesel electric propulsion engines.

**Chesapeake Specialty Products, Inc. - Booth # 753**  
This company manufactures metgrain steel abrasive, which is used for blasting with air blast or rotary wheel, and jetgrain and jetgrit abrasive, used for rough pressure water testing.

**Claremont Sales Corporation - Booth # 853, 855**  
This company develops and manufactures high temperature thermal and acoustic fire-resistant insulation materials for the marine industry.

**Cummins Marine - Booth # 837, 839, 936, 938**  
A division of Cummins Engine Co., this company manufactures marine diesel propulsion and auxiliary units from 64 to 6,000 hp.

**CYBO Robots - Booth # 601**  
This company will present automatical-

ly programmed smart robot systems capable of welding on both military and commercial ships.

**Denison Hydraulics Inc. - Booth # 828**  
This company manufactures hydraulic components, supplying a line of axial piston pumps and motors, vane pumps and motors, control valves, hydrostatic transmissions, electronic control cards and electrohydraulic systems.

**Deutsch Metal Components - Booth # 315**  
This company manufactures Deutsch Pyplok and Marine Deutschlok, mechanically attached pipe fittings reportedly approved by NavSea.

**Devoe Coatings Co. Inc. - Booth #**

This company manufactures high performance paints, coatings, linings and anti-fouling for marine and offshore applications.

**Dry Air Technology - Booth # 814**  
This company supplies portable ventilators. Its VAF Series is designed for industrial use, and provides powerful positive and negative airflow for all types of applications, including those in hazardous locations.

**Dynabrade, Inc. - Booth # 311**  
This company manufactures industrial, abrasive power tools for grinding, finishing, sanding and polishing.

**Elliott Bay Design Group, Ltd. - Booth # 838**

This company offers naval architecture, marine engineering and production support for the commercial marine industry; providing service to shipyards, vessel owners and operators and government agencies.

**E.R.L. Marine Products - Booth # 447**  
This company manufactures a complete line of tank barge equipment, which includes liquid level gauges and alarms, as featured in its new catalog.

**Freeport Shipbuilding & Marine Repair, Inc. - Booth # 355**  
This yard specializes in the construction of aluminum and steel commercial and private vessels, sized 50 to 350 ft. (15.2 to 106.7 m), for the offshore and inland industries.

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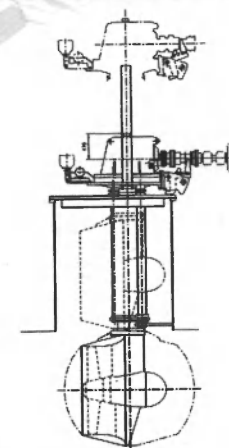
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**AISE '96 Exhibitor Profiles**

**GE Marine - Booth # 327, 426**

GE will display marine automation systems for monitoring, alarm and control of propulsion and auxiliary equipment; adjustable speed drives for AC and DC motor control; and electrical power distribution equipment and power management systems.

**Gibbs & Cox, Inc. - Booth # 813-815**

This firm of independent naval architects and marine engineers provides a complete range of engineering and design services for the marine industry.

**Green Marine & Industrial Equipment Co., Inc. - Booth # 945**

This company manufactures marine sanitation systems, oily water separators, lube and fuel filtration equipment, reverse osmosis watermakers, brominators, U.V. purifiers and fuel oil coolers. Fast System, Inc. and Envirovac Inc. will exhibit at this booth.

**Grinnell Corporation - Booth # 812**

The company will exhibit its specially developed AquaMist marine nozzles, designed to achieve rapid fire suppression, converting either fresh or salt water into a blanketing mist for engulfing flames.

**Hawboldt Industries (1989) Ltd. - Booth # 749**

This company manufactures propellers and deck machinery, including deck winches and anchor handling and mooring equipment.

**Hamworthy Marine - Booth # 501**

Hamworthy will be exhibiting its V-Line range of low-vibration, marine starting air compressors, designed to provide savings in running costs.

**Hiller Systems, Inc. - Booth # 221**

This company provides engineering and design and installation of marine fire detection equipment, alarm and suppression systems, and marine decking and insulation. Riding crews are provided when required.

**International Marine Software Associates - Booth # 421**

This association of select developers of marine design computer software provides next-generation solutions for the shipbuilding industry, offering strategic advances in hull design, lofting, NC burning, hydrostatic stability, power and propulsion, finite element analysis and structural optimization

from project conception to completion.

**Jamestown Metal Marine Sales, Inc. - Booth # 136-138**

This company provides design, engineering, material supply and installation of vessel interiors.

**John Evans' Sons, Inc. - Booth # 914**

This springmaking company produces a complete line of helical isolators — shock and vibration mounts designed to protect commercial electronics (COTS) under demanding shipboard conditions. It has aligned with A & J Mfg. for the presentation of a complete shock and vibration package.

**KaMeWa Group - Booth # 411**

This company supplies azimuthing propulsion, controllable and fixed pitch main propellers and tunnel thrusters, contra-rotating propellers, waterjets and deck machinery.

**Kobelt Manufacturing Co. Ltd. - Booth # 653**

This company provides the marine industry with push/pull mechanical, pneumatic, electronic controls and hydraulic steering gears, and disc brakes for propeller shaft and winch applications.

**Krupp MaK Diesel, Inc. - Booth # 811**

Krupp Mak manufactures marine diesel engines, diesel generator sets and marine propulsion systems.

**Kvaerner Masa Marine Inc. - Booth # 330**

Kvaerner offers a full range of naval architecture and marine engineering services, including design, innovation product development, feasibility studies, construction supervision and project management.

**Leisritz Corporation - Booth # 320**

This company supplies screw pumps for various shipboard services, including cargo handling, lube oil and fuel oil systems, and hydraulic supply for steering gear and deck machinery.

**L.F. Gaubert & Co., Inc. - Booth # 110**

L.F. Gaubert supplies shipboard electric cable, marine lights, receptacles, junction boxes, blowers, connectors, battery chargers, portable cable and kindorf cable mounting systems.

**Lufkin Industries, Inc. - Booth # 412**

The company produces carburized and ground rotor pinions with teeth finished by CBN grinding process, which reportedly meets AGMA Class 14 and 20

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**M. Rosenblatt & Son, Inc. - Booth # 200/202**

This firm provides naval architecture and marine engineering services, ranging from R&D to preliminary through detailed design for newbuilds and conversion projects for commercial and naval vessels and offshore platforms.

**Mackay Communications, Inc. - Booth # 310-316**

This company will display Inmarsat satellite communications products, Oilcon ballast monitoring systems, JRCS electric power monitoring and control instrumentation systems, and Racal-Decca ARPA radar with electronic charting systems.

**Marine Gears, Inc. - Booth # 928**

This company will exhibit its new design hydraulic clutch gearbox, Haley DRV-1816; Haley HRC torsional couplings; and Haley TR and TB series pneumatic clutches.

**Marine Industries Corp. - Booth # 453**

This problem-solving commercial marine distributor will exhibit products for several companies, including Thordon Bearings, Stearns, Philadelphia Resins, Microphor, Kobelt, Johnson-Duramax and Carlisle & Finch.

**Marinette Marine Corporation - Booth # 145**

Marinette Marine Corp. is a U.S. yard specializing in highly technical ship design and construction.

**Metritape, Inc. - Booth # 300**

This company will exhibit tank gauging systems featuring resistance-tape level sensor technology, which can be used in cargo, ballast, fuel, oil and water tanks aboard a variety of vessel applications.

**Midland Manufacturing Corp. - Booth # 836**

This company produces high liquid level visual indicators; vapor control system components, including liquid level gauges and high level/overflow sensors, overflow control alarm systems; and high velocity pressure vacuum valves.

**MMC - Booth # 441**

This company supplies closed, portable gauging, sampling and sounding equipment, high/overflow alarm systems, vapor control valves, butterworth plates and lube oil clarifiers/coalescers.

**Newport News Shipbuilding - Booth # 144**

This yard will emphasize the diversity

of its capabilities at the show, by including displays on: the Double Eagle tanker; its new, robotic, automated steel handling and processing facility; its extensive repair capabilities; its design and construction capabilities for Navy aircraft carriers and submarines; and its family of surface ship combatants.

**Noskab - Booth # 418**

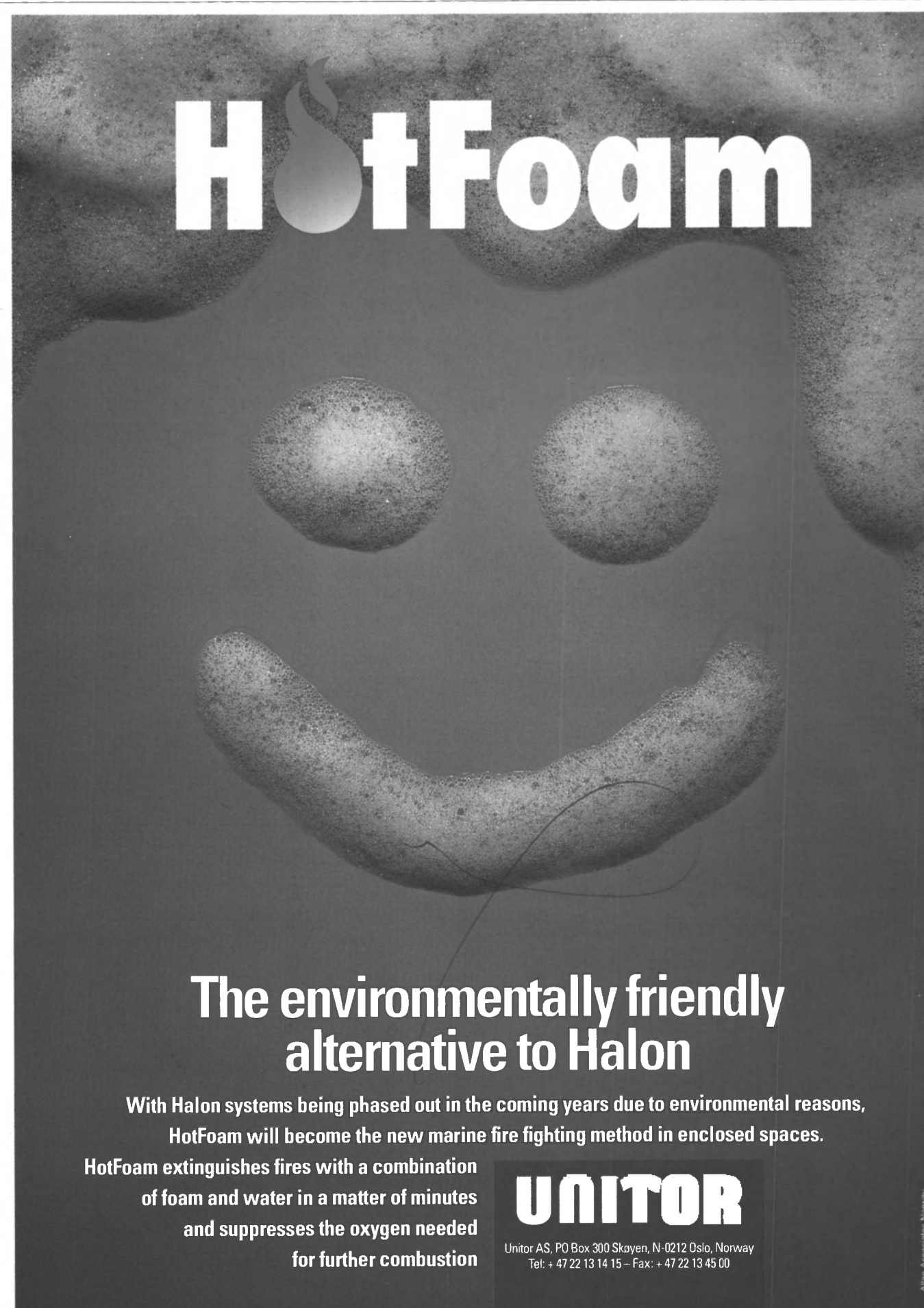
Noskab is a trading name of an international group which includes Coastal Wire & Cables, specializing in the management, distribution and supply of power, control and instrumentation cables to the energy industry worldwide.

**Offshore Marine Lab. - Booth # 737**

This company designs and manufactures process filtration systems, and will exhibit its new titanium pump head.

**Omega Products, - Booth # 516**

Omega supplies rust-free, stainless steel doors and shower stalls for new-



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## AISE '96 Exhibitor Profiles

builds or for retrofit projects.

### Orion Corporation - Booth # 939

Orion manufactures thrust bearings and thrust blocks for marine applications, including main propulsion thrust bearings, sleeve bearings and strut bearings. The company custom

designs for tankers, naval and coast guard vessels and submarines.

### Patent Construction Systems, Harsco Corp. - Booth # 231

This company provides custom workstands and access scaffolding to the marine industry, and will feature its

QES and Tubelox scaffolding systems at the show.

### PermastopRust Inc. - Booth # 104

This company sells Isotrol/Isoguard, a newly imported sealant that protects metal surfaces from rust and corrosion. The sealant can be applied to

fresh surfaces and already painted surfaces, and can be used on ships, tanks and pipes.

### Radio-Holland USA - Booth # 851

Radio Holland sells communications and navigation equipment, and will exhibit Kelvin Hughes, Transas, Texas Instruments, SP Radio, Vingtor and Praxis Automation products.

### Rochem - Booth # 816

Rochem manufactures membrane separation equipment for the desalination of seawater, capable of processing raw seawater and recovering large volumes of pure water.

### Royal Chemical Corp. - Booth # 416

Royal Chemical manufactures highly surface tolerant, water-based, modified asphaltic coatings for ballast, voids and potable water tanks.

### Schottel North America/Marine Propulsion Inc.

This outfit provides sales and servicing of complete propulsion systems, bowthrusters, z-drives, pump jets, waterjets, marine gears, torsional couplings and cardan shafts.

### Seaclear Industries, Inc. - Booth # 243

This company supplies window heaters and has recently introduced a new laminated, heated glass.

### Seacoast Electric - Booth # 1200, 1202, 1204

Seacoast Electric will exhibit Shipboard Cable, Glamox marine lighting, and Americable shipboard cable marine electrical products.

### Selby Marine - Harris Specialty Chemicals - Booth # 902

This outfit offers a complete line of marine deck coverings, which reportedly have been approved by DoD military specifications, the USCG, and numerous international regulatory agencies.

### Service Marine - Booth # 410

This yard designs, builds, outfits and repairs specialty passenger, cruise and riverboat vessels, as well as workboats, barges and inland vessels.

### Sigma Coatings - Booth # 436

Sigma manufactures and distributes marine paints and coatings for new construction and maintenance of marine vessels.

### SMR Technologies, Inc. - Booth # 401

This company is a U.S.-based manufacturer of Elliott and Crewsaver USCG/SOLAS approved inflatable life rafts, buoyant apparatus and marine evacuation slides.

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Maritime Reporter/Engineering News

**SPD Technologies - Booth # 215**

This company supplies products and services covering a wide range of shipboard electrical protection, control, and communication needs.

**Sperry Marine - Booth # 141, 143**

Sperry will exhibit its Voyage Management System, which includes its universal electronic chart manager, automatic navigation and track-keeping system (ANTS), voyage optimization and safety system (VOSS), and Autocad abilities.

**Stidd Systems, Inc. - Booth # 326-328**

Stidd supplies advanced, ergonomic marine seating for the commercial marine environment.

**Techcrane Intl. Inc. - Booth # 1406**

This company promotes the EBI pedestal mounted marine crane models, as well as EBI winches, gearboxes and watertight doors and hatches.

**Teleflex Inc. - Booth # 542/544**

The company will exhibit its remote mechanical valve actuator (RMVA) and a tank level indicator (TLI) designed without moving parts under the principles of time domain reflectometry.

**Tenmat Inc. - Booth # 924, 926**

Tenmat manufactures Ferroform, a high temperature, non-metallic composite material, and Refel, a reaction-bonded ceramic material, both of which are used for wearing and bearing applications in wet and aggressive environments. Applications for these materials include stern tube, rudder and pump bearings; seals; and hatch cover and deck equipment bushings.

**Textron Marine & Land Systems - Booth # 951**

Textron will feature the 47-ft. motor lifeboat designed for operation in hurricane conditions, which it recently built for the U.S. Coast Guard.

**Thordon Bearings Inc. - Booth # 453**

This company will feature propeller shaft bearings for all ship types; and rudder pintle, stock and carrier bearings, and bearing for deck machinery; pumps; and other shipboard applications.

**3M - Booth # 225-227**

This company supplies a complete line of abrasives, adhesives, sealants, electrical products, respiration equipment, taping and masking systems, and traction control and SOLAS products.

**Timco Industries Inc. - Booth # 445**

Timco represents several marine equipment lines, and will exhibit its oily water separator and epoxy chocking compounds at the show.

**Unitor Ship Service Inc. - Booth # 526**

Unitor supplies marine equipment and services, specializing in fire fighting systems, marine refrigeration, medical equipment, and a complete line of marine chemicals.

**Victaulic Co. - Booth # 352/354**

The company will exhibit bolted piping systems which allow fast assembly and

reduce piping costs.

**Village Marine Tec - Booth # 947**

This company manufactures reverse osmosis desalination equipment, offering a production range from 150 gpd to 500,000 gpd.

**Wärtsilä Diesel - Booth # 637**

Wärtsilä is an international supplier of

diesel engines, particularly in the medium-speed range, with a reported 30,000 MW installed worldwide.

**York International - Booth # 428**

York produces shipboard air conditioning and refrigeration equipment for many vessel types worldwide.

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#### American Mobile Satellite Corp.

This company supplies satellite services, particularly its SkyCell Satellite Telephone Service, reportedly the lowest cost, satellite-delivered, mobile telephone service ever offered to the North American maritime market.

#### Aquamaster-Rauma Inc.

A global supplier of ship's equipment. Both Aquamaster azimuthing thrusters and Rauma winches have proven their reliability in several standby and service vessel applications. The recent applications based on Aquamaster CRP units are proof of how the company's R&D efforts benefit the customer.

#### Furuno USA

This company offers a wide range of marine electronic products, including its Voyager integrated bridge, GMDSS products, as well as its new FAR2805 28-in. color ARPA radar series.

#### Hopeman Brothers

Provides cruise ship owners with fully integrated packages of services and products, including construction, repair or refurbishment of ship interiors.

#### Intermarine USA

This Savannah, Ga., yard builds coastal minehunters for world navies, and also builds for the megayacht sector. The yard offers repair services for aluminum, steel and composite vessels.

#### Inventory Locator Service, Inc.

This company operates an electronic marketplace to bring buyers and sellers of marine equipment together, allowing subscribers to access databases of suppliers through modem-equipped PCs.

#### John Crane Marine USA

John Crane Marine offers sterntube seals, bulkhead seals, rudderstock seals, sterntube bearings and line shaft bearings.

#### Kockums Computer Systems

Kockums Computer Systems offers the Tribon integrated design and information system to shipyards. Tribon applications cover all aspects of design, from initial design to production, including advanced features from the assembly phase of ship production

and materials control.

#### Kockum Sonics

Kockum Sonics AB designs, produces and markets a complete range of marine equipment such as the Tyfon, the level-gauging system Levelmaster 350/400 and the cargo planning computer LoadRite.

#### Lips USA, Inc.

Lips supplies bowthrusters, control systems and propulsion for both newbuilding and repair.

#### Lloyd's Register of Shipping

This U.K. classification society will exhibit its enhanced version of its ShipRight Fatigue Design Assessment software for single and double hull bulk carriers.

#### MAN B&W Diesel

This diesel engine manufacturer has introduced the L16/24 GenSet, a new generation family of engines that deliver 500-900 kW at 1,200 rpm.

#### Marine Management Systems, Inc.

This company provides its Fleet Manager Series, which offers a practical solution for automating ship-board management functions such as inventory control, ship/shore communications, cargo loading and maintenance planning.

#### National Steel and Shipbuilding Co.

This San Diego, Calif.-based yard is a traditional builder of ships for the U.S. Navy, while lately making facility and procedural upgrades to tap the commercial vessel market. NASSCO recently announced plans to jointly develop a design for a new U.S.-flag trailership.

#### Pauluhn Industries

Pauluhn supplies lighting products for a wide variety of maritime applications.

#### Raytheon Marine

International supplier of a wide range of electronic products. Offers the Bridge Control 3000 integrated bridge from Raytheon/Anschutz, which is designed as a flexible, total solution to enhance safety onboard while maximizing efficiency.

#### Scale Reproductions

Manufacturer of high-quality vessel models to exacting specifications.

#### Trimble Navigation

This company provides GPS solutions, manufacturing a variety of equipment for navigation, surveying and GIS update.

#### Trinity Marine Group

Trinity owns 21 shipyards located throughout the southeastern U.S. that offer newbuild, repair and retrofit services for a wide variety of vessel applications.

#### Viking Life Saving Equipment

Manufacturer of a varied range of rescue equipment such as inflatable life rafts, marine evacuation systems, rescue boats and immersion suits.

#### Zodiac of North America

Supplier of diving equipment, inflatable boats, life rafts, oil spill control equipment and work boats.

### Moore Appointed to Lead Volvo Penta

Clint Moore was appointed president and CEO of Volvo Penta of the Americas Inc., Chesapeake, Va. "Based on his wide experience, thorough knowledge of the North American leisure marine business and good achievements, we know that Mr. Moore will contribute to our future success," says Anders Hellman, president and CEO of Sweden based AB Volvo Penta, a wholly owned subsidiary of AB Volvo.

### McDermott Sells Stake In Caspian Sea Oil Fields

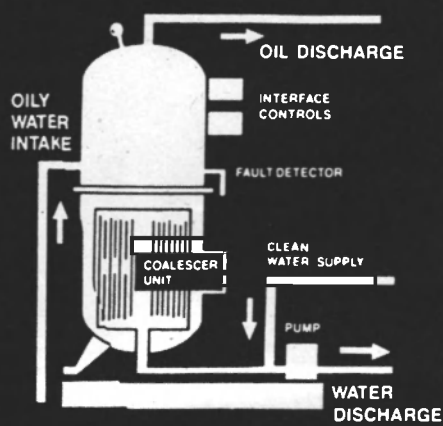
The State Oil Company of the Azerbaijan Republic (SOCAR) and McDermott International, Inc. announced that McDermott will sell its interests in three Caspian Sea oil

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fields to Itochu Corporation, a Japanese trading company, for an undisclosed amount. The transaction is expected to close within 60 days.

McDermott is one of the 11 foreign oil companies which have a production sharing agreement (PSA) with SOCAR for the development of the Azeri and Chirag fields and the deepwater portion of the Guneshli field in the Azerbaijan sector of the Caspian Sea.

At the completion of the transaction, McDermott's 2.45 percent interest in the PSA and all of its shares of Azerbaijan International

Operating Company (AIOC) will be transferred to Itochu.

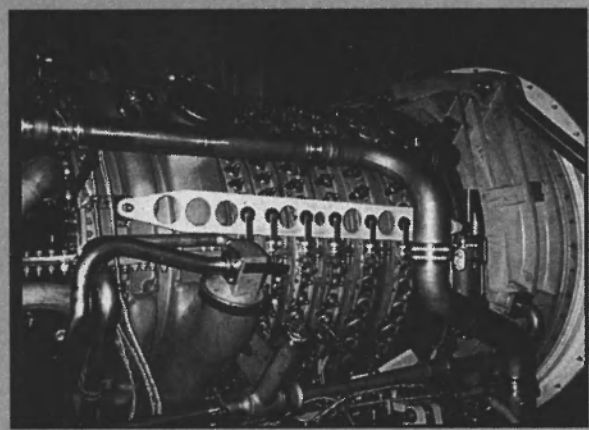
Through its existing relationships with SOCAR and other Azeri companies, McDermott intends to continue to provide support and services for engineering, procurement, fabrication, and installation of offshore structures, pipelines, and marine vessels, as well as for onshore engineering and construction. McDermott-SOCAR marine construction joint ventures include Macshelf and Macdock; McDermott joint ventures for onshore con-

struction include Deltatranstroy and Deltapromstroy.

At the conclusion of the transaction, companies remaining a party to the PSA will be: SOCAR with a 10 percent interest; BP (17.1 percent); Amoco (17.01 percent); Lukoil, the Russian oil company (10 percent); Pennzoil Co. (9.8 percent); Unocal Corp. (9.52 percent); Statoil of Norway (8.6 percent); Turkish Petroleum (6.8 percent); Exxon Corp. (5 percent); Itochu (2.45 percent); Ramoco Energy plc (2.1 percent); and DNKL (1.7 percent).

## PROPULSION UPDATE

### Kvaerner Gas Turbine Package Powers Stena Explorer



Pictured is one of the two GE LM 1600 gas turbines supplied by Kvaerner, onboard *Stena Explorer*.

*Stena Explorer*, the first of three high-speed Sea Service (HSS) 1500 craft — 415.4 x 131.2-ft. (126.6 x 40-m) sisterships from Finnyards in Rauma — is powered by a gas turbine system designed and supplied by Norway's Kvaerner Energy, and utilizes a General Electric (GE) aeroderivative gas turbine. The HSS can reportedly carry 1,500 passengers and 375 cars, and is designed to operate at 40 knots in seas of 16.4 ft. (5 m), due to its gas turbine propulsion system.

The vessel is equipped with four Kvaerner Energy/GE gas turbine modules — two modules located in each of the craft's hulls. Of the four modules, two will consist of GE-LM 1600 gas turbines, and the other two will consist of GE-LM 2500 units. The LM 1600 gas turbines will be used for speeds up to 25 knots, and the LM 2500s will take over for speeds up to 32 knots. For maximum speed — 42 knots — both pairs of LM 1600s and LM 2500s will be used. Total output power is 68,000 kW, approximately 100,000 hp.

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## Principal Contracts Recorded, February 1996

Orders are listed alphabetically, by vessel type. Publisher is not responsible for errors or omissions. For additional information on this, or other ship market information, contact: FERLUSHIP, Paseo De San Francisco De Sales, 8, 28003 Madrid, Spain, tel: +34 1441 4138; fax: +34 1441 4138.

OWNER/ OPERATOR	COUNTRY (Owner)	SHIPYARD	COUNTRY (Builder)	TYPE	No.	DWT	DELIV. Date	PRICE (\$Million)
SINGAPORE INTERESTS	SINGAPORE	PRESIDENT MARINE	SINGAPORE	ASPHALT CARRIER	1	4,000	1997	—
NEPTUNE C.	—	DAEWOO SHIPYARD	KOREA	BULK CARRIER	1	23,000	6/98	19
UNKNOWN	—	SHIN KURUSHIMA	JAPAN	BULK CARRIER	1	7,800	96	—
UNKNOWN	—	TSUNEISHI	JAPAN	BULK CARRIER	1	68,000	97	—
SINOTRANS	CHINA	DAEWOO SHIPYARD	KOREA	BULK CARRIER	1	37,000	10/97	—
COSCO / SUMITOMO	CHINA+JAPAN	OSHIMA SHIPBUILDING	JAPAN	BULK CARRIER	2	45,000	96	49
PLEIADES	GREECE	TSUNEISHI	JAPAN	BULK CARRIER	1	73,000	97	26.16
COSCO HONG KONG	HONG KONG	TSUNEISHI	JAPAN	BULK CARRIER	6	45,000	98	—
MTSUI O.S.K. LINES	JAPAN	HAKODATE DOCK	JAPAN	BULK CARRIER	2	24,200	97	—
MTSUI O.S.K. LINES	JAPAN	HITACHI ZOSEN	JAPAN	BULK CARRIER	1	71,400	97	—
JAPANESE INTERESTS	JAPAN	IMABARI SHIPBUILDING	JAPAN	BULK CARRIER	1	28,450	5/98	20
ITOCHU CORP.	JAPAN	NAMURA ZOSENSHO	JAPAN	BULK CARRIER	2	71,200	97	55.6
MTSUBISHI	JAPAN	SUMITOMO	JAPAN	BULK CARRIER	1	73,000	98	26.16
SUMITOMO	JAPAN	SUMITOMO	JAPAN	BULK CARRIER	1	73,000	97	26.16
MTSUBISHI ORE TRANSPORT	JAPAN	TSUNEISHI	JAPAN	BULK CARRIER	1	68,000	97	—
KEOYANG SHIPPING	KOREA	DAE DONG SHIPBUILDING	KOREA	BULK CARRIER	1	46,000	98	24
WAGENBORG SHIPPING BY	NETHERLANDS	BIJLSMA	NETHERLANDS	BULK CARRIER	5	9,400	98	—
TAIWANESE INTERESTS	TAIWAN	JIANGNAN	CHINA	BULK CARRIER	2	72,000	97/98	56
IMC / GLOBAL MARITIME	U.K.	JIANGNAN	CHINA	BULK CARRIER	2	45,000	8/98	46
CCNI	CHILE	OSHIMA SHIPBUILDING	JAPAN	BULK CARRIER	4	46,200	98	100
CLIPPER AMERICAS	—	DALIAN SHIPYARD	CHINA	BULK CARRIER	2	29,358	98	42
LEIF HOEGH	NORWAY	MTSUI	JAPAN	BULK CARRIER	1	56,800	1/97	45
DANNEBROG REDERI AS	DENMARK	ALABAMA SHIPYARD	U.S.	CHEMICAL	2	16,000	97	50
MARNAVI-NOVAMAR	ITALY	C. ORLANDO-MORINI-SMEB	ITALY	CHEMICAL	5	9,800	99	220.8
MARNAVI/MIMMO	ITALY	CANT. NAV. MARIO MORINI	ITALY	CHEMICAL	2	9,800	98	73.34
NAVIGAZIONE DI CAROTAGGIO	ITALY	NUOVI CANTIERI APUANIA	ITALY	CHEMICAL	1	10,000	9/97	37
AURORA TANKERS	MALAYSIA	DALIAN SHIPYARD	CHINA	CHEMICAL	2	46,000	98/99	71
SKIBSAKSELSKAPET STORLI	NORWAY	KVAERNER FLORO	NORWAY	CHEMICAL	2	37,500	—	—
LIBRA GROUP	BRAZIL	CCN MAUA	BRAZIL	CONTAINER	2	—	97	—
LIBRA GROUP	BRAZIL	CCN MAUA	BRAZIL	CONTAINER	4	—	97	—
LIBRA GROUP	BRAZIL	CCN MAUA	BRAZIL	CONTAINER	2	—	97	—
CMA	FRANCE	DAEWOO	KOREA	CONTAINER	2	—	97	—
CMA	FRANCE	HALLA	KOREA	CONTAINER	2	—	97/98	112
CONTI REEDEREI	GERMANY	DAEWOO HEAVY INDUSTRIES	KOREA	CONTAINER	2	—	97	64
CLAUS PETER OFFEN	GERMANY	FLENDER WERFT	GERMANY	CONTAINER	5	—	—	—
CLAUS PETER OFFEN	GERMANY	FLENDER WERFT	GERMANY	CONTAINER	3	—	97	—
GERBUDER S WINTER	GERMANY	GOYNIA	POLAND	CONTAINER	2	—	98	—
LEONHARDT & BLUMBERG	GERMANY	GUANGZHOU	CHINA	CONTAINER	2	14,000	97/98	48
HAPAG LLOYD	GERMANY	SAMSUNG	KOREA	CONTAINER	3	67,000	97/98	—
SCHLUSSEL REEDEREI	GERMANY	SAMSUNG	JAPAN	CONTAINER	1	40,000	2/98	43
REEDEREI F LAEISZ	GERMANY	THYSSEN NORDSEWERKE	GERMANY	CONTAINER	1	—	97	—
ARKLOW SHIPPING	IRELAND	PETERS WEWELSFLETH	GERMANY	CONTAINER	1	8,850	96	—
HANSA MARE	JAPAN	HYUNDAI	KOREA	CONTAINER	1	—	97	—
ROYAL NEDLLOYD	NETHERLANDS	MTSUBISHI H.L.	JAPAN	CONTAINER	2	—	98	—
UNICLORY MARINE	TAIWAN	CHINA SHIPB. CORP.	TAIWAN	CONTAINER	4	—	98	1,000
YARDIMCI SHIPPING GROUP	TURKEY	YARDIMCI	TURKEY	CONTAINER	1	—	96	—
NYK LINE	JAPAN	JAPANESE ALLIANCE	JAPAN	CONTAINER	5	—	—	—
SILVERSEA CRUISES	MONACO	C.N. VISENTINI	ITALY	CRUISE	2	22,000	98/99	200
ASSOC. BRITISH PORTS	U.K.	FERGUSON SHIPBUILDERS	U.K.	DREDGER	1	6,270	97	22
DANISH STATE RAILWAY	DENMARK	ORSKOV	DENMARK	FERRY	2	—	4/97	—
SWEFERRY - OFO	SWEDEN-GERMANY	FERRIES AUSTRALIA	AUSTRALIA	FERRY	1	—	—	—
ACZON GROUP	NETHERLANDS	BALENCIAGA	SPAIN	FISHING	—	—	—	—
STEADFAST FISHING COMPANY	—	CAMPBELTOWN SHIPYARD	U.K.	FISHING	1	—	10/96	—
MURMANSK SHIPPING	RUSSIA	ADMIRALTEISKI	RUSSIA	FUEL CARRIER	1	1,400	98	11.5
UNKNOWN	MOROCCO	LEROUX ET LOTZ	FRANCE	GENERAL CARGO	1	—	—	18
YROON	NETHERLANDS	VAN DIEPEN	NETHERLANDS	LIVESTOCK CARRIER	1	2,882	97	—
UNKNOWN	—	HYUNDAI	KOREA	LPG	1	5,200	97	—
UNKNOWN	—	SHIN KURUSHIMA	JAPAN	LPG	1	3,800	96	—
G. MARINE TRANSPORT CO.	LIBYA	KANREI SHIPBUILDING	JAPAN	LPG	1	—	12/96	—
ELITE SHIPPING	DENMARK	AARHUS FLYDEDOK	DENMARK	MULTI-PURPOSE	2	8,500	98	—
GERMAN INTERESTS	GERMANY	KROGERWERFT	GERMANY	MULTI-PURPOSE	3	4,850	97/98	—

OWNER/OPERATOR	COUNTRY (Owner)	SHIPYARD	COUNTRY (Builder)	TYPE	No.	DWT	DELIV. Date	PRICE (\$Million)
MACS MARITIME CARRIER	GERMANY	SHANGHAI SHIPYARD	CHINA	MULTI-PURPOSE	1	32,000	97	—
DOCKENDALE	BAHAMAS	DALIAN SHIPYARD	CHINA	MULTI-PURPOSE	2	46,000	98	—
CARE OFFSHORE	SWITZERLAND	ULSTEIN VERFT	NORWAY	MULTI-PURPOSE SUPPORT	1	—	—	48
ROYAL BRUNEI ARMED FORCES	BRUNEI	YARROW	U.K.	OFFSHORE PATROL	3	—	—	—
BP	DENMARK	SINCK	NORWAY	OFFSHORE SUPPLY	2	4,000	—	68
SIMONSEN & SLANG	NORWAY	ABG SHIPYARD	INDIA	PAPER CARRIER	1	6,000	12/97	—
OCEAN BRIDGE INVESTMENTS	—	FINCANTIERI	ITALY	PASSENGER	1	—	96	29
DONG YANG EXPRESS	KOREA	DAEWOO HEAVY INDUSTRIES	KOREA	PASSENGER/CAR FERRY	1	6,500	97	—
MINOAN LINES	GREECE	FOSE MEK VERKSTEDER	NORWAY	PASSENGER FERRY	1	—	12/97	116
PARKVIEW FERRY SERVICES	HONG KONG	FBM MARINE	U.K.	PASSENGER FERRY	1	—	—	—
UNKNOWN	—	KVAERNER FJELLSTRAND	SINGAPORE	PASSENGER	6	—	—	35
SWEFERRY	SWEDEN	AUSTAL SHIP	AUSTRALIA	PASSENGER/CAR	1	45,000	96	37.76
GUARDIA DI FINANZA	ITALY	FINCANTIERI	ITALY	PATROL VESSEL	—	—	—	—
MOROCCAN GOVERNMENT	MOROCCO	LEROUX ET LOTZ	FRANCE	PATROL VESSEL	1	—	—	20
FEDERAL MINISTRY OF TRANSPORT	GERMANY	VOITSWERFT STRALSUND	GERMANY	POLLUTION CONTROL	1	—	9/98	—
EUROPEAN INTERESTS	—	KITAHON	JAPAN	REEFER	1	6,300	96	—
DALMOREPRODUCKT	RUSSIA	AARHUS FLYDEDOCK	DENMARK	REEFER	2	—	97/98	—
SCOTTISH OFFICE	U.K.	FERGUSON SHIPBUILDERS	U.K.	RESEARCH	1	—	10/97	29
US NAVY MSC	U.S.	NATIONAL STEEL	U.S.	RoRo	1	60,000	99	207
DRAXL	GERMANY	ROLANDWERFT	GERMANY	RoRo CONTAINER	2	7,000	96	26.84
UNKNOWN	TUNISIA	SCHICHAU SEEBECKWERFT	GERMANY	RoRo	2	6,000	—	—
UNKNOWN	—	SHIN KURUSHIMA	JAPAN	TANKER	1	8,000	96	—
HYUNDAI MM	KOREA	HALLA	KOREA	TANKER	2	300,000	—	175
JO TANKERS	NORWAY	UNION NAVAL DE LEVANTE	SPAIN	TANKER	1	5,100	97	—
PHOENIX MARINE SHIPHOLDING	PANAMA	SHIN	KOREA	TANKER	1	300,000	98	88
PENTOW MARINE	SOUTH AFRICA	DORBYL MARINE	SOUTH AFRICA	TANKER	1	3,500	96	—
NAVIERA PETROGAS	SPAIN	UNION NAVAL DE LEVANTE	SPAIN	TANKER	1	9,500	97	—
TEEKAI SHIPPING	BAHAMAS	ONOMICHI	JAPAN	TANKER	1	—	7/97	45
KLAUS OLDENDORFF	CYPRUS	SAMHO	KOREA	TANKER	2	105,000	98	185
GLAFKI MARITIME	GREECE	NKK CORP.	JAPAN	TANKER	3	110,000	97/98	135
SENA PERKORAN	INDONESIA	SELS	SINGAPORE	TANKER	1	10,000	97	230
UNKNOWN	—	SHIN KURUSHIMA	JAPAN	TANKER	1	15,300	10/96	30
MUTIARA NAVIGATION	INDONESIA	DALIAN SHIPYARD	CHINA	TANKER	2	46,000	98/99	71
VAN OMMEREN	NETHERLANDS	NEWPORT NEWS	U.S.	TANKER	5	46,500	97/98	247
SOVCOMFLOT	RUSSIA	UNKNOWN	CUBA	TANKER	6	45,000	—	186
STATOIL	NORWAY	ASTILLEROS ESPAÑOLES	SPAIN	TANKER	4	125,000	—	—
GOLDEN OCEAN GROUP	HONG KONG	HITACHI ZOSEN	JAPAN	TANKER	2	300,000	98	180
MO SHIP MANAGEMENT	—	TSUNEISHI	JAPAN	WOOD CARRIER	1	45,000	96	—

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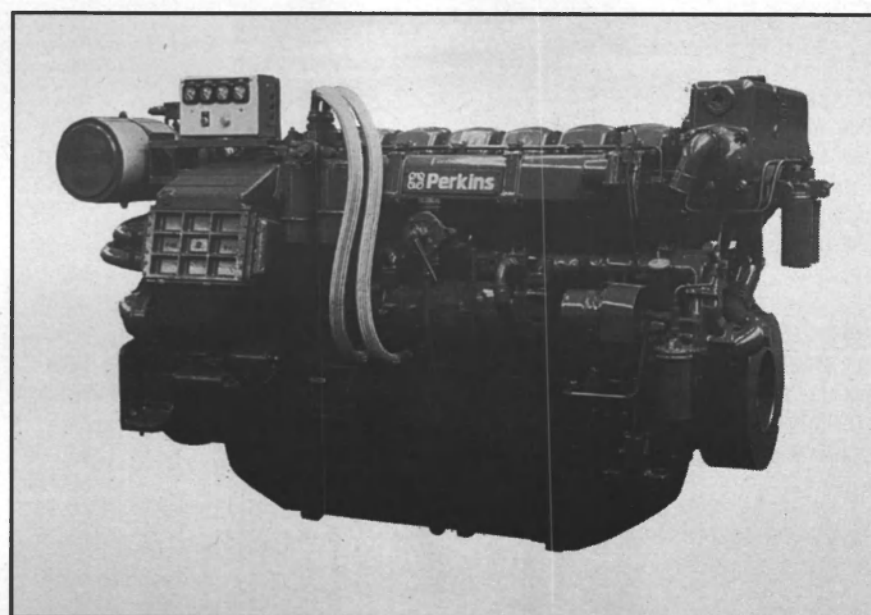


## PROPULSION UPDATE

### Perkins To Supply Marine Engines To Herbosch-Kiere

Perkins has announced it will supply three of its marine engines to Herbosch-Kiere of Kollo in Belgium, through its Belgian distributor, Constructiewerkhuizen E. Van Wingen, a part of the Netherlands' National Network operated by Kemper en Van Twist, the Perkins distributor. The engines will satisfy the complete propulsion power requirements onboard a newly ordered, self-propelled pontoon operating in both Belgian and international waters. The engines are Perkins' Sea King 6X and Sea King 8 models. The main propulsion for the pontoon will be provided by two Sea King 8 keel cooled engines. Operating between 1,500 rpm and

1,800 rpm, they will produce an output of 800 hp. Due to the operational requirements placed on the pontoon, maneuverability is a key demand. Therefore, the vessel will be fitted with a bowthruster powered by a Sea King 6X keel-cooled engine rated at 500 hp and 1,500 rpm. After commissioning in 1996, the vessel will be used in inland waterways and around the Belgian coast for repair and maintenance of shipping channels and bank repairs. Perkins is a business of Varsity Corporation, which also owns Kelsey-Hayes, a supplier of brake system products; Dayton Walther, a manufacturer of wheel and brake components for medium and heavy



Pictured is a Perkins Seaking 8 engine.

duty trucks and trailers; and Zecal, a technology-based company that has developed a patented process for bonding copper to ceramics in

electronic circuitry

For more information on Perkins  
Circle 25 on Reader Service Card

#### Alliance Set to Accelerate Growth In Key World Markets

Goulds Pumps, Inc. and John Crane International, a division of TI Group plc., announced that they have established a global strategic alliance. This alliance between John Crane, a leading mechanical seal company, and Goulds, a leader in pumps, will jointly develop pump and seal combinations which enhance plant performance and optimize life cycle costs. John Crane will establish a permanent support organization within Goulds' locations.

For more information  
Circle 105 on Reader Service Card

#### Scandinavian Bunkering Receives ISO 9002 Certificate

Norwegian bunker trading company Scandinavian Bunkering AS has gained ISO 9002 standard certification, audited by Det Norske Veritas. Scandinavian Bunkering is reportedly one of few bunker trading companies in Europe who can provide this level of quality. "Shipowners worldwide have shown an increased interest in this very important quality aspect of bunkering, and we are proud to be the first major bunkering company in Norway to receive the certificate," said Bjorn Isaksen of Scandinavian Bunkering.

#### American Overseas Equips Third Vessel With Malin Engine Analyzer

American Overseas Marine Corporation has equipped M/V *Overseas Joyce* with a Malin 3000 precision diesel engine analyzer. The vessel joins M/V *Overseas Philadelphia* and M/V *Overseas New Orleans*, which were equipped with Malin 3000 analyzers last year. In addition, Princess Cruise Lines is continuing its program of providing precision analyzers for its fleet. *Star Princess* has been equipped with a Malin 3000 precision diesel analyzer, and Malin CDM crankshaft deflection analyzer. The Malin 3000 is a portable diesel engine analyzer

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USSC 41MB-13 Stidd Seats aboard.  
photo by Don Herney

USSOCOM M/V 50C-22 Stidd Seats aboard  
photo courtesy Trinity Marine Group

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which reportedly increases the speed, accuracy and reliability of determining the health of the main and generator diesel engines.  
**For more information on the Malin 3000**  
**Circle 32 on Reader Service Card**

**Thordon SXL Rudder Bearing Chosen For APL Containerships**



APL China, which features Thordon SXL rudder bearings.

American President Lines (APL) has added six new containerships to its fleet and ordered Canadian-made Thordon SXL rudder bearings from HDW in Germany and Daewoo in Korea. The 4,830 TEU ultra-Panamax vessels are the latest version of the Generation 6000 series of containerships designed by HDW. *APL China* — the first such vessel to enter service — has an overall length of 906.5 ft. (276.3 m), a breadth of 31.2 ft. (40 m) and design draught of 39.4 ft. (12 m). The vessels are reportedly among the fastest in their class, with a specified service speed of more than 24 knots on design draught.  
**For more information on Thordon**  
**Circle 29 on Reader Service Card**

**Seabulk Receives Jiangnan Yard Order For Materials Handling Systems**

Seabulk Systems Inc. of Richmond, B.C., has received a contract from Jiangnan shipyard of China for the design and supply of the materials handling system for three, new generation, self-unloading ships. The 70,800 dwt, self-unloading bulk carriers will be delivered to Canada Steamship Lines (CSL) and Egon Oldendorff beginning in 1998. The Seabulk design is based on a unique, automated gravity reclaim system in the cargo hold. Cargo is elevated to the deck by an incline conveyor and onto a fully enclosed tubular boom with a reversible shuttle for discharge to shore. The entire unloading system will be designed to minimize noise and for "zero tolerance" dust emission.  
**Sidney Sridhar**, president of Seabulk, said, "This project is a major achievement. We believe this new unloading system will provide owners with great advantages on cargo flexibility while minimizing maintenance costs in the future."  
**For more information on Seabulk**  
**Circle 30 on Reader Service Card**

**Peregrin Offers Refrigerant Seminar Series**

Peregrine Technologies Inc., a training consultancy from Brunswick, Maine, offers an in-house seminar series called *Refrigerants for the 21st Century*. During the one-day program, which Peregrine will bring on-site, developments in refrigerant tech-

nology and regulations will be discussed. New refrigerants, new lubricants, refrigerant retrofit procedures, refrigerant replacement options and alternative cooling applications will be covered. The seminar is not intended only for air conditioning & refrigeration technicians, but also for facility managers, plant engineers, maintenance directors, purchasing agents, environmental managers

and industrial training supervisors.  
**For more information on the seminar**  
**Circle 48 on Reader Service Card**

**iTT Offers BCP Heat Exchangers**

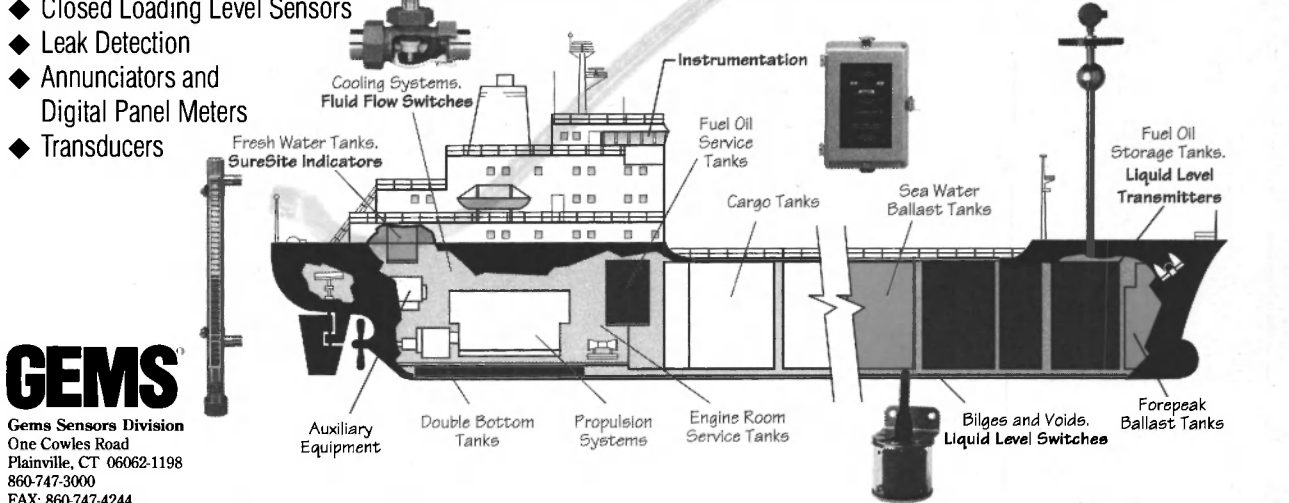
iTT Standard offers BCP heat exchangers, which feature remov-

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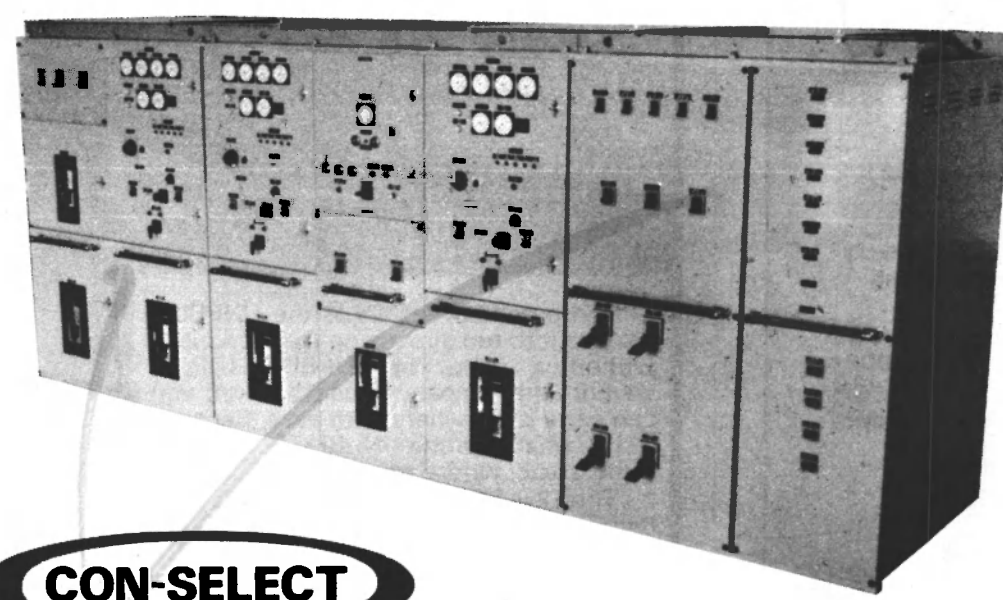
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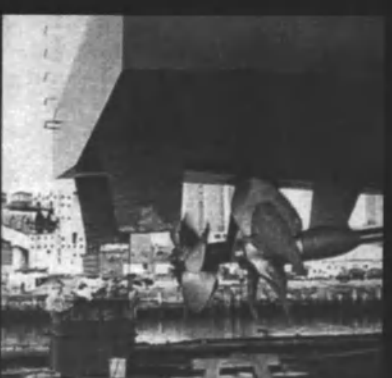
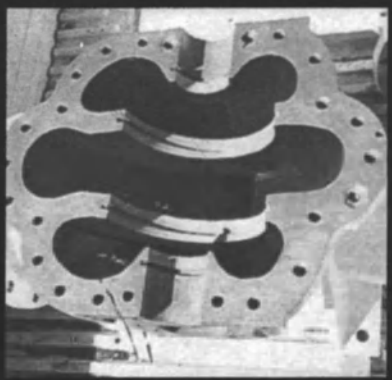
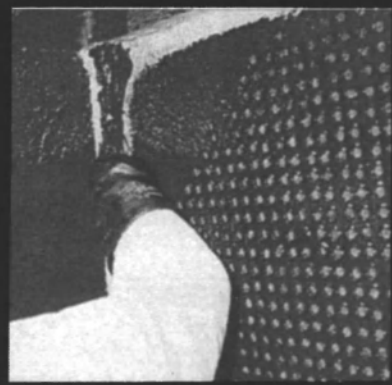
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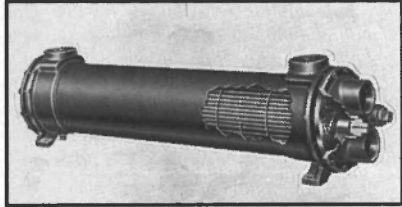
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able bundles with straight tubes and packed floating heads.

The floating end design reportedly enables the BCP heat exchanger to handle differential expansion between the shell and tubes.

Fabricated with a brazed shell assembly, these units have a red brass shell, brass hubs and either cast iron or cast bronze bonnets.

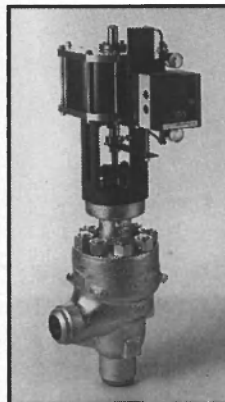
They are available in shell diameters from 3 to 12 in., with heat transfer surface areas ranging from 2.75 to 576-sq.-ft.

BCP heat exchangers can be specified to meet U.S. Navy requirements of MILC015730.

For more information on ITT Standard  
Circle 28 on Reader Service Card

### Leslie Offers High-Performance Control Valves

Aeroflow high performance control valves for low pressure applications are available from Leslie Controls, Inc., Tampa, Fla.



Typical applications include: power operated relief valves; superheat/reheat sprays; turbine bypass valves; steam NOx reduction valves; steam dump valves and pegging steam. Aeroflow valves feature tight shut-off, tri-sheer protected seat design and DPS Electro-Pneumatic Positioner.

For more information on Aeroflow  
Circle 27 on Reader Service Card

### Acman Provides Coordinate Meters

Acman, Inc. offers the portable Acman 100 real-time coordinate meter.

Integrated into the Acman 1000 3-D Dimensional Control system, Acman 100 reportedly provides a complete system for measurement and dimensional control, graphical analysis of structures and mating process simulation.

The interactive and programmable Acman 200 coordinate meter, integrated into the Acman 2000 & 2400 Automatic Dimensional

Control Systems, is an on-line system for measurement and dimensional control of production lines, which has been designed to develop an accuracy control database to identify areas for improvements in production methods, and ensure exact parts for assembly stages.

For more information on Acman  
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### NACE Offers Corrosion Solutions

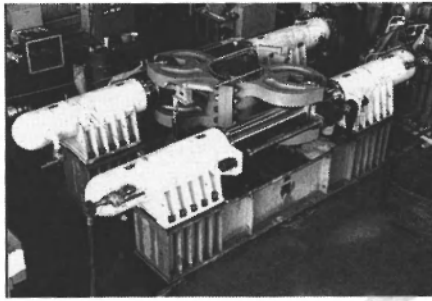
NACE provides engineers, manufacturers and end-users the information and network needed to stop corrosion. NACE offers extensive training programs, information dissemination and participates in standards developments. The company's extensive brochure explains its comprehensive services.

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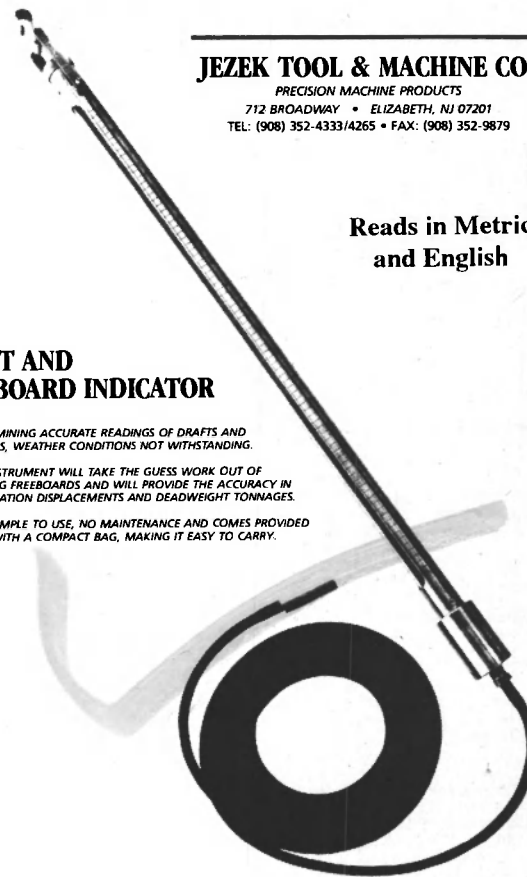
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ABB Field Marine, Box 1043, S-436 21 ASKOM SWEDEN  
Adrick Marine, 1410 Central Ave., Farmingdale, NY 11735  
Bill Brown Enterprises, Inc., 4095 Ocean Pines, Berne, MD 21811  
Carrier Transcold, P.O. Box 4805, Syracuse, NY 13221  
Novenco H-Press AS, P.O. Box 310, Roskildevej 325A, DK-2630 Taastrup, DENMARK  
Manson Mfg., 780 Pearle Jensen Way, LaConner, WA 98257  
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie IL 60076-0226  
Pan American Systems, 125 S. Witchduck Rd., 101, Virginia Beach, VA 23462  
SECO 353 S. Astory Commons Dr., Atlanta, GA 30338
- ALUMINUM BOATS**  
American Eagle Mfg., 780 Pearle Jensen Way, LaConner, WA 98257  
Manson Mfg., 780 Pearle Jensen Way, LaConner, WA 98257  
Workskill, Inc., 10524 Bethel Hwy S.E., Bethel, WA 98012-6869
- ASBESTOS ABATEMENT**  
Chemtron Environmental, 3405 Highway 33, Neptune, NJ 07753
- AUCTIONS**  
MACI Auctioneers, 2334 W. 11th St., Richmond, VA 23230
- BALLAST**  
Mineral Research & Recovery Inc., 4620 South Coach Dr., Tucson, AZ 85714
- BASKET STRAINERS**  
Beard Industries, P.O. Box 31115, Shreveport, LA 71130
- BEARINGS** - Rubber, Metallic  
B.F. Goodrich, Engineered Polymer Products, 150 Division Dr., Wilmington, NC 28401  
Böhm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY  
U.S.A. Reas: Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363P, -0168  
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
Orion Corp., 1111 Cedar Creek Rd., Grafton, WI 53024  
Ortel Engineering Plastics, 2535 Prairie Rd., Eugene, OR 97402  
Thoron Bearings Inc., 3225 Mainway, Burlington, ONT., CANADA L7M 1A6
- BILGE OIL/FUEL ABSORBERS**  
Northstar Marine, 94 Wall Street, Farmingdale, NY 11735  
RGF Marine, 3875 Fiscal Court, West Palm Beach, FL 33404
- BILGE SYSTEMS**  
Nelson Dr., Exhaust & Filtration Sys., Hwy. 51 West, P.O. Box 428, Sloughon, WI 53589
- BOAT SHAPING**  
Northstar Marine, 94 Wall Street, Farmingdale, NY 11735
- BRIDGE WIPERS**  
In-Mar Systems, Yellowstone Street, Kenner, LA 70064
- BROKERS**  
151 Maritime Services, 34062 El Encanto B, Dana Pt. CA 92629  
Captain-Atlad Company, Inc., P.O. Box 350486, Ft. Lauderdale, FL 33335  
Jack Paulsen, 2419 Cady Lane, P.O. Box 371, Plasmor IL 60422  
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Monticello NJ 07960
- BULKHEAD SEALS/PANELS**  
Bohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY  
U.S.A. Reas: Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168  
Panel Specialists, Inc., 306 Dodge Drive, Temple, TX 76704
- CABLE ASSEMBLIES**  
Times Microwave Systems, P.O. Box 5039, Wallingford, CT 06492
- CABLE TRANSIT SYSTEMS**  
NMP Corp., P.O. Box 35493, Tulsa OK 74153-0493
- CAD/CAM SYSTEMS**  
All Alpha Int'l, Inc., P.O. Box 498885, Cincinnati, OH 45249  
Autoshop Systems Corp., #403, 611 Alexander St., Vancouver, BC, Canada V6A1E  
Creative Systems, Inc., P.O. Box 1910, Fort Townsend, WA 98381  
IMS 202 K Packets Ct., Williamsburg, VA 23185  
Kokkum Computer Systems AB, P.O. Box 50555, S-202 15 Malmo SWEDEN  
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029  
TIMSCO, P.O. Box 91360, Mobile, AL 36691
- CATHODIC PROTECTION SYSTEM**  
Electrocatlytic Inc., 2 Milham Ct., Union, NJ 07083
- CHAINS**  
All Alpha Int'l, Inc., P.O. Box 498885, Cincinnati, OH 45249  
Anderson Dry Dock Engineers Inc., 2 Williams Street, Chelsea, MA 02150  
Marit Chain, 230 Avenue Desardrouins, 59300 Valenciennes FRANCE  
Washington Chain & Supply Inc., Box 3645, Seattle, WA 98124  
Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748
- CHEMICALS**  
Ashland Chemical/Drew Ameroid Marine, One Drew Plaza, Boonton, NJ 07005  
Uster Ship Service Inc., 2375 West Esther Street, Long Beach, CA 90813
- CLAMPING** - Pipe, Tubes, Hose  
ZSI, 12749 Richard Ct., Lyons, MI 48150
- CLASSIFICATION SOCIETY**  
American Bureau of Shipping, 2 World Trade Center, 106th Fl, New York, NY 10048
- CLUTCHES**  
Haley Dutch and Coupling Corp., 1820 Hwy. 1 North, Greenville, MS 38702
- COAMING WELDER**  
Bug-O-Systems 3003 W. Carson St., Pittsburgh, PA 15204
- COATING PROTECTION**  
NACE Int'l, P.O. Box 21840, Houston, TX 77218-8340
- COAXIAL CABLES**  
Times Microwave Systems, P.O. Box 5039, Wallingford, CT 06492
- COMMUNICATIONS SERVICE**  
Acorn Talcote AB, Eppendorfer Weg 234, D-20251 Hamburg, GERMANY  
Inventory Locator Service, 3995 Meridian Rd., Memphis, TN 38115
- COMPOUNDS**  
ITW Philadelphia Resins, 130 Commerce Dr., Montgomeryville, PA 18936
- COMPUTER LOFTING**  
Baratavia Lofting Co., Inc., 1616 Banatara Blvd., Ste. 4, Manassas, VA 70072
- COMPUTER SOFTWARE**  
Applied Flow Technology, 7293 Hahn St., Louisville, OH 44641  
Autoshop Systems Corp., #403, 611 Alexander St., Vancouver, BC, CANADA V6A1E  
Chand Corporation, 157 Hwy 654, Matthews, LA 70375  
Creative Systems, Inc., P.O. Box 1910, Fort Townsend, WA 98388  
IMS 202 C Packets Ct., Williamsburg, VA 23185  
Planowor Software, P.O. Box 536, Ledyard, CT 06339  
Senar, C/Severo Ochoa, 4 Parque Tecnológico de Madrid, 28780 Tres Cantos - Madrid SPAIN
- CONDENSERS/SEPARATORS**  
Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130
- CONTROL SYSTEMS** - Monitoring  
Engina Monitor, Inc., 179 Hickory Ave., Harahan, LA 70123  
GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 11, Houston, TX 77043-1412  
Ian-Conrad Bergen, 3402 Gulf Breeze Pkwy, Gulf Breeze, FL 32561  
IMO Industries, Gerns Sensors Division, One Cowles Rd., Plainville CT 06062  
MMC International, 80 Trip Dr., Inwood NY 11996
- Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006  
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
- CONTROL SYSTEMS** - Steering  
Engina Monitor, Inc., 179 Hickory Ave., Harahan, LA 70123  
Kokkum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
- CONTROL VALVES**  
Leslie Controls, 12501 Telecom Dr., Tampa, FL 33637
- CONVERSIONS & REPAIRS**  
Vancouver Shipworks, 50 Fernberth Ave., N. Vancouver, B.C. CANADA V7P 2P2
- CORROSION CONTROL**  
Corrosal Inc., 1045 12th Ave. NW FSA, Issaquah, WA 98027  
TMT Services Corp./RUSTECO P.O. Box 11398, Torrance, CA 90813
- COUPLINGS**  
American Vulkan, P.O. Drawer 673, Winter Haven, FL 33882  
Haley Dutch and Coupling Corp., 1820 Hwy. 1 North, Greenville, MS 38702  
Mapco Products, 90 Forest Avenue, P.O. Box 982, Locust Valley, NY 11560
- CRANE-HOIST-DERRICK-WHIRLEYS**  
Basso Marine Co., P.O. Box 4113, New Orleans, LA 70178  
Del Gavo Marine Hydraulics Inc., 619 Industrial Rd., Canastota, NY 07072  
Liebherr-Werk Nanzing GES.m.b.H., P.O. Box 10, A-6710 Nenzing, AUSTRIA  
Magregor USA 20 Chapin Rd., Pine Brook, NJ 07008  
Marine Travell, Inc., 49 E. New St., Sturgeon Bay, WI 54235  
McEroy Machine & Mfg. Co., Inc., P.O. Box 4454, Blox, MS 39535-4454  
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
- CRANES**  
Lakeshore, Inc., P.O. Box 809, Iron Mountain, MI 49801  
T.C.W., 1607 port Barnmouth Pl., Newport Beach, CA 92660
- CRANKSHAFT REPAIR**  
Tech Crane Int'l, Inc., 81130 Timberland Dr., Laconne, LA 70445
- DECK CAULKING/REPAIR**  
Gollems Worldwide, 180 Van Buren St., Brooklyn, NY 11231  
In-Place Machine Co., 1529 North Butum Street, Milwaukee, WI 53212-3793
- DECK MACHINERY - Cargo Handling Equipment**  
Life Industries, Corp., 2081 Bridge View Dr., N. Charleston, SC 29405  
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150  
Lakeshore, Inc., P.O. Box 809, Iron Mountain, MI 49801  
Mackey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788  
McEroy Machine & Mfg. Co., Inc., P.O. Box 4454, Blox, MS 39535-4454  
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150  
Smith Berger Marine Inc., 516 South Chicago Street, Seattle, WA 98108
- DECK MACHINERY**  
Lakeshore, Inc., P.O. Box 809, Iron Mountain, MI 49801  
McEroy Machine & Mfg. Co., Inc., P.O. Box 4454, Blox, MS 39535-4454  
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150  
Pulsator, P.O. Box 102, H-6818, Faerne, NORWAY  
Stookum/Roppa Master, P.O. Box 280, Hubbard, OR 97032  
Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108  
T.C.W., 1607 Port Barnmouth Pl., Newport Beach, CA 92660  
Timberland Equipment, P.O. Box 490, Woodstock, Ontario N4S 7Z2 CANADA  
Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748
- DERAILATION - REVERSE OSMOSIS**  
LifeStream WaterSystems, Inc., P.O. Box 634, Huntington Beach, CA 92647  
Mains Desalination, 3295 S.W. 11th Ave., Fort Lauderdale, FL 33315  
Rochem Separation Sys., 10 Grand Ru C-41, Divoone Les Bains, FRANCE  
Waterman Systems, Inc., 2233 South Andrews Ave., Ft. Lauderdale, FL 33316
- DIESEL ACCESSORIES**  
General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105, Plymouth, MA 02360  
Kene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Adcock, IL 60101
- DIESEL ENGINE ANALYZER**  
FCS, Inc., 22 Main Street, Centerville, CT 06409
- DIESEL ENGINE - Spare Parts & Repair**  
Alaska Diesel, 4420 14th Ave., NW, Seattle, WA 98107  
Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610  
Coltec Industries, 701 Lawton Ave., Beloit, WI 53511  
Cummins Engine Co., Inc., 650 E. Main St., Charleston, SC 29405-8521  
Cummins Mid-South, Inc., 110 E. Airline Highway, Warren, LA 70062  
John Deere, John Deere Rd., Moline, IL, 61265  
DM Maritzson Co., P.O. Box 2102, Norfolk, VA 23501-2100  
GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 11, Houston, TX 77043-1412  
Gollems Worldwide, 180 Van Buren St., Brooklyn, NY 11231  
In-Place Machine Co., Inc., 1529 North Butum Street, Milwaukee, WI 53212-3793  
Kene Diesel, 325 S. Fairbanks, Addison, IL 60101  
Klatterberg Marine, 17 Grandview Ave., W. Orange, NJ 07052  
MAN B&W Diesel AG, Sackbacherstrasse 1, D-86153 Augsburg 1, GERMANY  
MAN B&W Diesel AS, Tegholmsegade 41, DK-2450 Copenhagen SV, DENMARK  
MAN B&W Diesel, 17 State St., New York, NY 10004  
Motor-Service AB, Box 2115, S-144 04 Roninge, SWEDEN  
Motor-Service-Hupp Stamp, 3190 S.W. 4th Ave., Ft. Lauderdale, FL 33315  
Norman Diesels, P.O. Box 8, Pasmor Works, Colchester, Essex, CO1 2HW, ENGLAND  
Uster Bergen AS, PO Box 924, N5002 Bergen, NORWAY  
Wartsila Diesel, 201 Defense Highway, Annapolis, MD 21401
- DISPUTES ANALYSIS**  
Resolution Management, 11 Eves Drive Suite 140, Marlton, NJ 08053
- DIVING & SALVAGE**  
Basso Marine Co., P.O. Box 4113, New Orleans, LA 70178  
H.J. Menhues, P.O. Box 23123, New Orleans, LA 70183  
Midcon Marine Services, Inc., P.O. Box 5221, Terminal Island, CA 90731
- DOORS - MARINE & INDUSTRIAL**  
Branton Int'l., 1101 Edwards Ave., Jefferson, LA 70181  
Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123  
Mapco Watz & Krenzer, Inc., 60 Forest Ave., Locust Valley, NY 11560
- DRIVE SHAFTS**  
Aquatic Systems, 17 Ave. D, Atlantic Highlands, NJ 07716
- DRY DOCK-DESIGN**  
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
- DUCTORS**  
Vita Molitor, 566 Parker St., Newark, NJ 07104
- ELECTRICAL EQUIPMENT**  
L. F. Gaubert & Co., Inc., P.O. Box 50200, New Orleans LA 70150  
M&C International, 80 Trip Dr., Inwood NY 11996
- ELECTRICAL WIRE DEVICES**  
Metric Corp., 1936 Azor World Wide Lane, Cudahy, WI 53110
- ELECTRONIC/ELECTRONIC DISPLAY**  
Engina Monitor, Inc., P.O. Box 85, N-3280 Todding NORWAY  
Kokkum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068  
Scandinav Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY
- ELECTRONIC INFORMATION SUPPORT**  
Scandinav Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY
- EMISSION CONTROL**  
ABB Fiat Marine, Box 1043, S-436 21 ASKOM SWEDEN  
Hador Topose Nymollevej 55, DK-2600, Lyngby, Denmark
- EMPLOYMENT**  
Boat Crews, 1 Seine Court, Suite 309, New Orleans, LA 70114  
Marine Jobs, Inc., 800 Downriver Blvd. Ste. 111, Mobile, AL 36609
- ENGINEERING SERVICES / MARINE ENGINEERS**  
Kvaerner Masa Marine Inc., 201 Defense Highway, Suite 202, Annapolis, MD 21401  
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
- ENGINE EFFICIENCY EQUIPMENT**  
Stellar Marketing, 7759 Granddune Place, New Orleans, LA 70126
- ENGINE ROOM LIGHTING**  
Pauluhn Electric Mfg. Co., Inc., 1616 N. Main, P.O. Box 53, Pearland, TX 77581
- ENGINE TEST EQUIPMENT**  
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Rd., Plymouth, MA 02360
- EPIRADS**  
ACR Electronics, Inc., 5757 Ravenwood Rd., P.O. Box 5247, Ft. Lauderdale, FL 33310-5247  
Aiken Electronics, 40 Washington St., Westborough, MA 01581
- EVAPORATORS**  
Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974  
Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130
- FANS - VENTILATORS - BLOWERS**  
ABB Fiat Marine, Box 1043, S-436 21 ASKOM SWEDEN  
Kane Associates, Inc., 411 Borel Ave., San Mateo, CA 94402
- FASTENERS**  
Jamestown Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835  
Orange Co., Inc., 645 Forest Edge Drive, Vernon Hills, IL 60061-3106
- FENDERING SYSTEMS/BUOYS - Dock & Vessel**  
B.F. Goodrich, 150 Division Drive, Wilmington, NC 28401  
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
Schuyler Mfg. Co., Inc., 16901 Woodville-Redmond Rd., Woodville, WA 98072  
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook, VA 22624  
Ultra Poly Inc., 2206 South Steele Tacoma, WA 98409  
Viking Fender Co., 1160 State St., Perth Amboy, NJ 08861
- FIBERS**  
Allied Signal, Meyer I Box, 101 Columbia Rd., Monticello, NJ 07962
- FILTER SYSTEMS**  
Everpure Inc., 600 N. Blackhawk Dr., Westmont, IL 60559  
Liber-Finer, Inc., 5020 Osborn Drive, Dallas, TX 75240
- FIN STABILIZERS**  
Bohm & Voss AG, P.O. Box 10 07 20, D-2000 Hamburg 1, GERMANY  
U.S.A. Reas: Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168
- FIRE FIGHTING EQUIPMENT**  
International Marine Supply & Service Co., 2726 Shelter Island Dr., Ste. 73, San Diego, CA
- FIRE RESISTANT PANELS**  
Thermax N.A., 13115 Dulany Valley Rd., Glen Am, Baltimore, MD 21057
- FIRE SUPPRESSION AGENT**  
American Pacific Corp., 3710 Howard Hughes Pkwy, Las Vegas, NV 89109
- FLAME CUTTING MACHINE**  
Bug-O-Systems, 3003 West Carson St., Pittsburgh, PA 15204
- FLEXIBLE COUPLINGS**  
American Vulkan, P.O. Drawer 673, Winter Haven, FL 33882
- FUEL CONSERVATION**  
Scientific Computer & Controls, Inc., 70 South Bow Rd., Hooksett, NH 03106
- GALLEY EQUIPMENT**  
Cospolch Refrigerator Co., 949 Industry Rd., Kenner, LA 70062  
Jamestown Metal Marine Sales, 4710 Northwest Second Ave., Boca Raton, FL 33431  
Lang Manufacturing, P.O. Box 905, Redmond, WA 98073
- GANGWAYS, LADDERS**  
Sea Systems Inc., 157 Ward Hill Ave., Ward Hill, MA 01835-0579  
Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691
- GEAR REPAIR**  
Hepman Gears International, Inc., 2600 N. Concord Belle Chasse, LA 70037
- GENERATOR**  
Alaska Diesel, 4420 14th Ave., NW, Seattle, WA 98107  
Jamestown Metal Marine Sales, 4710 Northwest Second Ave., Boca Raton, FL 33431  
Baywood Inc., 3841 Soundway, Bellingham, WA 98223  
KBI Corporation, U.S. Reas: Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168
- HEAT EXCHANGERS**  
Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974  
Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130
- HOISTS**  
JD Neuhaus Corp., 2603 Rolling Rd., Owyen Oak, MD 21027
- HORN/HORNBLOWERS**  
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
Kokkum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
- HYDRAULICS**  
Curmughan Marine Hydraulics Co., 201 Harrison St., Hoboken, NJ 07030  
Del Gavo Marine Hydraulics Inc., 619 Industrial Rd., Canastota, NY 07072  
Engina Monitor, Inc., 179 Hickory Ave., Harahan, LA 70123  
Hamilton Jet, P.O. Box 790, Christchurch, New Zealand
- INERT GAS SYSTEMS**  
Vilar Systems, 3710 Lakeside Court, Mobile AL 36693
- INFORMATION TECHNOLOGIES**  
Marine Management Systems, 102 Hamilton Ave., Stamford, CT 06902
- INSULATION**  
Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123
- INTERIORS**  
Custom Ship Interiors, Inc., P.O. Box 237, Lusby, MD 20657  
Hopman Brothers, 435 Essex Ave., Waynesboro, VA 22980  
Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123  
Jamestown Metal Marine Sales, 4710 Northwest Second Ave., Boca Raton, FL 33431  
Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031  
TODCO, Inc., P.O. Box 1087, Marion, OH 43002
- JOINERS - WaterTight Door-Paneling - Ceiling System-Decking**  
All Alpha Int'l, Inc., P.O. Box 498885, Cincinnati, OH 45249  
Branton Int'l., 1101 Edwards Ave., Jefferson, LA 70181  
CustomShip Interiors, Inc., P.O. Box 237, Lusby, MD 20657  
Hopman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980  
Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123  
Jamestown Metal Marine Sales, 4710 Northwest Second Ave., Boca Raton, FL 33431  
Slidd Systems, Inc., 220 Carpenter St., Greentown, NY 11944  
Watz & Krenzer, Inc., 59 Forest Ave., Locust Valley, NY, 11560
- KEEL COOLERS**  
R.W. Fernham & Co., 1716 Eleventh Ave., Menominee, MI 49858  
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307
- LIFEBOATS/RAFTS**  
American Eagle Mfg., Inc., 780 Pearle Jensen Way, LaConner, WA 98257  
Norsale AS, P.O. Box 115, N-4818 Faerik, Norway  
Viking Life Saving Equipment, 1525 N. Miami Ave., Miami, FL 33136  
Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806  
Zodiac of North America, P.O. Box 400, Stevensville, MD 21666
- LIFEBEATING EQUIPMENT**  
MGI International, 119-225 West 1st St., North Vancouver, B.C. CANADA
- LIQUIDATION SYSTEMS / EQUIPMENT - Lamps, Fixtures, Searchlights**  
ACR Electronics, Inc., 5757 Ravenwood Rd., Ft. Lauderdale, FL 33310-5247
- LIGHTING SYSTEMS**  
Acway Marine, 4501 Swan Ave., St. Louis, MO 63110  
Daiter Inc., P.O. Box 1152, Kinder, LA 70648  
Gollem Marine, 180 Van Buren St., Brooklyn, NY 11231  
Kokkum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068

L.C. Doane, P.O. Box 675, Essex, CT 06426  
Paulm Electric Mfg Co., Inc., 1616 N. Main, P.O. Box 53, Pearland, TX 77581  
Francis Searchlights/Star Supply Co., 4415 6th N.W., Seattle, WA 98107

**LIQUID LEVEL GAUGES**  
King Engineering Corp., P.O. Box 1228, Ann Arbor, MI 48106

**LIQUID LEVEL INDICATORS**  
Futuro Mfg. Corp., 1733 Gross Rd., Skokie, IL 60076-0226

**LIQUID OVERFILL PROTECTION SYSTEMS**  
E.R.L. Marine Products, P.O. Box 1026, New Albany, IN 47151-1026  
Maritage, Inc., 59 Porter Rd., Littleton, MA 01460  
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie, IL 60076-0226

**LOGISTICS**  
Newport News Shipbuilding, Logistics & Technical Services, 12129 Jefferson Ave., Newport News, VA 23603  
OED, 4646 N. Witchduck Road, Virginia Beach, VA 23455  
V.L. Logistics Consultants, Inc., 3420 Blenheim Blvd., Ocean Springs, MS 39564

**LUBRICANTS**  
Royal Lubricants, P.O. Box 518, East Hanover, NJ 07836  
Texaco, International, 2000 Westchester Avenue, White Plains, NY 10650

**MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING**  
Del Gavo, 619 Industrial Rd., Carlstadt, NJ 07007  
Gotkin Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231  
Maritime Power 200 Henderson St., Jersey City, NJ 07302  
New England Trawler Equipment Co., 251 Eastern Avenue, Chelsea, MA 02150  
Wallace Coast Machinery, 1620 Wakeegan Rd., Glenview, IL 60025

**MARINE ACCOMMODATIONS**  
Koopman Brothers, P.O. Box 950, 435 Essex Ave., Waynesboro, VA 22980  
Institutions, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807  
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Ave., Boca Raton, FL 33431  
Maritime Services Corp., 3457 Guilford Dr., Hood River, OR 97031

**MARINE CEILINGS**  
Hydro-Aluminum, Via Verk, N. 5880 VIK I SOGN, Norway  
Institutions, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807

**MARINE DECKING**  
Koopman Brothers, Inc., P.O. Box 950, Waynesboro, VA 22980  
Institutions, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807  
Sefby, P.O. Box 1030, Sapulpa, OK 74067

**MARINE DRILLING & BLASTING**  
Marine Drilling & Blasting, Inc., P.O. Box 10455, Jacksonville, FL 32247-0455

**MARINE ELECTRICIANS**  
Fark & Bauer Reeds, 2001 Ridgelyke Drive, Metairie, LA 70001  
Kocum Sponks, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068  
Sabo Marine Electronics AB, Box 13045, 402 51 Göteborg, SWEDEN  
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029

**MARINE ELEVATORS**  
Del Gavo Marine, 101 Lorraine Rd., Bixby, MI 49835-4454

**MARINE EQUIPMENT**  
Behrnt & Associates, 1150 Rule Rochelle, Sidell, VA 70458  
McClintock Marine, P.O. Box 405, Long Beach, CA 90802

**MARINE FINANCING**  
Safeco Credit Co., Inc., 4909 150th Ave. NE, Redmond, WA 98052

**MARINE FIRE PROTECTION**  
Harris Systems, 3710 Lakeside Court, Mobile, AL 36693  
Institutions, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807  
Under Sea Service, 2375 West Esher Street, Long Beach, CA 90813

**MARINE FUEL MANAGEMENT**  
Del Gavo Marine, Heestachstraat 7, 3079 DC Rotterdam, The Netherlands

**MARINE FURNITURE**  
Institutions, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807  
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Ave., Boca Raton, FL 33431  
Maritime Services Corp., 3457 Guilford Dr., Hood River, OR 97031

**MARINE FURNISHING**  
Del Gavo Marine, 101 Lorraine Rd., Bixby, MI 49835-4454

**MARINE GEARS**  
Cincinnati Gear Co., 5657 Wexler Pike, Cincinnati, OH 45227  
The Falk Corp., PO Box 492, Milwaukee, WI 53201-0492  
Haley Marine Gears, Inc., P.O. Box 689, Greenville, MS 38702  
Marine Gears, P.O. Box 298, Greenville, MI 38701

**MARINE HYDRAULICS**  
Del Gavo Marine, 619 Industrial Rd., Carlstadt, NJ 07072

**MARINE INTERIORS**  
Institutions, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807  
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Ave., Boca Raton, FL 33431  
Johnson Construction Specialties, Inc., 3420 Rusk P.O. Box 1380 Houston Texas 77251  
Maritime Services Corp., 3457 Guilford Drive, Hood River, OR 97031

**MARINE PLUMBING**  
Bill Brown Enterprises, Inc., 4995 Ocean Pines, Berlin, MD 21811

**MARINE PUMPS**  
Globe Inc., P.O. Box 628, Seabrook, TX 77586

**MARINE SURPLUS SALES**  
Defense Reutilization & Marketing Service, 2163 Airways Blvd., Memphis, TN 38114

**MARINE ARTWORK**  
Safeta Art Studio, 6 Ridge Drive, Old Saybrook, CT 06475

**MULTI-ANGLE PERITRATION DEVICE**  
NMP, 12437 E. 60th St., Tulsa, OK 74133

**NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS**  
A. H. Wainwright Marine Services, Inc., 1725 Jefferson Davis, Arlington, VA 22202  
Donald L. Blount, 2550 Elmmer Ave., Ste. K, Norfolk, VA 23513  
C. Bauer & Associates, P.O. Box 9006, Mobile, AL 36609  
SAB Marine Co., 4040 Woodstock Dr., Suite 200, San Francisco, FL 32207  
Chids Engineering Corp., Box 333, Medfield, MA 02052  
Crandall Dry Dock Engine, Inc., 21 Pottery Ln., Dodham, MA 02026  
Crane Consultants, 15301 First Ave. S., Seattle, WA 98148  
C.R. Cushing, 18 Vesey St., New York, NY 10007  
CT Marine, 56 Crooked Trail, Rowayton, CT 06853  
Arthur D. Gordon, 3200 Roperdale Dr., Suite 403, Metairie, LA 70002  
DeJong & Leber, Inc., 1734 Emerson Street, Jacksonville, FL 32207  
Design Associates, Inc., 14350 Chief Merritt Highway, New Orleans, LA 70129  
Designers & Planners, 2120 Washington Blvd. Ste 200, Arlington, VA 22204  
Elliot Bay Design Group 5301 Shiloh Ave. N.W. Ste. 200, Seattle, WA 98107  
Erzon Mgmt & Engineering Consultant Services, P.O. Box 770, Beaumont, TX 77709  
NASA 20 Ridgeley Ave., Annapolis, MD 21401  
J.H. Inc., 3412 Progress Dr., Bensalem, PA 19020  
F.O. Jacobs & Associates, 11425 Main St., Roscoe, IL 61073  
Kuemser Marine Inc., 201 Defense Highway, Suite 202, Annapolis, MD 21401  
James S. Krogan, 799 Brickell Plaza Ste. 701, Miami, FL 33131  
Rohney E. Lay & Associates, 13951 Atlantic Blvd., Jacksonville, FL 32225  
MCA Engineers, Inc., 2960 Airway Ave., #A-103, Costa Mesa, CA 92626  
Alan C. McClure Associates, Inc., 2000 South Gessner, Houston, TX 77056  
McEwen Machine & Mfg. Co., Inc., P.O. Box 4454, Bismarck, ND 58505-4454  
John J. McMullen Associates, Inc., 1 World Trade Cir., Ste 3000, N.Y.N.Y. 10048  
Ferdinand Marbury, P.O. Box 2321, Annapolis, MD 21401  
Marine Design & Operations, Inc., 229 Chestnut St., Roselle Park, NJ 07024  
Marine Management Systems Inc., 102 Hamilton Ave., Stamford, CT 06902  
Marine Power Associates, 1910 Turquoise St., Ste 217, San Diego, CA 92109  
Maribach, Seaford, Bay Road, Newmarket, NH 03857  
Maritima Design, Inc., 3020 Harley Rd., Jacksonville, FL 32257  
R.L. Mellor & Co., 71 Hudson St., New York, NY 10013  
Nautical Designs, Inc., 2101 S. Andrews Ave./Suite 202, Ft. Lauderdale, FL 33316  
Ocean Motions Co., P.O. Box 130, 49 Shore Drive, Barrington, RI 02806-0130  
Olsen Marine Survivors Co., P.O. Box 383, Fort Jefferson, NY 11777  
OED Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455  
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 620 Fulson St., Ste. 301, San Francisco, CA 94107  
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, 19312 Gandy Boulevard, St. Petersburg, FL 33702  
Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426, 17 Battery Pl., New York, NY 10004, P.O. Box 975, Barringer Light, NJ 08006, 2 Skyline Pl., 5203 Leeburg Pike, Suite 700, Falls Church, VA 22041  
50 Vashell Way, Orinda, CA 94563

George G. Sharp, Inc., 100 Church St., New York, NY 10007  
R.A. Steam, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235  
A.K. Suda & Ass., 3004 15th St., Metairie, LA 70002-4989  
TUSCO, P.O. Box 9150, Mobile, AL 36691

**NAVIGATION & COMMUNICATIONS EQUIPMENT**  
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Futuro U.S.A., 2711 Harbor Way, S. San Francisco, CA 94080  
IC3 Electronics Ltd., Unit V, Rufford Industrial Estate, Ford, Airedale, West Essex, UK  
KVH Industries, Inc., 110 Enterprise Center, Middletown, RI 02842-5268  
Mackay Communications, 200 Columbus Circle, Edison, NJ 08837  
Neptron Marine Consultants, 840 Bond Street, Elizabeth, NJ 07201  
Offshore Systems Ltd., 107-500 West 1st St., North Vancouver, B.C. V7P 3N4 CANADA  
Raytheon Marine Co., 576 Island Pond Rd., Manchester, NH 03109-5420  
Scandinavian Mico Systems P.O. Box 155, N.141, Kolbotn, NORWAY  
Scientific Atlanta, Inc., 1650 International Court, Norcross, GA 30095  
Sea, Inc., 7030 220th S.W., Mountlake Terrace, WA 98043  
Simrad, 19210 53rd Avenue West, Lynnwood, WA 98036  
Sirmad Robertson, 10851 Hammary, Suite 100, Houston, TX 77043-1923  
Sperry Marine Inc., 1070 Seminoe Trail, Charlottesville, VA 22901  
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009  
Sturkie, Inc., 8400 Highway 290 East, Suite 302, Austin, TX 78752  
Trimble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086  
Waterlog Communications System, Inc., 453 E. Park Pl., Jeffersonville, IN 47130

**NOZZLE SYSTEMS**  
Rice Propellers, Av. Rio Espinoza #88, Mazatlan, MEXICO 82180

**OIL-Marine-Additives-TESTING**  
Lubriport Laboratories, Inc., 1650 Airline Hwy., Kenner, LA 70062  
Mobil Oil Corporation, 3225 Gallops Road, Fairfax, VA 22037-0001  
Tosco, International, 2000 Westchester Avenue, White Plains NY 10650

**OIL/WATER SEPARATORS**  
Alta-Laval Separators, Inc., 655 Meams Rd., Warrington, PA 18974-0556  
Bohm & Voss AG, P.O. Box 10 07 20, D-20467 Hamburg 1, GERMANY  
U.S.A. Repps Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168  
Fast Systems, 2400 North Broadway, St. Louis, MO 63147  
MAC International, 80 imp. Dr., Tweed Rd., Wexford, CO 80144  
National Fluid Separators, 827 Harley Industrial Ct., St. Louis, MO 63144  
Nedetzka, 14001 Highway 101, Plymouth, IN 46587  
Devoe Coatings 4000 Dupont Circle, Louisville, KY 40207  
Egand, Inc., P.O. Drawer 2698, Lafayette, LA 70502  
Finner Corp., 1301 Main St., Plymouth, RI 02869  
Jamestown Distrib., 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835  
Hempal Coatings, 4901 Cavalcade St., Houston, TX 77028  
Inceptor, Inc., Marine Div., E. Hill Rd., P.O. Box 1460, Willis, CA 94540  
Permapost Rust, 264 South Main St., Wallingford, CT 06492  
Product Research Service, Inc. 229 Hwy 23, PO Box 159, Belle Chasse, LA 70057  
Royal Chemical, 2705 Concord Road, Belle Chasse, LA 70037  
Sigma Coatings, 8797 Market St., Houston, TX 77029, 330 River Rd., Harvey, LA 70059, 1100 Adams St., Hoboken, NJ 07030  
Ultrad Ship Services Inc., 2775 Esher Street, Long Beach, CA 90813  
U.S. Yacht Parts, 1525 Rte. 1 South, N. Brunswick, NJ 08902

**PIPE FITTING/OUTLET/CONNECTING SYSTEMS**  
Klopp Metal Pipe, 407 Highway St., Box 40, Holly, MI 48442  
Loring Corp., 396 Hatch Drive, Foster City, CA 94404

**PLASTICS**  
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**POLLUTION CONTROL PRODUCTS/MARINE SERVICES**  
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Oil Mod. Inc., 221 Rue De Jean, Lafayette, LA 70508

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Falk Corp., P.O. Box 253, Monroe, CT 06468

**PREDICTIVE MAINTENANCE**  
PredictDL, 253 Winslow Way West, Bainbridge Island, WA 98110

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Rice Propellers, Av. Rio Espinoza #88, Mazatlan, MEXICO 82180  
Rolla SP Propellers SA, Via Silva, P.O. Box 251, 6828 Balena - SWITZERLAND  
Rolla SP Propellers, P.O. Box 400, Mustang Road, Melbourne, FL 32934 USA  
Sound Propeller, 1608 Fairview Avenue E., Seattle, WA 98102

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Marco Filippi, P.O. Box 1400, Flower Power, Chicago, IL 60662  
ABB Drives Inc., P.O. Box 372, Milwaukee, WI 53201-0372, USA  
ABB Industry Oy, P.O. Box 185, 00281 Helsinki, FINLAND  
ABB Turbochargers, 1400 Flower Power, Chicago, IL 60662  
Aquamaster-Rauma Ltd., Box 220, SF-26101, Rauma, FINLAND  
Aquamaster-Rauma Inc., 2315 North Woodman Ave., Ste. 103, Metairie, LA 70001  
Carl Johnson Company, P.O. Box 1528, Paspago, CA 94645  
Brunoil AS, P.O. Box 370, N-6401, Molde, Norway  
Caterpillar, 100 NE Adams Street, P.O. Box 618, 61828-2320  
Cincinnati Gear Co., 5657 Wexler Pike, Cincinnati, OH 45227  
The Falk Corp., PO Box 492, Milwaukee, WI 53201-0492  
Fininvest, Diesel Engines, Drive-GMT, P.O. Box 234, Trieste, ITALY  
GE Marine & Drive Turbine Systems, 166 Boulder Dr., Filchburg MA 01420  
Golems Marine Company, 160 Van Brunt St., Brooklyn, NY 11231  
Halbert Engineering, Inc., 1520 Kemper Meadow, Ste. 500, Cincinnati, OH 45240  
In-Place Machining Co., Inc., 1929 North Bullfinch Street, Milwaukee, WI 53212-3793  
Kahlerberg Box. Co., P.O. Box 558, Two Rivers, WI 54241  
Klopp Metal Pipe, 755 Barber Street, Mississippi, Oran, CANADA L5M 6P9  
Kobelt Manufacturing, 8238 129th Street, Surrey, B.C. CANADA V3W 0A6  
LIPS U.V., P.O. Box 6, 5151 RP Duren, The Netherlands  
Lips U.V., Inc., 2817 Koppers Way, Chesapeake, VA 23323  
Lohmann & Stoltehoff, P.O. Box 1860, D-58408 Witzen, Germany  
Lu-Res Vacation Cottels, 185 West 9th Ave., Vancouver, BC, CANADA V5Y 1N2  
Maspec Products, Inc., 90 Forest Ave., Loudon Valley, N.Y. 11950  
Markisches Werk, P.O. Box 1442, D-5884 Halver GERMANY  
MAN B&W Diesel, 17 State St., New York, NY 10004  
MAN B&W Diesel AS, Ostervej 2, DK-4660 Holeby, DENMARK  
MAN B&W Diesel AS, Alpha Drive, Nies Jais Vej 15, DK-9000  
Federikshavn, DENMARK  
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-86153 Augsburg 1 GERMANY  
Omnistruster, Inc., 9515 Sorenson Ave., Santa Fe Springs, CA 90670  
Oron corp., 1111 Cedar Creek Rd., Grifton, NC 28524  
Rolla SP Propellers SA, Via Silva S, P.O. Box 251, 6828 Balena SWITZERLAND  
Rolla SP Propellers USA, 4030 Mustang Road, Melbourne, FL 32934, USA  
Karl Saenger Inc., 25 W. Third, Kenner, LA 70062  
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Schotter North America, Inc., 1505 Coben Ave., Hammond, LA 70403  
Ships Machinery International, Inc., 8275 N.W. 56 Street, Miami, FL 33166  
Siemens Electric Ltd., 1180 Courtneypark Rd., Mississauga, ONTARIO  
Stewart & Stevenson, 1400 Destrehan, P.O. Box 8, Harvey, LA 70059-0008  
Thrustmaster of Texas, P.O. Box 840189-12277 FM 529, Houston, TX 77284-0189  
Ustain Bergen Diesel AS, P.O. Box 824, N-5002, Bergen, NORWAY  
J. M. Voth GmbH, Marine Division, Postfach 1940, D-7620, Heidenheim/Brenz,  
GERMANY U.S. Rep. Voth Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11020  
De Wersluis Ab, Vasa and Abo Divisions, P.O. Box 244, SF60500 Vasa, FINLAND  
PUMP-Repairs-Drives  
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Viles, Inc., P.O. Box 628, Seabrook, TX 77586  
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Leitritz Corporation, 183 Chestnut Street, Allentown, NJ 07101  
Vita Motivator, 566 Parker St., Newark, NJ 07104

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Ashland Chemical Co., Drew Marine Co., One Drew Plaza, Boonton, NJ 07005  
RTF Mfg. FD #1 Route 66, Hudson, NY 12534  
Lambert Ship Services Inc., 2775 West Esher Street, Long Beach, CA 90813

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Elliott Manufacturing, P.O. Box 73, Brightonton, NY 13602

**RIGID INFLATABLE BOATS**  
American Eagle, 780 E. Prairie Jensen Way, LaCrosse, WA 98257  
Willard Marine, Inc., 1250 N. Grove St., Anaheim, CA 92806

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Zodiac of N. America Thompson Corset, P.O. Box 400, Stevensville, MD 21666

**ROPE—Manila—Nylon—Hawesey—Fibers**  
Allied Signal Inc., Fibers Division, 101 Columbia Rd, Montewton, NJ 07962  
American Mfg. Co., 200 Southpark Rd., Lafayette, LA 70508-3609

**RUDDER BUSHES**  
Vesco Plastics, P.O. Box 40647, Cleveland 2022, South Africa

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Diene, Inc., P.O. Box 1150, Kinder, LA 70648-1150

**SALVAGE/SPILL RESPONSE**  
Dorian Marine, 1520 Liberty Ave., Hillsdale, NJ 07025

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Eitech International Corp., 1110 Industrial Blvd., Sugarland, TX 77478  
Envirovac, Inc., 1260 Turlet Dr., Rockford, IL 61111  
Fast Systems, 3240 North Broadway, St. Louis, MO 63147  
Research Products Partnership, 2639 Ardian Datas, TX 75220

**SATELLITE COMMUNICATIONS**  
American Mobile Satellite Corp., 10822 Parkridge Blvd., Reston, VA 22091  
British Telecom, Room 203, 43 Bartholomew Close, London EC1A 7DP  
Comsat Mobile Communications, 22300 Comsat Dr., Clarksville, MD 20781-9475  
CP Comm. Int'l., 2100 Park Central North, Ste. 900, Pompano Beach, FL 33064  
IS Mobile Comm., 8933 Rockledge Dr., Ste. 503, West Bethesda, MD 20817  
Maritime Cellular Network, 560 Village Blvd., W. Palm Beach, FL 33409  
Norwegian Telecom, Postboks 6701 St. Olavs Plass, N-0130, Oslo, Norway  
PTT Telecom, Station 12, P.O. Box 20150-2500 JD The Hague, NETHERLANDS  
Scientific Atlanta, Inc., 1650 International Court, Norcross, GA 30093  
Singapore Telecom, 15 Hill Street, Telephone House, 2nd Storey, Singapore 0517  
Telsita Mobile Satellite & Radio Services, 79 St. Hillers Rd., Auburn NSW 2144, AUSTRALIA

**SCALE MODELS**  
Maritima Design, Inc., P.O. Box 225, Oceanmonoc, WI 53066  
Scale Reproductions, 16346 County Road 13, Fairhope, AL 36532  
Sturgeon Bay Model Shop, 187 N Ninth Ave., Sturgeon Bay WI 54225

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IS Mobile Comm., 8933 Rockledge Dr., Ste. 503, West Bethesda, MD 20817  
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VaNova, Via Duca d'Aosta 12, 34074 Montafione, Gorizia ITALY

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Arrels, Inc., P.O. Box 3107, Brownsville, TX 77523  
Asistencia Espanoles, S.A. Ochoanduro, 14-18 26023 El Plantio SPAIN  
Atlantic Marine, Inc., P.O. Box 3202, Mobile, AL 36622  
Atlantic Marine, Inc., 8500 Heckscher Dr., Jacksonville, FL 32226  
Avondale Industries Inc., P.O. Box 50280, New Orleans, LA 70150  
Bender Shipbuilding & Repair, P.O. Box 12, Moore, AL 36501  
Carpco Corp., P.O. Box 4113, New Orleans, LA 70178  
Bullinger Lockport & Laroze, P.O. Box 250, Lockport, LA 70374-0250  
Caridoc, P.O. Box 1147 Port Of Spain, Trinidad, WI  
Chris-Marine AB, P.O. Box 9025, S 2000 39, Malmo, SWEDEN  
Comsat Mobile Communications, 22300 Comsat Dr., Clarksville, VA 70811  
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY  
Golems Marine Company, 160 Van Brunt St., Brooklyn, NY 11231  
Great Coast Fabrication, Inc., P.O. Box 538, Lakeside, MD 38658  
HDW, Kiel, Germany USA Rep.: Roland Marine Inc., 80 Broad St., NY, NY 10004  
Hitachi Zosen, Hitachi Shipbuilding & Engineering Co., 1-1-1 Hitotsubashi Chiyoda-Ku Tokyo 100 Japan  
Intermarine (USA), Inc., 301 N. Lathrop Ave., Savannah, GA 31402  
In-Place Machining Co., Inc., 929 North Bullfinch Street, Milwaukee, WI 53212-3793  
Jamison Marine, 750 E. Bay St., Jacksonville, FL 32202  
JetBoat, Inc., P.O. Box 610, Jeffersonville, IN 47130  
Kvaerner Masa-Yards Oy, Box 122, SF-01511, Helsinki, FINLAND  
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Linderau GmbH, Skagenstrasse 10, Postfach 9093 D-2300 Kiel, Friedrichshafen GERMANY  
Marine Services AB, Box 2115, 144 N Rommelsgatan, Borgholm, SWEDEN  
Munson Hammerhead, 780 Pearle Jensen Way, LaCrosse WA 98257  
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607  
Northrop, P.O. Box 2100, Norfolk, VA 23511-2100  
Peterson Builders, Inc., 101 Pennsylvania Ave., Sturgeon Bay, WI 54235-0650  
Thomas Marine, 37 Bramford Street, Patchogue, NY 11772  
Turkish Shipyard, P.O. Box 148, Borocay-dong, Chungku, Seoul, Korea  
SeaArk, P.O. Box 210, Monticello AR 71655  
SeaArk, P.O. Box 1651, 4111 Cedar St., Pascago, MS 39667  
Service Marine Industries, P.O. Box 9696, Morgan City, LA 70381  
Skipperline Shipyards, 521 Park Plaza Dr., Dept 21, LaCrosse WI 54601  
Steiner Shipyard, Inc., P.O. Box 742, Bayou la Batre, AL 36559  
Swath Ocean, 979 G Street, Chula Vista, CA 92011  
Tenny Marine Group, Box 3029, Gulfport, MS 39505-3029  
Vasa Nova Engineering Solutions, Via E. Tol. 20, 34074 Montafione ITALY  
Westport Shipyard, P.O. Box 308, Westport, WA 98555  
Willard Marine, Inc., 1250 N. Grove St., Anaheim, CA 92806  
Zoff Marine Corp., 3121 S.W. Moody Street, Portland, OR 97201  
Zodiac of North America Inc., Thompson Creek Rd., P.O. Box 400, Stevensville, MD 21666

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Ocean Technical Services 624 Peters Road, Harvey, LA 70058  
T.A.S.T. Corp., PO Box 10382, Fairfield, NJ 07004

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Nelson Division, Exhaust & Filtration Systems, Hwy. 51 West, P.O. Box 428, Sloughon, WI 53589

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Kobeco Marine Engineering Co., 6F Tatsunuma Bldg., 3-19 Yasui 1-Chome, Chuo-Ku, Tokyo 100, JAPAN  
U.S.A. Rep. Roland Marine Inc., 80 Broad Street, New York, NY 10004

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U.S.A. Rep. Roland Marine Inc., 80 Broad Street, New York, NY 10004

**STERN TUBE SEALS**  
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U.S.A. Repps Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168  
Kobeco Marine Engineering Co., 6F Tatsunuma Bldg., 3-19 Yasui 1-Chome, Chuo-Ku, Tokyo 100, JAPAN  
U.S.A. Rep. Roland Marine Inc., 80 Broad Street, New York, NY 10004

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## Reviewing IMO's SOLAS Amendments

Major changes to 1974's International Convention for the Safety of Life At Sea (SOLAS) entered into force on January 1, 1996. These amendments were adopted in May 1994, and include the addition of two new chapters. One of these chapters, Chapter X, makes mandatory the International Code of Safety of High Speed Craft (HSC Code). Due to increased construction of HSC applications, the new chapter was added to provide international regulations dealing with the special needs of these vessels, setting requirements for equipment, maintenance and conditions of operation.

HSC Code applies to high-speed craft engaged in international voyages and includes passenger craft that do not proceed for more than four hours at operational speed from a place of refuge when fully laden, as well as cargo craft of 500 gt and above which do not travel more than eight hours from a port of refuge. The Code includes air-cushion vehicles such as hovercraft and hydrofoil vessels, requires that all passengers be provided with seat, and mandates the absence of enclosed sleeping berths for passengers.

The second new chapter, Chapter XI, includes Special Measures to Enhance Maritime Safety in the form of four regulations. Regulation 1 states that organizations entrusted by administrations with the responsibility for carrying out surveys and inspections shall comply with the guidelines adopted by the IMO Assembly in November 1993, as specifically applied to SOLAS, MARPOL, the 1966 Load Line Convention and the 1969 Tonnage Convention regulations.

Regulation 2 requires that bulk carriers and oil tankers are subject to an enhanced program of inspections, to be carried out during the periodical, intermediate and annual surveys prescribed by the SOLAS Convention. This regulation was developed as a cautionary measure in light of the aging merchant shipping fleet and the increased casualties in recent years. Regulation 2 specifically addresses corrosion, and its annexes put forth implementation guidelines for checks that should be performed during enhanced surveys. The annexes specify the structural members that should be examined in areas of extensive corrosion, outline procedures for certification of companies engaged in thickness measurement of hull structures, recommend procedures for thickness measurements and close-up surveys, and offer guidance for preparation of required documentation. Regulation 3 states that all passenger ships of 100 gt and above, and all cargo ships of 300 gt and above are required to be provided with an identification number conforming to the IMO ship identification number scheme.

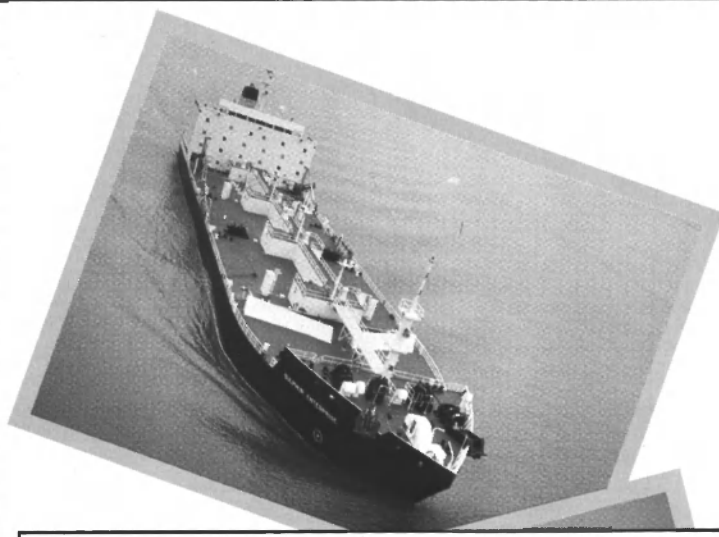
Regulation 4 allows port state control officers inspecting foreign ships to check operational requirements of vessels and carry out

detailed inspections if certificates are not valid or "when there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the safety of ships." Other amendments (to Chapter V) entered into force on January 1, specifically regarding ship reporting systems and the Standards of Training, Certification and Watchkeeping for Seafarers (STCW). General principles for ship reporting systems —

which are used to provide, gather or exchange information through radio reports for search and rescue, VTS, weather forecasting and the prevention of marine pollution — were adopted by IMO in 1989. By making IMO-adopted ship reporting systems mandatory, the SOLAS amendments make it obligatory for ships entering or using a system to give their position, identity and other information, which enables tracking of vessel passages. Amendments to

STCW increase special training requirements for personnel on tankers, specifically including tanker familiarization courses, and specialized programs targeted at oil tanker, chemical tanker and liquefied gas tanker crew members.

A new regulation under Chapter V states that tankers of 20,000 dwt and above are required to be fitted with emergency towing arrangements at both vessel ends, and states that existing tankers must comply by January 1, 1999.



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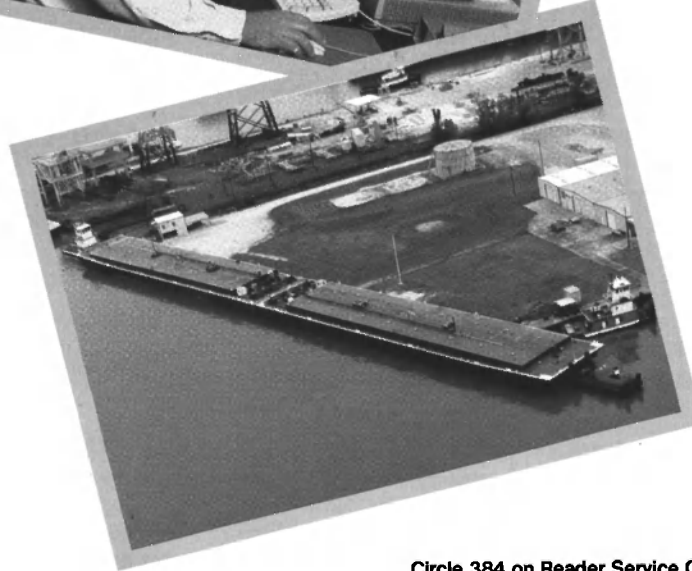
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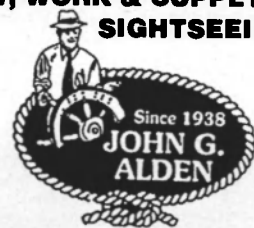
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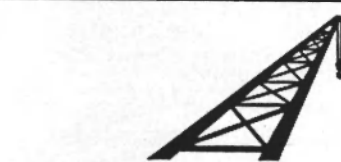
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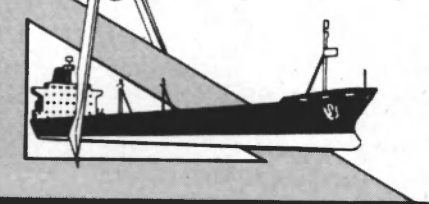
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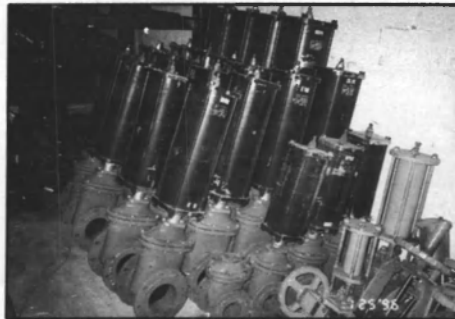
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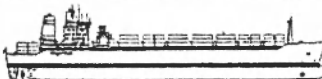
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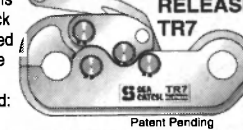
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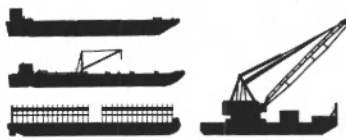
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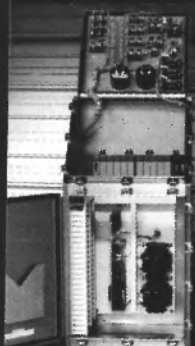
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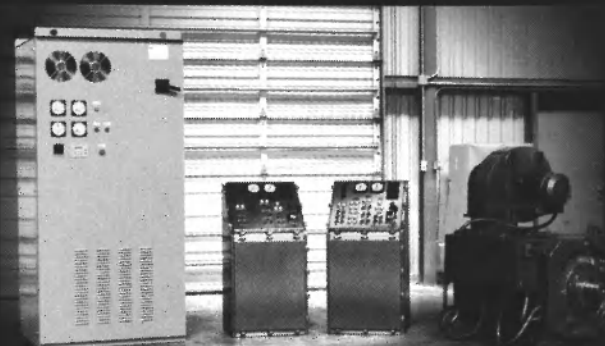
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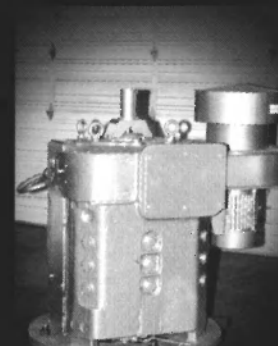
In this console, all control functions can be operated locally or remotely.



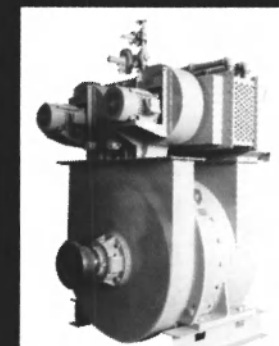
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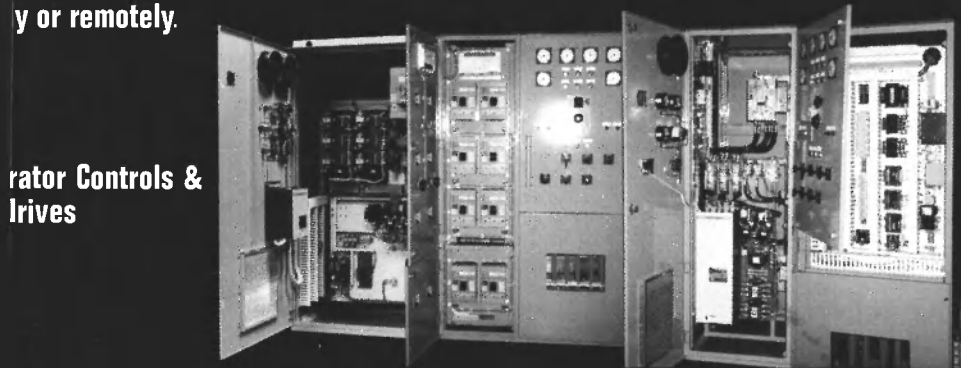
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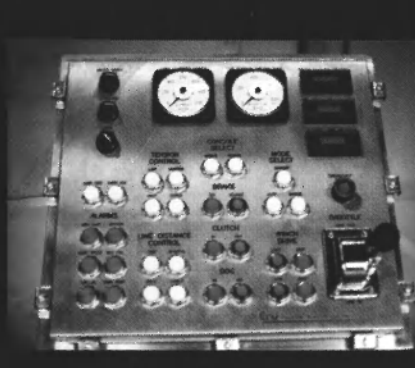
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