

December 2004

MARITIME REPORTER

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ENGINEERING NEWS

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Aquatic Species: Why this

Little Guy

could cost shipping companies

Big Bucks



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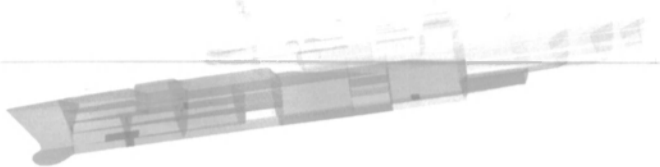
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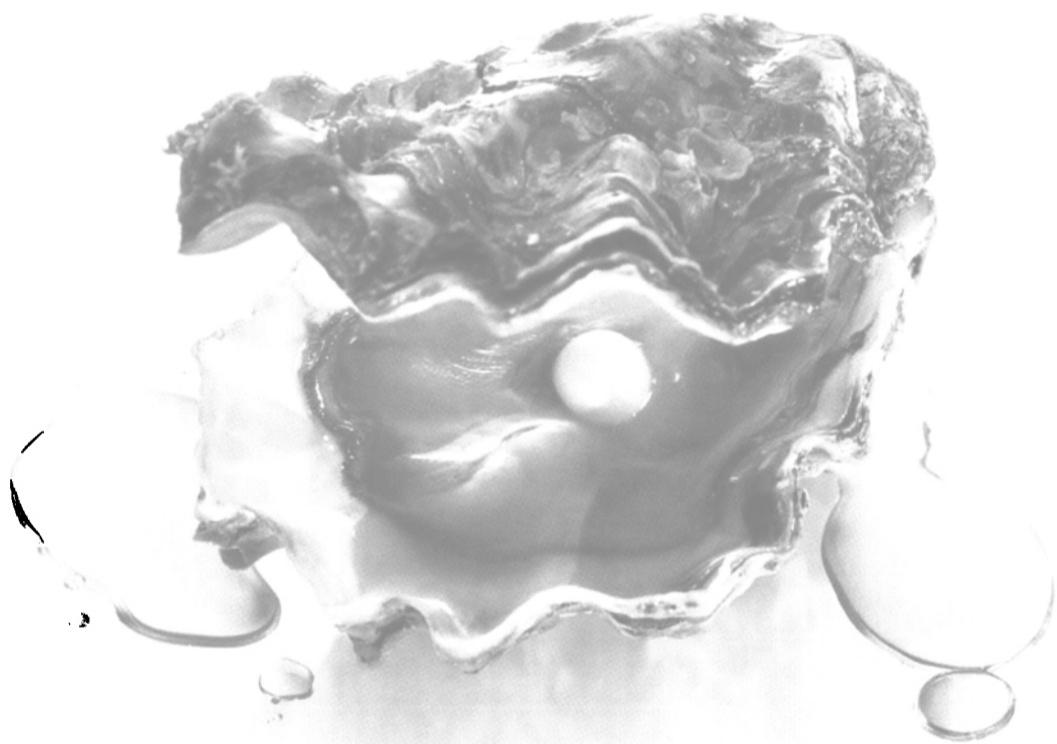
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Maritime Meanings

Guzzle

To drink (or sometimes eat) frequently and greedily. Originally, **guzzle** or **guz** was the slang name in the British navy for Devonport, where it was traditional for sailors returning from a long voyage to gorge themselves on copious quantities of Devonshire cream, butter, cakes, etc. The word was in use in the sixteenth century, and may be connected with the French **gosier**, throat.

Source: *An Ocean of Words: A Dictionary of Nautical Words and Phrases*, by Peter D. Jeans; Birch Lane Press, 1998



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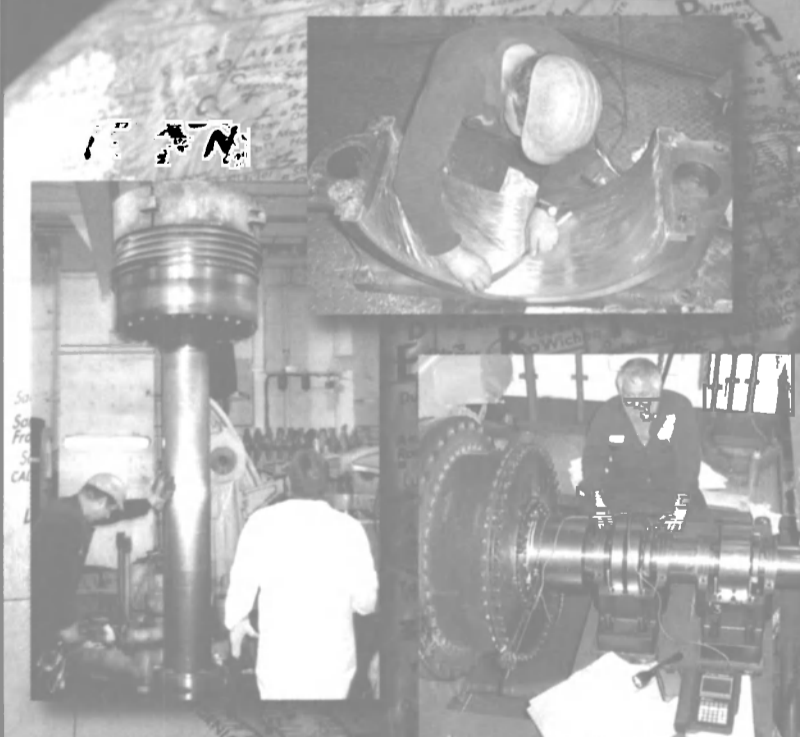
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Editor's Note

Don't Rock the Boat

After spending nearly three hours crashing through the swells about a mile off of Jamaica's southern coast on a recent trip over Thanksgiving break, I had an epiphany regarding the contribution marine safety product and system manufacturers make to our industry. Not that I ever doubted the importance of safety products and systems; but this memorable experience simply solidified my appreciation.

Early in the trip a member of our group hatched the ingenious idea to arrange a "fishing" trip with one of the locals, and with no more detail than "\$30 and 6 a.m.," I and six others agreed that this was, indeed, a good thing. Stumbling down to the beach at 5:45 a.m. with blueberry muffin in hand, I was amazed to find that our "charter boat" was little more than a 22 x 5 ft. craft with four wooden bench seats and a 60 hp Evinrude strapped on the back; the fishing gear, literally, consisting of a pair of trolling "rods" made from tree branches. We, in essence, had paid a cumulative \$240 to go to work with these guys for four hours.

In short, the safety systems onboard consisted of:

- Floatation Devices: None
- Electronic, or for that matter, any signaling device aside from hands waving above white caps: None
- Bilge Pump: A 1/2 of an old Chlorox bottle, activated by the skipper about every five minutes as pools of water built in the boat.
- Safety instructions: The captain did tell his mate to stow his spear gun after a wave knocked it back toward the passengers.

This edition features our "Safety Products & Systems" guide, the result of an e-mail survey conducted in November 2004. If you would like an electronic version of the directory or to be included in the next survey, simply drop me a line.



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On the Cover



Pictured on this month's cover is *artemia salina*, just one of a number of aquatic species that have become the center of the ballast water issue. Read about emerging technologies starting on page 31.

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Seville Shipyard Delivers Ferry to ENTMV

Izar Sevilla delivered the ferry Tassili II to Algeria's Entreprise Nationale de Transport Maritime de Voyageurs (ENTMV). Tassili II is the first of the two sister vessels for ENTMV, with the second, dubbed El Djazair, scheduled for delivery in May 2005.

The 475-ft. (145 m), 2,900-dwt ship is unique in many ways, and the ferry has meant a challenge for Izar Sevilla as this was the first ship built at this shipyard attending more to the passenger area than to the cargo carrying spaces. The design more than ever focused on commodity and security matters.

The vessel offers 11,300 sq. m. in which 1,300 passengers can be accommodated. In order to provide quality service for the passenger, the ship has several dining-rooms, a self-service restaurant, a discotheque and several leisure areas. Accommodation standards are on par with the levels of higher European vessel and the finishing details have been specially looked after.

Tassili II includes the latest in maritime security electronics, including a new Automatic Identification System (AIS) and a Security and Alarm System (SSAS). This equipment is in accordance with the ISPS code (International Ship and Port Facility Security) in force since July 1, 2004.

Stability and deadweight requirements have been overcome as a result of strict controls during every step of the project. Both Tassili II and El Djazair II will operate between Marseilles and Algiers replacing Hoggar, Tipasa and Zeralda vessels, all of which were built at the beginning of 70s. This fleet modernization contributes to improve ENTMV's current services.

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EU, US Strengthen Container Security

The first measures contributing to strengthening the security of maritime container transport have been agreed by the EU and the US. The measures are designed to facilitate legitimate trade through mutually acceptable reciprocal security standards and industry partnership programs. The measures include creation of an information exchange network, the agreement on minimum requirements applicable for all European ports willing to participate in the US Container Security Initiative (CSI) and identification of best practices concerning security controls of international trade. They also include also a pilot project that focuses on shipments transiting through both the US and the EU in view of testing the feasibility of exchanging cargo information on transshipments and freight remaining on board.

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This Isn't Your Father's Coast Guard Manual

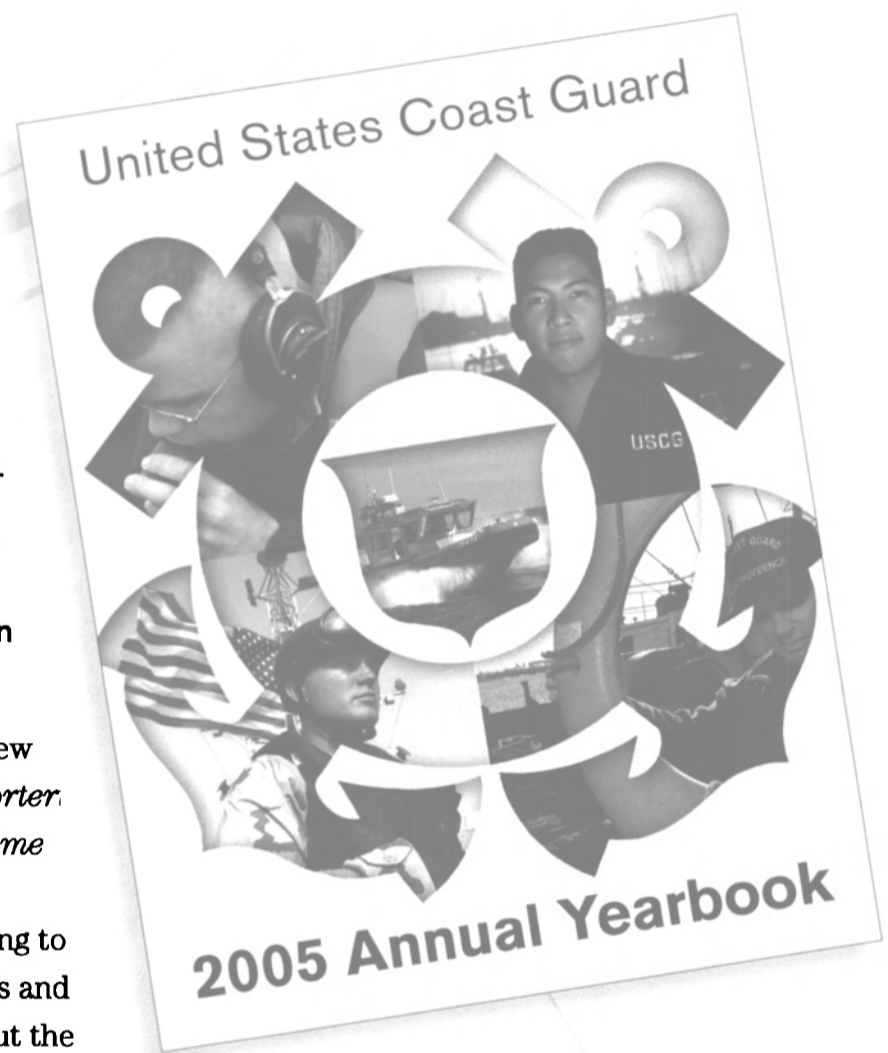
Introducing the *United States Coast Guard Annual Yearbook—Charting A New Course for the Gatekeeper of Maritime Security & Safety*

A sea change is taking place at the United States Coast Guard, and the stakes have never been higher.

The *United States Coast Guard Annual Yearbook*, premiering June 2005, takes an in-depth look at the strategies driving the **20-year, \$17 billion expansion** of America's oldest maritime service.

Written and produced by the respected editors of *New Wave Media* (renowned publisher of *Maritime Reporter and Engineering News*, *Marine News*, and *Maritime Security Source Book*), this valuable and insightful source will focus on how the Coast Guard is rebuilding to better protect America's coastline, shipping channels and seaports. The Yearbook will be referred to throughout the year by Coast Guard officers, procurement decision-makers, government officials, and maritime industry professionals.

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CP Ships Makes Key Appointments

Jeff Drake has been appointed to the new position of Vice President Intermodal and Logistics, reporting to CEO Frank Halliwell. CP Ships has also restructured the management of its Montreal-based services in anticipation of the year-end retirement of Terry Burrows, Senior VP Commercial responsible for this business, after 40 years of service. Mark Royden, VP Sales, has assumed responsibility for Montreal-North Europe services. Tony Bruno, Senior VP Commercial Gulf/Atlantic, is now also responsible for Montreal-Mediterranean services. In addition, Alan Boylan, whose appointment as Executive VP Commercial for Montreal-North Europe, Australasia and Middle East/India was announced earlier in the year, joined CP Ships on 15th November.

ABS Becomes Associate Member of SIGTTO

ABS has become the first classification society accepted into membership to the Society of International Gas Tanker & Terminal Operators (SIGTTO). A not-for-profit international organization established in 1979, SIGTTO's mission is to enhance the safety and operational reliability of gas tankers and terminals.

Shell Marine Products Wins MSC Contract

Shell Marine Products (US) Company (SMP) has been awarded a Department of Defense contract to support more than 150 government-owned ships in the U.S. Navy's Military Sealift Command (MSC) fleet worldwide. The company competed for the right to supply marine lubricants and provide waste oil disposal services and related engineering support services. The contract value is approximately \$8.6 million and work will be performed in various locations around the world for a period of one year, starting January 1, 2005. The contract represents a significant achievement for the growth aspirations of SMP. It includes four one-year options, which if exercised, would bring the total cumulative estimated value of this contract to approximately \$46.5 million. SMP will dedicate existing and new resources to the fulfillment of this contract, which the company believes will further cement the position it and its affiliates hold as leaders in the global marine lubricants market.

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U.S. Ocean Dumping Act

As this article is being written, the chief executive officer of an American ocean carrier is on trial for alleged participation in the discharge of contaminated wheat into waters of the South China Sea. The charges were brought under the somewhat obscure U.S. Ocean Dumping Act.

In 1999, a U.S. flag ship owned and operated by the company was carrying U.S. wheat to Bangladesh. Due to a leak in a fuel tank, some of the wheat became contaminated and was rejected upon arrival. Some Bulgarian workers were brought on board the ship in Singapore and discharged the wheat overboard en route to the United States. The company and the company's former president have already pled guilty to the offence. If convicted, the CEO faces up to five years in prison and a fine of \$250,000.

The Ocean Dumping Act implements, for the United States, the International Convention on the Prevention of Marine

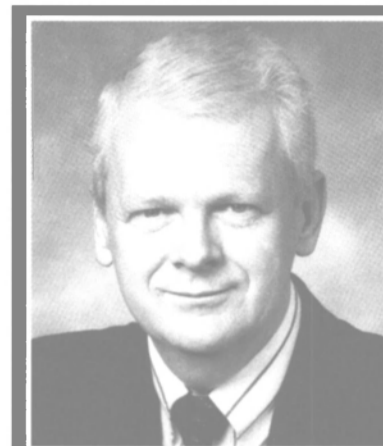
Pollution by Dumping of Wastes and Other Matter, popularly known as the London Dumping Convention. The Ocean Dumping Act, though, contains provisions that exceed equivalent provisions of the Convention.

The London Dumping Convention and the U.S. Ocean Dumping Act both have as a primary goal the prevention of pollution of the sea by dumping of waste and other matter that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities, or to interfere with other legitimate uses of the sea. The London Dumping Convention specifically provides that dumping does not include, among other things, "the disposal at sea of wastes or other matter incidental to, or derived from the normal operations of vessels." The U.S. Ocean Dumping Act adopts a narrower view with regard to exemptions, excluding from the definition of dumping only "a routine dis-

charge of effluent incidental to the propulsion of, or operation of motor-driven equipment on, vessels."

In practical terms, the London Dumping Convention incorporates and is consistent with the garbage disposal provisions found in Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL Convention). The U.S. Ocean Dumping Act, in some respects, is not consistent with Annex V of the MARPOL Convention.

Annex V of the MARPOL Convention provides that disposal into the sea of garbage shall be made as far as practicable from the nearest land, but disposal is prohibited if the distance to the nearest land is less than 25 nautical miles in the case of floating garbage such as dunnage or less than 12 nautical miles in the case of food wastes and garbage that normally sinks. Garbage is defined as all kinds of victual, domestic, and operational



Dennis L. Bryant, Senior Maritime Counsel at the law firm of Holland & Knight, Washington, D.C., is a contributing editor of MR/EN.

waste generated during the normal operation of the ship and liable to be disposed of continuously or periodically.

Guidelines for the implementation of Annex V were promulgated by the International Maritime Organization (IMO) to provide governments and vessel operators with additional detail regarding the goals of this annex. The Guidelines define cargo residues as "the



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remnants of any cargo material on board that cannot be placed in proper cargo holds (loading excess and spillage) or which remain in cargo holds and elsewhere after unloading procedures are completed (unloading residual and spillage)." The Guidelines go on to define operational wastes as including cargo-associated waste, maintenance waste, and cargo residues. Among other things, the Guidelines provide that cargo residues are to be treated as garbage under Annex V except when those residues include material defined or listed under other annexes of the MARPOL Convention, as when the residues contain oil or noxious liquid substances. Cargo residues of all other substances (other than those containing material defined or listed under other annexes) and not prohibited from disposal at sea as garbage (such as plastic) are not explicitly excluded from disposal as garbage under the overall definition of garbage in Annex V.

In the regulations implementing the MARPOL Convention, the U.S. Coast Guard does not have a specific definition of cargo residues. The regulations do, though, define operational waste as including cargo associated waste, maintenance waste, and cargo residues. Garbage is defined by the regulations as "all kinds of victual, domestic, and operational waste, excluding fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of continuously or periodically, except dishwater, graywater, and those substances that are defined or listed in other Annexes to MARPOL 73/78." The regulations go on to provide that garbage may not be discharged from a ship located outside the navigable waters of the United States and outside a special area if the distance to the nearest land is less than 25 nautical miles for dunnage and related floating garbage or less than 12 nautical miles for victual waste and other garbage likely to sink. Thus, the USCG regulations are consistent with the MARPOL Convention and the London Dumping Convention insofar as the disposal of garbage is concerned.

What the USCG regulations do not tell the mariner is that the U.S. Ocean Dumping Act, which is enforced primarily by the Environmental Protection Agency (EPA), prohibits some of the discharges allowed by the London Dumping Convention, the MARPOL Convention, and the USCG regulations. The U.S. Ocean Dumping Act prohibits almost all discharges from ships at sea, whereas the London Dumping Convention, the MARPOL Convention, and the USCG regulations prohibit dis-

charges of garbage (other than those containing plastic, oil, liquid noxious substances, or other listed material) only in designated special areas or when the ship is within a certain distance of land. The U.S. Ocean Dumping Act applies to U.S. flag ships worldwide and, with one caveat, to non-U.S. ships operating in U.S. waters.

The U.S. Ocean Dumping Act pro-

hibits (except as authorized by permit issued by the EPA) the transporting of any material from the United States for the purpose of dumping it into ocean waters. In the case of a vessel or aircraft registered in the United States, the prohibition extends to the transporting of any material from any location worldwide for the purpose of dumping into ocean waters. For ships registered in

another country, the prohibition extends to the transporting of any material generated or loaded in the United States for the purpose of dumping into ocean waters. 'Material' is defined as matter of any kind, including but not limited to solid waste, garbage, and other waste. 'Ocean waters' means those waters seaward of the baseline from which the territorial sea is measured. 'Dumping'

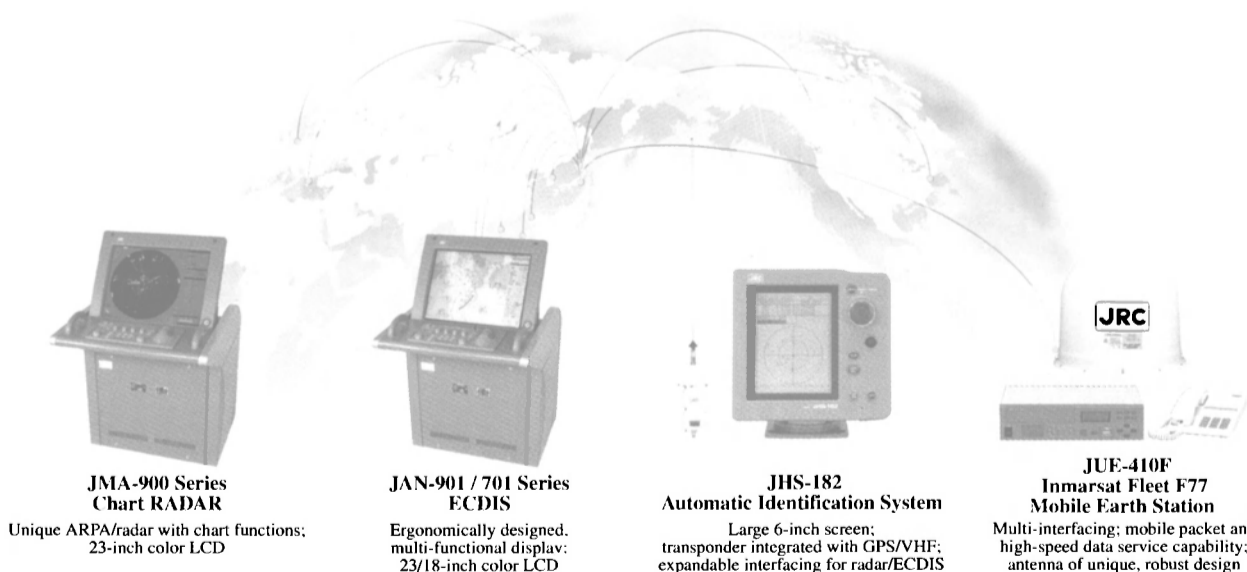


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Government Update

means a disposition of material.

Research has revealed three prior prosecutions for alleged violations of the Ocean Dumping Act. The first, in 1988, ended in an acquittal on the dumping allegations, but convictions with regard to other environmental crimes. Baytank (Houston), Inc., its parent company, five executives, and fourteen seamen were charged with violating vari-

ous federal environmental laws, including the Ocean Dumping Act. The Ocean Dumping Act charges resulted from a whistle-blower report by a disgruntled employee, who alleged that wastewater was being loaded on a ship for illegal disposal at sea. EPA investigators boarded the ship in port and found the wastewater. At trial, the court directed an acquittal on the Ocean Dumping Act

charges since the wastewater had not been dumped and there was insufficient evidence to prove the intent to illegally dump the wastewater at sea. Baytank and three executives were convicted of various environmental violations other than violation of the Ocean Dumping Act. The company was sentenced to a \$1 million fine. The company's former executive vice president and former operations manager were each sentenced to a fine of \$40,000. The company's former technical manager was sentenced to a fine of \$20,000.

In 1993, two executives were sentenced to confinement and criminal fines in a case involving the illegal dumping of a cargo of incinerator ash from the M/V Khian Sea. Incinerator ash from Philadelphia was loaded on the vessel in 1986 under a contract that called for legal disposal in another country. The vessel owner attempted to unload the ash in various countries, including the Bahamas, Honduras, Haiti, and Guinea Bissau, but when word was publicized that the ash was potentially toxic, no country would accept the cargo. The vessel returned to Delaware Bay in May 1988. It soon departed, calling in Yugoslavia (where its name was changed) and Singapore. When it arrived in Singapore in November 1988, its holds were empty. At trial, the master testified that the two executives ordered him to dump the incinerator ash as the vessel was transiting the Atlantic and Indian Oceans. The two executives were convicted of illegal dumping and of lying to the grand jury. The company president was sentenced to 37 months in prison and a fine of \$7,500. The company vice president was sentenced to five months confinement, five months detention, and a fine of \$20,000.

A ship owner and a former port captain were sentenced to a criminal fine of \$250,000 and confinement for six months, respectively, in May 1998, for dumping drums of oil residue and cleaning wastes into the Pacific Ocean. Trinidad Corporation, a subsidiary of Apex Oil Corporation, and the company's former port captain in Portland, Oregon, pleaded guilty to violating the Ocean Dumping Act. The charges arose from the dumping of approximately 365 drums of oil residue and cleaning wastes (muck) from the vessel Admiralty Bay in September 1990 and September 1992. The wastes were stored in 55-gallon drums on the vessel's deck and were dumped into international waters after the ship left port. While dumping of the ship-generated waste may have been permissible under the MARPOL Convention under certain conditions if discharged as generated, storing the waste in drums for a large-scale dumping is not authorized by MARPOL.

The three prior prosecutions and the ongoing one should send a clear signal to ship owners and operators that they must heed the U.S. Ocean Dumping Act and its strictures. The U.S. Government and the EPA have long arms that can, in appropriate cases, reach halfway around the world. It is a violation of the U.S. Ocean Dumping Act for a U.S. ship to dump material into the ocean anywhere in the world. It is a violation of the U.S. Ocean Dumping Act for a non-U.S. ship to dump material into the ocean anywhere in the world if that material was generated or loaded on the ship while in the United States. It is thus recommended that ships dispose of their garbage (including dunnage generated by discharging cargo in a U.S. port) ashore prior to departure from the United States.

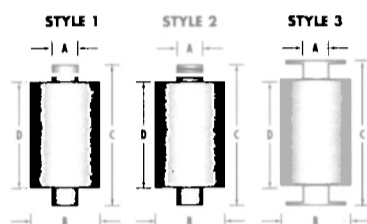
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AIM-05	5.563"	10.75"	21"	15"	\$300
AIM-06	6.625"	12.75"	24"	18"	\$400
AIM-08	8.625"	16.00"	30"	24"	\$500
AIM-14	4.500"	8.625"	22"	16"	\$300
AIM-15	5.563"	10.75"	26"	20"	\$375
AIM-16	6.625"	12.75"	30"	24"	\$450
AIM-18	8.625"	16.00"	38"	32"	\$700
AIM-24	4.500"	8.625"	46"	40"	\$675
AIM-25	5.563"	10.75"	56"	50"	\$900
AIM-26	6.625"	12.75"	66"	60"	\$1,000
AIM-28	8.625"	16.00"	86"	80"	\$1,550

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WW-2	2.0"	1.54"	-	2.375"	-	30
WW-250	2.5"	.203"	-	2.875"	-	40
WW-03	3.0"	.216"	-	3.500"	-	50
WW-4	4.0"	.237"	-	4.500"	-	70
WW-5	5.0"	.258"	-	5.563"	-	80
WW-6	6.0"	.280"	-	6.625"	-	90
WW-8	8.0"	.322"	-	8.625"	-	120

Carbon Steel Flanged Pipe Stainless Flexible Exhaust

PART #	HOSE I.D.	A	B	C	D	PRICE
FF-150	1.5"	10.25"	875"	12.000"	1.95"	\$60
FF-2	2.0"	10.00"	1.000"	-	2.44"	70
FF-250	2.5"	9.750"	1.125"	-	2.94"	100
FF-3	3.0"	9.625"	1.1875"	-	3.57"	110
FF-4	4.0"	9.375"	1.3125"	-	4.57"	165
FF-5	5.0"	9.250"	1.4375"	-	5.66"	190
FF-6	6.0"	8.875"	1.5625"	-	6.72"	210
FF-8	8.0"	8.500"	1.750"	-	8.72"	275

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TIB-3-4 3" & 4" Exhaust Connector 1" Thick & 18" Long x Circum.	\$40
TIB-5 5" Exhaust Connector 1" Thick & 18" Long x Circum.	\$50
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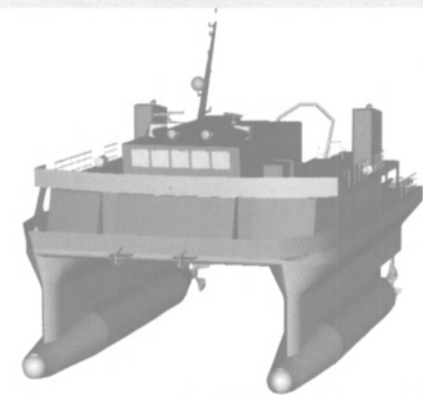
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ACMA, VT Halter Win NOAA Deal

The National Oceanic and Atmospheric Administration (NOAA) awarded Alan C. McClure Associates (ACMA) and VT Halter Marine Phase II of a three-part contract that calls for the design, development and construction of a new Small Waterplane Area Twin Hull (SWATH) coastal mapping vessel (CMV). Initially, NOAA awarded two teams the chance to participate in the first phase of the project. ACMA and VT Halter Marine were one of the two teams that qualified for Phase I, a stage that lasted four months and consisted of Feasibility Analysis and Preliminary Design contracts. Phase II will entail the Contract Design and is expected to wrap up around May of 2005. At that time, NOAA will decide whether to proceed with the last phase of the program which will be the Detail Design and Construction of the NOAA SWATH CMV.

The primary mission of the ship will be to conduct full seafloor mapping of coastal areas. Doug Ottens, principal marine engineer with ACMA, explained the significance in terms of US National Security, "In mapping the U.S. coastal seafloor, we will be able to monitor discrete changes and detect any potential intruders."



Maritime Reporter & Engineering News

GE for Korean Destroyers

GE Transportation's marine gas turbine operations will supply Samsung Techwin Co. Ltd. with 12 LM2500 aeroderivative gas turbines. The Republic of Korea (ROK) Navy will use the gas turbines for its next-generation KDX Type III destroyer. Hyundai or Daewoo Shipyards in Korea are building a total of three KDX Type III destroyers, each of which weigh more than 7,000 tons. The vessels will be equipped with AEGIS combat systems. Each will use four LM2500 gas turbines rated at 30,000 shp for total propulsion system output of 120,000 shp.

Circle 32 on Reader Service Card

ShipNet Expands

ShipNet is embarking on an aggressive expansion strategy to establish and develop regional branch offices worldwide. Branch offices are subsidiaries of one of the three ShipNet companies (ShipNet AS, ShipNet USA, ShipNet Asia). The intention is to enable higher levels of proactive Account Management, Customer Support and the provision of local Consultancy Services. The first two of these offices will be established in Athens and London. The branch office in Athens will be fully operational by the end of Q2 2005. In London, the office will be operational on Account Management during Q1 and fully operational by the end of 2005.

Circle 26 on Reader Service Card

Vietnam Signs On

A Licence and Cooperation Agreement was signed by Vietnam Shipbuilding Industry Corporation (Vinashin) and MAN B&W Diesel A/S, Denmark. The new agreement, which was signed by Vinashin Chairman & CEO **Pham Thanh Binh** and MAN B&W Executive Vice President Dr. **Peter Sunn Pedersen** at a ceremony in Hanoi, will provide Vinashin with technology and support for the production of MAN B&W two-stroke diesel engines for the growing Vietnamese shipbuilding industry.

Circle 23 on Reader Service Card

Hornbeck 3Q Results

Hornbeck Offshore Services, Inc. announced third quarter revenues increased 16.7% to \$32.9 million compared to \$28.2 million for the third quarter of 2003. Of the \$4.7 million increase, \$1 million was due to an increase in the average number of vessels in the company's offshore supply vessel fleet from 19.9 in the third quarter 2003 to 23 in the third quarter of 2004, and \$3.7 million was due to an increase in demand for the company's vessels. **Todd**

Hornbeck, the company's President and CEO, said, "Throughout the third quarter we have seen consistent strengthening in our OSV segment. As our customers devote increasingly more capital to drilling opportunities in the Gulf of Mexico, we are seeing demand for our new generation OSVs starting to outpace supply, which has led to full practical utilization and higher dayrates."

LR Wins LNG Deal

Lloyd's Register has won the classification contract for four 155,000 cu.-m. Technigaz Mk III membrane-type LNG carriers, ordered by BP Shipping at Hyundai Heavy Industries (HHI) with a further four options. These ships are the largest LNG carriers ordered to date.

The ships are also noteworthy in that they will have dual fuel diesel electric

propulsion and will be the first LNG ships with this type of propulsion to be built in Korea. The last of the first four ships will be built at Hyundai's Samho yard, representing this particular yard's first LNG carrier. The BP ships are intended for trade in the Atlantic basin and will serve, among others, Trinidad and Tobago's Atlantic LNG project, the UK, the US and Spain.

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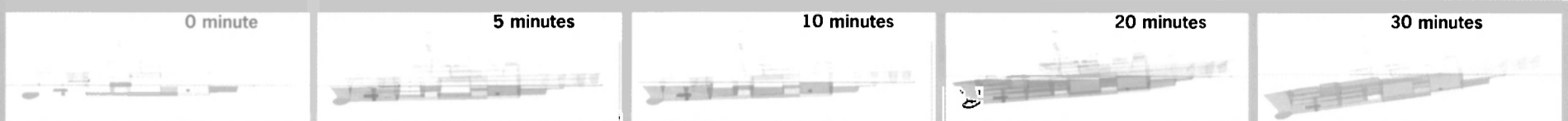
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Naval Architecture & Marine Engineering



Continuous Flooding simulation in the time intervals (from left) 0 minute, 5 minutes, 10 minutes, 20 minutes and 30 minutes. The dark grey areas show damage openings.

Continuous Flooding Simulation

Due to a number of severe accidents involving RoRo ferries in recent years, there is an increased interest in modeling continuous flooding within marine vessels. For many years, safety regulations have been prescriptive rather than being based upon individual vessels. This is changing. Within procedures laid down by the IMO, there is an option for vessels to comply with regulations using numerical simulation. It is generally considered that numerical simulation will become the predominant method for the verification of ship safety.

Tribon M3 contains an application for Continuous Flooding Simulation for modeling progressive flooding within a vessel. It is based on the numerical sim-

ulation of the physical properties of fluids and the geometry of the individual vessel rather than a prescriptive approach. Fundamentally, it models two interconnected issues: the distribution of fluid within the compartments of the vessel and the attitude of the vessel to the water as time evolves.

To enable simulation to be carried out, it is first necessary to model the geometry of the vessel. This includes designed openings between compartments in the hull, or those due to damage. There is no practical limitation on the number of compartments or the number of openings between connected compartments or even the number of openings connecting any two compartments.

Once modeled, it is very simple to alter any opening or any initial distribution of fluid in a vessel to simulate a range of scenarios. This facilitates the assessment of the severity of damage and the effectiveness of any counter measures taken to prevent sinking. Counter measures may consist of closing off certain openings or pumping water into or out of certain compartments in an attempt to balance the vessel. For this reason, water pumps are a feature of the modeling approach. This means that the simulation is useful for both design and operational training.

The software application has been written to make it easy to alter or refine the equations that model flow between

compartments. For example, it is a straightforward matter to add the ability to model pumping into and out of compartments and cross flooding through pipes. As the illustration shows, mathematical modeling has already produced a sophisticated functionality, particularly in the progression of water through the vessel. Furthermore, a number of research organisations, such as the Ship Stability Research Centre (SSRC) at Strathclyde University, are investigating sophisticated methods for modeling the ship dynamics.

The preceding was written by Alex Drozdowicz, Senior Product Manager, AVEVA.

New Marine Rated Circuit Breaker

Bussmann Automotive Parts, a division of Cooper Industries, offers the Series 187 marine rated circuit breaker. The Series 187 MRCB is a Type 3 manual reset style circuit breaker with a switching function. Available in rates from 25A to 150A, it is available in

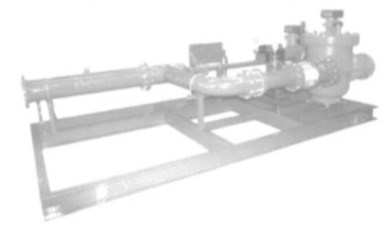


panel mount or surface mount models.

Circle 2 on Reader Service Card

Barge Mounted Bunker Blender

Jiskoot has supplied an in-line fuel oil blending system for use on a barge by Astilleros de Murueta in Spain. The skid-mounted system will be mounted on the deck of a bunker barge, giving the client the flexibility to deliver bunker fuels across a wide range of viscosities,



from IF30 to IF460 as well as single products such as HFO. System control is by a Jiskoot InSight Blend Controller. The blender continuously blends the component products according to the recipe set by the operator and produces a finished product of closely defined qual-

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NMEA Product Award Winners - 2004

NMEA dealer members and the Certified Marine Electronics Technicians voted based on Quality, Ease of Use, Innovation, Product Support from the Manufacturer, Reliability, Customer Satisfaction, 0183 Compatibility (where applicable) and Warranty. Below is a select list of the commercial category winners.

Autopilot (Commercial)	Simrad AP50
Compass, Electronic	Simrad RC36
Autopilot (Commercial)	Simrad AP50
Compass, Electronic	Simrad RC36
Electronic Cartography	C-Map NT+
GPS/DGPS/WAAS Position Receiver	Furuno GP37
Instrumentation	Furuno RD30
Integrated Navigation System	Furuno NavNet
Marine Antenna	Digital Antenna 529-VW
Marine Specialty Product	Digital Antenna DA4000
Navigation Plotter	Furuno GP1900C
Navigation Software	Nobeltec Visual Navigation Suite 7.0
Radar (Commercial)	Furuno FAR 2107
Satellite Communications	KVH Industries Tracphone 252
Shipboard Power Systems	Newmar Phase Three Battery Charger
Sonar	Furuno CH250
SSB Radiotelephone	ICOM M802
Stabilized TV Antenna	KVH Industries TracVision 4
UAIS	Furuno FA100
VHF Radiotelephone, Fixed	ICOM M602
VHF Radiotelephone, Portable	ICOM M88
Video Sounder/Fish finder (Commercial)	Furuno FCV1100

ity, allowing blending and loading in a single process.

Circle 4 on Reader Service Card

Color Compliant Gel Coats

Ashland Composite Polymers has released a new boat MACT-compliant line of color gel coats. Maxguard 33LE color gel coats feature the company's patented low emission technology and are formulated for marine applications.

Circle 5 on Reader Service Card

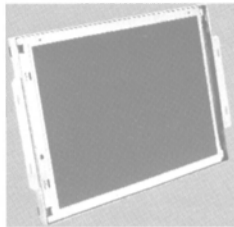
New W-Series Marine Generators

Northern Lights introduced the W-Series of marine generators, a major step forward, the company claims, in providing consistent, reliable and rugged performance. At the heart of the improved performance is an auxiliary stator winding that delivers dedicated power to Northern Light's new DST-100-2FAK Automatic Voltage Regulator (AVR). It is separate from the main stator windings, and is not affected by load changes or power corruption.

Circle 6 on Reader Service Card

New Range of LCD Displays

Global Display Solutions (GDS) offers a new range of industrial LCD displays for use in the marine industry. The improved range includes industrial LCDs and high brightness Mitra panels and Morpheus monitors. They are available in sizes from 6.4 to 19 in.



Circle 7 on Reader Service Card

Sigma Adds to its Coatings Line

After successful use in non-marine applications such as land based storage tanks, Sigma Coatings has launched the solvent free epoxy phenolic tank coating Sigma Novaguard for Marine applications. Sigma Novaguard has increased chemical resistance versus Pure Epoxy and standard Solvent Free Epoxy tank coatings currently on the market while possessing the same excellent flow and

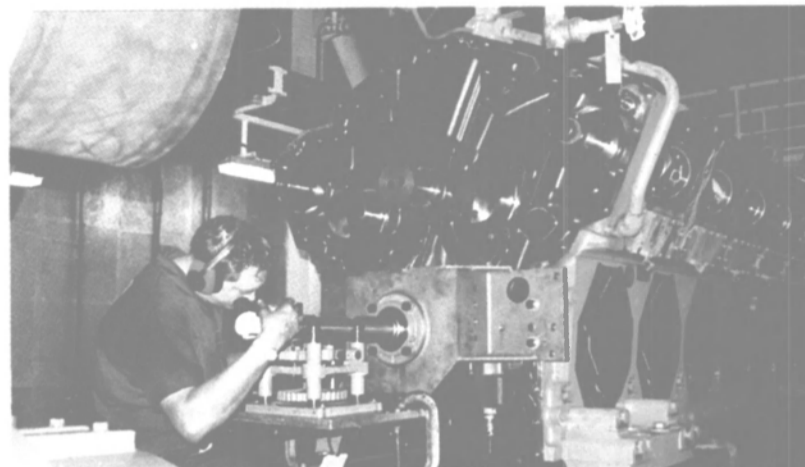
Mark Your Calendar

On the heels of success in Washington, D.C., the SNAME Annual Meeting & International Maritime Exhibition is set to expand to 200 booths and is scheduled for October 20-21 in Houston, Texas. Watch these pages in the coming months for new developments regarding this crucial maritime event, or visit www.sname.org for program details. To book a booth in the expanded exhibition hall, contact **Rob Howard** at tel: 561-732-4368 or e-mail: howard@marinelink.com

3PS INC	516	Intl. METALIZING & COATINGS INC	327
ABS Americas	601 603	International Paint Inc	413
ADVANCED TECHNOLOGY INSTITUTE/NSRP	512	JASTRAM ENGINEERING	602
Airchime Manufacturing	529	Jesse Engineering	235
ALBACORE RESEARCH LTD	519	Kobelco Marine Inc	605
Alexander / Ryan Marine & Safety Co	308	LEISTRITZ CORPORATION	400
Allied Systems Company	408	Lloyds Register Americas INC	701 703
Anteon Corporation-Proteus Engineering	618	MacGregor Group AB	604
Appleton Marine INC	427	Man B&W Diesel INC	418
Applied Termal Sciences Inc	227	MARIN	426 428
Aveva	821	MMC International Corp	309
Ballast Technologies	608	Nautican Research Development	412
Binsfeld Engineering Inc	515	NIIIP-SPARS	514
BMT Scientific Marine Services INC	419	Northern Lights	318
Carderock Division NSW	410	Northrop Grumman Newport News	509
Caterpillar	600	Ocean Power & Equipment Co Inc	511
CD-ADAPCO	434	Oceanic Consulting Corp	700
Deansteel Mfg. Co.	626	Potts Welding	610
DET NORSE VERITAS	503 505	R.W. Fernstrum & Co	209
Detroit Diesel Corp.	300	RETLIF TESTING LABORATORIES	708
Duramax Marine LLC	304	RFD BEUAFORD INC	305
ElectroWave	823 825	Saab Rosemount	326
EVAC	526	SDT North America	122
Fast Systems-Smith & Loveless	402	Seaworthy Systems Inc	302
FIRE PROTECTION SERVICE INC	301 303	Sigma Coatings	310
FLEETWAY INC	513	SNAME	128 130
Formation Desing Systmes	726	Sohre Turbomachinery	627
GE Transportation / Marine	709 711	The Maritime Group	501
General Dynamics MARINE SYSTEMS	401	THRUSTMASTER OF TEXAS	414
GENOA DESIGN INTERNATIONAL LTD	702	Umoe Schat-Harding	319
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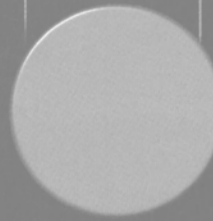
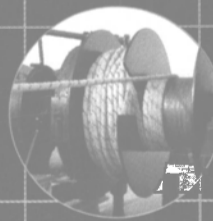
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Naval Architecture & Marine Engineering

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Sigma Novaguard allows the user to specify/apply it at dry film thickness down to 150 microns, enabling a two coat system of total 300 microns to be specified. Previously the minimum application film thickness for a single coat solvent free tank coating was in the

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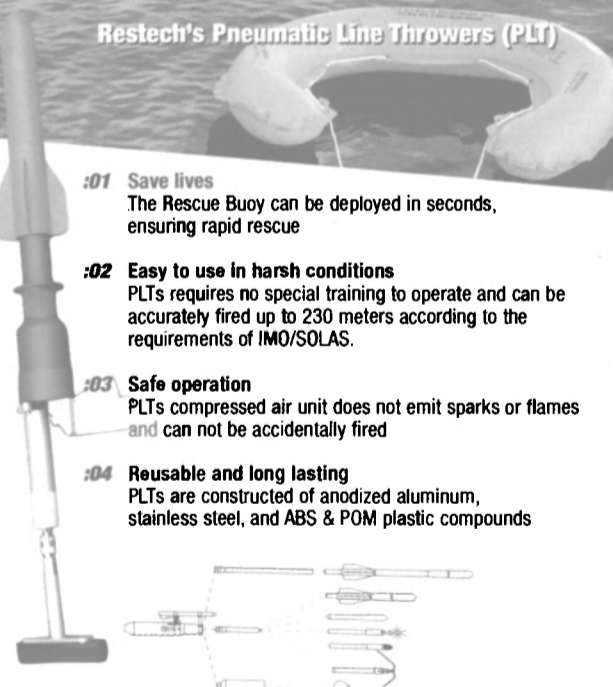
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Ameron Raises the Coatings Bar

Ameron launched a new high performance epoxy anticorrosive, Amercoat 240 Universal Epoxy. The new product offers the benefits of Amercoat 225, plus additional features, including:

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 - > 70% edge retention, better coverage on angles and sharp corners
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- Circle 9 on Reader Service Card

Simrad Offers New Satellite TV System

Simrad offers three new models: TV45, TV46 and TV60, which are touted as providing superior performance for unparalleled television viewing on vessels of all types and sizes. TV45 is designed for slower moving boats in areas with strong satellite signals. TV46 features a faster antenna follow up speed, making it ideal for faster vessels. TV60 is designed for areas with weak satellite signal.



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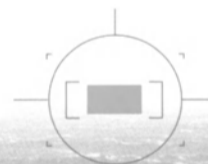
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Great Ships of 2004



Name Alaskan Frontier
Type DH Oil Tanker
Owner BP Oil Shipping Co.
Builder NASSCO

National Steel and Shipbuilding Company delivered the Alaskan Frontier, the first of four Alaska-class double-hull oil tankers being built for BP Oil Shipping Company, USA. These state-of-the-art ships are designed to be and touted by the builder and owner as the most environmentally friendly oil tankers ever built. The Alaskan Frontier's double hull has been designed for a life of 35 years and the deck structure has a life of 50 years, a robust configuration that is designed to perform at peak efficiency for decades in the rigors of the Gulf of Alaska's waters.

The diesel-electric propulsion system, with redundant engines, shafts and screws, significantly increases reliability and reduces air emissions and maintenance downtime. The ships also use seawater instead of oil to cool and lubricate their propeller shafts, thus eliminating

the possibility of accidental oil leaks. The ship's cargo piping, normally installed on the deck, is inside the cargo tanks to reduce the risk of small spills.

"NASSCO was acquired by General Dynamics in 1998 and they have invested more than \$120 million since then to improve our shipbuilding technologies and production efficiencies," said Richard Vortmann, NASSCO president. "BP is the first customer to fully benefit from this investment, and we are extremely proud of the ship we are delivering." The double-hull ships measure 941 x 164 ft. (287 x 50 m) and have a capacity of 1.3 million barrels of oil. The design of the tankers in the Alaska Class allows maximum flexibility for oil deliveries from Alaska to West Coast ports, including BP refineries in Los Angeles, Calif., and Cherry Point, Wash.

The four ships are scheduled to be delivered between now and the end of 2006. Once completed, the four BP ships will be operated by the Alaska

Tanker Company of Beaverton, Ore., which operates BP-chartered tankers used in the Alaska North Slope trade.

In September 2000, NASSCO received a \$630-million contract from BP for the construction of three state-of-the-art, double-hull tankers for the carriage of crude oil from Valdez, Alaska, to BP's U.S. West Coast refineries. In September 2001, BP exercised an option for a fourth ship and has options remaining for two additional ships. The ships will incorporate the latest proven technology in ship navigation and cargo and machinery control systems.

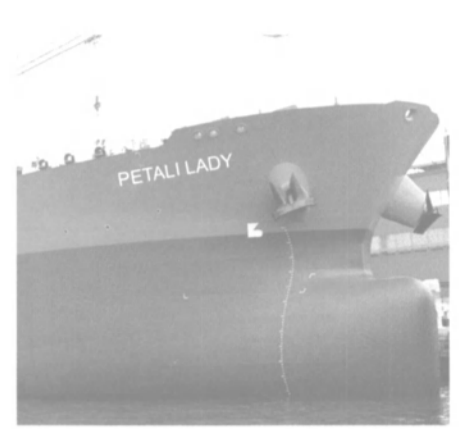
The new, 185,000 DWT double-hull ships will have a length of 941 ft. (287 m) and a beam of 164 ft. (50 m). Capacity will be approximately 1.3 million barrels at a design draft of 61.5 ft. (18.5 m). Construction on the first ship has begun and the ships will be delivered in 2004, 2005 and 2006.

Main Particulars

Length, o.a.	943.2 ft. (287.3 m)
Beam	164 ft. (50 m)
Depth	91.8 ft. (28 m)
Design Draft	61.7 ft. (18.8 m)
Speed at 85% MCR	15.3 knots
Cargo Capacity (98%)	1,300,000 bbls
Design Deadweight	185,000 MT
Design Displacement	220,966 MT
Lightship Weight	approx. 35,950 MT
Classification	ABS
Main engines	four (each) MAN B&W 6L48/60
Electric Propulsion	Alstom 6.6 kV system

Shipboard Automation

Power Management System for automatic control of electrical power generation and distribution
 Integrated alarm, control, and monitoring system for control and supervision of machinery, electrical, cargo, and ballast systems.



Ship Name Petali Lady
Ship Type Oil Tanker
Ship Owner Byzantine Maritime
Ship Builder STX Shipbuilding

Petali Lady has been built to endure 25 years fatigue life time with north Atlantic trading route of 12% (Ice class 1C) with a double hull forming common side and center double bottom water ballast tanks, and it has a cargo space divided into 15 tanks (six port + six starboard, two slop tanks and one residue tank) by a centerline and eight transverse bulkheads. The cargo space design is arranged for the carriage of crude oil fuel and clean petroleum products, with a specific gravity of 1.055 (tons/cu. m.) for filling up to 98% full and partial loading. Cargo is handled by two Framo pump 1500 cu. m./hr. each in pump room serving all the cargo tanks. Loading and discharging is accomplished through a deck manifold at midships P&S. All cargo tanks are fitted with stainless steel 316 heating coils that are arranged with three circuit for cargo oil tanks and two circuit for slop and residue tanks. Those thermal systems are capable to heat main cargo tank from 44°C to 66°C in 96 hours, slop and residue tank from 33°C to 66°C in 24 hours. For clean purposes, each tank is fitted with fixed nozzle appliances, capable of using either hot or cold sea/fresh water. Flow through method of ballast water exchange is adopted by using auto remote control valve system. All water ballast tanks are provided with Cu-Ni heating coil for anti-freezing due to Ice class. Petali Lady is fitted with a STX-MAN B&W, type 6S60MC-C direct reversible, single acting two stroke exhaust gas turbocharged and air cooled cross head diesel engine, with an output of SMCR 12,240 kW at 105 rpm and driving a fixed pitch propeller for a fully loaded service speed of 15.26 knots at 90% MCR with 15% sea margin.

Main Particulars

Flag	Liberia
Class	Lloyd's Register
Length, (o.a.)	748 ft. (228 m)
Length, (b.p.)	718.5 ft. (219 m)
Breadth, (molded)	105.7 ft. (32.24 m)
Depth, (molded)	66.9 ft. (20.4 m)
Draft, (designed)	40 ft. (12.22 m)
Draft, (scantling)	45.4 ft. (13.9 m)
GT	42,058
DWT, (at design draft)	60,579
DWT, (at scantling draft)	71,830
Speed	15.26 knots
Main engines	MAN B&W 6S60MC(MK6)
Total installed power	12,240 kW (16,680 bhp)
Propellers	FPP: Dia. 7.2 m
Generators	900 kw ~ 900 rev/min
Electronics	Saab (SF-control)
Radars	Furuno/2sets/FAR-2835S
Depth Sounders	Furuno, FE-700
Radios	Furuno
Auto Pilot	Yokogawa PT500A-J-N2
GPS	Furuno, DD-80
GMDSS	Furuno, RC-1800F
AIS	Furuno, FA-100
Weatherfax	Furuno, FAX-210
SatCom	Furuno
Complement	27 P + 6 Suez
Steering control	Rolls-Royce
Tank Capacities (100 percent full)	
Water Ballast Tanks	28,590.9 cu. m.
Heavy Fuel Oil Tanks	2,509.8 cu. m.
Diesel Oil Tanks	141.2 cu. m.

Name Azzura
Type Bulk Carrier - Handysize
Owner Cello Inc.
Builder IHI Marine United Inc.

IHI Marine United Inc. delivered the Azzura, a 52,000 DWT Handymax size bulk carrier, to Cello Inc. on June 30, 2004 at the Yokohama Shipyard. The Azzura is the first of a series of Future-52 type bulk carriers developed by IHIMU. The Azzura has the optimum dimensions to qualify for worldwide trade, and well-appointed fittings for easy operation and maintenance. The cargo holds have been strengthened for heavy cargo with holds Nos. 2 and 4 empty, and wide weathertight folding type hatch covers are fitted. Four deck cranes of 30t capacity are provided, and the deck cranes can be fitted with electro-hydraulic grabs as an option. The hold access complies with AWWF requirements.

Since 1967, IHI/IHIMU has delivered over 380 standardized multi-purpose cargo vessels, the well known F-series. The Freedom series, the first of the F-series, was highly evaluated for its excellent operating economy and reliability, and such high performance and evaluation were followed by its successors, the Fortune, Freedom Mark II, Friendship and Future series. The Future-52 was developed as a successor to the superior features of the well established Future series. The Future series has been particularly well evaluated for its operating efficiency from domestic and overseas owners, and the



Future-52 retains such good operating efficiency with the maximum deadweight in the Handymax size Future series.

Main Particulars

L (o.a.) x L (b.p.) x B x D x d	189.96m x 181.00m x 32.20m x 17.30 x 12.26m
DWT/GT	52,050/29,407t
Main Engine	DU-Sulzer 6RTA48TB diesel x1 unit
Output	
MCR	8,100kW x 118.0rpm
NOR	6,885kW at 111.8rpm
Speed, service	14.7 kt
Classification	NK
Complement	25



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Great Ships of 2004



Ship Name Methane Kari-Elin
Ship Type LNG Carrier
Ship Owner British Gas
Ship Builder Samsung Heavy Industries

Methane Kari-Elin is an oceangoing, single-screw steam turbine driven and suitable for the transportation of LNG under approximately atmospheric pressure at a temperature of -163°C with an operational life of at least 25 years. It has a continuous upper deck with aft sunken deck, a raked stem with bulbous bow, and a transom stern. The hull form, overall propulsion and power generation systems are designed for maximum propulsive efficiency and fuel economy. Accommodations including navigation bridge are located after part and under trunk deck passageways are provided port and starboard for access over the cargo tank length of the vessel.

The aft body of the ship with transom stern is used for the steering gear compartment, fresh water tank, distilled water tanks, aft peak ballast tank and

conventional rudder. The engine room is arranged to accommodate the main propulsion machinery, sufficient platform decks for the auxiliary machinery, engine control room, workshop and stores. The cargo area is of double decks, double hull, and cofferdams which are located at forward and after part of cargo area and between cargo tanks with double bottom construction, and consist of four center cargo tanks with the liquid domes and the gas pipe by GTT MARK-III cargo containment system for the carriage of LNG cargoes at cryogenic temperature (-163°C) and atmospheric pressure, and six pairs of wing and double bottom water ballast tanks. Fore peak tank for water ballast, forward water ballast tanks (P&S), fuel oil tank (C), fuel oil pump room, chain lockers, bow thruster room, emergency fire pump room and bosun store with rope stowage space are arranged at fore body. Two sets of jib cranes are provided after part of cargo manifold pipe lines near the midship for handling of mani-

fold and fittings with spares in a deck store. One combined foldable signal and radar mast on the top of wheelhouse to meet air draught requirement and one fore mast are fitted.

Main Particulars

Flag	Bermuda
Class	Lloyd's Register of Shipping
Length, (o.a.)	914.6 ft. (278.8 m)
Length, (b.p.)	872.7 ft. (266 m)
Breadth, (molded)	139.8 ft. (42.6 m)
Depth, (molded)	85.3 ft. (26 m)
Draft, (designed)	37.2 ft. (11.4 m)
Draft, (scantling)	39.4 ft. (12 m)
GT	93,410
DWT, (at design draft)	68,250
DWT, (at scantling draft)	74,000
Speed	20.1 knots
Accommodation	36 persons + 6 Crew
Main engines	Cross compound impulse steam turbine
Total installed power	39,500 shp (29,044 kW)
Propellers	FPP Dia. 8.25 m
Bow Thrusters	1 x 2,500 kW
Generators	1 x diesel-driven x 3,450 kW and 2 x steam turbine x 3,450 kW
Reduction gears	Kawasaki Integrated in main steam turbine
Deck machinery	Self-contained, high pressure, electro-hydr. type
Bearings	Self-aligned roller bearing
Cargo pumps	8 x 1,700 cu. m/hr x 155 mic
Cargo control system	Kongsberg Simrad, PS-400
Ballast control system	Kongsberg Simrad, PS-400
Radars	Kongsberg Norcontrol, DB 1028
Depth Sounders	Kongsberg Norcontrol, GDS-101
Radios	Kongsberg Norcontrol, HC4500
Auto Pilot	Kongsberg Norcontrol, AP 2000
GPS	Kongsberg Norcontrol, MX412B
GMDSS	Kongsberg Norcontrol, GMDSS 4000
AIS	Kongsberg Norcontrol, -
Weatherfax	Kongsberg Norcontrol, FAX-214
Plotters	Kongsberg Norcontrol, SEAMAP1021
SatCom 1 x SAT-B, 2 x SAT-C	Kongsberg Norcontrol, Satern Bm MK2, H2095C
Boilers	Kawasaki, UME 65/50, 2 x 65 tons/hr
Mooring equipment	2-Windlass, 7-Mooring winch, 20-Mooring drum
Fire extinguishing systems	High pressure CO2, Dry powder, Sea water & Fresh water
Fire detection system	Consilium Marine As, CS-3000
Motor starters	ABB
Tank Capacities (100 percent full)	138,200 cu. m.



Ship Name Everest Spirit
Ship Type Oil Carrier
Ship Owner Teekay Shipping
Ship Builder DSME

Everest Spirit is an Aframax crude oil carrier constructed by DSME, Okpo shipyard for Teekay Shipping Ltd. under the survey of Lloyd's Register of Shipping. The vessel was designed with three (3) longitudinal bulkheads including one (1) centerline bulkhead and transverse bulkheads to have six (6) pairs of cargo tanks, two slop tanks and wing and double bottom water ballast tanks for water ballast.

In careful consideration of the environmental protection, the heavy fuel oil storage tanks having a capacity of 3,000 cu. m. in engine room area were protected by the double hull structure.

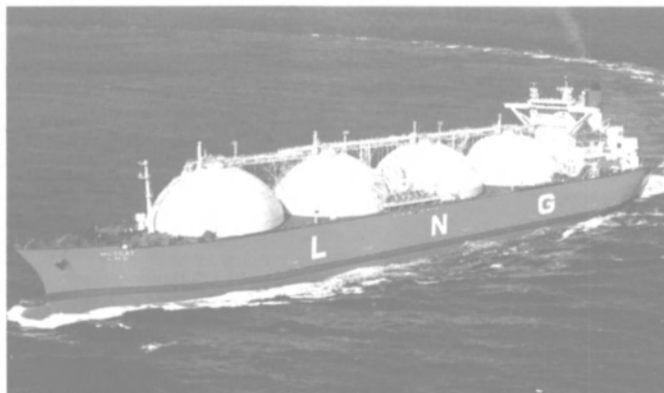
The vessel has designed and built to meet the classification notations of : +100A1, "Double Hull Oil Tanker", ESP, ShipRight(SDA, FDA, CM), LI, +LMC, UMS, IGS, *IWS, SPM with the descriptive notes of "PiHt, ETA, COW". The vessel has a continuous upper deck without forecastle, a raked stem with bulbous bow, a transom stern, a semi-balanced rudder and a fixed pitch propeller directly driven by a B&W 7S60MC engine with MCR output of 19,460 PS at 105 rpm. Design fatigue life of 30 years was applied for the longitudinal stiffener's end corrections to transverse webs/bulkheads in cargo area according to the requirement of LR FDA level II and all main longitudinal material in cargo area were suitably scarfed fore and after to ensure that all loads are transferred effectively. The vessel is capable of carrying and handing three (3) grade of crude oil simultaneously with double valve segregation and ballast piping system in the water ballast tank consist of glass reinforced plastic (GRP). The cargo and ballast system is controlled by the conventional central control console at separate cargo control room. Electric power generating plants consist of three(3) diesel generators and one(1) emergency generator. Exhaust gas emission from the main engine and aux. engine complied with the IMO NOx limit.

Ship Name Muscat LNG
Ship Type LNG Carrier
Ship Owner Oasis LNG Carrier S.A.
Ship Builder Kawasaki Shipbuilding Corporation

Kawasaki Shipbuilding Corporation has delivered Muscat LNG, an LNG carrier with a cargo capacity of 145,000 cu. m. LNG, to Oasis LNG Carrier S.A. of Panama.

The carrier is the second of the 145,000m³ type developed by Kawasaki and designed with the 10,000m³ larger capacity than the conventional 135,000m³ type carrier, although the ship dimensions are almost the same as the conventional type. Therefore, the carrier can visit many LNG terminal ports worldwide. Four LNG cargo tanks of independent spherical MOSS type are provided. The heat insulation is the Kawasaki panel system, which has a high heat insulation effect. The boil-off gas rate is maintained at about 0.15% per day by the system. The cargo tanks are installed inside the compartment built with double side shells and double bottom to ensure safety so that the cargo tanks are not damaged directly

The wheel-house is equipped with the advanced integrated navigation equipment, which has improved ship operation tasks. Windows around the wheel-house provide a panoramic view of 360 degrees, allowing one-man operation during ocean-going navigation. Cargo-handling operation is carried out at the cargo-handling room located in front of the accommodation quarters, where the Kawasaki IMCS (integrated



Management Control System) is installed for monitoring and control of cargo handling operation as well as monitoring engine conditions. The IMCS is very easy to use since it was developed by incorporating experience and opinions from many operators.

Main particulars

L (o.a.) x L (b.p.) x B x D x d:	289.50m x 277.00m x 49.00m x 27.00m x 11.90m
DWT/GT	77,351t/118,219t
Cargo tank capacity	145,494m ³
Main engine	Kawasaki UA-400 steam turbine x1 unit
MCR	26,900kW at 80 rpm
Speed, service	approx 19.5kt
Complement	45
Classification	NK
Completion	April 12, 2004

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SAMSUNG HEAVY INDUSTRIES

Great Ships of 2004



Ship Name Almarona
Ship Type LPG
Ship Owner Qatar Shipping
Ship Builder STX Shipbuilding

STX Shipbuilding officially broke into the LPG Tanker market with the delivery of Almarona, the first of two Vessels to Qatar Shipping, in May. This new optimized LPG Tanker has three pairs of cargo tanks and each cargo tank has two deepwell cargo pumps with the capacity to discharge the cargo in approximately 13 hours based on 98 percent of tank volume and density of 0.97 ton/cu. m., and cargo pump (6 sets x 350 cu. m./hr.) and ballast pump (2 sets x 600 cu. m./hr.) are fitted.

Almarona is designed primarily to carry the fully refrigerated liquefied gases into the tanks that are designed for a maximum density of 0.97 t/cu. m., a maximum vapor pressure of 0.25 bar

and lowest temperature of -48°C.

The STX-MAN B&W 6S50MC (MK6) installed in engine room developing 12,900 bhp full power at 127 rpm is intended to burn fuel of 380 cSt at 50°C.

This engine, which is well matched with STX designed propeller, produced a sea trial speed of 17.04 knots, 0.5 knots higher than guaranteed.

Free and forced vibration analyses were performed using a 3-D finite element model to investigate all the possible vibrations of the vessel. And the global vibration measurement during the sea trial was done in accordance to the stepwise RPM sweeping method as recommended in ISO 4867.

The electrical supply derived from three sets of main diesel generator produces 900 kW at 900 rpm each and one oil-fired composite boiler supplies

steam. The wheelhouse is equipped with a console incorporating navigation, control and alarm system. Cargo loading is monitored to ensure the ship's condition is within strength and stability criteria limits.

Accommodation is provided for a complement of 18 officers and six crew, plus six Suez crew in the aft superstructure with one set of gravity type lifeboat handled by fixed electric motor driven lifeboat winch.

Main Particulars	
Flag	Qatar
Class	DNV
Length, (o.a)	560.6 ft. (164.8 m)
Length, (b.p.)	509.5 ft. (155.3 m)
Breadth, (molded)	85.9 ft. (26.2 m)
Depth, (molded)	50.2 ft. (15.3 m)
Draft, (designed)	27.2 ft. (8.3 m)
Draft, (scantling)	27.8 ft. (8.5 m)
GT	17,357
DWT, (at design draft)	16,769
DWT, (at scantling draft)	17,446
Speed	17.04 knots
Main engines	MAN B&W 6S50MC(MK7)
Total installed power	12,900 bhp @ 127 rpm
Propellers	FPP
Cargo control system	Hydraulic Actuator, Computer Control
Ballast control system	Hydraulic Actuator, Mimic Control
Radars	JRC JMA-9832-SA, JMA-9822-XA
Auto Pilot	Tokimec
DGPS	JRC
SatCom	INMARST-B, MODEL
Mooring equipment	6 Sets
Fire detection system	Sarhcom
Heat exchangers	Plate Heat Exchanger
Steering control	Rotary Vane Type
Tank Capacities(100 percent full)	23,165.7 cu. m.
Water Ballast Tanks	8,694.4 cu. m.
Heavy Fuel Oil Tanks	1,201.4 cu. m.
Diesel Oil Tanks	209.4 cu. m.
Fresh Water Tanks	244.4 cu. m.

Ship Name Bilbao Knutsen
Ship Type LNG
Ship Owner Knutsen OAS/Repsol YPF
Ship Builder Izar Sestao

Izar Sestao delivered Bilbao Knutsen to Knutsen OAS, which will operate it for Repsol YPF. The ship has an LNG capacity of 138,000 cu. m. and it is the second ship with these characteristics built by the yard, following the FOC Inigo Tapias. The burgeoning gas carrier segment is a key market for Izar, which has ample technical and industrial capacity in Sestao and Puerto Real. There are two more LNGs under construction at Izar's Puerto Real shipyard. Bilbao Knutsen was launched in September 2002. The ship underwent sea trials in November and the gas trials in December, which consisted on the cooling, loading and unloading of the tanks. For this purpose 5,000 cu. m. of LNG from Bahia de Bizcaia were used.

Main Particulars	
Length	933 ft. (284.4 m)
Breadth	139 ft. (42.5 m)
Draught	37.3 ft. (11.38 m)
Depth	83.3 ft. (25.4 m)
Speed	19.5 knots
Crew	40

Propulsion 28,000 kW at 83 rpm generated by one Kawasaki-IZAR steam turbine, provided by IZAR's Turbine Factory. This factory, located in Ferrol, has also provided the condenser of the propulsion plant.

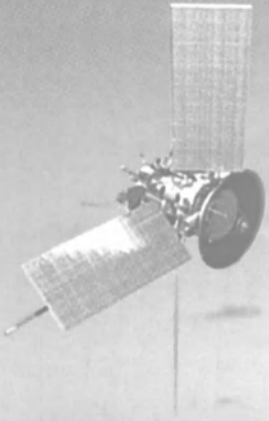


Ship Name CSCL EUROPE
Ship Type Container Vessel
Ship Owner SEASPAN
Ship Builder Samsung Heavy Industries

Main Particulars	
Flag	Cyprus
Class	LRS
Length, (o.a)	1096 ft. (334 m)
Length, (b.p.)	1046.5 ft. (319 m)
Breadth, (molded)	140.4 ft. (42.8 m)
Depth, (molded)	80.7 ft. (24.6 m)
Draft, (designed)	42.6 ft. (13 m)
Draft, (scantling)	47.5 ft. (14.5 m)
GT	90,645
DWT, (at design draft)	84,200 MT
DWT, (at scantling draft)	101,700 MT
Speed	25.2 knots
Accommodation	31 P + 6 Suez (30 Cabins)
Main engines	MAN B&W 12K98MC-C
Total installed power	93,120 bhp
Auxiliary engines	MAN B&W 6L32/40, 4 sets
Propellers	1 set x FPP
Bow Thrusters	1 set x 3,000 kW
Anti heeling system	1 set x 1,200 cu. m./hr, reversible type pump
Generators	4 sets x 2,700 kW
Engine controls	HKM, Bridge control
Deck machinery	Ele-hyd.(high pressure) type with auto tension
Ballast control system	Hyd. Valve control in ballast control console
Electronics	HKM, Alarm monitoring system
Radars	JRC, 2 radars, 2 ARPA, JMA-9932, JMA-9922
Depth Sounders	JRC, JEF-582
Radios	JRC, JH5-180
Auto Pilot	YOKOGAWA, PT500A-J-T2
GPS	JRC, 2 DGPS, JLR-7077MK2
GMDSS	JRC, A3
AIS	JRC, JH5-180
Weatherfax	JRC, JAX-9A
SatCom	JRC, INMARSAT-B, JUE-310B
Boilers	1 set, 5.5 ton/h x 7 bar, KANGRIM
Mooring equipment	Mooring winch (16 drums), fairlead, mooring chock
Fire extinguishing systems	CO2 for engine room / cargo hold
Fire detection system	Saracom-Thorn, Conventional
Motor starters	Samsung
Steering control	W/H and local
A/C	Central air conditioning system
Lifeboats	34 P, Conventional type
Liferafts	4 x 17 P + 1 x 6 P inflatable throw overboard type
Davits	Hinged gravity type lifeboat davit (ele. motor driven)
Firefighting	CO2, Local fire fighting for E/room, Sea water, Portable fire extinguishing
Tank Capacities (100% full)	
Water Ballast Tanks	25,200 cu. m.
Heavy Fuel Oil Tanks	10,700 cu. m.
Diesel Oil Tanks	560 cu. m.
Fresh Water Tanks	450 cu. m.

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Great Ships of 2004

CMA CGM Hugo: A 8,200 TEU Class Containership

The 8,200 TEU class containership CMA CGM HUGO built at Hyundai Heavy Industries (HHI) was delivered to Conti Reederei, Germany on July 29, 2004. The vessel is the first of five 8,200 teu container ships and has an overall

length of 1095 ft. (334 m), width of 140.4 ft. (42.8 m) and depth of 80.7 ft. (24.6 m) with a design draft of 42.6 ft. (13 m). She is powered by the powerful diesel engine, a Hyundai-B&W 12K98MC model, developing an NCR



of 84,020 bhp at 90.8 rpm which enables the ship to sail at a service speed of 26 knots with 15% S.M.

The Hyundai containership features a wider beam which ensures a better stability when loading and unloading at international container terminals. The vessel is also designed to have superior propulsion efficiency against the various draft that will be caused by loading scheme.

The vessel has nine holds, seven of which are arranged forward of the engine room (20 ft. container/30 bay) and 2 is backward (20 ft container/ 8 bay) and a maximum of 15 rows and 9 tiers of containers can be stowed in the holds. Two air changes per hour are provided to No.1-4, 8 & 9 hold in which dangerous cargoes of SOLAS classes 1.4S/2/3/4/5.1/6.1/8/9 can be carried. However, SOLAS class 1.4 dangerous cargo can be carried for No.2 hold.

The Hyundai containership is girderless type and can carry the maximum 15 rows in holds and 17 rows on deck of containers. Total TEU capacity is 8,238 of which 3,835 TEU in holds and 4,403 TEU on deck, with 700 FEU reefer sockets provided. Pontoon type hatch covers close the 9 holds.

Each hatch cover is made up of three panels with maximum panel weights kept below 41 tons to suit handling by port cranes. The vessel is arranged to carry 20 ft.; 40 ft.; 45 ft. containers. Cargo holds are provided with 40 ft. fixed cell guide that can load seven tiers of 20 ft. container.

The 45 ft. containers can be loaded directly on hatch cover No. 8F and 9F.

Athwartship lashing bridges for 40 ft. and 45 ft. containers are arranged with necessary fittings so that containers on hatch cover/stool on upper deck can be conveniently and securely lashed up to 4/5/6/7 tiers.

The Hyundai container ship is provided with both optimum section profile of rudder and tip-raked propeller to reduce the possible cavitation. For durability of outside shell, self-polishing paint of five-year life time and ICCP is applied to the vessel. The vessel is classed and registered as GL, +100A5, Container Ship, IW, SOLAS ?-2, Reg 19, +MC, AUT.

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Golar Viking, A 140,000 cu. m. Membrane LNG Carrier

Hyundai Heavy Industries Co., Ltd. (HHI) will deliver a 140,000 cu. m. LNG carrier to Golar LNG of Norway in December 2004. Golar Viking is 918 x 141 x 85 ft. (280 x 43 x 36 m) with a designed draft of 37.4 ft. (11.4 m). Equipped with four Mark membrane cargo tanks, the ship is of flush decker without forecastle and has a lowered mooring deck, transom stern and single screw propeller driven by a steam turbine. Golar Viking has a flat deck configuration. It gives easy access from the Central Control Room (C.C.R) situated just below wheelhouse, to the compressor room and to the trunk deck for easy survey, inspection & maintenance of the cargo piping and the electric cable. A shore manifold is provided on each side of the upper deck between Nos. 2 and 3 tanks. A compressor room is arranged on the starboard side on the upper deck above four tanks. Tank insulation is of GTT Mark system which has a 270 mm thick to satisfy the low boil off rate of 0.15 % by volume of the total cargo per day.

Cargo loading of the ship is performed by shore pump facilities after cargo tank is cooled down reach to the proper temperature previously. Generated vapor during loading is returned to shore by using high duty compressors on board. During loaded voyage, generated boil off gas is heated up and delivered to the main boilers as fuel gas by low duty compressors and boil off gas heater.

The cargo is discharged by electric motor driven submerged cargo pumps provided on the bottom of each cargo tank having capacity of 1,700 cu. m./hr. and supplement gas is received from shore or onboard LNG vaporizer in emergency during discharging operation to maintain cargo tank pressure.

The ship is provided with a emergency cargo pump



for emergency cargo discharge, in case of both two cargo pumps in a tank fail at a same time. During ballasted voyage, small amount of cargo heel will be left in the cargo tank for maintaining a cold condition with cool down of cargo tank.

Besides, a Central Control Room (C.C.R) which is arranged in the accommodation deck allows the centralized control of loading, discharging, ballasting, deballasting and continuous monitoring and control of the cargo handling system. Main propulsion machinery of the ship consists of a marine steam turbine driving a single propeller through double reduction gear and two(2) sets of main boilers of the gas/oil dual burning type. The engine room machinery is remotely controlled from the wheelhouse and C.C.R. Unmanned operation of the main engine is available during sea going.

Main Particulars

Shipbuilder	Hyundai Heavy Industries Co., Ltd.
Vessel's name	Golar Viking
Length o.a.	918 ft. (280 m)
Breadth molded	141 ft. (43 m)
Depth molded	85 ft. (26 m)
Draft designed	37.4 ft. (11.4 m)
Deadweight at design draft	70,000 t
Gross	93,750 ton
Displacement	109,400 ton
Ship's speed	19.7 knots
Flag	Marshall Island
Cargo Tanks	Four
Cargo Liquid volume	140,207 cu. m.
Heavy oil	5,660 cu. m.
Diesel oil	240 cu. m.
Water ballast (cu. m.)	56,170
Daily fuel consumption (tonnes/day) at NCR	
Fuel Oil Mode	174 ton/day
Dual fuel mode	F.O. 55.5 ton/day
B.O.G.	96.7 ton/day
Main propulsion	Hyundai Steam Turbine
Propeller	FPP Dia. 8.6 m

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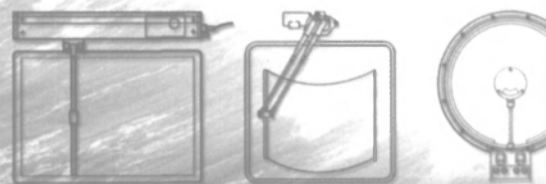
Heavy lift specialist Jumbo enters its heavy lift vessel MV "Jumbo Javelin" newbuild into service this week after having been mated with cranes successfully and passing final sea trials in the North Sea. With its 1,600 tons lift capacity, a hold space of 19,000 cu. m. and a main deck of 2,650 sq. m., MV Jumbo Javelin is without contest the largest heavy lift ship in its class in the world. She is the first in a series of two new ships ordered by Jumbo. MV "Jumbo Javelin" will be joined by its twin sister vessel MV Fairpartner in September. The ships will boost the Jumbo fleet to a total of 12 units. On its commercial maiden

voyage Jumbo Javelin will load a combination of power plant material and petrochemical equipment from Dutch and Italian ports for destinations in Bahrain, Qatar and Iran. The heaviest cargo item is a reactor column - weighing 620 tons weight and measuring 61.06 x 9.736 x 9.878 m - destined for the styrene monomer plant of the ninth olefin project in Bandar Assaluyeh, Iran.



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Maersk Durban: Innovative Panamax Containership



Main Particulars	
Length, (o.a)	964.7 ft. (294 m)
Length, (b.p.)	928.4 ft. (283 m)
Breadth, (molded)	105.6 ft. (32.2 m)
Depth, (molded)	70.8 ft. (21.6 m)
Draft, (designed)	39.4 ft. (12 m)
Draft, (scantling)	44.3 ft. (13.5 m)
DWT (at design draft)	55150 ton
DWT (at scantling draft)	67550 ton
Speed	23 knots at 90% MCR
Accommodation	MAN B&W 9K90MC-C
Main engines	MAN B&W 9K90MC-C
Total installed power	41,130 kW (55,890ps)
Bow Thrusters	KAWASAKI
Generators	HYUNDAI
Engine controls	NORCONTROL BMS
Bearings	Blohm + Voss
Coatings	JOTUN
Ballast control system	Garbarino
Radars	FURUNO
Depth Sounders	FURUNO, FE-700
Auto Pilot	EMRI, FAP-2000
GPS	FURUNO, DD-90 2sets
GMDSS	FURUNO, A3 AREA GMDSS
Weatherfax, VDR, AIS	FURUNO
SatCom	FURUNO
Classification	GL
Boilers	KANGRIM KOREA
Mooring equipment	TOWIMOR
Passengers	29 + 6(SUEZ CREW)
Fire extinguishing systems	HYGRAPHIA
Fire detection system	SARACOM / THORN
Heat exchangers	GEA
Motor starters	HYUNDAI
Bearing	JMT
Lifeboats	FR. FASSMER
Liferafts	DSB Limited

Maersk Durban (Jennifer Rickmers) is the series vessel adopting a new panamax length design of 964.7 ft. (294 m). Hanjin has developed and designed the vessel themselves, and have attracted orders 32 units, making it one of the most popular design in its class.

The ship has been designed to move flexibly both in the Pacific and Atlantic Oceans through the Panama Canal. This ship offers the maximum intake of 5,060

TEU, the largest intake capacity among the Panamax class container ships at present. It is composed of six holds, each capable of holding 1 stacks of hi-cube containers and also equipped with cell guides exclusively for 40 ft. containers together with fittings for the 20 ft. container, which enhances loading flexibility. On deck it is even more flexible due to the loading ability of 20/40/45 ft. containers including sepa-

rate loading facility for special cargoes like dangerous cargoes and 454 refrigerated FEU.

The accommodation is equipped with convenient facilities for a total of 35 person including accommodation for 6 Suez-canal crews. Recent sea trials show a marked reduction in noise and vibration levels. An HSD-built MAN B&W 9K90MC-C has been mounted, providing a trial speed of 23 knots when

operating at 15% sea margin (90% MCR) at the scantling draft of 13.5 m.

Needless to say, the supply material and accessory features are arranged based on the environment-friendly design. The major machineries and electronics are the ones whose performance has been verified through plenty of testing periods for the easy operations and also has been selected among the makers familiar to the operators.



Ardenne Venture, A 318,000 DWT VLCC

The 318,000 dwt VLCC Ardenne Venture built at Hyundai Heavy Industries Co., Ltd. (HHI) was delivered to Wah Kwong Shipping, Hong Kong on September 8, 2004.

The ship has one continuous freeboard deck from stem to stern with sunken deck-type stern deck, transverse bulkheads and four longitudinal bulkheads in way of the cargo space. Special attention has been paid to the ship's maneuverability resulting in a large rudder being fitted.

Ardenne Venture is designed to carry three grades of cargo simultaneously, handled by three steam turbine cargo pumps, each delivering 5,000 cu. m./hr. and housed in a pump room at the forward of engine room. The cargo and ballast valve's control systems are hydraulic medium pressure.

The cargo and ballast control systems of the ship are

electro-hydraulically operated. Cargo control and monitoring covers ullage measurement, operation of pumps, inert gas systems with manual control also available. Radar beam type level gauges have been fitted to cargo tanks, with electro pneumatic type level gauges used in the ballast tanks.

The ship to have five center cargo oil tanks, five pairs of side cargo oil tanks, one pair of slop tanks and water ballast tanks surrounding cargo oil tanks to be arranged. Double bottom and double hull construction to be arranged throughout cargo oil tanks with longitudinal framing.

The vessel has an overall length of 1092 ft. (333 m), width of 196.8 ft. (60 m) and depth of 99.7 ft. (30.4 m) with a design draft of 68.9 ft. (21 m). She is powered by a Hyundai-B&W 6S90MC-C main engine with an MCR output of 29,340 kW at 76 rpm, enabling her to sail at a service speed of 16.1 knots. Electric power is supplied by three main diesel generators with an output

Great Ships of 2004

of 1,170 kW at 720 rpm and one 250 kW emergency generator. The Ship is classed by BV, I +HULL +MACH, Oil Tanker ESP, unrestricted navigation, Veristar hull, SPM AUT-MS.

Main Particulars	
Owner/Operator	Wah Kwong Shipping
Shipbuilder	Hyundai Heavy Industries Co., Ltd.
Length o.a.	1092 ft. (333 m)
Breadth (molded)	196.8 ft. (60 m)
Depth (molded)	99.7 ft. (30.4 m)
Scantling draft (molded)	73.8 ft. (22.5 m)
Design draft (molded)	68.9 ft. (21 m)
Flag	Hong Kong
Gross: 161,045	
Cargo Liquid volume	353,483
Water ballast (cu. m.)	103,549
Daily fuel consumption (tonnes/day)	
Main engine only	: Abt. 104.7 ton/day

Auxiliaries	: Abt. 4.3 for one at normal seagoing condition
Classification	BV
% high-tensile steel used in construction	: about 35%
Main engine	Hyundai-B&W 6S90MC-C
Output of each engine	29,340 kW x 76 rpm at MCR
Propeller	FPP Dia. 10 m
Exhaust-gas scrubbing equipment	Kangrim
Boiler	Aalborg Industries
Cargo pumps	Shinko
Cargo control	Danfoss
Bridge control	Nabco
Fire detection	Saracom-Thorn
Radars	JRC

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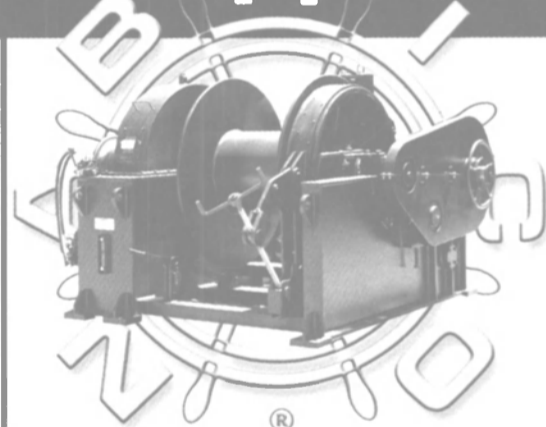
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Ship Name Monte Cervantes
Ship Type Container Ship
Ship Owner Hamburg-Süd
Ship Builder DSME

Monte Cervantes is a containership constructed by DSME, Okpo Shipyard for Hamburg-Süd under the survey of Germanischer Lloyd.

The vessel has a fully welded upper deck with fore-castle, aft sunken deck, a raked stem with bulbous bow, a transom stern with open water type stern frame, a semi-balanced rudder and a fixed pitch propeller directly driven by a slow speed diesel engine.

The vessel has been built generally as double skinned construction in way of cargo holds and arranged with 7 cargo holds. The number of containers with 14 tons is 4,000 TEU at the scantling draft. The Vessel has been designed and built to meet the Classification Notations of : 100 A5 E, "Container Ship". IW, +MC E, AUT, RCP 1085/25, "SOLAS II-2, Reg.19.

The cargo holds are equipped with cell guides and support structure for the carriage of 40 ft ISO containers, 14 rows and 8 tiers of 9.5 ft. high containers in general. All the stringers and container platforms in cargo area has been designed based on a container height of 9.5 ft. The cell guide structure and strength have been designed to permit flexible stowage of containers of different height (8 ft 6 inch and 9 ft 6 inch) in every composition.



Loading of 20 ft containers up to 7 tiers above inner bottom has been considered in the 40 ft cell guide.

A total 1,365 electric receptacles for refrigerated containers (665 in holds and 700 on deck) has been arranged. One (1) access gastight steel door has been fitted on longitudinal bulkhead at transverse box gird-

er in way of each reefer bay. Total stack load on each hatch cover is 120 metric tons for 40ft and 100 metric tons for 20ft containers. For block stowage, total stack load on each hatch cover shall be 68.5 metric tons. Electric power generating plant is consist of four(4) diesel generators and one(1) emergency generator.

Ship Name Minerva Lisa
Ship Type Crude Oil Tanker
Ship Owner Minerva Marine
Ship Builder Samsung Heavy Industries

Minerva Lisa is the fourth vessel of Minerva 105,000 DWT Crude Oil Tanker series. The vessel is built according to ABS Ice Rule and granted the qualification of Ice 1A for Hull and Ice IC for Propulsion by ABS.

Main Particulars

Flag	Greek
Class	ABS
Length, (o.a)	798.9 ft. (243.5 m)
Length, (b.p.)	764.4 ft. (233 m)
Breadth, (molded)	137.8 ft. (42 m)
Depth, (molded)	69.9 ft. (21.3 m)
Draft, (designed)	44.6 ft. (13.6 m)
Draft, (scantling)	48.6 ft. (14.8 m)
GT	58,156
DWT, (at design draft)	93,209 MT
DWT, (at scantling draft)	103,755 MT
Speed	15.45 kts
Accommodation	5Tiers (29+1P)
Main engines	HSD MAN B&W 7S60MC License made
Total installed power	14,280 kW
Auxiliary engines	MAN B&W 6L21/31, 3sets
Propellers	FPP, 4 blades
Bow Thrusters	Brunvoll (1,500 kW)
Generators	Hyundai (HFC6 564-84K-HSD, 1225KVA, 900 rpm)
Engine controls	KMK-Norcontrol
Deck machinery	8-Mooring winches (20MTx15m/min)
Coatings	Sigma
Cargo control system, Ballast control system	Shinko
Radars	3, JRC/JMA-9833-SA, JMA-9823/2-7XA
Depth Sounders, Radios, GPS	JRC/JFE-582
Auto Pilot	TOKIMEC/PR-6531A-DT-SS2
GMDSS, AIS, Weatherfax, Plotters, Satcom	JRC
Fire detection system	Consolium Marine AS/NSAC-1
Motor starters	Samsung Heavy Industries

Tank Capacities (100% full)

Water Ballast Tanks	40,000 cu. m.
Heavy Fuel Oil Tanks	3,670 cu. m.
Diesel Oil Tanks	160 cu. m.
Fresh Water Tanks	430 cu. m.

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Great Ships of 2004

Ship Name High Endeavour
Ship Type Oil/Chem Tanker
Ship Owner D'Amico Societa Di Navigazione SPA
Ship Builder STX Shipbuilding

STX Shipbuilding developed an advanced 47K tanker with nine cargo segregations for the purpose of handling diverse cargoes, and delivered High Endeavour to the d'Amico Soc. Di Navigazione S.P.A in Italy in September. The design is single-decked with forecastle, and features a double hull. This contains a cargo space divided into seven pairs of tanks, and the center and transverse bulkheads on stools are corrugated, and no structural obstacles inside of cargo tank. With side stiffening included in the double hull space, and deck beams arranged externally on top of the cambered deck, the tanks present a flush internal surface.

Two slop tanks, residual tank and a heavy fuel bunker are positioned between the cargo tanks and the engine room, and the side and bottom in the double hull are given over to water ballast.

High Endeavour is designed primarily to carry crude oil, oil products and IMO Type II & III chemicals. More than 330 commodities, including sodium hydroxide solution, can be loaded in cargo tanks which are coated with 300 microns of phenolic epoxy.

The piping system is designed for nine cargo segregations, with ten cargo holds



connected with a Frank Mohn (Framo) hydraulic motor driven, submerged pump rated at 600 cu. m./hr. Four cargo tanks and two slop tanks are provided and served by six 300 cu. m./hr. pumps. Water ballast capacity is 24,050 cu. m., carried in tanks coated with a light colored tar free epoxy, and handled by two Frank Mohn 750 cu. m./hr. hydraulic pumps.

And each ballast tank has overflow line for Ballast Exchange which is operated by auto remote control valve system. An STX MAN B&W 6S50MC-C Mk 7 main engine is fitted, developing 12,900 bhp full power at 127 rpm and

running at an NCR (85% MCR) of 10,960 bhp x 120.3 rpm to drive STX designed FP propeller for a service speed of 15 knots, allowing a 15% sea margin.

A Kawasaki 950 kW bow thruster and Becker rudder are fitted and are designed to give the vessel excellent maneuverability with MANOVR notation. Three sets of MAN B&W Holeby diesel-driven alternators powered by STX built diesel engines supply the electrical power. The steam is generated by an 18,000 kg/hr. Kangrim oil-fired boiler, and a 1,200 kg/hr. composite boiler. Control can be effected from

either engine control room or wheelhouse using a STX/HKM bridge control system. Accommodation is provided in the after deckhouse for 11 officers and 14 crew, with six additional berths for a Suez Canal riding crew, served with two sets of gravity type lifeboat handled by fixed electric motor driven lifeboat winch.

Main Particulars

Flag	Liberia
Class	BV
Length, (o.a)	600 ft. (183 m)
Length, (b.p.)	570.5 ft. (173.9 m)
Breadth, (molded)	105.6 ft. (32.2 m)
Depth, (molded)	62.6 ft. (19.1 m)
Draft, (designed)	36 ft. (11 m)
Draft, (scantling)	40.8 ft. (12.4 m)
GT	30,028
DWT, (at design draft)	39,625
DWT, (at scantling draft)	46,992
Speed	15.3 knots
Main engines	STX MAN B&W 6S50MC(MK7)
Total installed power	12,900 bhp @ 127 rpm
Auxiliary engines	STX MAN B&W Holeby 6L23/30H
Bow Thrusters	Kawasaki
Generators	STX Cummins
Engine controls	KTE
Coatings	Tar Free Epoxy A/C. Phenolic Epoxy
Radars	ARPA 343/12(S-BAND). ARPA 342/8(X-BAND)
Depth Sounders	Telemar ES 5000
Radios	Telemar
Auto Pilot	Telemar V HSC/G-TMC
DGPS	Telemar LMX420
GMDSS	Telemar
AIS	Telemar KDU 1905
Weatherfax	Telemar JAX-9A
SatCom	INMARSAT-B, INMARSAT-C
Fire detection system	Sarheom
Tank Capacities (100 percent full)	54,458 cu. m.
Water Ballast Tanks including peak tanks	24,050 cu. m.
Heavy Fuel Oil Tanks	1,344 cu. m.
Diesel Oil Tanks	183 cu. m.
Fresh Water Tanks	411 cu. m.

Ship Name Polar Viking
Ship Type LPG
Ship Owners Hydroship AS
Shipbuilder Hyundai Heavy Industries Co., Ltd.

Polar Viking is a 60,000 cu. m. LPG carrier, a fully-refrigerated type with a cargo space divided into four individual holds to suit four prismatic cargo tanks was delivered in October 2004 to Hydroship AS, Norway by Hyundai shipyard. The 60,000cu. m. LPG carrier vessel has an overall length of 672 ft. (204.9 m), width of 105.6 ft. (32.2 m) and depth of 68.2 ft. (20.8 m) with a design draft of 35.4 ft. (10.8 m). The vessels is powered by a B&W 5S60MC-C main engine with a NCR output of 11,900 bhp at 94.6 rpm, enabling it to sail at a service speed of 16 knots with 15% sea margin. Electrical supply is derived from three diesel driven alternators of 1,200 kW, plus an emergency unit of 130 kW. Polar Viking has a cargo space divided into four cargo holds. And each hold accommodates a free-standing and saddle supported prismatic cargo tank, designed for a maximum vapor pressure of 0.25 bars g. and a lowest

temperature -48. Cargo tanks are insulated with 120mm thick rigid polyurethane foam clad with 0.5 mm aluzink steel sheeting.

The LPG carrier is able to carry two cargoes simultaneously, one of which may be refrigerated. Cargoes which can be carried include anhydrous ammonia, butadiene, butane (ISO and normal), butylene, 1,3-propane, commercial propane (max 3.0 mole % ethane in the



liquid phase) and propylene.

A reliquefaction plant of the carrier can handle two compatible cargo grades simultaneously and major equipments such as four oil free, two stage cargo compressors and motors are located on main deck level in sheltered spaces.

One cargo heater (combined with condenser) and inert gas generator is provided. Three 1,200 kW diesel generators, one auxiliary boiler (3,000 kg/hr)

and one exhaust gas economizer(1,500 kg/hr) are provided.

Polar Viking, is capable of carrying other products, provided that their toxicity, aggressiveness, pressure, temperature and specific gravity are within the limits of the design.

Main Particulars

Length, o.a.	672 ft. (204.9 m)
Length b.p.	639.7 ft. (195 m)
Breadth molded	105.6 ft. (32.2 m)
Depth molded	68.2 ft. (20.8 m)
Draft designed	35.4 ft. (10.8 m)
Draft scantling	39 ft. (11.9 m)
Main engine	Hyundai-B&W 5S60MC-C
Output MCR	13,220 bhp x 105 rpm
Flag	Liberia
Scantling	42,700 mt
Design	36,500 mt
Speed	16 knots at 11,900 bhp @ 94.6 rpm
Cargo volumen	60,000 cu. m.
Heavy oil	2,000 cu. m.
Diesel oil	200 cu. m.
Water ballast	16,900 cu. m.
Daily fuel consumption (tonnes/day)	
Main engine only	34.76
Classification	GL
% High Tensile Steel	16%
Propeller	FPP 6.7 m
Boilers	Kangrim
Cargo pumps	Hamworthy
Ballast control	Danfoss Marine System
Bridge control	Norcontrol
Fire detection	Consilium
Radars	Furuno
Integrated bridge system	Transas
Sewage plant	Hamworthy

Meeting the Ballast Water Challenge

Increasingly, environmental demands from governments and groups - large and small - will continue to shape the way in which the marine business is conducted. Pressure on ship and boat owners to keep the waters in which they work as pristine as possible has been building for years, but has built even more steam in recent months with a rash of cases involving illegal dumping of oily bilge water in coastal waters.

Deserved or not, the maritime industry has become a visible target, and astute owners will invest in the technologies now to keep ships and boats running clean for years to come.

At the SMM 2004 exhibition in Hamburg, Germany, Alfa Laval, a leader in separation, heat transfer and freshwater generation, announced its broadened offering of solutions for environmental protection, dubbed "Pure Thinking." The highlight of a company presentation was the announcement that a new, "potent technology" for dealing with unwanted organisms in ballast water - a technology created in cooperation with Swedish company Benrad AB and is based on the patented Benrad AOT (advanced oxidation technology) - is already in full-scale trials aboard a Wallenius

species in the ballast water of ships has caused a wide range of environmental and economic catastrophes, and solutions has been a pressing issue for years. While local legislation already exists in some areas, future international regulations soon to be put in effect will demand certified solutions to the ballast water problem. The IMO convention adopted in 2004 will require ships constructed in 2009 or later to meet ballast water treatment standards. By 2014, existing ships must also start to meet these standards. Though IMO has not yet finalized the test procedures required for certification, indications are that many of the technologies currently proposed or being researched will be unlikely to comply. Besides being well suited to the marine environment, any control measure must meet a number of criteria for biological effectiveness, safety, environmental acceptance and cost efficiency.

Additional challenges lie in creating a treatment system that not only meets the proposed standards, but which is also easy to integrate and ready for shipboard use. Alfa Laval conducted extensive pre-study interviews with shipbuilders and ship operators.

Among the interviewees was Wallenius Marine, a

later," explains Croner. "But if this system fails, you are not welcome to load or unload in any port."

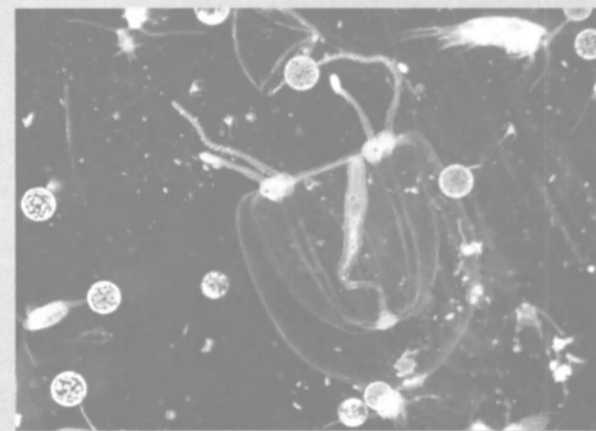
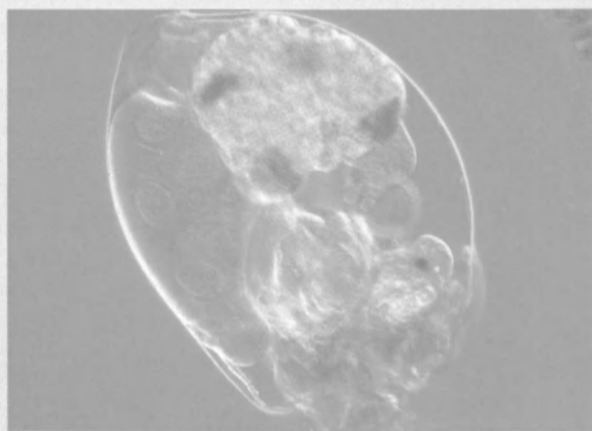
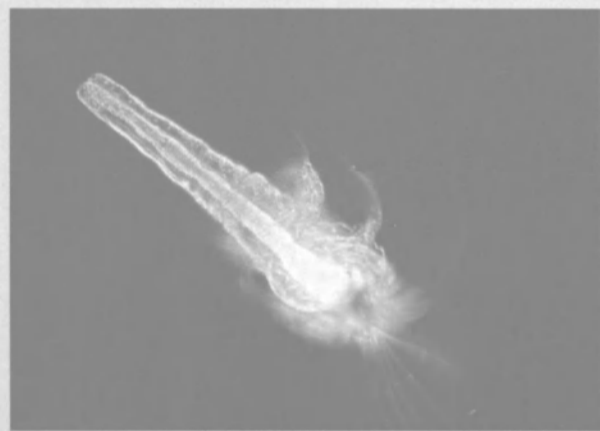
Alfa Laval's ballast water treatment system consists of two distinct stages. The first is a pre-treatment stage, while the second is the patented Benrad AOT (advanced oxidation technology) which is the heart of the system. Benrad AOT is a technology developed by Benrad AB, a Swedish company with whom Alfa Laval has a cooperation agreement.

Benrad AOT differs substantially from traditional UV (ultraviolet) technology, even though UV light is one of its components. In traditional UV technology, microorganisms are exposed to strong UV rays, which in most cases leads to the destruction of the DNA.

Benrad AOT uses a lower amount of a special UV light wavelength in combination with catalysts to generate hydroxyl radicals, which effectively destroy the microorganism by breaking down the cell membrane.

Despite the advanced science behind Benrad AOT, the Alfa Laval system is touted as being robust and well prepared for the harsh practicalities of the marine environment. During ballasting, water passes through a pre-filter to remove any larger particles and organ-

The Culprits: From Left *Artemia Salina*, Rotatoria and Zooplankton



Marine transoceanic carrier and will be commercially available as early as 2006.

In addition to its ballast water system, the company is targeting two other areas for the push: Bilge cleaning, where it already offers the EcoStream solution; and Crankcase gas cleaning, where a product is under development. "As with all new technologies," said **Peter Carlberg**, General Manager of Alfa Laval Marine and Diesel, "There will be a lot of challenges over the next 10 years or so. Both working and non-working solutions are going to reach the market, so ship owners need to know that the solution they purchase rests on a solid foundation of knowledge and support."

When it comes to ballast water treatment, the challenges of onboard installations have been taken into account when setting the commercial launch for 2006. A full-scale installation of the solution was made aboard a transoceanic car and truck carrier in autumn 2003. The test system, retrofitted while the vessel was in full operation, is integrated with the ship's ordinary ballast system and can be operated during ballasting and deballasting.

The Problem

The transport of microorganisms and even larger

company that has chosen to stay at the forefront by playing an active role in the development of marine environmental equipment. "For us and many other ship owners who have an environmental focus and are strong believers in really looking at long-term operating economy, the fulfilment of basic demands is only a start," says **Per Croner**, president for Wallenius Marine. Among the projects Wallenius Marine has been involved in was the EU-funded MARTOB Project, administrated by Newcastle University, whose goal was to evaluate different ballast water treatment solutions.

"We conducted tests aboard our vessels as a part of the project and evaluated heat exchanger and chemical solutions for ballast water treatment," says Croner. "Given the results I have seen from the MARTOB project, I believe the AOT solution is the most potent one. A reliable solution with good operating economy and no environmental side effects."

As shown by Alfa Laval's pre-study, operators and ship owners like Wallenius Marine are also concerned about reliability, since a failure of the ballast water treatment system would make entering port to load or unload impossible. "If the bilge water system fails, you can keep the dirty water in your tanks and deal with it

isms. The water then continues to the Benrad AOT unit, which produces free radicals that effectively break down any organisms which have passed the filter. Sediment buildup in the ballasting tanks is avoided thanks to the pre-filter stage, and any backflushing water is returned to the ocean directly at the ballasting site. During deballasting, water passes the Benrad AOT unit in order to kill any organisms that might have regrown in the tanks during voyage. The filter, on the other hand, is bypassed, leaving no unwanted residuals on board the ship, so as not to produce or discharge any backflushing water.

This way there is no risk of contamination at the deballasting site. Onshore efficiency studies of the solution have been conducted using natural communities of seawater plankton and laboratory-generated algal cultures. The treatment efficiencies measured have been higher than 99% for natural plankton after a storage period. These results, backed up by full-scale studies at sea and combined with the principle of treating water during both ballasting and deballasting, ensure that the system has every ability to meet future IMO requirements and stop the spread of unwanted species.

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www.landseasystems.com
Tara Bair
tel: 757-463-9557 - fax: 757-463-9581
email: writes@ttdk.com
Products: Maritime Inmarsat Fleet Communication Systems, Landmobile Inmarsat Communication Systems, Aeronautical Inmarsat Communication Systems

TUFF Coat Manufacturing, Inc.
2065 E. Main Street, Suite C, Montrose, CO 81401
www.ultratuff.net
Bill Duffie
tel: 877-252-9457 - fax: 970-240-8963
email: utwest@frontier.net
Products: Ultra TUFF water based Non-skid Safety Coatings

UE Systems, Inc.
14 Hayes Street, Elmsford, NY 10523
www.uesystems.com
Alan Bandes
tel: 9145921220 - fax: 9143472181
email: info@uesystems.com
Products: Ultrasonic leak detection, hatch testing, water tightness leak testing, mechanical inspection, bearing testing

VingCard Marine
Rabekkgaten 5, MOSS, N-1522 Norway
www.vingcardmarine.com
Karen E.R. Mathisen
tel: +47 69 24 54 02 - fax: +47 69 24 54 50
email: marine@vingcard.com
Products: Locking systems

Worthington Products, Inc.
3411 Middlebranch Ave NE, Canton, OH 44705
www.tuftboom.com
Paul Meeks
tel: 330-452-7400 - fax: 330-452-7495
email: pmeeks@tuftboom.com
Products: Port Security Barriers, Buoys, Float Lines, Safety Booms

Zistos Corporation
55A Kennedy Drive, Hauppauge, NY 11788
www.zistos.com
Bob Levine
tel: 631-434-1370 - fax: 631-434-9104
email: rlevine@zistos.com
Products: The Walkabout is a modular, portable video inspection system with submersible cameras for security/inspection

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Circle 223 on Reader Service Card

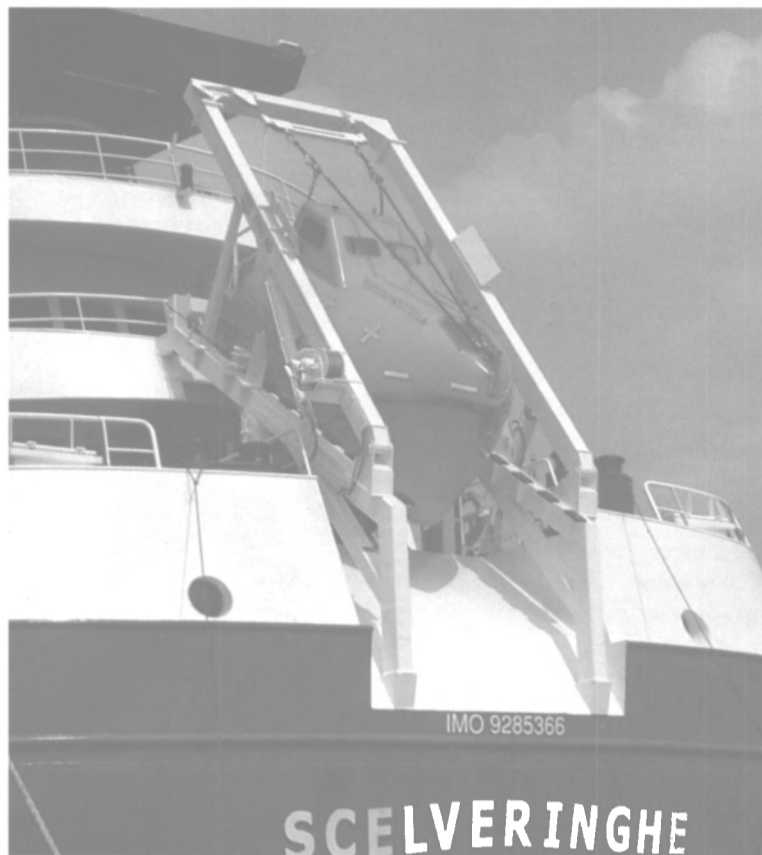
NorMar Introduced

Norwegian Maritime Equipment AS has developed a new, complete program of lifeboats and rescueboats. The program is currently introduced to the market under the brand name NorMar, and embraces a full scope of enclosed lifeboats, free-fall lifeboats, semi-enclosed lifeboats and rescueboats. Enclosed lifeboats: Included in the program are enclosed lifeboats of a variety of sizes, from 5 m to 9.35 m. The capacity varies from 22 to 102 persons. These boats comes in cargo as well as tanker versions. Standard propulsion is Bukh diesel, but other engine makes are optional.

- Free-fall lifeboats: Also free-fall lifeboats can be delivered in many sizes, from 4.9m to 8.5m and corresponding capacities from 19 to 48 persons. The drop height can be as much as 25m. The free-fall lifeboats comes in both cargo and tanker versions, and can be delivered with a number of engine options. Standard engine is Bukh.
- Semi-enclosed lifeboats: The program also includes semi-enclosed lifeboats with capacity from 45 to 150 persons, and corresponding lengths from 7.5m to 9.6m. Bukh propulsion is standard, but other makes are optional.
- Rescueboats: NorMar's scope of rescueboats consists of a number of versions with capacity from six to 15 persons and lengths from 4.25m to 7.5m. The rescueboats are equipped with either outboard motors or inboard engine with waterjet.

Over the last couple of years Norwegian Maritime Equipment AS has had a steady increase in the deliveries of life-saving equipment, e. g. provided many ship owners and major offshore companies like Bergesen, IUM, AGIP, Singel Buoy Mornings ans Stolt Offshore with complete life-saving packages.

Circle 28 on Reader Service Card



Hazardous Area Multi-color Status Indicator

Federal Signal offer a new model of its multi-color, shingle high status indicator, UniStat, to accommodate Hazardous Area and Type 4X applications. Using LED technology, it can produce up to four colors from a single light source: amber, blue, green and red; while offering vibration resistance and 100,000 hours of service from the lights.



Circle 3 on Reader Service Card

Schat-Harding Books Strong Year

Schat-Harding, a maker of lifeboats and davits, reported a strong orderbook in the third quarter of 2004, with orders totaling \$16 million booked, driven by strong demand from passenger ships, offshore rigs, LNG and ice-class tankers and naval vessels.

Key passenger ship orders included six CTL38 cruise tenders and 14 MPC32 compact cruise lifeboats with PD davits for two MSC newbuildings at Chantiers de l'Atlantique, eight MPC32 boats and VIP davits for a series of RoPax building at Italy's Visenti yard, and two MPC32 boats with davits for the lengthening of the RCCL Enchantment of the Seas. Offshore orders included two KISS800 systems

for the Atwood Beacon rig, four KISS boats and davits for Pemex and two MCB 600 boats for the Dolphin Energy project. Specialist orders include four MCB28 boats and davits for a Russian icebreaker and four KISS700 boats and davits for two icebreakers to be built at Norway's Havyard Leirvik and two MCB24 boats for the LNG carrier building for Kristen Navigation at Korea's Daewoo yard. The Portuguese navy has also ordered Schat-Harding davits for its 10-ship Offshore Patrol Vessel series.

Circle 35 on Reader Service Card

Thrane & Thrane Launches 128 KBPS

Thrane & Thrane is launched a new and enhanced feature for the maritime Fleet77 products: a 128 kbps ISDN

capability that effectively doubles the data speed on the Fleet77 systems. Thrane & Thrane expects this enhancement - a single, dedicated 128 kbps ISDN channel - to be available on all existing Fleet77 systems during Q1 2005. The upgrade will provide users at sea with a single, integrated terminal platform delivering 128 kbps mobile ISDN data and up to 64 kbps Mobile Packet Data Service (MPDS) capabilities, as well as voice and Group 3 & 4 fax services. The 128 kbps ISDN combined with the MPDS always on capacity will enable customers with high traffic volumes and those requiring higher data rates to achieve the optimal, cost efficient "office at sea".

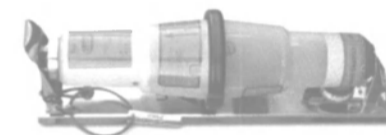
Circle 12 on Reader Service Card



Stearns Acquires SOS and Sospenders

Stearns Inc., a manufacturer of Personal Flotation Devices (PFD's) acquired SOS and Sospenders, a market leader in inflatable PFD's for a variety of water sports uses. According to Paul Ebnet, President of Stearns, "Sospenders products offer an excellent opportunity for Stearns to expand our presence in the fast-growing inflatable PFD market and provide us with additional opportunities for our current and new customers alike. With the increasing focus on comfort by water sports enthusiasts, Sospenders is a great fit for Stearns. Both Stearns and Sospenders have a long history of producing innovative products with the safety and comfort of boaters in mind."

Circle 37 on Reader Service Card



Kongsberg Launches Simplified VDR

Kongsberg Maritime launched a Simplified Voyage Data Recorder (S-VDR) designed to provide simple and cost effective retrofitting to meet IMO regulations.

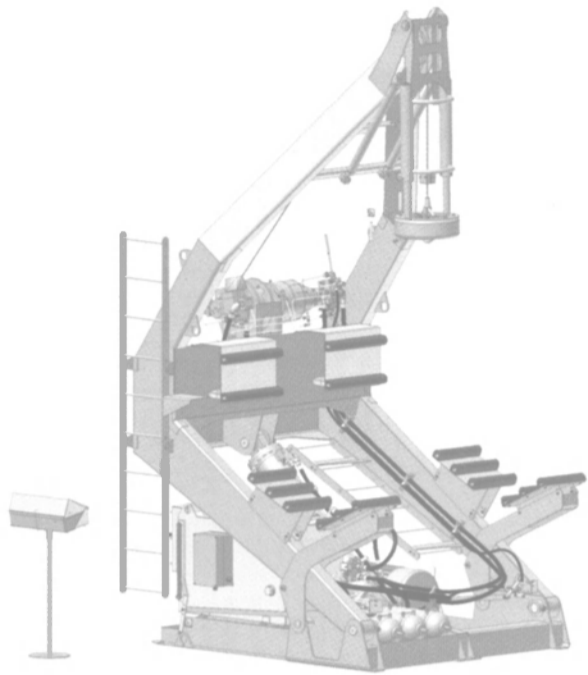
The Maritime Black Box S (MBBS) is based on the company's Maritime Black Box (MBB), which has been installed on more than 200 vessels.

The modular design of the MBBS is designed to make it simple to install on existing vessels. Each individual module complies with the environmental requirements specified in IEC 60945. The modules meet the requirements for radiated emission (EMC) so they can be installed anywhere on a vessel without causing interference to existing systems.

The MBBS is delivered as a kit that includes the four main modules, installation materials and plug-in cables. External cables are available by specification for radar, gyro, speed log, GPS, microphones, VHF radio and AIS. The four main modules to the MBBS are the Main Computer Unit (MCU), the Signal Connection Unit (SCU), the Uninterrupted Power Supply (UPS) and the Protective Storage Unit (PSU).

Circle 13 on Reader Service Card

Allied Systems Tapped by Coast Guard



Allied Systems Company's DC-8600CTS, a single point 7-meter rigid hull inflatable rescue boat davit system, will equip the USCG Maritime Security Cutter Large. Allied Systems Company's model DC-8600CTS, a 7-meter rescue boat davit system with an 8,600 lb safe working load, will be installed on the USCG Maritime Security Cutter, Large (WMSL 750). Currently under construction, the WMSL will be a 421-ft. vessel with a 4,112-ton displacement at full load. The ship will be powered by a twin-screw combined diesel and gas turbine power propulsion plant designed to travel at maximum speed of 28 knots. The cutter will include an aft launch and recovery area for two rigid hull inflatable boats; a flight deck to accommodate a range of rotary wing manned and unmanned aircraft and state of the art command and control electronics.

Allied System's rescue boat davit system includes an integral boat cradle, active drive constant tension winch, removable boat docking head and control box. The DC-8600CTS is completely self-contained, requiring only electrical power. It features a watertight tethered electronic control box for normal operations



that can be attached to most any desired deck location, in addition to an auxiliary back-up control panel located on the davit. The SOLAS approved davit is powered

by a 75 horsepower electro-hydraulic power unit constructed of 316 stainless steel.

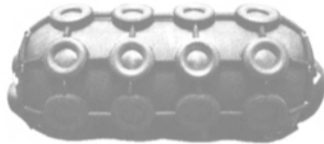
Circle 16 on Reader Service Card



Fenders

Pneumatic Fenders

Dolphin pneumatic fenders used for ship to ship operations and for dockside or dolphin applications. Delivered in a wide range of sizes. High quality fender with ISO 9001 certification.



Port Fenders

Rubber fenders in wide range of sizes and types to suit the vessels attending the port.



Manufacturing and supply

We manufacture and provide first class fenders for all kinds of ships, exploration rigs, fixed or floating production platforms, at very competitive prices.

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Circle 232 on Reader Service Card

WE JUST MADE OUR NO.1 POSITION EVEN SAFER

The Hammar H20 is a hydrostatic release unit, that enables liferafts and EPIRBs to surface and inflate when a ship is sinking. The H20 is the world market leader and has more approvals from shipping authorities than any other release unit.

The new Hammar H20 has a 3-step coupling device

that, by eliminating the risk of incorrect installation, makes it even safer.

The new Hammar H20 has a Red Weak Link™ - but there is nothing weak about it

A brand new Hammar H20 with the Red Weak Link™ connector makes the installation easier and safer.

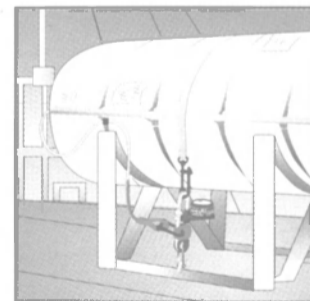
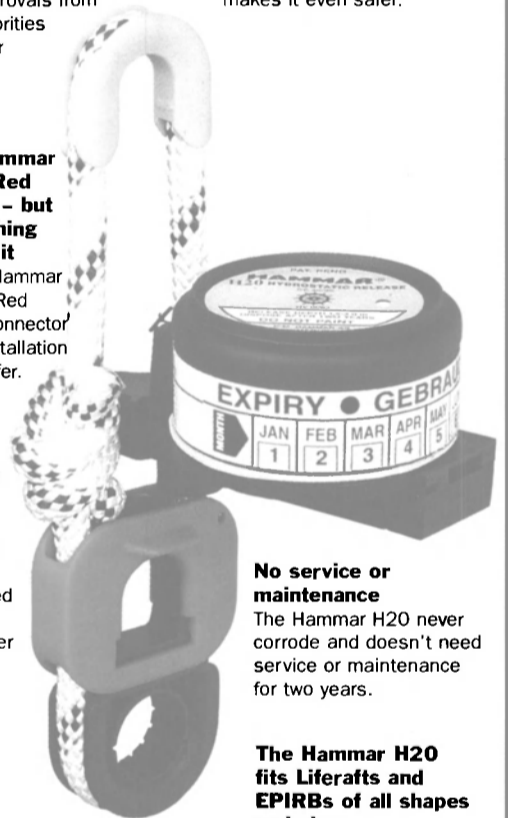
A new black thimble

The new Hammar H20 has a black thimble marked DECK which makes it easier to install.

No service or maintenance

The Hammar H20 never corrode and doesn't need service or maintenance for two years.

The Hammar H20 fits Liferafts and EPIRBs of all shapes and sizes.



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Circle 206 on Reader Service Card

Products



Azonix

Azonix HMI Product Solutions are totally-sealed ruggedized industrial systems ranging from data acquisition and control systems to stand-alone computers, smart terminals and remote displays. Originally designed for the standards of the offshore oil industry, this core technology is now integrated into the ProPanel Mariner for use in the commercial and military marine industry.

Circle 101



MAN B&W

MAN B&W has released a publication entitled, "Propulsion Trends in Tankers." The paper discusses the different bulk carrier classes, the average ship particulars used as a function of the deadweight tonnage, as well as the required propulsion power and appropriate choice of main engine.

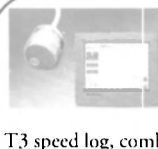
Circle 102



Anchor Lamina

Versatile hydraulic drill system is portable like electric drills, but lasts longer (typically 10 to 20 years) with little maintenance. It drills or taps up, down and sideways, even underwater. Six interchangeable heads, with a variety of quick-change tools and simple, convenient controls. Meets NFMA, CE and other global standards. Also available for rent.

Circle 103



Consilium

Consilium Navigation AB has launched the new SAL T3 speed log, combining a longitudinal and transversal true speed measurement with echo sounding. The SAL T3 is the first type approved combination of speed log and echo sounder in one housing, using only one combined transducer.

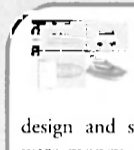
Circle 104



DMX

DMX has low coefficient of friction at both breakaway throughout the full operating range of shaft speeds. Lower friction means engines can operate more efficiently and conserve fuel. The DMX Locking Stave System does not require a bearing shell. Instead DMX staves equal in length to the housing are alternated with rubber staves that are axially longer than the bearing housing.

Circle No. 105



Autoship

Autoship Systems Corporation has developed a hull design and surface modeling software money can buy! Autoship Pro combines the graphical user interface of Windows with the dexterity of NURBS mathematics, the high-end CAD standard for surface modeling. Quickly and efficiently create any hull shape from a racing yacht to a super tanker, including the superstructure, appendages and foils.

Circle 106



John J. McMullen

John J. McMullen, founded in 1957, is a full service company that provides ship and system design from mission analysis and feasibility trade-off studies through contract and detail design, production supervision and testing support for the commercial and naval markets.

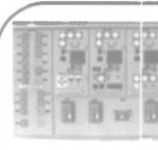
Circle 107



HRP

HRP thruster systems are in operation world-wide in both inland navigation and on board all kinds of sea going vessels. At HRP they have thrusters that can be driven by diesel engines, electric or hydraulic drive systems. All HRP products are designed, engineered and produced at Krimpen aan de Lek, Holland facilities.

Circle 108



IPS

Industrial Power Systems offers a full line of marine switchboards for any application. All are custom built to your design and in conformance with any required regulatory body rules. American quality and craftsmanship since 1981.

Circle 109



Kroy

Kroy has introduced the new K4100 desktop label printer which features auto sizing, quick response and fast print speeds, scalable and downloadable fonts, enhanced memory and a print resolution of 300 dpi. The K4100 can be connected to a PC for customized label, wire wrap and shrink tube applications.

Circle 110



Omnithruster

For 25 years, Omnithruster has been a company in the development of (waterjet) maneuvering systems. Omnithruster's unique patented designs, which provide diverse maneuverability and auxiliary propulsion, have been the installation choice on vessels worldwide.

Circle 111



Midwest

Midwest Instrument has introduced its new, Model 123 Differential Pressure Gauge. This new gauge uses the same sensing and output method as the Model 120. The Model 123 extends the upper differential pressure range from 100 PSID to 400 PSID.

Circle 112



Marine Propulsion Research

Marine Propulsion Research Inc. in Bradenton, Fla., patented a sea chest that provides an abundant supply of water for engines, generators and air conditioning at speed. There is no cavitation or drag. This design makes it possible for easier and reduced plumbing throughout the craft.

Circle 113



Pinpoint

Pinpoint Laser Systems has introduced a new and improved flatness measuring and alignment kit. Machine beds, rollers, web assemblies, X-Y stages and mechanical slides can be precisely checked to .0005 in. for flatness and adjusted with this new Pinpoint product.

Circle 114



Premet

Premet Indicators are designed and manufactured for use on diesel and gas engine applications for the marine market and mobile and stationary power stations. The equipment is not affected or restricted by heavy fuel oil. Its main applications include: combustion engines, compressors, hydraulic-equipments, steam piston engines and integral motors.

Circle 115



SDT

The Sherlog TA, as required by the IACS Unified Rule Z.17, and Russian Register, has been formally Type Approved by Lloyd's Register, ABS, DNV and Hellenic Register. It offers a software routine, dedicated to hatch cover ultrasonic tightness testing to memorize, log and download to PC all measured survey data and allow detailed and accurate reporting.

Circle 116



Southco

Southco Marine is a new organization that combines two brands of marine hardware: the Mobella brand of marine locks, latches and accessory hardware with the solutions of Southco. The Southco Marine portfolio provides a range of solutions for access hardware challenges in cabin, cockpit and entry door applications.

Circle 117



Coastal Marine Equipment's

Anchor Windlasses are supplied with catheads, lever operated jaw clutches and hand wheel operated band brakes. All Anchor Windlasses are available in electric or hydraulic drive and can be supplied constant speed, multi-speed and variable speed. Hydraulic drives operate off central hydraulic system or dedicated system supplied with unit.

Circle 118



Techcrane

Techcrane Global provides worldwide sales and service for marine cranes. Techcrane is the largest distributor of EBI Cranes- capacities 2.5 - 200 tons. Telescoping cranes feature a unique Rack & Pinion telescoping mechanism. Techcrane.net proudly offers a full arsenal of marine crane CAD drawings and technical data specifications for all visitors.

Circle 119



Leslie Controls

Leslie Controls has released their new Steam & Thermal Fluid Controls brochure. The new brochure includes photos and descriptions for every product in Leslie's extensive line, suitable for Industrial/Commercial, Power, Process and Maritime applications.

Circle 120



IRT

IRT Integrated Rectifier Technologies, Inc. is an independent, employee-owned business that designs, manufactures and supplies rectifiers, control panels and related products for the corrosion industry. As an OEM, IRT has the ability to meet the needs of clientele by ensuring dependable delivery of reliable products for a reasonable price.

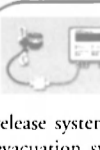
Circle 121



Graco

Graco has introduced a data recording kit designed to record critical application information on its Reactor proportioning system. The kit records the volume of material sprayed, target and actual A and B pressures, primary temperatures of the A and B components as well as hose temperature.

Circle 122



Hammar

C.M. Hammar AB has launched a new electronic remote release system (ERRS) for life rafts, evacuation systems or other lifesaving appliances. The new electrical ERRS is designed for quick and efficient evacuation of passengers. It is operated via an electronic control panel that activates one or several electric Hammar H20 Remote Release Units.

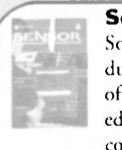
Circle 123



Wynn

Traditional wiper control systems run on an analogue basis but the digital nature of the Series 3000 Network Control system makes it a far more powerful utility. Among the many features, the Series 3000 has a LCD console mount control panel, modular systems that offer full flexibility and full wiper control including integral wash and air purge.

Circle 124



Sonardyne

Sonardyne has introduced Fusion, a concept of flexible and integrated navigation solutions coupled with the coordinated development of software and hardware. It has developed into a family of acoustic hardware and software products that can be configured to offer accuracy subsea navigation, adaptable for all offshore survey, construction and drilling applications.

Circle 125

BUYER'S DIRECTORY

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

ACCOMMODATION LADDERS & GANGWAYS

Rampmaster, Inc., 6600 NW 32nd Avenue, Miami, FL 33147, 800-327-8917, 305-694-8270, sales@rampsonline.com, Contact: Al Davis, www.rampsonline.com

AIR CONDITIONING & REFRIGERATION

Adrick Marine Corp., P.O. Box 1549, N. Massapequa, NY 11758, 631-491-9475, 631-491-9478, adrick1976@aol.com
Bailey Refrigeration, 4986-1 Euclid Road, Virginia Beach, VA 23462
Cospolich Refrigeration, 14695 Highway 61, Norco, LA 70079
Stork Bronswerk Inc., 3755 C. Boul. Matte, Brossard, Quebec J4Y 2P4, Canada

AIRHORNS/SIGNALING EQUIPMENT

Airchime Manufacturing Co., 5478 267th St., Gloucester Industrial Estate., Langley, BC V4W 3S8, Canada
Kahlenberg Brothers Co., P.O. Box 358, Two Rivers, WI 54241

ALARMS, FACTORY-MUTUAL APPROVED

NREC Power Systems, 5222 Hwy 311, Houma, LA 70360
Selco USA Inc., 2508 Lakebrook Ct, Atlanta, GA 30360-1715

ALUMINUM BOATS

Island Boats, 6806 Highway 90 East, New Iberia, LA 70560
Metal Craft Marine Inc., 347 Wellington St., Kingston, Ontario K7K 6N7, Canada
Sea Ark Marine, P.O. Box 210, Monticello, AR 71655-0210
William E. Munson Co., 18130 Sunset Way, Edmonds, WA 98026

ANCHORS & CHAINS

Anchor Marine, PO BOX 58645, Houston, TX 77258
GJ Wortelboer Jr. B.V., P.O. Box 5003, 3008 AA Rotterdam, Netherlands

AUCTIONEERS

Tranzon Venuebid, 908 Town and Country Blvd, Suite 120, Houston, TX 77024

AUTOPILOT SYSTEMS

ComNav Marine Ltd., 13511 Crestwood Pl., Ste 15 15, Richmond, BC V6V 2G1, Canada
Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

BALLAST

Ballast Technologies, 4620 S. Coach Dr., Tuscan, AZ 85714
Redland Genstar Inc., Executive Plaza IV, Hunt Valley, MD 10912-1031

BEARING- RUBBER, METALLIC, NON-METALLIC

Cooper Bearing, 5795 Thurston Ave., Virginia Beach, VA 23455
Craft Bearing, 5000 Chestnut Ave., Newport News, VA 23605
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234, 440-834-5400, 440-834-4950, Contact: Richard Spangler
Thordon Bearings Inc., 3225 Mainway, Burlington, Ontario L7M 1A6, Canada

BILGE SYSTEMS

Coffin World Water Systems, 326 S. Dean Street, Englewood, NJ 07631

Westfalia Separator, Inc., 100 Fairway Court, Northvale, NJ 07647, (201) 767-3900, (201) 784-4399, brown.courtney@wsus.com, Contact: Courtney Brown

BOATBUILDER

Gladding Hearn, 1 Riverside Ave., Somerset, MA 02725
Kivchak Marine, 469 NW Bowdoin Place, Seattle, WA 98107
ROSBOROUGH BOATS, 37 Crane Lake Dr., HALIFAX, NS B3S 1B5, Canada
Sea Ark Marine, P.O. Box 210, Monticello, AR 71655-0210
Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544
Willard Marine Inc., 1250 N. Grove St., Anaheim, CA 92806

BOLLARDS

Maritime International, Inc., 204 Ida Rd., Brossard, LA 70518

BRIDGE SUNSCREENS

Martek Marine Blinds, Unit 46, Century Business Centre, Mavertsway, Rotherham, South Yorkshire S63 5DA, UK

BROKERS

Merrill Marine Marketing & Capital Group, 7909 Big Bend Blvd., Webster Groves, MO 63119

BULKHEAD SEALS/PANELS

CSD North America, 880 Candia Rd., Unit 10, Manchester, NH 03109
Thermax, 3115 Range Rd, Temple, TX 76501

CAD/CAM SYSTEMS

Albacore Research, 4196 Kashtan Place, Victoria, BC V8X 4L7, Canada

Albacore Research LTD., 304-3960 Quadra St., Victoria, B.C. V8X 4A3, Canada, 250 479-3638, 250 479-0868, Marketing@ShipConstructor.com, Contact: Silke Sommerfeld, www.ShipConstructor.com

Autoshop Systems Corp., 611 Alexander Street, Suite 312, Vancouver, BC V6A 1E1, Canada, 604-254-4171, 604-254-5171, sales@autoshop.com, Contact: Ross Muirhead, www.autoshop.com

Cadmatic, Ostra Strandgatan 72 (Vita Huset), FI-20810 Turku, Finland
Creative Systems Inc., P.O. Box 1910, Port Townsend, WA 98368

CAPSTANS

McElroy/Catchot Winch Company, Inc., P.O. Box 4632, Biloxi, MS 39535-4632, 228-875-6327, 228-872-7880, hcalchot@bellsouth.net, Contact: Harold Catchot, www.mcelroycatchotwinch.com
Superior Lidgerwood Mundy, 1101 John Ave., Superior, WI 54880

CARGO MONITORING & CONTROL SYSTEM
Hermatic Inc., 4522 Center St., Deerpark, TX 77536

CARGO SECURING SYSTEM

Peck and Hale, 180 Division Street, W.Sayville, NY 11796

CAST IRON REPAIR

In-Place Machining, 3811 N. Holton St., Milwaukee, WI 53212

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G. J. Wortelboer, Postbus 5003, 3008 AA Rotterdam, Netherlands

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American Bureau of Shipping, 16855 N. Chase Drive, Houston, TX 77060
Lloyds Register Americas, Inc., 1401 Enclave Pkwy., Ste.200, Houston, TX 77077

CLOSED CIRCUIT TELEVISION

Herris Scan Systems A/S, Postboks 619, NO_4809 Arendal, Norway

CNC PLATE CUTTING

Advanced Fabricating Inc., PO Box 3721, Galveston, TX 77552

COATINGS/ CORROSION CONTROL/ PAINT

Chugoku Marine Paints, P.O. Box 73, 4793, Netherlands
Ferro Corp., 1301 North Flora St., Plymouth, IN 46563
Flow International Corp., 23500 64th Ave., South Kent, WA 98059
Hempel Coatings, 10-3511 Viking Way, Richmond, BC V6V 1W1, Canada
Mr. Longarm, Inc., P.O. BOX 377, Greenwood, MO 64034-0377
Sherwin Williams, 101 Prospect Ave., Cleveland, OH 44115
Sigma USA, P.O. Box 816, Harvey, LA 70059
Visions East, Inc., 1600 West State Rd., 84, Suite 5, Ft. Lauderdale, FL 33315

COMMUNICATIONS

Inmarsat Ltd, 99 City Rd., London EUY 1AX, UK
Japan Radio, 1011 SW Klickitat Way, Bldg B Suite 100, Seattle, WA 98134
L-3 Communications, 6000 Fruitville Road, Sarasota, FL 34232
Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851
Seawave, 76 Hammarlund Way, Middletown, RI 02842
World-Link Communications, 74 Main St., Framingham, MA 01701

COMPOSITE SHAFTS

American Vulkan, 2525 Dundee Rd, Winter Haven, FL 33884

COMPOUNDS

Philadelphia Resins, P.O. Box 309, Montgomeryville, PA 18936

COMPUTER/ COMPUTER SOFTWARE

Autoshop Systems Corp., 611 Alexander Street, Suite 312, Vancouver, BC V6A 1E1, Canada
Creative Systems Inc., P.O. Box 1910, Port Townsend, WA 98368
Spec Tec., Professor Koth's Vey, 1366 Lysaker, Norway

CONSOLE- QMDSS

Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

CONSULTANTS

Captain R.J. Underhill & Associates, P.O. Box 1030, Groves, TX 77619
Elliot Bay Design Group, 5301 Shishole Ave. NW, Ste 200, Seattle, WA 98107
Hornblower Marine Services, P.O. Box 112476, Campbell, CA 95011-2476

CONTROL SYSTEM- MONITORING/STEERING

Alma Impex, Inc., 4000 Broderlown Ave., Suite 15, Sayreville, NJ 08872

Electronic Marine Systems, 800 Ferndale Pl., Rahway, NJ 07065
Electrowave U.S.A., 6125 W. Sam Houston Pkwy., Ste 406, Houston, TX 77041
G.R. Bowler, 2261 Lake Rd., Ontario, NY 14519

Industrial Power Systems, 3010 Powers Avenue Unit 16, Jacksonville, FL 32207, 904 731-8844, 904 731-0188, marine@ipsjax.com, Contact: Glenn Beaupre, www.ipsswitchgear.com
Kobeit Manufacturing Co., Ltd., 8238-129 Street, Surrey, BC V3W0A6, Canada
MMC International, 60 Inip Dr, Inwood, NY 11096
Prime Mover Controls, 3600 Gilmore Way, Burnaby, BC V5G 4R8, Canada
Seastate Ply.Ltd., 2 Egmont Road, Henderson WA 6166, Australia

CORROSION CONTROL

Furuno USA Inc., 4400 NW Pacific Rim Blvd, Camas, WA 98607
Gardner Denver Water Jetting Systems, 12300 N. Houston Rosslyn Road, Houston, TX 77086
Ultra Strip, 3515 SE Lionel Terrace, Stuart, FL 34996

COUPLERS- TUQ & BARGE

Intercontinental Engineering, PO Box 9055, Kansas City, MO 64168
COUPLINGS
American Vulkan, 2525 Dundee Rd, Winter Haven, FL 33884
Centa Corp., 815 Black Hawk Drive, Westmont, IL 60559
Mapeco Products, 91 Willenbrock Rd., Unit B, Oxford, CT 06478
MMC International, 60 Inip Dr, Inwood, NY 11096

CRANE - HOIST - DERRICK - WHIRLEYS

Bisso Marine Co., P.O. Box 4113, New Orleans, LA 70178
DMW Marine, LLC, 1123 Street Matthews Road, Chester Springs, PA 19425
E. Crane, 241 Executive Dr., #3, Marion, OH 43302

CRANKSHAFT REPAIR

In-Place Machining, 3811 N. Holton St., Milwaukee, WI 53212
Waltz & Krezner, 91 Willenbrock Rd., Oxford, CT 06478

CUTTING & WELDING MACHINES

Bug-O-Systems, 3001 W. Carson St., Pittsburgh, PA 15204
ESAB Cutting Systems, 411 South Ebenezer Road, Florence, SC 29501

DECK MACHINERY- CARGO HANDLING EQUIPMENT

Burrard Iron Works Ltd., 220 Alexander Street, Vancouver, BC V6A 1C1, Canada, 604-684-2491, 604-684-0458, sales@burrardironworks.com
Coastal Marine Equipment, Bldg 9114 MISAAP Ind. Complex, Stennis Space Center, MS 39529
DMW Marine, LLC, 1123 Street Matthews Road, Chester Springs, PA 19425
Hyde Marine Inc, 28045 Ranney Parkway G, Cleveland, OH 44145-1144
Intercontinental Engineering, PO Box 9055, Kansas City, MO 64168
Markev Machinerv, P.O. Box 24788, Seattle, WA 98124

McElroy/Catchot Winch Company, Inc., P.O. Box 4632, Biloxi, MS 39535-4632, 228-875-6327, 228-872-7880, hcalchot@bellsouth.net, Contact: Harold Catchot, www.mcelroycatchotwinch.com
Norwegian Maritime Equipment AS, BOX 244, NO-5480 HUSNES, Norway
Rapp Hydema, 4433 27th Ave. West, Seattle, WA 98199
Smith Berger Marine, 7915 10th Ave. S., Seattle, WA 98108
Superior Lidgerwood Mundy, 1101 John Ave., Superior, WI 54880

DEEPWELL PUMPS

Marflex Deepwell Pumps, Louis Pasteurstraat 12, 3261 LZ Oud-Beijerland, Netherlands

DESALINATION - REVERSE OSMOSIS

Exstar International, 6709-B Netherlands Drive, Wilmington, NC 28405
Reverse Osmosis of South Florida, Inc., 150 S.E. 29th St., Fort Lauderdale, FL 33316

DETECTOR DOG TEAMS

American Detection Technologies, Inc., 415 Main St. (3rd flr), Worcester, MA 01608

DIESEL CYLINDER INDICATORS

General Thermodynamics Corp., PO BOX 642, Hampton Falls, NH 03844
Kiene Diesel, 325 S. Fairbanks St., Addison, IL 60101

DIESEL ENGINE OVERHAUL

Detroit Diesel Corporation, 13400 Outer Drive West, Detroit, MI 48329-4001

Motor-Services Hugo Stamp, 3101 S.W. 3rd Ave., Ft. Lauderdale, FL 33315

DIESEL ENGINE- SPARE PARTS & REPAIR

Alma Impex, Inc., 4000 Broderlown Ave., Suite 15, Sayreville, NJ 08872

Caterpillar, Inc., P.O. Box 610, Mossville, IL 61552-0610
Chris Marine AB, Box 9025, 200 39 Malmo, Sweden
Cummins Marine, 4500 Leeds Ave., Ste 301, Charleston, SC 29405

GUASCOR INC, 7220 NW 36TH ST #310, MIAMI, FL 33166
Man B&W Diesel, 17 State St., NY, NY 10004
Man B&W Diesel A/S, Telgholmsgade 41, Copenhagen SV DK-2450, Denmark

Man B&W Diesel AG, Stadtbachstrasse 1, Augsburg D-86153, Germany

Marine Exhaust Systems of Alabama, P.O. Box 698, 757 Nichols Ave., Fairhope, AL 36533

Marine Turbo & Diesel Inc., 1090 7th St., Richmond, CA 94801

Mariso USA, Inc., 100 Davidson Ave., Somerset, NJ 08873

Motor-Services AB, Box 2115, Ronninge S- 144 04, Sweden

Motor-Services Hugo Stamp, 3101 S.W. 3rd Ave., Ft. Lauderdale, FL 33315

Scardana Americas Bkg., 502 Empire St., Greenfield Park J4V 1V7, Canada

Wartsila Diesel, 201 Defense Hwy, Annapolis, MD 21401

Wartsila North America, Inc., 16330 Air Center Boulevard, Houston, TX 77032

DIESEL FUEL DECONTAMINATION

Algae X International, P.O. Box 4011, Fort Myers Beach, FL 33932

DIGITAL TORQUE METER SYSTEMS

Instruments, Computers & Controls, 78 Londonderry Tpke, Hookset, NH 03106

DISPLAY TECHNOLOGY

Data Modul Inc, 1751-46 Veterans Memorial Hwy, Islandia, NY 11749

DIVING & SALVAGE

Bisso Marine Co., P.O. Box 4113, New Orleans, LA 70178

Muldoon Marine Services Inc., P.O. BOX 41340, Long Beach, CA 90853

DOORS- MARINE & INDUSTRIAL

Joiner Systems, 1925 52nd Avenue, Lacine, Quebec H8T 3C3, Canada

Juniper International, 72-15 Metropolitan Ave., Middle Village, NY 11379

Manly Marine, P.O. Box 86788, N. Vancouver, BC V7L 4L3, Canada

Mapeco Products, 91 Willenbrock Rd., Unit B, Oxford, CT 06478

Nabrico Marine Products, 1050 Trinity Road, Ashland City, TN 37016

Pacific Coast Marine, 4314 Russell Road, Mukiteo, WA 98275

USA Sliding Doors, Inc., 801 Hosmer Road, Churchville, NY 14428, 585-538-4160, 585-538-2806, info@usaslidingdoors.com, Contact: Mr. Robert Weiland, www.usaslidingdoors.com

Waltz & Krezner, 91 Willenbrock Rd., Oxford, CT 06478

DRIVES

Allied Systems, 2300 Oregon St., Sherwood, OR

DRIVESHAPTS

The Cine Company, 600 Buncombe St., Greenville, SC 29602

DRUG TEST KITS

Sun State Specialty K-9s, 1500 Beville Road, Daytona Beach, FL 32114

DRY DOCKS- DESIGN

Heger Dry Dock, Inc., 13 Water St., Holliston, MA 01746

EDUCATION

Massachusetts Maritime Academy, 101 Academy Drive, Buzzards Bay, MA 02532

ELECTRICAL EQUIPMENT

MMC International, 60 Inip Dr, Inwood, NY 11096

EMERGENCY DISTRESS SIGNAL

Greatland Laser, LLC., 4001 West International Airport RD, Anchorage, AK 99502, 907-245-4475, 907-245-4599, laser@alaska.net, Contact: Jim O' Meara, www.greatlandlaser.com

EQUIPMENT

All American Marine, P.O. Box 191237, Tillman's Corner, AL 33619

ENGINES

DEUTZ Corporation, 3883 Steve Reynolds Blvd, Norcross, GA 30093

Dynamold, Inc., 2905 Shamrock Ave., Fort Worth, TX 76107

FDGM, Inc., 800 Principal Court, Suite C, Chesapeake, VA 23320

Giro Engineering Limited, Talisman, Duncan Road, Park Gate, Southampton, Hants SO31 7GA, UK

ENVIRONMENTAL SOLUTIONS

Hyde Marine, 28045 Ranney Parkway G, Cleveland, OH 44145-1144

EVAPORATORS

Alfa -Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974

Sasakura Engineering, 7-32 Takeshima, 4-Chome, Nishiyodogawa KY Osaka555, Japan

EXHAUST

American Vulkan, 2525 Dundee Rd, Winter Haven, FL 33884

Applegate Industrial Materials, P.O. BOX 428, Baton Rouge, LA 70821-0428

Marine Exhaust Systems of Alabama, P.O. Box 698, 757 Nichols Ave., Fairhope, AL 36533

EXPANSION JOINTS

Applegate Industrial Materials, P.O. BOX 428, Baton Rouge, LA 70821-0428

Silex Inc., 6659 Ordan Dr., Mississauga, ON L5T 1K6, Canada

EXTRUDED RUBBER PRODUCTS

Clean Seal Inc., PO Box 2919, South Bend, IN 46880

FASTNERS

Superbolt, PO Box 683, Carnegie, PA 15106

FENDERING SYSTEMS/ BUOYS - DOCK & VESSEL

Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234, 440-834-5400, 440-834-4950, Contact: Richard Spangler

Marine Fenders International, Inc., 909 Mahar Avenue, Wilmington, CA 90744, 310-834-7037, 310-834-7825, jerry.thermos@mpowercom.com, Contact: Jerry Thermos

Maritime International, Inc., 204 Ida Rd., Brossard, LA 70518

Schuyler Rubber Co., 16901 Woodred Rd., Woodinville, WA 98072

Trelleborg Engineered Products, P.O. Box 98, Clearbrook, VA 22624

Urethane Products, 9076 Rosecrans Ave, Bellflower, CA 90706

Viking Fender Co., 1160 State St., Perth Amboy, NJ 08861

FILTERS/FILTER SYSTEMS

Alfa Laval Tumba AB, 147 80, TUMBA, Sweden

Algae X International, P.O. Box 4011, Fort Myers Beach, FL 33932

Boll Filter, 9822 General Drive, Ste. 180, Plymouth, MI 48170

Hellan Strainer, 3249 East 80th St., Cleveland, OH 44104

US Filter, 2 Milltown Ct., Union, NJ 07083

FIRE & SAFETY PRODUCTS

Brookdale International, 1--8755 Ash St., Vancouver, BC V6P 6T3, Canada

DBC Marine Safety Systems, 101-3760 Jacobs Rd., Richmond, BC V6V 6T3, Canada

HEAT TREATING SERVICES & SUPPLIES

Mannings USA, 200 Richards Ave., P.O. Box 896, Dover, NJ 07802-0896, 973-537-1576, 973-537-1581, sales@manningsusa.com. Contact: Daniel Ciarlariello, www.manningsusa.com

HEAVY FUEL TREATMENT

Alfa Laval Tumba AB, 147 80, TUMBA, Sweden
Algae X International, P.O. Box 4011, Fort Myers Beach, FL 33932

HIGH SPEED FERRY BUILDERS

Incat Australia Pty. Ltd., 18 Bender Marine, Hobart 7009, Australia

HMI CONTROLS DISPLAY

Azonix-Dynalco, 3690 NW 53rd St., Ft. Lauderdale, FL 33309

HOISTS

Coastal Marine Equipment, Bldg 9114 MISAAP Ind. Complex, Stennis Space Center, MS 39529

HORNS/WHISTLES

Airchime Manufacturing Co., 5478 267th St., Gloucester Industrial Estate., Langley, BC V4W 3S8, Canada
Kahlenberg Brothers Co., P.O. Box 358, Two Rivers, WI 54241

HOSES/HOSE FITTINGS

JGB Enterprises, Inc., 115 Metropolitan Dr., Liverpool, NY 13088

HYDRAULIC SYSTEMS

Allied Systems, 2300 Oregon St., Sherwood, OR
Anchor Lamina, 38565 Country Club Drive, Farmington Hills, MI 48331

INFRARED IMAGING EQUIPMENT

Fir Systems, 16505 SW 72ND AVE, Portland, OR 97224

INSPECTION EQUIPMENT

Staveley Instrument, 421 N. Quay St., Kennewick, WA 99336

INSULATION

Mascoat Products, 10890 Alcott, Unit 12, Houston, TX 77043
Shannon Enterprises of W.N.Y., Inc., 162 Sweeney Street, PO BOX 199, North Tonawanda, NY 14120-0199

Superior Energies Inc., 3115 Main Ave., Groves, TX 77619

INSURANCE SERVICES

WQIS, 80 Broad St., 21st Floor, New York, NY 10004

INTERIORS

Jamestown Metal Marine Sales, Inc., 4710 Northwest 2nd Ave., Boca Raton, FL 33431
Lit Industries, 516 Costner School Rd., Bessemer City, NC 28016-9801

JOINER PANELS/FURNITURE

Thermax Marine-Panel Specialists, Inc., 3115 Range Rd., Temple, TX 76501, 254-774-9800, 254-774-7222, thermax@panelspec.com. Contact: John Hutchinson, www.thermaxmarine.com

JOINER- WATERTIGHT DOOR-PANELING- CEILING SYSTEM

Joiner Systems, 1925 52nd Avenue, Lacine, Quebec H8T 3C3, Canada
Waltz & Krezner, 91 Willenbrock Rd., Oxford, CT 06478

K-9 DETECTION

Sun State Specialty K-9s, 1500 Beville Road, Daytona Beach, FL 32114

KEEL COOLERS

Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234, 440-834-5400, 440-834-4950, Contact: Richard Spangler

LASER ALIGNMENT

Ludeca, Inc., 1425 NW 88th Ave, Miami, FL 33172

LEAK REPAIR

Indumar Products Inc., 2500 Tanglewide, Suite 260, Houston, TX 77063

LIFEBOAT TESTING

Water Weights, Inc., 5139 Brook St., Suite E, Mont Clare, CA 91763

LIFEBOATS/DAVITS

Umoe Schat-Harding, Inc., 912 Hwy 90 East, New Iberia, LA 70560

LIFEBOATS/RAFTS

DBC Marine Safety Systems, 101-3760 Jacombs Rd., Richmond, BC V6V 6T3, Canada
Viking Life Saving Equipment, 1400 NW159th Street Suite 101, Miami, FL 33169
Willard Marine Inc., 1250 N. Grove St., Anaheim, CA 92806
Wolong International, 151 Chin Swee Road #03-14, Manhattan House, 169876, Singapore

LIFESAVING EQUIPMENT

C.M. Hammar AB, August Barks Gatan 15, 421 32 Vastrå Frolunda, Sweden
Umoe Schat-Harding, Inc., 912 Hwy 90 East, New Iberia, LA 70560
Viking Life Saving Equipment, 1400 NW159th Street Suite 101, Miami, FL 33169

LIFT EQUIPMENT TESTING

Water Weights, Inc., 5139 Brook St., Suite E, Mont Clare, CA 91763

LIGHTING PRODUCTS

Phoenix Products Co., Inc., 8711 West Port Avenue, Milwaukee, WI 53224

LIGHTING SYSTEMS/ EQUIPMENT

ACR Electronics Inc., 5757 Ravenswood Rd., Ft. Lauderdale, FL 33310-5247
L.C. Doane, P.O. Box 975, Essex, CT 06426
Maritime Associates, P.O. BOX 1788, Crystal Bay, NY 89402, 775-832-2422, 775-832-2424, maritimeas@charter.net. Contact: unknown, www.marinesigns.com

LINE & NET CUTTERS

Spurs Marine, 201 S.W. 33rd St., Ft. Lauderdale, FL 33315

LUBRICANTS/LUBRICATION SYSTEMS

Benjamin R. Vickers & Sons Ltd., Airedale Mills, 6 Clarence Road, Leeds, W. Yorkshire LS10 IND, UK

MACHINERY MAINTENANCE, REPAIR & TESTING

Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

MANEUVERING EQUIPMENT

Schottel GMBH & Co. KG, Mainjer Str 99, D-56322-Spay/Rhine, Germany

MARINE & OFFSHORE SIGNAGE

Maritime Associates, P.O. BOX 1788, Crystal Bay, NY 89402, 775-832-2422, 775-832-2424, maritimeas@charter.net. Contact: unknown, www.marinesigns.com

MARINE DECKING & FLOORING

Lonseal Flooring, 928 East 238th Street, Carson, CA 90745

MARINE DIESEL ENGINES

Wartsila North America, Inc., 16330 Air Center Boulevard, Houston, TX 77032

MARINE ELECTRONICS

ACR Electronics Inc., 5757 Ravenswood Rd., Ft. Lauderdale, FL 33310-5247

Comark Marine, 93 West Street, Medfield, MA 02052, 800-280-8522, 508-359-2267, sales@comarkcorp.com

DRS Technologies, 5 Sylvan Way, Parsippany, NJ 07054

Hatteland Display, Bogstadveien, 19, N-0355 Oslo, Norway

Jotron Electronics, Box 85, NO-3280T Jodalving Norge, Norway

Marine Electronic Solutions, 1522 Crabapple Cove, Jacksonville, FL 32225

Midwest Instrument, 6500 Dobry Dr., Sterling Heights, MI 48314

Saab Marine Electronics, Box 13045, 402 5Goteborg, Sweden

MARINE ENGINEERING

Elliot Bay Design Group, 5301 Shishole Ave. NW, Ste. 200, Seattle, WA 98107

Heger Dry Dock, Inc., 13 Water St., Holliston, MA 01746

Ocean Crest, 2 Pidgeon Hill Dr., Sterling, VA 20165

MARINE EQUIPMENT

Rasmussen Equipment Co., 8727 5th Ave S, Seattle, WA 98108

Scardana Americas Bkg., 502 Empire St., Greenfield Park J4V 1V7, Canada

MARINE FURNITURE

Deansteel Mfg., 111 Merchant St., San Antonio, TX 78204

MARINE HARDWARE

HMS Marine Hardware, 333 W. Merrick Road, Valley Stream, NY 11580-5219

MARINE HAZARD RESPONSE

Manne Respose Alliance LLC, 1102 SW Massachusetts St., Seattle, WA 98134-1030

MARINE MANAGEMENT

Hornblower Manne Services, P.O. Box 112476, Campbell, CA 95011-2476

MARINE POWER PLANT SYSTEMS

Auramanne Ltd., Box 849, FI-20101 Turku, Finland
Wartsila North America, Inc., 16330 Air Center Boulevard, Houston, TX 77032

MARINE SERVICES

International Shipping Agency, Freeport Harbour Complex, Bldg #2, Ste #9, Freeport F41109, Bahamas

MARINE VENTILATORS

Tuthill Energy Systems, PO Box 8000, milbury, MA 01527

MARITIME TRAINING & SCHOOLS

Maine Maritime Academy, MMA, Castine, ME 04420-5000

METALIZING

Climax Portable Machine, 2712 E. 2nd St., NEWBERG, OR 97132

Cutting Edge Metal Processing Inc, Po Box 42, Mobile, AL 36601

DMC Clad Metal Division, Po Box 680633, Houston, TX 77266

MONITORING SYSTEMS

American Vulkan, 2525 Dundee Rd, Winter Haven, FL 33884

Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

Prime Mover Controls, 3600 Gilmore Way, Burnaby, BC V5G 4R8, Canada

MOORAGE FACILITY

Sea Ark Marine, P.O. Box 210, Monticello, AR 71655-0210

MOTION CONTROL SYSTEMS

Seastate Pty Ltd., 2 Egmont Road, Henderson WA 6166, Australia

MOTOR PROTECTION

Manne Safe Electronics, 261 Milway Ave. #12, Concord, Ontario L4K 4K9, Canada

NAV/COMM EQUIPMENT

C- Map Commercial, 133 Falmouth Rd, Mashpee, MA 02649

Chartco, New North Road, Hainault, Ilford Essex 166 2UR, UK

Electronic Marine Systems, 800 Ferndale Pl., Rahway, NJ 07065

Furuno USA Inc., 4400 NW Pacific Rim Blvd, Camas, WA 98607

Hose-McCann Telephone Company, 1241 W. Newport Center Drive, Deerfield Beach, FL 33442, 954-429-1110, 954-429-1130, mchip@hosemccann.com

Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

NAVAL ARCHITECTS, MARINE ENGINEERS

A.K. Suda, Inc., 3004 19th St., Metairie, LA 70002-4989

Arthur D. Darden, Inc, 3200 Ridgeway Dr., Suite 403, Metairie, LA 70002

Band, Lavis, & Associates, Inc., 900 Ritchie Hwy, Suite 203, Severna park, MD 21146

Bay Engineering, 253 N. First Ave., Sturgeon Bay, WI 54235

Bristol Harbor Group, Inc., 103 Poppasquash Road, Bristol, RI 02809

C. Baxter & Associates, P.O. Box 9006, Mobile, AL 36609

CDI Manne Co., 9550 Regency Square Blvd, Ste 400, Jacksonville, FL 32222

Computer Sciences Corporation-Advance Marine Center, 1201 M St. SE., Washington, DC 20003

Elliot Bay Design Group, 5301 Shishole Ave NW, Ste. 200, Seattle, WA 98107

Guanno & Cox, 639 Lotus Drive, N., Suite 3, Mandeville, LA 70471

Jamestown Marine Service, 1084 Shennecossett Rd., Groton, CT 06340

John J. McMullen Associates, 4300 King St., Suite 400, Alexander, VA 22302

Kvaerner Masa Marine Inc., 201 Defense Highway, Ste 202, Annapolis, MD 21401

MCA Engineers, Inc., 2960 Airway Ave., #A-103, Costa Mesa, CA 92626

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Bloxi, MS 39535-4454

MIL Systems, 200-1150 Morrison Dnve, Ottawa, Ontario K2H 8S9, Canada

Nautical Designs, Inc., 2101 S. Andrews Ave., Ste 202, Fort Lauderdale, FL 33316

Robert Allan Ltd., 1639 W. 2nd Avenue Ste 230, Vancouver, BC, Canada

The Glosten Associates Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104

VUYK Engineering, P.O. Box 204., 9700 AE Groningen, Netherlands

Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544

NAVIGATION

ComNav Marine Ltd., 13511 Crestwood Pl., Ste 15 15, Richmond, BC V6V 2G1, Canada

D & B Technologies, 1458 OCEAN SHORE BLVD #132, ORMOND BEACH, FL 32176-3613

Nauticast AG, Mariahilfer Strasse 50/211, A-1070 Vienna, Austria

Scandinavian Micro Systems, 1001 South Andrews Avenue, Suite 120, Fort Lauderdale, FL 33316

OIL SPILL RESPONSE

MARINE PRESERVATION ASSOCIATION, 877 N GAINEY CENTER DR, SCOTTSDALE, AZ 85258

Marine Response Alliance, 1102 SW Massachusetts St., Seattle, WA 98314-1030

Manne Spill Response Corporation, 220 Spring Street, Suite 500, Herndon, VA 20170

OIL/WATER SEPARATORS

Alfa -Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974

Alfa Laval Tumba AB, 147 80, TUMBA, Sweden

MMC International, 60 Inip Dr, Inwood, NY 11096

PAINT APPLICATOR

Mr.Longarm, Inc., P.O.BOX 377, Greenwood, MO 64034-0377

PAINT MARKERS

Sakura of America, 30780 San Clemente St., Hayward, CA 94544, 800-776-6257, 510-475-0973

PARTS LOCATOR SERVICE

Inventory Locator Service, 3965 Mendenhall Rd., Memphis, TN 38115

PIPE FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS

RAMCO Manufacturing Co., 365 Carnegie Ave., Kenilworth, NJ 07033

W & O Supply, 3485 Evergreen Ave., Jacksonville, FL 32208

PIPE LEAK REPAIR

CSD North America, 880 Candia Rd., Unit 10, Manchester, NH 03109

PLANNED MAINTENANCE SYSTEMS

Design Maintenance Systems, Inc, 340 Brooksbank Ave. Ste 100, North Vancouver, BC V7J 2C1, Canada

PNEUMATIC LINE THROWERS

Restech Norway A/S, Box 624, NO-8001 BODO, Norway

PORT AUTHORITY

National Port Authority, BOX 32696, 2017 Braamfontein, South Africa

PORT DEVELOPMENT

Sasakura Engineering, 7-32 Takeshima, 4-Chome, Nis yiodogoaw KY Osaka555, Japan

PORTABLE FOAM APPLICATORS

IMSSCO Corporation, 2040 Harbor Island Drive, Ste. 201 A, San Diego, CA 92101

PORTAL MONITORS

Canberra Industries, 800 Research Parkway, Meriden, CT 06450, (800) 243-3955, (203) 235-1347, customersupport@canberra.com

PREVENTATIVE MAINTENANCE

Marine Safe Electronics, 261 Milway Ave. #12, Concord, Ontario L4K 4K9, Canada

PROPELLERS

Rice Propulsion, Av. Rios Espinoza 88, Mazatlan, Sin, 82180, Mexico, 8778396304, 011526699842533, rice@ricepropulsion.com

PROPULSION EQUIPMENT

ABB Turbocharger, Inc., 1460 Livingston Ave., North Brunswick, NJ 08902

Alstom Power Conversion, 3 Ave. Des Trois Chenes, 90018 Belfort Cedex, France

Brunvoll A/S, P.O. Box 370, N-6401 Molde, Norway

Caterpillar, Inc., P.O. Box 610, Mossville, IL 61552-0610

Chas S. Lewis & Co. Inc, 8265 Grant Rd, St. Louis, MO 63123

Cummins Marine, 4500 Leeds Ave., Ste 301, Charleston, SC 29405

CWF Hamilton Co., P.O. Box 709, Christchurch, New Zealand

Fincantieri, Diesel Engine Div., GMT, Bagnoli della, Rosandra 3334 Treste, Italy

Hagglunds Drives Inc., 2275 International Street, Colur bus, OH 43228

Harbormaster Marine, Inc., 31777 Industrial Rd., Livonia, MI 48150

Karl Senner Inc., 25 W Third, Kenner, LA 70062

Kawasaki Heavy Indust., World Trade Center Bldg., 4-1 Hamamastu-cho, 2-chome, Minato-ku Tokyo 105-6116, Japan

L.A.M.E Srl Marine Division, Via della Fornace 4, Opera (MI), Italy

Man B&W Diesel, 17 State St., NY, NY 10004

Man B&W Diesel A/S, Telgholmsgade 41, Copenhagen SV DK-2450, Denmark

Man B&W Diesel AG, Stadtbachstrasse 1, Augsburg D-86153, Germany

Mapeco Products, 91 Willenbrock Rd., Unit B, Oxford, CT 06478

Napier Turbochargers, P.O. Box 1, Waterside, South Lincoln LN5 7FD, UK

Nya Berg Propulsion AB, Box 1005, 430 90 Ockerö, Sweden

Rolls-Royce Commercial Marine, 10255 Richmond Ave., Ste 101, Houston, TX 77042

Ultra Dynamics (UltraJet), 1110A Claycraft Road, Colur bus, OH 43230

Voith Schiffstechnik GMBH & Co., P.O. Box 2011, 89510 Hedenheim, Germany

Wartsila Corporation, Box 244, FI-65101 Vasa, Finland

Wartsila Lips, 3617 Koppens Way, Chesapeake, VA 23323

Wartsila North America, Inc., 16330 Air Center Boulevard, Houston, TX 77032

ZF Manne Group., Ehlerst, 50, 88046 Friedrichshafen, Germany

PROPULSION MONITORING

Azonix-Dynalco, 3690 NW 53rd St., Ft. Lauderdale, FL 33309

PUMP-REPAIR-DRIVES

New England Pump and Valve, 36 Industrial Park Road, Niantic, CT 06357

Scardana Americas Bkg., 502 Empire St., Greenfield Park J4V 1V7, Canada

Wooster Hydrostatics, 4570 West Old Lincoln Way, Wcooster, OH 44691

RADARS-ARPAS

<

Centa Corp., 815 Black Hawk Drive, Westmont, IL 60559

SHIP DELIVERY

Redwise Maritime Services BV, P.O. Box 20, 3740 AA Baarn, Holland Eemweg 8, Netherlands, +31 (0)35 54 80 500, +31 (0)35 54 80 511, info@redwise.nl

SHIP MANAGEMENT

Crowley Maritime, 9487 Regency Sq Blvd, Jacksonville, FL 32225
Eurasia Group, 22A Floor Chinachem Exchange Sq., 1 Hoi Wan St., Quarry Bay, Hong Kong
OCEAN TECHNICAL SERVICES, MILITARY OCEAN TERMINAL BAYONNE UNIT #8-FOOT OF 32ND STREET, BAYONNE, NJ 07002

SHIP REPAIR

HALIFAX SHIPYARD, 3099 BARRINGTON ST, HALIFAX, NS, Canada
Manitowoc Marine Group, 1600 Ely St., Marinette, WI 54143-2434
NORSHIPCO, PO BOX 2100, Norfolk, VA 23501-2100
R&F Maintenance Inc., 5700 Proctor St. Extension, Port Arthur, TX 77642
Trident Technologies, 4011 C Highway 377 S., Fort Worth, TX 76109
United Marine Enterprises Inc., P.O. Box 22077, Beaumont, TX 77720

SHIP SIMULATORS

Kongsberg Maritime AS, PO Box 1009, 3194 Horten, Norway

SHIPBUILDING-REPAIRS, MAINTENANCE, DRYDOCKING

American Ship Repair, 1011 38th St, Brooklyn, NY 11219
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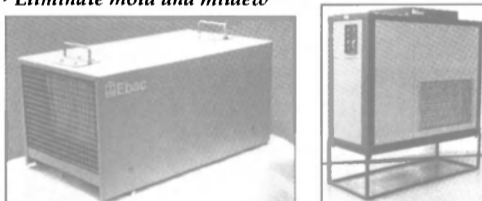
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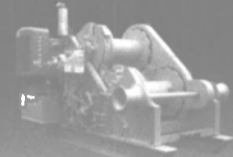
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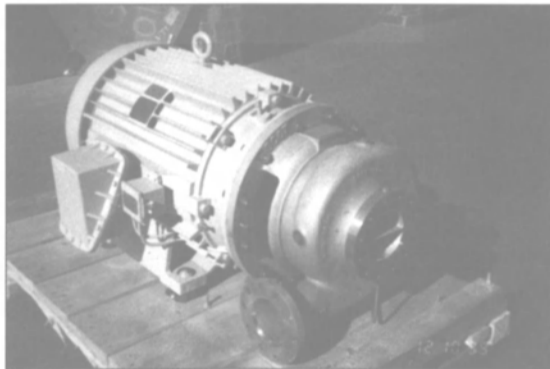
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LEGAL NOTICE BRIDGEPORT PORT AUTHORITY

Request For Proposals for
Transportation System Prime Contractor
Bridgeport, CT

Connecticut State Project No. 170-2297
"Establishment of a Two Way Waterborne
Transportation Service for Sea Containers ..."

The Bridgeport Port Authority is seeking a firm to conduct the duties and responsibilities as the Transportation System Prime Contractor ("TSPC") for the new Barge Feeder Container Service to operate in Bridgeport at the Bridgeport Regional Maritime Complex.

The TSPC is responsible for the overall operation of a container shuttle system between Bridgeport Connecticut and port terminals under the jurisdiction of the Port Authority of New York & New Jersey. Responsibilities include operation and management of the Bridgeport Terminal, arrangement of Longshore services at all participating terminals, management of movement schedules, coordination with marine services and marketing the service. A detailed explanation of the service is further described in the RFP specifications.

RFP specifications will be available starting on Thursday, December 16, 2004. Interested bidders may obtain a copy of the RFP specifications during regular business hours at the offices of the Bridgeport Port Authority, 330 Water Street, Bridgeport, CT 06604 (written requests can be made via facsimile at 203-384-9686).

Sealed bids will be received by the Bridgeport Port Authority until 2:00 p.m. on Tuesday, February 1, 2005, and then publicly opened and read aloud; 5 copies of the proposal should be included in each bid package. Bid packages should be clearly marked "Transportation System Prime Contractor". Proposals submitted after this time and date, or at any other location, will not be accepted.

The Bridgeport Port Authority reserves the right to reject any bids and to waive irregularity in bidders. The DBE percentage for this contract is 15%.

The Bridgeport Port Authority is an equal opportunity, affirmative action employer.

LEGAL NOTICE BRIDGEPORT PORT AUTHORITY

Request for Proposals for
Water Transportation Contractor
Bridgeport, CT

Connecticut State Project No. 170-2297
"Establishment of a Two Way Waterborne
Transportation Service for Sea Containers"

The Bridgeport Port Authority is seeking a firm to conduct the duties and responsibilities as the Water Transportation Contractor ("WTC") for the new Barge Feeder Container Service to operate in Bridgeport Harbor at the Bridgeport Regional Maritime Complex.

The WTC is responsible for the operation of a Tug barge-in RO/RO service transporting containers on chassis between the Bridgeport terminal and designated port terminals under the jurisdiction of the Port Authority of New York & New Jersey. Responsibilities include vessel staffing, safety, reliable operation of each unit and suitable interface with terminals. A detailed explanation of the service is further described in the RFP specifications.

RFP specifications will be available starting on Thursday, December 16, 2004. Interested bidders may obtain a copy of the RFP specifications during regular business hours at the offices of the Bridgeport Port Authority, 330 Water Street, Bridgeport, CT 06604 (written requests can be made via fax at 203-384-9686).

Sealed bids will be received by the Bridgeport Port Authority until 2:00 p.m. on Wednesday, February 2, 2005, and then publicly opened and read aloud; 5 copies of the proposal should be included in each bid package. Bid packages should be clearly marked "Water Transportation Contractor Bid". Proposals submitted after this time and date, or to any other location, will not be considered.

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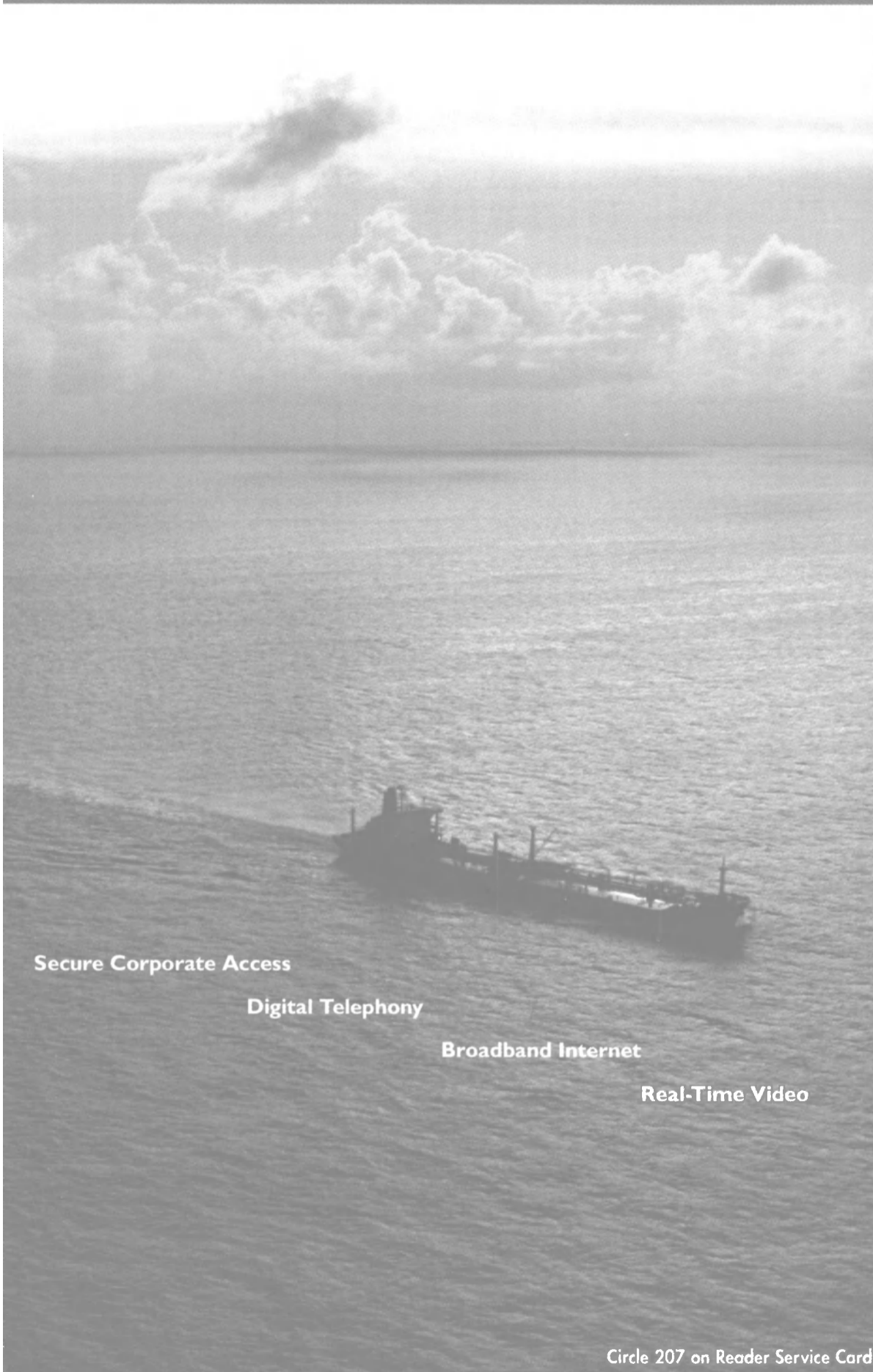
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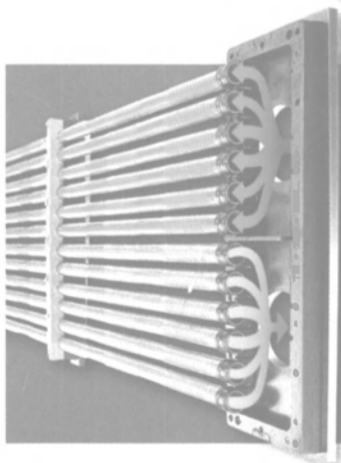


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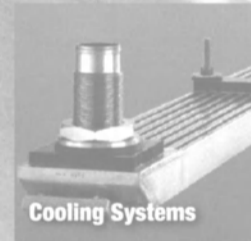
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