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JUNE 2012

MARITIME REPORTER AND ENGINEERING NEWS

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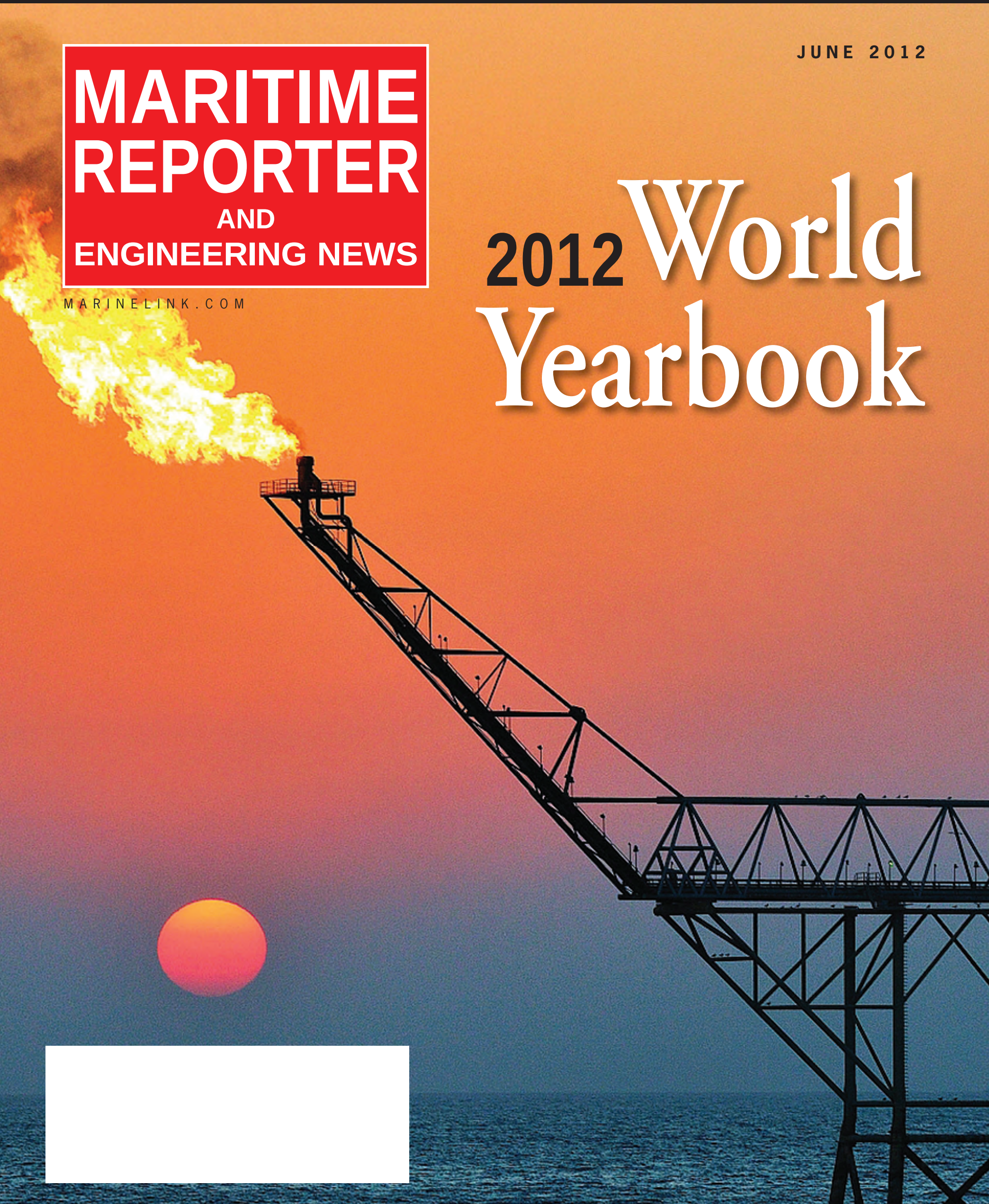
2012 World Yearbook



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(U.S. Navy photo illustration by Mass Communication Specialist 2nd Class Larry Wolfe/Released)

Glory Days

As the U.S. Navy tries to balance ever-tightening budget constraints with rapidly evolving and expanding missions, Captain Ned Lundquist examines the daunting task facing "the world's preeminent maritime force." **Pictured above:** In commemoration of the Battle of Midway, fought June 4-7, 1942. The U.S. Navy effectively destroyed Japan's naval strength by sinking four of its aircraft carriers. It is considered one of the most important naval battles of World War II. Sailors assigned to the aircraft carrier USS Nimitz (CVN 68) created posters for a Battle of Midway Remembrance Dinner.

Navy Coverage, central to the June Yearbook, starts on page 36

ON THE COVER

40

We are pleased to present the Overall Winner of the Don Sutherland Photo Contest on our Yearbook cover, this dramatic photo entitled "Bombay High Clean & Dirty Energy" submitted by Jan Berghuis of the Netherlands.

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

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Maritime Global News

"What a long strange trip it's been!" In amassing and assessing the bounty of data for this, our 2012 Annual Yearbook, I think those *Grateful Dead* lyrics — and the graphic and corresponding numbers on page 66 regarding "New Ship Orders" — are my hands-down favorite and the most apt description for what many of you experience every day.

In casual conversation and business presentation alike, I often classify the maritime market with two words: *cyclical* and *conservative*. And while I know this to be an apt description in broad overview, it is of course an over simplification of a broad global, dynamic industry that is made up of many moving parts. Looking back to the financial crash and burn of 2008, I don't know that many of you envisioned that a full four years later the world would remain mired in a financial funk; a funk which itself has had highs and lows. But here we are in mid-2012, with many of the major sectors of the industry (ie. containership, bulker, tanker) stuck not in neutral, but rather with the appearance of dropping the transmission altogether, lurching forward and falling back.

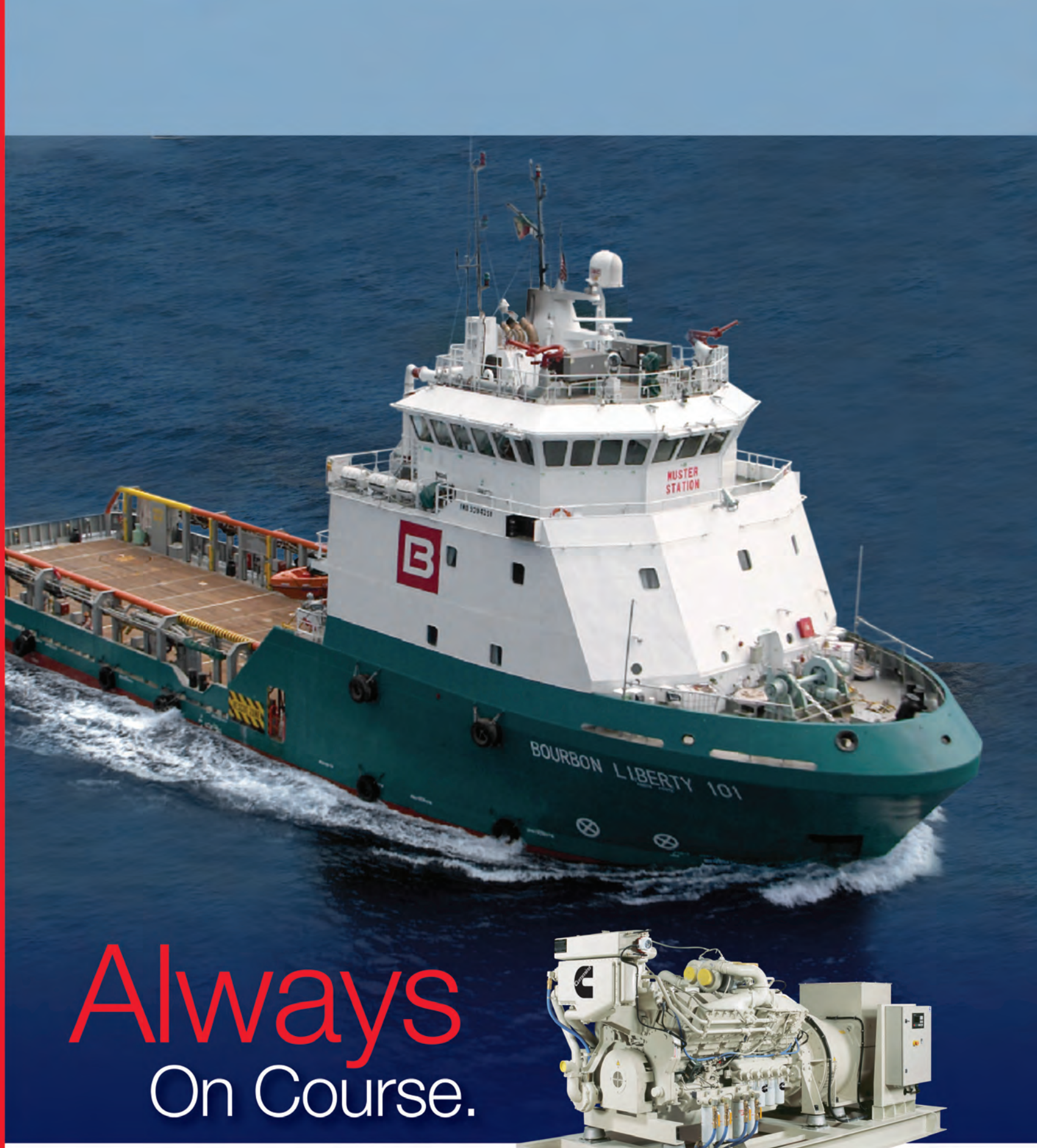
There is no more solid proof of this than in Greg Knowler's Containership report, "*Containership Conundrum*," starting on page 58. Knowler, who lives in Hong Kong with a ringside seat to the continership industry, realistically needed to file only 25 words to sum up this sector when he wrote:

> "In 2009, the container shipping industry lost $16 billion. In 2010, it made a profit of $20 billion, and last year it lost $8 billion."

While that tells the tale in short, I encourage you to read his full report, complete we insights from the world's leading and largest containershipping concerns on their vision of the market going forward. Whereas the big shipping sector collectively is down, it will eventually rebound, and today there are bargains to be had for quality shipowners that are in it for the long haul.

While there is plentiful bad news, as you know in this market, when one door is closed, another opens. To find an excellent growth opportunity, you need to look no further than the cover of this edition, an offshore oil rig, a photo submitted by Jan Berghuis of the Netherlands which was selected as the Overall Winner in the **2nd Annual Don Sutherland Photo Contest**. The offshore energy industry is certainly no stranger to strong cyclical pulls, but today it is universally on the curve heading up, as the push to discover and recover oil and gas in increasingly scarce resources in deeper, more remote and hostile waters rises. We are honored this month to present to you a unique insight on Tidewater Inc., the world's largest supplier of Offshore Service Vessels and one of the industry's strongest and longest players in this sector. Tidewater's ubiquitous **CEO Dean Taylor** officially retired this month, turning over the reigns of the company to incoming **CEO Jeff Platt**, who is no stranger to the industry or the company, having been groomed for the post and serving 15 years alongside Taylor, most recently serving as Tidewater's COO. Susan Buchanan's story on this dynamic duo and the company that they have navigated through times good and bad starts on page 32.

For the perspicacious readers of this publication, you may have wondered about the curious looking "app" logo found atop this editorial. This, as you may have surmised, is our company's latest offering toward fulfilling the informational needs of an ever growing and mobile subscription base, our "**Maritime Global News**" service for the iPhone and iPad (downloadable for free from the Apple App Store). I have been serving this market for nearly 20 years, and when I started we published only *Maritime Reporter & Engineering News*; there was no internet, there was no Email *(the latter two, when I mention to my oldest, now 15, is met with a simultaneous head-shake and eye-roll that insinuates I'm roughly as old as dirt!)*. Print remains a solid staple, and in fact our family of print publications continues to grow and now includes four print titles covering every corner of the martitime, offshore and subsea world. At the same time, we have been aggressive and progressive in using all means electronic to develop and deliver the information you demand, when you need it, where you want it. In the last year, across our six websites and numerous ENews services, we recorded a significant statistical increase in the number of subscribers accessing our information with the Apple product line. With that we offer to you our first app, marking the latest step in our own nearly 75-year journey, which is certainly "long," sometimes "strange," but always a pleasure to cover and present to this ever-changing industry.



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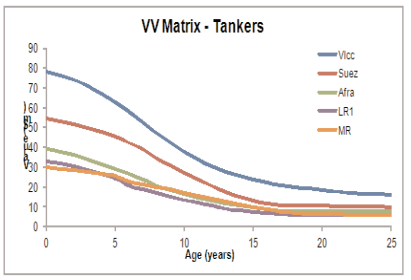
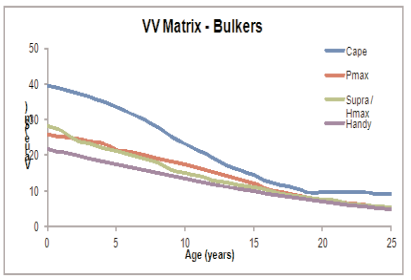
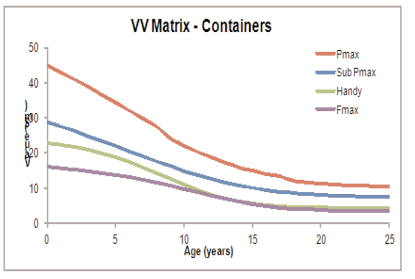
VesselsValue.com provides data driven ship valuations for tankers, bulkers and containerships. These graphs show how vessel value depends on age for the major types. Vessels are assumed to have typical size and specification for age and high built quality at a top tier shipyard.







Shipbuilding, Machinery & Marine Technology Trade Fair

25th SMM Set for Hamburg

By Peter Pospeich, Germany

The countdown is on for the world's leading maritime exhibition – the 25th shipbuilding, machinery & marine technology, international trade fair hamburg, which will be fully booked again this year. "We are already better placed than at the highly successful SMM 2010," says Bernd Aufderheide, President and CEO of Hamburg Messe and Congress GmbH (HMC), the SMM organizer. He adds that demand from the major shipping nations particularly in Asia is up again – China will be represented not only by numerous companies, but also by CSIC and CSSC, the most important shipyard associations; the Korean shipyard association KOSHIPA will also be there; and alongside the major Japanese shipyards also the Japanese marine equipment suppliers association JSMEA. There will be more than 30 national pavilions, including India and for the first time also Argentina, using SMM to present new developments and to generate international leads and cultivate relations with existing contacts. All in all, more than 2,000 exhibitors are expected from more than 60 countries – from specialist medium-sized companies to globally acting shipbuilding groups. Registrations already include over 150 first-time exhibitors at SMM. In response to the tremendous demand for space by exhibitors, SMM management has created additional capacities by construction of a high-quality temporary exhibition hall. That makes the biggest maritime exhibition in the world, which now has 90,000 square metres of in-hall space, more attractive than ever. It is the top event for the international maritime industry, with more than 50,000 trade visitors, and an extensive supporting program with more than 150 program items. The official opening of the world's leading maritime industry fair will be in the evening before the first day of the fair, hat is the evening of 3 September 2012, at CCH-Congress Center Hamburg.

(Image: PPM News Service Pospiech Maritim)

Bernd Aufderheide, President and CEO of Hamburg Messe and Congress GmbH (HMC) during the advanced press conference on May 24, 2012.

Main Particulars	
Length	229 m
Length, bpp	225.5 m
Width	32.26 m
Draft, max.	12.2 m
Capacity	82,000 dwt
Main engine	Wärtsila 5RT-Flex 58T
Speed	14.1 knots

Two for A.O. Schiffahrt

Caroline Oetker, Ida Oetker Christened in Shanghai

On May 19, 2012, A.O. Schiffahrt christened the Kamsarmax bulk carrier Caroline Oetker at the Taizhou Catic Shipbuilding yard near Shanghai. The sister vessel Ida Oetker is due to be christened June 26, 2012. Both ships measure 229 x 32m and have a capacity of 82,000 dwt. The sponsor of the Caroline Oetker was Daniela Oetker, wife of Alexander Oetker, owner of A.O. Schiffahrt and son of Dr. hc August Oetker, Chairman of the Advisory Board of Dr. August Oetker KG. This is the second ship to bear the name Caroline Oetker, the first Caroline Oetker being a turbine tanker delivered to Hamburg Süd by Deutsche Werft AG in Hamburg in 1957. At the time, it was the largest vessel in the German merchant fleet. Both ships take their name from Caroline Oetker, the wife of company founder Dr. August Oetker. With her commitment she made an important contribution to founding, preserving and expanding the global corporation Dr. August Oetker KG. The second ship, the Ida Oetker, is named after the wife of Richard Kaselowsky, who guided the Dr. Oetker company from the 1920s to the 1940s. Immediately after the christening the two vessels will be placed under long-term charter with Rudolf A. Oetker (RAO), which has been a part of the Hamburg Süd Group's tramp operations for 60 years.

Sponsor of the Caroline Oetker was Daniela Oetker, wife of Alexander Oetker, owner of A.O. Schiffahrt and son of Dr hc August Oetker, Chairman of the Advisory Board of Dr. August Oetker KG.

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The project's Title XI application was thoroughly reviewed by the United States Maritime Administration [MARAD](1995-2000) but terminated without prejudice after the American Classic Voyages' default. Rather than break the logjam, on May 9, 2012, MARAD announced a new "policy" prohibiting the financing of overnight passenger ships in the United States.

The city-ship will be built. It can and should be built in the United States for operation under the American flag, creating thousands of jobs and generating billions in tax revenues. Instead of just marveling at the growth of the foreign-flag cruise sector* — MARAD should focus on its mission to promote the US maritime industry and merchant marine.

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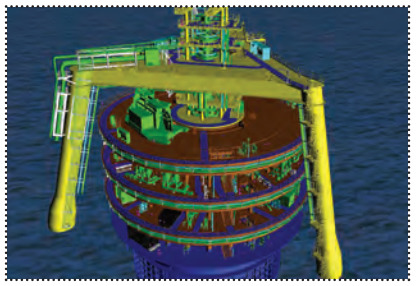
*DOT_47-12.htm



Damen Delivers ... Again

Damen Shipyards announced that it launched the first of its newly designed Stan Pontoon (SPo) 12032. The SPo 12032 is the longest pontoon ever built by Damen and part of a series of 34 pontoons currently being built. In addition, Damen Pontoons & Barges has started building a second new design: the Damen Crane Barge (CBa) 6324, a transshipment barge for handling dry bulk and container operations. The 120 m x 32.2 m Stan Pontoon was launched at Jiangsu Ganghua Shipyard, one of Damen's Chinese partner yards. With a deck strength of 20 t/sq. m., its heavy duty deck is suitable for heavy RoRo operations. The pontoon's ballast system includes Econosto valves and Azcue pumps. Furthermore, the SPo 12032 is equipped with two DMT-winches, a Van der Leun electrical system (incl. a Caterpillar generating set), an International Paint system and it is classified under Lloyd's Register.

New Damen Crane Barge

Damen's newly designed crane barge is called the CBa 6324. It's a shallow draft transshipment barge (optionally self-propelled) able to on- and offload ship-to-ship and ship-to-quay and vice versa. The CBa 6324 (i.e. 63m x 23,5m) is outfitted with a Liebherr CBG 350 crane with a grab load capacity of 35 t @ 12-36m and a hook load capacity of 45 ton @ 12-36m. The average throughput will be around 20,000 tons a day. There's accommodation for 12 crew, incl. a pantry, a change room, an office and of course cabins. Several of these new transshipment barges are currently being built, with the first ready for delivery in November 2012 (The Netherlands).

Bulk Carrier Trio Debuts in Greece

'Ultimate Fuel Savers'

On May 29, 2012, SINOPACIFIC Shipbuilding Group held an introductory meeting and social gathering in Athens, promoting what it dubs its new series of 'Ultimate Fuel-Saving' bulk carriers, the CROWN 63, CROWN MHI 82 and CROWN 121 designs which aim at the segmented markets for 60,000, 80,000 and 120,000 DWT bulk carriers respectively.

At a service speed of 14.3-knots, the fuel consumption of CROWN 63 Ultramax bulk carrier is reduced to 25.8 tons/day, reduced by 13% compared to the CROWN 58 (58,000DWT) bulk carrier, achieved using a combination of hull form design and propulsion system innovation (larger diameter & lower rotate speed propeller and the electrically controlled main engine).

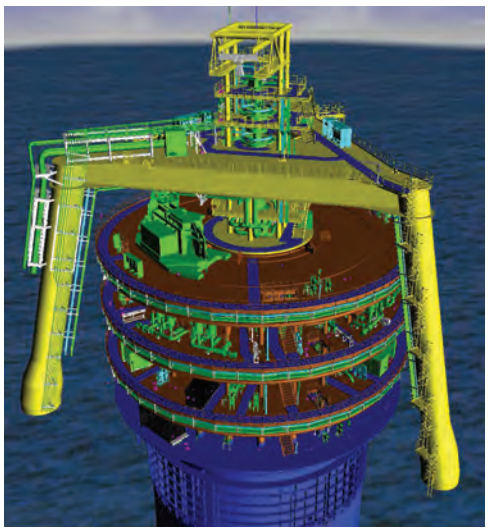
The CROWN 63 has already been built and delivered (the first in March 2012 + three sisterships to Greenship Singapore), and has won BV's first global EEDI (Energy Efficiency Design Index) designation. Based on the attained EEDI stage 2 value of the ship, it has achieved a reduction factor of up to 20% making it eligible to a serious reduction in Initial Registration Fees as well as Annual Tonnage Tax rebates until December 31, 2019."

The CROWN MHI 82 (82,000DWT) is a bulk carrier jointly developed by SINOPACIFIC and Mitsubishi Heavy Industries, Ltd. (MHI), a collaboration which was announced earlier this year. The tank test of the CROWN MHI 82 will be performed in the mid-2012. The overall joint design project is expected to be completed in the second half of 2012.

The CROWN 121 (121,000DWT) Mini-Cape bulk carrier is an upgraded CROWN 118 (118,000DWT) bulk carrier independently developed by SINOPACIFIC. With V-bow and MAN G-type main engine, the fuel consumption of CROWN 121 is reduced to 38 tons/day from a former 49.1 tons/day, a drop of 23% while DWT is at the same time increased.

Prelude FLNG Started at Drydocks World – Dubai

Drydocks World said that Shell's Prelude Floating Liquefied Natural Gas (FLNG) facility – the world's first – was initiated with a Steel Cutting ceremony of its Turret, the world's largest – at more than 90 m in height and 30 m in diameter and weighing 11,500 tons. The Turret will be built as six modules at the Dubai shipyard and shipped to Samsung Heavy Industry's yard in Korea, where these will be integrated into the FLNG facility, once it is built. Drydocks World had earlier been awarded the Turret building contract by SBM Offshore as part of its contract with Technip for the engineering, procurement and construction (EPC) of the FLNG Turret Mooring System. Once constructed the FLNG facility will be towed to location where it will be permanently moored in 250m-deep water through the turret, providing weathervaning capabilities, and a 4x4 mooring system. The FLNG facility and its mooring system have been designed to withstand extreme weather conditions including a Category 5 cyclone.



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Around 6% of a ship's total manufacturing cost is attributable to the NavComm equipment, giving a world market worth $1.7b for merchant ships, $0.5b for fishing vessels and $1.3b for pleasure craft.

Carrying an estimated 90% of world trade and billions of passengers every year, international shipping represents the life blood of the global economy. The massive increase in traffic in recent decades requires, among other things, new or better global communication and navigation solutions resting on internationally-agreed standards to maintain and improve safety levels. Because of its inherently global nature, the safety of shipping is regulated by various specialized United Nations and other agencies. The IMO has developed a comprehensive framework of international safety regulations enforced globally. Of particular importance is the International Safety of Life at Sea (SOLAS) Convention. The IMO does not generally produce detailed technical and test standards for maritime navigation and radiocommunications equipment and systems. The **International Electrotechnical Commission (IEC)** is the world's global standardization body for electrotechnology. Its Technical Committee 80: Maritime navigation and radiocommunications equipment and systems, prepares international standards for these, in agreement with the IMO.

KEEPING OFF THE ROCKS

For centuries, ships have relied on nautical charts and instruments like compasses or sextants for safe navigation and positioning. Electronic equipment such as radar and sonar was introduced from the 1930s, initially on naval ships, to provide data on distance to and from other ships and shores and on navigational depth. In recent years, significant changes have been phased in to the navigation equipment carried by ships. They now carry and rely upon improved radar equipment and automatic position fixing provided by satellite navigation systems.

This year also sees the introduction of a program for the mandatory carriage of electronic charts in the form of an IMO system called Electronic Chart Display and Information System (ECDIS), a computer-based navigation information system that can be used instead of paper nautical charts and integrates positioning information from satellites.

The first edition of standards for ECDIS, IEC 61174, was published in 1998; it is now on its third edition, reflecting the increased experience of use in the field and detailed changes to IMO requirements. ECDIS is not only fundamentally changing the way in which ships navigate but has also highlighted the evolution in a ship's bridge equipment, which is becoming increasingly complex and software-dominated, requiring constant updates.

The mandatory carriage of ECDIS certainly highlights the issues of software maintenance to the many shipping companies who still have a 'fit-and-forget' attitude to bridge equipment.

The International Hydrographic Organization (IHO), an intergovernmental organization representing the hydrographic community, recently updated its standard for electronic navigation charts and will complete work on the next generation of standards for electronic navigation chart databases in the next few years. This will lead to more changes in IEC standards for ECDIS and the presentation of charted information.

TO SEE AND BE SEEN

An Automatic Identification System (AIS) has been introduced which allows ships to provide information about them automatically to other ships and to coastal authorities. Regulations that come into force at the beginning of July 2012 require that AIS be fitted aboard all new build passenger ships of 300 gross tonnage (GT) and upwards and to new cargo ships of 500 GT and upwards. In both cases, the regulations apply to ships engaged on international voyages.

Voyage data recorders, comparable with the so-called black boxes found on commercial aircraft, have been installed to record and protect ship data and voice recordings which can be recovered and analysed after an accident.

This year also sees the start of a phase-in program for the carriage of a Bridge Navigational Watch Alarm System (BNWAS) designed to ensure that the bridge team is alert to the task and has not become incapacitated in any way. Automation of ship functions has resulted in vessels carrying fewer and fewer crew; even large ships may now be crewed by as few as 13 personnel.

IEC TC 80, which prepares International Standards for the shipping industry, was set up in 1980 and has produced some 50 standards so far, not only supporting IMO requirements, but also for more general ship and shore applications. They also enable interoperability of equipment on different types of vessels which share the same radio spectrum and enable the interconnection of equipment on a vessel for the exchange of data.

The TC's objective is to publish standards that gain international acceptance as suitable for type approval where required by the SOLAS Convention and certification where required by the International Telecommunication Union (ITU), another UN specialized agency that sets the basic standards for radio communications and the safeguarding of the radio frequency spectrum used by the shipping industry.

By being represented in both the IMO and the ITU, IEC TC 80 is able to influence the performance and technical content of those agencies' work. This is invaluable to equipment manufacturers, in that the performance and technical standards represent the practical state of the current and emerging technology.

STATE-OF-THE-ART

Ships are technically very sophisticated, high value assets, and one of the fundamental trends in the maritime industry has been an increasing reliance on electrical and electronic technologies for navigation and communication. These technologies have moved well out of the mechanical era of the magnetic and gyro compass and into the electronic and information age. The bridge of a ship is now a dense concentration of navigation, communication and machinery control equipment, all of which has to work together. The major trend in technology is an increasing focus on improving collaboration within the bridge team, between the bridge team and pilot and with shore-side sources of information. Associated with this is the development of smarter interfaces between navigation sensors and bridge workstation applications. This is leading to new developments for data transfer via Local Area Networks (LAN) and for Bridge Alert Management for handling alarms. Changes introduced by the ITU in radio-frequency allocations and maximum acceptable levels of out-of-band emissions are promoting development of navigation radars not based on pulsed-magnetron designs.

The IMO has now embarked on a major program called E-navigation. This is intended to integrate existing and new navigational tools, in particular electronic tools, in an all-embracing system that will contribute to enhanced navigational safety and operational efficiency while simultaneously reducing the burden on the navigator and taking account of environmental issues.

FOR SAFER FUTURE SAILING

IEC TC80 expects to see a significant increase in new standards development and liaison activity. This will be driven by the increased mid-ocean coverage of broadband satellite communications, new capabilities of satellite systems in low earth orbit, the potential of eLoran (enhanced electronic navigation) as an affordable alternative technology backup to satellite navigation systems for position/time reference, and by the potential offered by digital radio for cooperative use of the radio frequency spectrum. IEC TC 80 will continue to support the IMO with the development of new or updated standards for ship bridge equipment and such systems as GMDSS, AIS, ACDIS, BNAWS, and shipborne Long-Range Identification Tracking. Work is currently under way on updating existing standards and preparing more than a dozen standards across all these systems.

Morand Fachot, a technical writer with the International Electrotechnical Commission (IEC), worked before as a BBC journalist, writing also for the Financial Times Business Group and several international publications.

David Clark

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The ECA's Are Coming

August 1, 2012: Enforcement of North American ECA Begins

On 1 August 2012, enforcement of the North American Emissions Control Area (ECA) is due to commence. This third and largest ECA (the other two encompass the North Sea and the Baltic Sea areas) was first proposed by Canada and the United States on 27 March 2009. The North American ECA came into force on 1 August 2011, but included a one-year grace period to give the regulators and the regulated community time to adapt to the new requirements. That grace period is rapidly coming to an end.

The North American ECA covers virtually all coastal waters of the two nations out to 200 nautical miles off their coasts, in accordance with provisions of Annex VI to the MARPOL Convention. Within an ECA, ships of 400 gross tonnage and above are required to reduce harmful air emissions by adopting one of three alternatives. The ship may either:

(1) utilize fuel the sulphur content of which does not exceed 1.0% m/m;

(2) utilize an exhaust gas cleaning system approved by its flag Administration in accordance with IMO guidelines; or

(3) adopt any other technological method that is verifiable and enforceable and has been approved by its flag Administration in accordance with IMO guidelines (such as the use of LNG as fuel for propulsion).

Ships must also maintain detailed records regarding fuel change-overs, as well as retaining bunker delivery notes and bunker samples. While the North American ECA is far-reaching, it does not include all coastal waters of the two nations. For Canada, waters of the Canadian Arctic are omitted. For the United States, omissions include the following: the US Pacific territories; the northwestern Hawaiian Islands (largely unpopulated); the Commonwealth of Puerto Rico; the US Virgin Islands; western Alaska (including Kodiak); the Aleutian Islands; and the US Arctic. In its news release announcing the proposal, the EPA acknowledged that these omitted areas experience impacts from ship-generated air emissions, but stated that further information must be gathered to properly assess these areas and determine how ECA controls can help. This will involve additional air quality and environmental impact studies. A separate proposal would be submitted to the IMO if this analysis supports ECA designation under the criteria contained in MARPOL Annex VI. Such a separate proposal has been made for an ECA covering waters off Puerto Rico and the US Virgin Islands. The proposal has been approved by the IMO and the United States Caribbean Sea ECA is scheduled to come into effect for enforcement on 1 January 2014. Possible future ECA proposals are under at least unofficial consideration for waters off Mexico and Japan, as well as the Mediterranean Sea.

(Photo: Martin Meissner)

DEVELOPMENT

Assertions regarding potentially deleterious effects of air emissions from ships have been heard for years. At the same time, the maritime industry rightly points out that ships are the least ecologically harmful mode of transportation. Internationally, the issue rose to the top of the political agenda with adoption of the Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships (MARPOL Convention). This Protocol consisted of the Regulations for the Prevention of Air Pollution from Ships (commonly referred to as MARPOL Annex VI) and the NOx Technical Code.

After several years of indecision and debate, the United States Senate gave its advice and consent to the Protocol on April 7, 2006 and, on July 21, 2008, Congress enacted the Maritime Pollution Prevention Act of 2008 to implement MARPOL Annex VI domestically. The statute, which amends the Act to Prevent Pollution from Ships (APPS), divides responsibilities and enforcement authorities between the Environmental Protection Agency (EPA) and the US Coast Guard. The legislation does not designate which agency is in charge of the ECA program, but does state that the Annex VI requirements apply to a ship that is bound for, or departing from, a port, shipyard, offshore terminal, or the internal waters of the United States, and is in (among other places) "an emission control area designated pursuant to section 4 [of APPS]."

On 30 April 2010, the EPA promulgated a final rule addressing control of NOx, SOx, and PM emissions from marine engines and vessels subject to the MARPOL Protocol (Annex VI). It largely incorporates into the US regulatory scheme the requirements of Annex VI, including the ECA provisions. The major exception in the final rule is that vessels operating exclusively on the Great Lakes are exempt from MARPOL Annex VI, at least through 1 January 2015. Subsequently, the EPA issued a direct final rule permitting the use, through 31 December 2025, of residual fuel in Great Lakes steamships that have been repowered with certified Tier 2 or later marine diesel engines. In 2011, the EPA and the US Coast Guard entered into a memorandum of understanding (MOU) regarding enforcement of MARPOL Annex VI as implemented by the Act to Prevent Pollution from Ships (APPS). The MOU recognizes the EPA expertise in development of protocols for, among other things, inspection of engines and review of and retention of documents. It also recognizes the expertise of the Coast Guard in ship and facility examination and investigation. The Coast Guard will take the lead on ship and facility inspections and will handle ship detention issues. Enforcement of fuel oil availability and quality issues will be shared, except that the Coast Guard will be the point of contact for foreign governments through its Port State Control (PSC) program. The MOU envisions extensive and continuing sharing of information and coordination between the two agencies regarding the maritime air emissions program.

CALIFORNIA

Striking out on its own, the State of California instituted a program to extensively regulate air emissions from ships. A ship owner association challenged regulations promulgated by the California Air Resources Board (CARB) requiring oceangoing vessels entering or departing California ports to utilize low sulfur fuel in their diesel engines out to a distance of 24 nautical miles from the California coast, the Vessel Fuel Rules. In a 2011 ruling denying the association's motion for summary judgment (and effectively upholding the regulations), the US Court of Appeals for the Ninth Circuit found

that the state regulation did not directly conflict with any federal requirement. The court took note that the IMO had recently approved the joint US-Canada application for the North American ECA. In this regard, the court stated: "it is reasonable to predict that, once the heightened standards established by the ECA go into effect, the Vessel Fuel Rules will be terminated." One can certainly hope.

The North American ECA will have an inordinate impact on certain trades. Currently, covered ships operating within an ECA may only use fuel oil with a sulfur content not exceeding 1.0% m/m. From 1 January 2015, the sulfur content of such fuel oil may not exceed 0.1% m/m. Coastwise and inland shipping in the US and Canada will potentially incur the most added cost, as those ships will be continually within the ECA. Foreign cruise ships operating out of US and Canadian ports argue that they deserve some dispensation as they, too, will spend a large percentage of their time underway within the ECA. To date, the complaints of both trade groups have fallen on deaf ears among the regulatory authorities.

Due to the widespread use of low-sulfur diesel fuel in the United States and Canada, there should be few problems with availability of ECA-compliant marine diesel fuel. The other issue for ship operators is that the ECA-compliant fuel must, in many instances, be obtained prior to sailing for a US or Canadian port. After all, the obligation to utilize the low-sulfur oil will arise when the ship comes within 200 nautical miles of the US or Canada, and remains in effect until the ship is at least 200 nautical miles off the coast. Numerous ships come to the US and Canada from ports all over the world. It is unclear whether ECA-compliant fuel is readily available in all these ports. Query whether ships will be required to carry ECA-compliant fuel at all times so as to be continually available to call in the US and Canada (or the North Sea or Baltic) in the event of a last-minute diversion.

BUNKERS

Bunker suppliers in the US will be subject to MARPOL Annex VI, APPS, and the implementing EPA regulations. Many of those US bunker suppliers have presumably been providing bunker delivery notes and bunker samples to requesting oceangoing ships for several years now. In the absence of complaints from this industry segment, it appears that US (and Canadian) bunker suppliers are prepared for the 1 August enforcement date.

As evidenced by the strenuous efforts of the Singapore Maritime and Port Authority (MPA), maintaining the integrity of the bunker fuel supply system is not a cake-walk. It will require constant vigilance. Provision of bunker samples and bunker delivery notes is not rocket science, but full compliance with Annex VI involves a higher level of attention to detail than past practice. It is expected that in the United States much of the detailed grunt work involved will be delegated to one or more private entities, but actual enforcement will remain with the EPA and the Coast Guard.

The North American ECA will have a broad impact. It will require operational changes for many ships and changes in business practices for many companies. Planning for bunkers and related products will have to be done further in advance. New recordkeeping and other requirements will come into effect. Care must be exercised when switching main diesel engines from regular bunkers to ECA-compliant fuel, and vice-versa. The world becomes ever more complex.

Blended Learning

Keeping Crew Ahead of the Game Takes Innovative Thinking, Action

(Photo: BC Ferries)

An excellent example is the pioneering work done by one of the largest ferry operators in the world, British Columbia Ferry Services Inc (BC Ferries), to transform their vessel- and job-specific training through the use of blended learning.

It is time for everyone involved in maritime training to engage in a serious conversation about e-learning. E-learning has transformed nearly every industry worldwide since its introduction approximately 15 years ago. We are now at the point where almost every university and most large training organizations around the world employ a web-based learning management system (LMS) to supplement (and sometimes replace) their in-person training. Research and experience have taught us that the best training outcomes are achieved when we use "blended learning" - a technique which uses face-to-face training and LMS-based e-learning in combination. Each has strengths the other cannot offer, and therefore the combination is more effective than either can be alone.

This is the third and final article in a series discussing e-learning in the maritime industry. The first article, on page 22 of April's Maritime Reporter and Engineering News, introduced blended learning and presented some research on its effectiveness. The second article, on page 20 of the May edition of Maritime Reporter, presented some of the limitations of e-learning - what it cannot do. This final article, possibly the most important in the series, presents the benefits of blended learning and how it can improve the effectiveness of your maritime training organization. This is information that everyone involved in maritime training should have as we are increasingly faced with decisions about whether and how to make use of e-learning to support our training activities. It is my hope that this series of articles helps inform those decisions.

THE BENEFITS OF BLENDED LEARNING IN MARITIME

The maritime industry has been a relative holdout to the "e-learning revolution", but that is starting to change as impediments diminish and awareness increases. On-board internet is growing and new maritime-specific LMS technologies continue to pave the way. We are now discovering that maritime training is not immune to the benefits of e-learning.

An excellent example is the pioneering work done by one of the largest ferry operators in the world, British Columbia Ferry Services Inc (BC Ferries), to transform their vessel- and job-specific training through the use of blended learning. Their new training approach is called the SEA program for "Standardized Education and Assessment". It uses a combination of LMS-based learning resources and face-to-face training and assessment to achieve more comprehensive, standardized, objective and effective training. The SEA program was described on page 68 of the November, 2011 edition of Maritime Reporter. It has been a resounding success at BC Ferries and recently won a prestigious international award for "transforming training through the use of technology". So what has BC Ferries discovered? What are the practical benefits of the use of an LMS to supplement traditional training? Let's look at them here.

OBJECTIVITY & STANDARDIZATION

One of the primary drivers in the creation of the SEA program at BC Ferries was improving the objectivity and standardization of training. These are especially important factors for any safety-critical industry.

E-Learning facilitates standardization because it delivers the collective wisdom and experience of your organization's most experienced and knowledgeable subject matter experts directly to your trainees. Your trainees read, see and hear exactly the lessons you need to deliver. There is no third-party re-interpreting your company-vetted best-practices. You can be confident that what you create is what they get. When you compare this to a classroom based experience, or even more so to a job shadowing experience, the difference can be significant.

This is not to say that trainers do not have value or should be replaced. They have incredible value and are a necessary to facilitate, mentor, motivate and add a personal element to training. But when the learning experience is supported by comprehensive and standardized learning materials, the outcomes are much more uniform and reliable. Additionally, when those materials are delivered on-line via an LMS, the cost and complexity of tracking and updating the materials is greatly reduced, and reports and analytics detailing their use are available to track the effectiveness your training.

ANYTIME / ANYWHERE

One of the first practical considerations that drove the e-learning revolution was the promise of "anywhere and anytime" access to learning. Instead of having to travel to a classroom on the schedule set out by the training organization, trainees can learn whenever and wherever it is convenient for them. The potential cost savings are obvious, but even more importantly, education and training now become more accessible to a larger audience. People who could not previously arrange to be at class when and where it was held now have the flexibility to make their training fit their schedule and location. Working in alternating shifts and in multiple locations, as mariners often do, is no longer a barrier to training and career advancement.

In the maritime community, another benefit of anytime/anywhere access to training is that learning can be accessible even to those who are not actively engaged in formal training. Take BC Ferries, again, as an example.

At BC Ferries, the LMS-based component of job training and familiarization is openly accessible to all employees of BC Ferries regardless of whether they are currently in training. This means that a BC Ferries employee who has a question about the company-approved best practice method to perform some task is able to consult the training materials at home, on board, or anywhere an internet connection is available. Thus the company's learning materials form an ongoing authoritative resource that any working mariner can access.

TRAINING REPORTS & METRICS

One of the greatest strengths of learning management systems is their ability to generate reports and analytics which provide deep insight into the health of a training program - both for individual trainees, and for the program as a whole. These reports provide insight into how the system is used, how long trainees are spending on the learning materials, and how individual exam questions and whole exams are being performed. There are two main reasons why these reports are critical to any training organization.

First, the reports allow the training organization to "keep their fingers on the pulse" of their training activities. Problems such as poor performance on specific exam questions, common misconceptions about some training topic, or trainees spending an unusually long time on some learning material can be identified and reported by the LMS analytics. When such a problem is identified, corrective action can be taken immediately to remedy the situation. Without an LMS, such issues would not likely be made apparent until some performance or safety issue manifested itself as a result of the training shortcoming.

Second, LMS metrics and analytics provide training organizations with a way of measuring the effectiveness of the training programs on an ongoing basis with the goal of continuous improvement. As a wise mentor once told me "if you can't measure it, then you can't manage it". LMS analytics ensure that you can measure training performance with analytics not otherwise available. These analytics provide the necessary foundation for a program of continuous improvement of training - a system of periodic evaluation and improvement. Every maritime training organization should be engaged in an ongoing continuous improvement program.

TRAINEE-CENTERED LEARNING

A current "buzz-word" (or more correctly, "buzz-term") in learning theory is "student-centered learning". The idea is that rather than training being focused on the trainer as it often is, the training should be focused on the trainee in order to provide better results. Unfortunately, traditional classroom-based courses are highly trainer-centered. They occur when and where the trainer is available, and at the pace dictated by the trainer. The

E-Learning facilitates standardization because it delivers the collective wisdom and experience of your organization's most experienced and knowledgeable subject matter experts directly to your trainees. Your trainees read, see and hear exactly the lessons you need to deliver.

trainer stands at the front of the class and lectures. The trainees are left to follow along and ask questions, if they are able.

The alternative to trainer-centered is student (or trainee) -centered. Being trainee-centered means that the training conforms individually to each trainee. It accommodates their individual learning styles, their varying levels of academic ability and preexisting knowledge, and their location and time constraints. E-learning is generally much more trainee-centered than classroom-based training.

We have already covered how e-learning automatically accommodates the location and time constraints of trainees. Perhaps more importantly, it also accommodates their varying academic ability and preexisting knowledge because it is more self-directed. Instead of sitting in a lecture which covers a topic at a depth and pace assumed to be "about right" for most of the trainees, with e-learning, each trainee can spend as much or as little time as they need on that topic. If they already have a strong background in it or are strong academically, they can move quickly over it. If it is completely new to them or presents a learning challenge, they can take as much time as necessary and dig more deeply by using additional company-provided or self-discovered resources. Everyone reaches the same goal in the end, but each has taken a different route to get there - a route that accommodates them as individual learners. The result is a better-trained and safer workforce - not to mention a more efficient training process.

MORE FREQUENT, MORE OBJECTIVE ASSESSMENTS

Another practical consideration of LMS-based training is the additional opportunity it provides for formative and summative assessments. Formative assessments (or self-tests) enable trainees to assess their knowledge as they progress through the learning materials. For example, at the end of a section or module, self-tests will give your trainee an idea of whether they have learned the materials to the required depth. Summative assessments (or final exams) are an important tool to objectively assess your trainee at the end of training stages. Although written exams may not be that useful for testing skills, they are excellent at testing the knowledge underlying the skills. In addition, the real strength of written exams is objectivity. All candidates who write the exam are being evaluated on a level playing field. As such, written exams are a valuable component of a comprehensive assessment strategy.

Whether for summative or formative assessment purposes, LMSs provide support for the delivery of exams. Typically they are able to randomly vary the questions in an exam (while maintaining consistency of coverage and difficulty) so that no two candidates receive the same exam. This is useful to reduce the incidence of answer "sharing" among candidates, and offers multiple opportunities for self-assessment when a trainee wants to test their knowledge more than once.

Another important feature of LMS exam delivery is automatic grading. Most LMSs automatically grade and record the results of on-line exams. The time savings allows for more frequent assessment than would otherwise be possible. This means your organization's training is able to offer more frequent feedback to the candidate. Likewise, more frequent assessment makes it possible to catch candidates who are having difficulty earlier in the process than would otherwise be possible. Early course corrections are less drastic and less costly than later course corrections.

TRAINEE COMMUNITY

One of the greatest misconceptions about e-learning is that it is necessarily a solitary experience. On the contrary. In fact, an LMS such as the one used by BC Ferries (which supports trainee communication and community) can provide even more interaction than classroom-based learning experiences. On the surface, the main value is that trainees can ask questions of their trainers or other trainees. This is indeed important, but falls short of describing the true value of creating a space where all trainees can share ideas and hold discussions.

First, realize that with classroom-based training, the extent of a trainee's "learning community" will usually be only a subset of the other trainees in that class. The trainee may be a member of one or more study groups and may also participate in classroom-based discussions. Instead, on-line learning communities facilitated by an LMS are likely to include all of the trainees in all of the courses the trainee is taking. They may even include past or prospective trainees. Secondly, not only is the size of the community increased, but the opportunities for discussion are also greatly enhanced because there is no need for the trainees to all meet in one place at one time in order to exchange ideas. Likewise, on-line communities are not forced to disband at the conclusion of the training and are therefore long-lived. In my own experience as a university faculty member these communities have been very powerful - often connecting trainees much more deeply than face-to-face classes.

The value of these trainee discussions is something called "informal learning" - that which happens outside the curriculum of structured courses. The value of informal learning cannot be understated. By some estimates, as much as 70% of professional knowledge comes from informal learning. Consider for yourself how much knowledge you have acquired from courses, vs. how much you have learned everyday from your peers and superiors. Trainee communities extend the opportunities for this kind of informal learning.

THE CURRENCY AND CORRECTNESS OF TRAINING RESOURCES

Training systems in most large organizations have become mission-critical large data systems. Being mission-critical, it is imperative that the integrity (correctness and completeness) of the learning materials is maintained. However, being large data systems, the data can be complex and expensive to maintain. One advantage of implementing the training materials as an LMS-based centralized learning resource is that if a change to the materials is needed, it is made in one place. The very next person to access the learning resource receives the new, current version. There are no onboard manuals to track, collect or revise, thereby reducing cost and complexity. In addition, some learning management systems have discussion forums or community modules which make it easy to communicate the fact that there has been a change. Thus, not only can an LMS greatly simplify the process of updating learning materials, but it can also help communicate the changes to those who need to know.

To further ease the burden, some LMSs (such as the one used by BC Ferries) have user-centered content feedback mechanisms. If a trainee, trainer or training administrator notices an error or omission in the learning materials, they simply click a feedback button and a report is made. This immediately starts a workflow to address the problem. This is important in order for the trainees to have confidence in their e-learning system and to encourage employee ownership of, and buy-in to, the learning process. It has been a simple yet very effective tool for ensuring the correctness of training content at BC Ferries.

CONCLUSION

In the maritime industry the stakes are high. As in other safety-critical industries, our training systems must be as structured, comprehensive and effective as possible. Training methods and outcomes must be continually tracked and improved. Otherwise, we invite accidents. Fortunately, an LMS applied as one part of a comprehensive training strategy provides mechanisms to achieve exactly those training goals, and does so to a degree that is not possible otherwise. The barriers to blended learning in the maritime industry continue to shrink, and the examples (and therefore awareness) of successful implementations continue to grow. By making ourselves aware of the benefits and limitations, we will be well positioned to ensure that our blended learning implementations, which are certain to come, provide the best possible training.

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Swedish Reliability in Maritime

New High-Speed SCANIA Marine Engine Range with Outputs from 294 to 735 kW (400 to 1,000 HP)

By Peter Pospeich, Germany

SCANIA, a tradition rich Swedish industrial company celebrated in 2011 its 120th-year of existence. Very early, in 1902, the first engines for marine applications was produced. In fact, the market was considered so promising that the company's new factory, which was built in 1907, was described at the planning stage as "intended particularly for the manufacture of automobiles and boats."

Without a doubt SCANIA (which is named after the latin name of the Southern Swedish province Schonen) deserves mention as a pioneers in the history of engines.

Today it is a company with around 37,500 employees and a turnover of $13 billion, according to figures at the end of 2011. Since 2008, SCANIA has been a part of the Volkswagen concern.

The 120-year history has been checkered. The enterprise originally goes back to two companies. The first enterprise ran under the name of Vagn Aktie Bolaget I Södertälje (VABIS) and was extablished in 1891 by Philip Wersen. Production at the time were bicycles, railway coaches, and horse buggies, starting in 1897 with motor cars and including trucks from 1902.

The second enterprise was the in 1900, established Maskinsfabriks Aktiebolaget Scania in Malmö. Its product portfolio included boxcars for the Swedish State Railway plus rolled steel products. The production of motor cars began in 1901; trucks in 1903.

In 1911, both companies merged into Scania-Vabis, with the common headquarters ever since situated in Södertalje. In 1968 Scania and Saab merged into Saab-Scania, and since 1989 operates the concern under the name of SCANIA.

Worldwide, the enterprise is represented in about 100 countries. R&D is based in Sweden, with production located in Europe and South America. At this, individual components and complete vehicles are globally changeable.

To guarantee best quality ("Made by SCANIA") the company's philosophy is according the principle "everything from one source." Hence, "the best product quality and highest customer satisfaction" shall be reached.

SCANIA MARINE ENGINES

As mentioned before, the first engines for marine applications were produced in 1902.

(Photo: PPM News Service)

ABOVE
The latest New Scania DI 16 Litre V8-Diesel Engine is now able to supply impressive 735 kW (1.000HP) at the flywheel.

LEFT
Two of the new engines are installed in the lifeboat GAD RAUSING of the Swedish sea rescue. Load performance and load acceptance is as expected. Max speed under full load is 31 knots. The drives are two Rolls Royce FF-550 Jets.

Introducing the Sea Tel 4012. It lets you go from Ku to Ka in eight easy turns.

It's as easy as that. Unfasten eight bolts. Remove and replace the front feed, and rear assembly. Within minutes, your Sea Tel 4012 makes the optional upgrade from the current Ku Band, to GX or other Ka Band networks. The new Sea Tel 4012's completely redesigned monolithic software architecture offers IP-based, secured communication and extensive diagnostic capability. The interface allows the antenna system to be controlled from a computer browser or even a tablet or mobile device. The new frequency-tuned radome is engineered to operate in Ku and Ka Band networks. And because the Sea Tel 4012 can be controlled over the internet, you can connect to it from anywhere in the world including your corporate offices. Finally, the sturdy pedestal design is based on the industry's best 1-meter maritime antenna system, the Sea Tel 4009. The best just got better.

The World's most trusted maritime antenna systems.

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Sea Tel
COBHAM

Built to last: The new DI16 features an impressive max torque of 3,340 Nm at 2,000 rpm.

(Photos: PPM News Service & Scania)

The Lifeboat GAD RAUSING

(Photo: PPM News Service)

The oldest — and still in good shape — Scania building is the foundry office, built in 1907.

At the same time the engines were very well-known for their outstanding reliability and low fuel consumption. First tests with diesel engines started in 1927, but series production with own developed diesel engines started in 1936: six-cylinder pre-chamber diesel engines with seven main bearings and output of 120 hp (88.8 kW).

The marine diesel engines of the Swedish manufacturer are installed in a wide variety of vessels, including inland navigation vessels, coaster and sea-going ships, passenger and authority ships, life boats and trawlers. Today's product range of the Swedish engine manufacturer for main and auxiliary drives starts with the 13-liter engine at 323 kW and ends with the 16-liter engine with 736 kW (1,000 hp). The speed range of both the engines is between 1,500 and 2,300 rpm. For Yanmar the company produces engines with outputs up to 660 kW for pleasure craft. The SCANIA engine philosophy is characterized by fundamental factors:

- **A high percentage of equal parts in the two series DI13 & DI16;**
- **high reliability;**
- **longevity;**
- **low fuel consumption; and**
- **low emissions.**

The amount of equal parts, the so called SCANIA module concept includes, beside others: pistons, cylinder liner, cylinder heads, gaskets, filters and unit-pump elements at the injection technology. The engines fulfill all existing worldwide current emission legislations. Each product, which is intended for ship application, passes a specific stringent test program which can run from four hours to two days.

The long-established company sup-

plies the complete drive-line for ship propulsions from one source: engine – transmission – instruments. Coupling – shaft and propeller are assembled from chosen, strategic partners.

With the on-board gensets the company delivers the engine and the chosen partners contributing frame and instrument panels 13- and 16-liter engines for propulsion and auxiliary

Scania's engine range illustrates the essence of the thinking: maximum uptime, proven reliability and outstanding operating economy. All this in compact and powerful packages built on Scania's modular product system, which simplifies servicing and parts management, and facilitates individual specifications as well as volume production. Power at the new in-line DI13 is available from 294 to 551 kW at speeds with 1,800 and 2,300 rpm for main-drives and outputs from 323 to 426 kW with speeds at 1.500/1,800 rpm for on-board gensets.

SCANIA INTRODUCES ITS NEW DI16 MARINE DIESEL ENGINE

The company showcased its new series of diesel engines for marine application, including the new DI16 series, at the Seawork show in the UK.

With the new DI 16 diesel engine, especially developed for applications in workboats as well as in patrol boats and yachts, Scania is aiming to consolidate its position in the marine market segment.

The turbocharged and aftercooled engine is available as 8-cylinder, in V-90 degrees configuration, only. With 130 mm bore and 154 mm stroke it features a displacement of 2.04 liters per cylinder. With the total displacement of 16.32 liters (a displacement increase of around 5% compared to the former DI 16 marine drive), the engine is capable of developing an output of 735 kW (1,000 hp).

With this power increase Robert Sobocki, Vice President Engines, says: "we are now highly competitive with engines well above 16-litres." The torque ratings of up to 3,340 Nm are particularly high for this output class. This ensures ample performance even at low revolutions, while facilitating running at favorable revolutions in all conditions, including high sea and high load. Individual cylinder heads with four valves per cylinder promotes repairability and fuel economy. The new DI 16 fulfills the emission standards IMO II, EU Stage IIIA and US Tier 2, Scania said. The engine is equipped with a Scania developed Engine Management System, EMS, in order to ensure the control of all aspects related to engine performance. The injection system is based on electronically controlled PDE unit injectors that gives low exhaust emissions with good fuel economy and a high torque already at low revolutions. According to Scania: Vital for marine installations is that the engine is compact, has easy-to-fit auxiliaries and is designed for easy servicing. Scania's V8 engines traditionally meet all of these requirements thanks to the compact vee-design, which reduces the overall length. Ancillaries can be efficiently accommodated inside the footprint of the engine. Scania's-Saver ring, placed at the top of each cylinder liner, reduces carbon deposits on the edge of the piston crown and reduces cylinder liner wear.

In spite of higher performance and tighter emission levels, Scania has been able to raise maintenance and oil-change intervals to 500 hours.

LNG Fueled Engines

They may be the future, but what about today?

In response to rising industry demand for more sustainable shipping, the industry is turning to LNG as a primary fuel. But with inadequate LNG infrastructure, engine manufacturers are working with other industry stakeholders to provide alternatives. The rising cost of energy and increased concerns about the environment have resulted in significant changes in the industry. Regulatory bodies in different states are working to introduce Emission Control Areas (ECAs). At present, sulphur emissions control areas (SECAs) are in effect in the Nordic region and the Baltic Sea and ECAs will be established in the English Channel, North America and some islands in the Caribbean.

Earlier this year, the EU published a consultation document which considered a number of options for curbing emissions which may either take the form of a market-based mechanism that would apply to ships' emissions in Eurozone waters or a "compensation fund" that would requires owners to make payments to offset damages caused by carbon emissions. At the same time, bunkering prices have tripled over the last three years and most analysts agree that prices will continue to rise for some time.

"LNG as fuel for ships an attractive option, but until a global network of LNG bunkering terminals is established, LNG-fuelled vessels will be limited to coastal trades where a LNG bunkering network exists."
Trond Skaufel, MD, Pon Power in Scandinavia

Fact Box

In 2008, the Ulstein shipyard together with NTNU, Norway's leading technical university and Marintek, the Norwegian Marine Technology Research Institute launched an initiative to improve strategic and operational aspects of production systems. "Ulstein was seeking a new way of working with suppliers to streamline the build process and create a more modular approach to production," says Skaufel. "NTNU invited a number of suppliers, including Pon Power, to help sponsor a long-term research and development project to optimize maritime production." Known as IGLO Maritime Production 2020, the program brought together NTNU, Marintek, Pon Power, Ulstein, Siemens and Fiskerstrand shipyard to strengthen and improve the competitive capabilities of the Norwegian maritime industry through a number of work packages. The initiative produced a number of scholarly publications on a broad range of issues, from CSR to innovation, sustainability to maritime supply chain networks. "While not every topic covered by IGLO has been relevant to Pon Power, we have gained a better understanding of yards and how we fit into the overall value chain."

NEXT GENERATION ENGINES

According to Trond Skaufel, Managing Director of Pon Power in Scandinavia, these changes have lead to a rising demand for more fuel-efficient engines that help lower emissions. "LNG as fuel for ships an attractive option, but until a global network of LNG bunkering terminals is established, LNG-fuelled vessels will be limited to coastal trades where a LNG bunkering network exists," he says. "In the meantime, engine manufacturers are busy developing a new generation of diesel engines optimised to reduce fuel consumption and corresponding emissions." Skaufel says that Pon Power is seeing rising demand for new more efficient engine types and related tools to manage new regulations. "Quality engines, operational reliability and good service remain critical to our success," he says. "But with pressure on owners to reduce fuel costs and comply with new regulations, we have to be able to work with other stakeholders to provide the right solutions, today."

PIONEERING INNOVATION

Skaufel notes that as a distributor for Cat and MaK Engines to the maritime and offshore segment, Pon Power has access to innovative engine technology. For example, Cat continues to develop ACERT technology, which enables the combustion process to be shaped and managed with an extremely high degree of precision, resulting in an engine that meets or exceeds emerging emissions requirements. At the same time, Mak has announced the development of the MaK M 46 DF, a new marine dual-fuel engine platform. Pon Power also offers a full range of NOx reduction kits to improve the performance of existing engines.

Pon Power was approached by Siemens to supply a specially modified propulsion package to be used in a new offshore supply vessel owned by Østensjø Rederi, which operates a large fleet of OSVs, tugs and towage vessels. The technology is built around an innovative variable drive propulsion system, known as the BLUEDRIVE PlusC, which reduces fuel consumption and includes an SCR catalyst that can operate over the load range of 6 - 100 per cent, resulting in significant reductions in both NOx and CO2.

According to Ketil Aagesen, Sales Manager for Siemens, the company had been working on variable drive systems for some years at the company's technology center in Trondheim, Norway. "While we had to design new components and control systems, everything in the BLUEDRIVE PlusC is based on proven technology," he says. "It is how we integrated different components that makes the difference."

In terms of emissions and fuel efficiency performance, the BLUEDRIVE PlusC is equal, if not better, than LNG fuelled engines, and is also more affordable. "While the BLUEDRIVE PlusC is optimized for the OSV segment, we are working to develop the technology to apply to larger vessels and different engines – including dual fuel," says Aagesen. "We have launched the concept in the US and Asia, and so far, we are pleased with the response."

To implement the project, Siemens and the owner spoke to a number of engine manufacturers before selecting Mak. "We were looking for a reliable engine with the right design parameters and good technical support," he says. "Mak and Pon Power fit the bill." Together with the MaK factory in Germany, technicians at Pon Power have modified two MaK 6M25C and two MaK 9M25C propulsion engines to function with the new Siemens variable drive frequency concept.

"This technology represents a genuine innovation in engine efficiency," says Skaufel. "And by pairing BLUEDRIVE PlusC with our existing propulsion systems, we are confident we can better support our customers efforts to improve fuel and environmental performance."

Skaufel acknowledges that Pon Power can't deliver a whole engine room, but says that the company's technical competence, customer network in Scandinavia and support from Cat and MaK make Pon a strong partner in the region.

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Competitive Shipbuilding

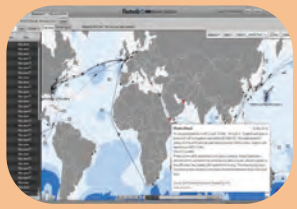
Cost Management is the Key; there are Software Solutions to Help

CrewInspector.com

Latvia based maritime crewing software provider CrewInspector released an online application tailored for mobile phone and tablets enabling its customers to access its crew management database. Since 2003 CrewInspector ship crew management system operates over the internet.

Crew management software itself is being available on all desktop browsers including most popular ones Internet Explorer, Mozilla Firefox, Google Chrome and Safari. CrewInspector mobile supports major mobile platforms and internet browsers, being constantly updated: Apple iOS, Android, Windows Phone, Blackberry, Palm WebOS, Firebox Mobile, Chrome for Android, Opera Mobile, Samsung bada, Nokia Symbian.

www.crewInspector.com



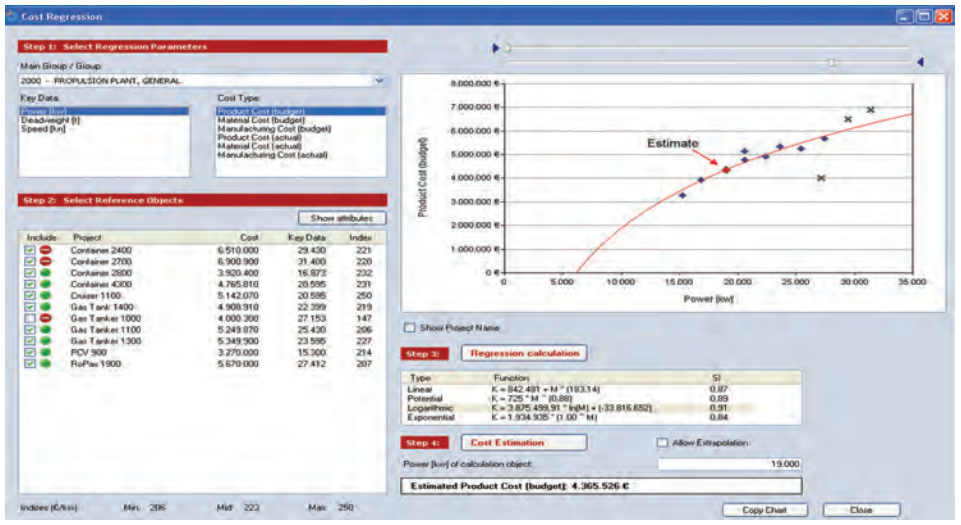
Weather Solutions Upgrades Fleetweb

GAC-SMHI Weather Solutions, an alliance between the GAC Group and the Swedish Meteorological and Hydrological Institute (SMHI), has unveiled a new feature of its Fleetweb online application to alert users of coordinates and details of sea crime attacks.

This latest upgrade adds a new tool to Fleetweb enabling constant monitoring and optimization of fleet routing and performance. Operators have an overview of how their vessels are performing in terms of speed and fuel consumption, bunker buyers can see on a daily basis what fuel volumes are required, and technical managers can better plan maintenance schedules.

The addition of Sea Crime Solutions provides rapid sea crime alerts with precise co-ordinates and incident details to allow operators to immediately inform their ships of attacks in their vicinity and along their planned routes. It also gives an accurate picture of the overall sea crime threat at any given time, particularly in high-risk waters.

Email smhi@gac.com
Email ake@gac.com



Cost pressure in shipbuilding has intensified over the past few years substantially. Cost management at an early stage of the shipbuilding process allows counteracting this cost pressure effectively. The fierce competition in global shipbuilding and the extreme rise in costs are forcing shipyards to implement effective cost management during product development and manufacture. However, the difficulty is that the majority of costs for a ship have already been defined before the start of production. Analyses indicate that approximately 90% of the total costs for a ship are established through decisions made in the initial design and design engineering phases. Therefore, cost management during the early phases in shipbuilding is especially effective. In reality, however, the available cost information at the beginning of a project is usually incomplete and imprecise, making cost management highly complex and elaborate.

Cost prognoses play an important role during the bidding process and in the evaluation of design options. They are also absolutely necessary for comparing the actual project status with targets. This, in turn, is the prerequisite for cost management measures during the project process.

Due to the number of persons involved and the calculation complexity, reaching consensus between the various participating planning units requires a high level of time and effort. The following difficulties often arise, especially for multiple component assemblies handled by several parties:

- The costs are incomplete because objects were “overlooked”, or it was erroneously assumed that these costs are part of another building group.
- Objects and their costs are mistakenly included in the planning multiple times.
- Cost values requiring validation cannot be traced to the person who initially generated them, so that other users can only guess at their logic and accuracy.

An often used method of predicting costs at an early project stage is the application of cost indexes, calculated by using the information gained in previous projects. A typical example is the cost per unit weight calculation. Besides weight, costs can also be determined by other parameters like length over all, surface area, surrounded volume, mass, speed, power, lane meter, (container) capacity, number of crew members or passengers etc. The advantages of using cost indexes for cost prognosis are the possibility to identify them quickly from previous projects and their simplicity in using them in cost forecasting. These advantages are counteracted by a number of disadvantages, in particular:

- Depending on the object to be calculated, the degree of imprecision for the cost forecast can be very high, as multiple parameters can potentially influences costs.
- Using key parameters to predict costs assumes a linear cost progression, which is usually not the reality, since costs can progressively increase or decrease.
- The use of a mean value provides no insight as to how the costs of the reference object are distributed, meaning there is no indication that the cost prognosis is reliable.

Ultimately, these parameters can be used only in rare instances to generate acceptable cost prognoses. Once the total costs for the ship are generated, they are then compared with the costs in the bid. Oftentimes, the new costs exceed the originally planned costs and cost savings must be attained. During ongoing cost forecasting, later estimates are also compared with earlier ones. If deviations between the two are evident, project management attempts to find the source of these differences in order to combat cost overrun.

INEFFICIENT MANAGING OF COST INFORMATION

Planned and actual costs from previous projects, identified planning errors, offers from suppliers and expert knowledge regarding technological and economic factors provide information that can be used as a basis for cost management in design and engineering. In practice, there are often no attempts to utilize this information systematically. Therefore, such knowledge is often filed away in the minds of specific individuals. Again, available information is usually distributed throughout various IT systems and occasionally exists only as a hard copy. These circumstances lead to problems:

- The necessity of manual system queries and subsequent cost aggregations makes predicting, planning and controlling the costs extremely time-intensive.
- The possibility of cost estimating belongs to single experts. Besides this fact, the quality of estimations, based on the knowledge of experts, differs widely.
- The expense of determining and updating dependences of technical and economical parameters, which can be used for cost estimations in new projects, reduces the value of those indexes extremely.
- The existing data base, generated in past projects, is far from being complete, caused by the lack of an integrated system for managing and providing the cost information.

In this situation, considerable cost knowledge is available in the company but scattered among employees and departments; there is no structured cost information consolidation and the information is often not clearly identified as cost knowledge.

PROBLEM SOLUTION BY SYSTEM SUPPORT: SOFTWARE ‘COSTFACT’

The ‘costfact’ software solution was developed to solve the mentioned problems and can be used during the bidding and the production phases to plan and control the costs of new projects as well for the analysis of completed projects. A uniform system platform enables the link-up of costfact to other external systems, e.g. to import current data from an ERP system. As a multi-

user capable, database-supported and globally usable application, costfact improves the consistency of the entire proposal and calculation process. Furthermore, costfact helps to avoid errors and to accelerate cost planning, analyzing and optimization throughout the entire life cycle.

With costfact, cost planning, both top down and bottom up, is done within the vessel's group system, differentiated by cost types and cost objects. costfact contains complete ship building structures that can be modified and expanded, belonging to the demands of the shipyard and the concerned project.

Beginning a cost planning by costfact, the user can start with an 'empty' cost structure, practicing a 'zero based budgeting'. However, this process will be accelerated clearly for usual, by deriving the cost of new objects from costs of already existing groups and consolidating this information to the calculation of the new vessel. By this procedure the cost planning is executed in three steps:

1. Choosing a project template: A master calculation or existing project with accordant similarities is used as starting point of the new ship's cost planning.

2. Importing the cost of building groups: The cost items, which differ to the model, were taken over from other projects as far as possible. Afterwards the costs can be increased or decreased by factors to update the cost according to the current situation.

3. Manual input and modification: The residual calculation objects that could not been determined by similar objects, are calculated manual by inserting the cost in a table sheet.

Every change of each single cost item is journalized automatically to enable the user to get always an answer to the question who changed what and when in the calculation. An additional cost forecast feature of costfact is its ability to determine cost functions, based on a comprehensive and in-depth statistical examination of the technical and economical characteristics of existing objects. These functions enable the user to deviate the costs of similar objects. In particular in early project phases, cost forecasts are always afflicted with significant uncertainties. To quantify this uncertainty, costfact offers a risk analysis function: On the basis of evaluations with regard to the forecast errors of the single components and the statistical error compensation, this function calculates how much the expected cost will probably differ from the planned cost.

If the accumulated actual costs during the building of the ship are recorded, costfact can be used for a concurrent calculation. This calculation accompanies the production process and shows the cumulated cost at any time of the project and enables comparisons of planned and actual data with reference to the different levels of the ship's structure. Thereby possible cost variances can be identified and analyzed. In that way indications for an inefficient input of materials or an inefficient manufacturing can be received, so that controlling measures can be taken to minimize the cost overrun.

The Author: *Dr. Jan O. Fischer has carried out numerous projects in naval and plant engineering, and has led the development of various software solutions supporting cost management. For more information: jan.fischer@costfact.de / www.costfact.de*

OMC Adopts MarineCFO Software Suite

MarineCFO said that Offshore Marine Contractors (OMC), has chosen to implement the full MarineCFO Enterprise software suite. OMC provides lift-boats to the offshore oil and gas industry. It offers 175 ft. Class lift-boats, 200 ft. class lift-boats and will take delivery of its first 215 ft. Class lift-boat this month. "We have the newest and most technically advanced fleet of lift-boats in the world and now we have the most effective and efficient software system to manage our fleet and organization," said **Raimy Eymard, Chief Financial Officer** (pictured) of Offshore Marine Contractors, Inc.. "MarineCFO allows us to integrate all our departments without the headaches of paper trails and errors, therefore increasing our bottom line."

CargoMax Trim Optimization Tool

Herbert-ABS Software Solutions launched CargoMax -Trim Optimization Tool. The Trim Optimization Tool is designed to offer a powerful solution bundled with a regulatory feature. End-users obtain achievable trim and draft optimization at the press of a button for enhanced fuel savings and regulatory compliance. The optimum is achieved under consideration of strength, stability, propeller emersion, visibility, freeboard and maximum deadweight. Combining rigorously tested algorithms, with user-friendly interfaces, it provides quick and consistent results ensuring that the safety of the vessel is maintained at all times.

VSTEP Delivers NAUTIS Tug Trainer Simulator

VSTEP delivered a NAUTIS Tug Trainer Simulator at Rotterdam-based T.O.S (Transport & Offshore Services). T.O.S. is an international maritime service provider with its head office in Rotterdam and a network of branch offices abroad. The NAUTIS Tug Trainer Simulator is a new generation of DNV certified Tug Handling Simulators, catering to the full range of maritime training goals in compliance with the latest STCW & IMO requirements. The NAUTIS Tug Simulators allow captains to experience and train the handling of tugs with different propulsion systems during tug operations.

SpecTec Launches New Version of AMOS Mail

SpecTec makes the humble claim that AMOS Mail 9.2 transforms the world of maritime communication, backed with claims that it could potentially saving up to 80% of satcom costs due to its high-optimized and solid compression algorithm. AMOS Mail, starting from version 9.1, runs on Sybase, Oracle and Microsoft SQL Server Database management systems and, the just introduced MySQL. AMOS Mail is compatible with all Microsoft Operating Systems, both 32 and 64 bits, Windows 8 included.

AVEVA Enterprise Resource Management

AVEVA released a new software product family for the marine and EPC market, AVEVA Enterprise Resource Management. Comprising the products AVEVA Material, AVEVA Planning and AVEVA Production, the application suite supports the entire project management and execution process. Shipyards and EPCs will benefit from lower material and production/construction costs through improved project efficiency, shortening timescales and increasing project quality and control.

www.aveva.com

Eniram Expands in Asia

Norwegian Jewel is the First NCL Vessel with Eniram DTA.

Eniram, a provider of real time decision-support systems for the shipping industry, has opened its Asian office in Singapore. The Finnish company develops onboard applications, performance management and analytics solutions that help fleet owners and captains better operate their ships towards reduced fuel consumption and improved overall vessel efficiency.

Philip Padfield, CEO of Eniram, said: "Singapore was a clear choice for us as it is not only one of the premier global hubs for shipping but has also made clear its intention to be a hub for 'green' shipping in the region. This is in line with our corporate strategy to provide ship owners and operators with technology to save fuel and improve their environmental performance."

The company's new office in Singapore will be headed by Noël Jelsma, Eniram's Asia Pacific Regional Director.

Harbor & Traffic Simulator

By Dr. Jin-Keun Choi, Xiongjun Wu, and Dr. Georges Chahine, Dynaflow Inc.

The U.S. has more than 95,000 miles of coastline and 3.5 million square miles of open water. Over the last 50 years, ship lengths, widths, and drafts have doubled and the amount of commerce has tripled such that over 98% of all U.S. cargo is transported at some point by ship through U.S. ports and harbors. Increasingly larger ships are utilized, and waterways designed for smaller ships are now handling larger ships resulting in decreased margins of safety and increased risk of accidents. Indeed, **according to the U.S. Bureau of Transportation Statistics there are more than 6,000 ships involved in accidents in U.S. waters resulting in over $100 million damage each year.**

A marine traffic simulator can help engineers and decision makers to cope with the changing requirements of waterway traffics and keep traffic safe. Under support from the National Oceanic and Atmospheric Administration (NOAA), Dynaflow Inc. has developed a harbor and waterway traffic simulator based on its ship maneuvering simulator, DYNASIM. This effort resulted in a Traffic version of DYNASIM, a user-friendly, PC Windows based, ship maneuvering and traffic simulator. This simulator is capable of simulating multiple interacting ships in the presence of waves, wind, currents, and obstacles. Through a graphical user interface, the simulator enables the user to input the topography of the simulation environment (including local water depth, shore lines, channels, and restricted water configurations, etc.) and observe the simulation progress.

SHIP MANEUVERING MODEL

The ship mathematical model enables real time solution of ship motion based on physics-based ship hydrodynamics equations including the effects of external forces and the environment. Each ship is modeled by its motion equations: mass (or moment of inertia) multiplied by the acceleration is equal to the sum of all hydrodynamic forces (or moments) including environmental and interaction forces. These hydrodynamic forces acting on the ship are modeled in DYNASIM in a modular fashion. Forces exerted on each of the components of the ship (hull, propeller, rudder, and environmental forces, etc.) are isolated, and the interaction between these components is treated separately. Each component force is modeled using first principles, model tests, sea-trials, and/or Taylor series expansions.

NAVIGATION RULES FOR ENCOUNTERS

Ship traffic is modeled by the concept of a user-input "itinerary" for each ship. The itinerary specified by the user defines the planned ship trajectory, the width of the zone of safe deviation from this ideal route, and the planned speed on each segment of the route. Auto-pilot routines are then applied to each ship to maneuver the ship along the planned route as much as possible.

A collision avoidance capability is implemented in the traffic simulator using the navigation rules from the U.S. Code of Conduct of Vessels. When the distance between two ships is deemed to be too short for safe maneuvering, the following procedures are performed:

- If the two ships are on the same itinerary, head-on or overtaking procedures apply, depending on whether the two ships are heading in the same direction or in opposite directions.
- If they are on different itineraries, crossing avoidance procedures apply, and the Closest Point of Approach (CPA) is calculated.

The CPA is defined as the point defining the shortest distance from the subject ship to the fictitious trajectory of the other ship assumed moving at a constant velocity along the relative velocity vector with respect to the subject ship (Figure 2, below). If the distance to CPA is less than the safe range specified by the user, then each ship is recognized as the give-way ship or the stand-on ship. The stand-on ship maintains its course and speed; however, the give-way ship changes its heading temporarily. If this alone is not sufficient to avoid a collision, the give-way ship slows down by lowering the engine regime.

EFFECTS OF THE ENVIRONMENT ON SAFETY

The simulator can provide safety scores as the simulation proceeds. In traffic management, a "safety significant event" is a ship collision with another ship, a ship collision with a structure, or ship grounding. A set of safety metric models evaluates quantitatively the safety of a ship as well as the

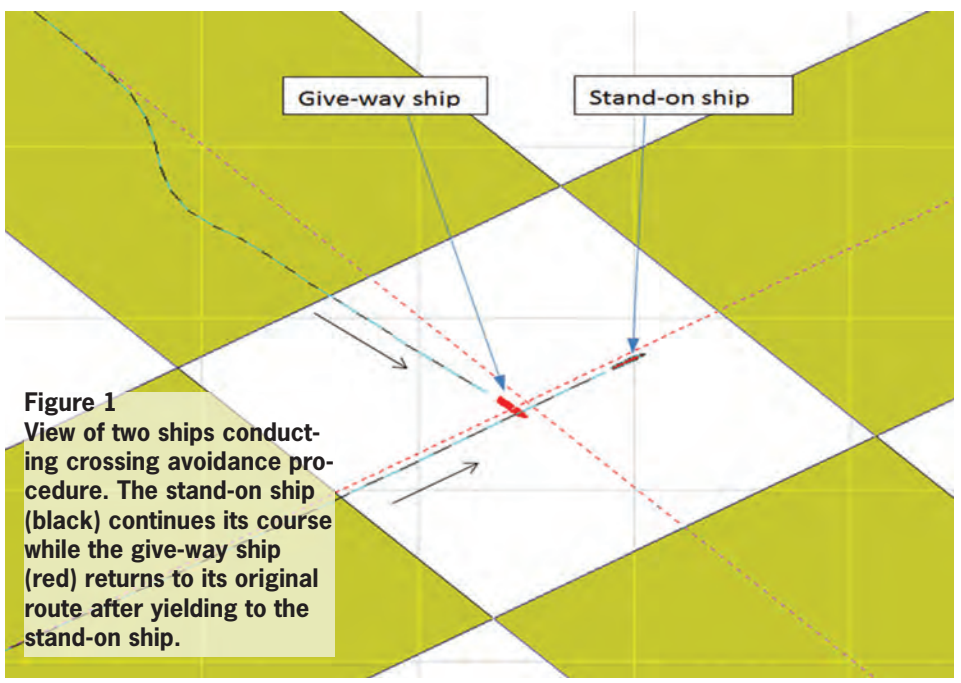


Figure 1
View of two ships conducting crossing avoidance procedure. The stand-on ship (black) continues its course while the give-way ship (red) returns to its original route after yielding to the stand-on ship.

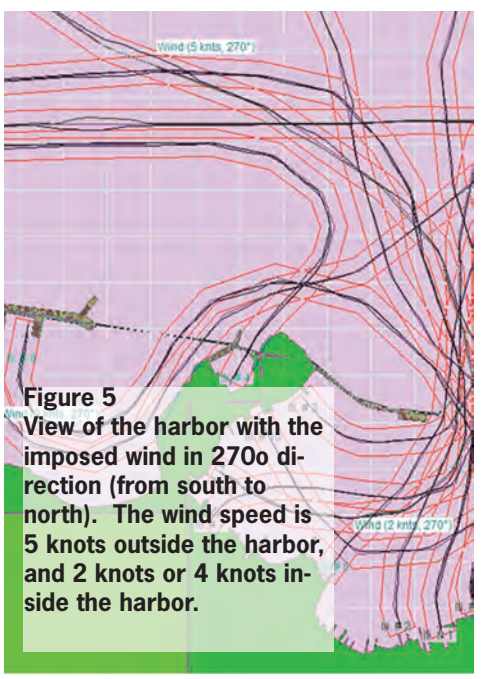


Figure 5
View of the harbor with the imposed wind in 270o direction (from south to north). The wind speed is 5 knots outside the harbor, and 2 knots or 4 knots inside the harbor.

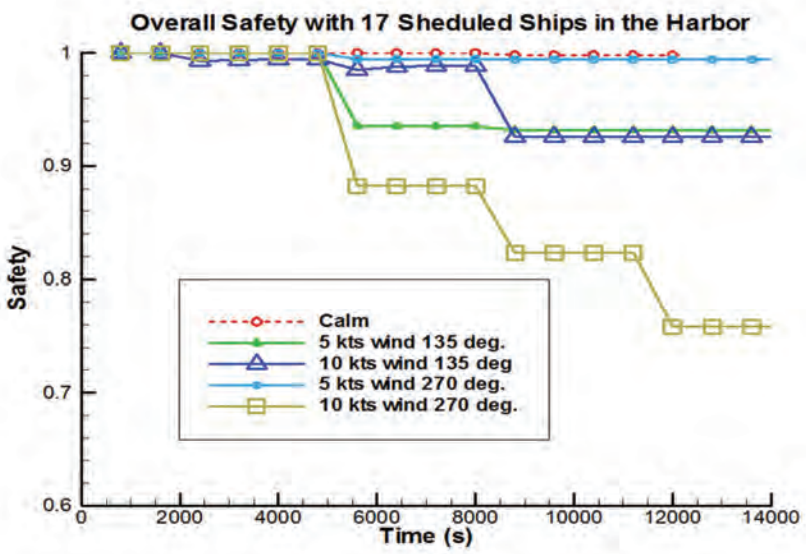


Figure 3
Comparison of the overall safety factor of the harbor traffic as a function of time for various wind speeds and directions.

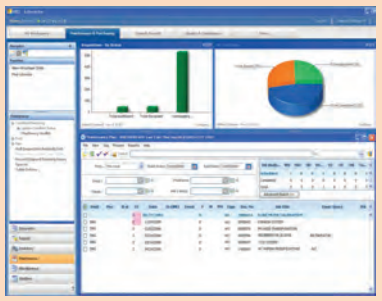
safety of the whole traffic system in consideration. The safety metric in DYNASIM© is a combination of the distance between the ships and CPA metrics.

An example is illustrated in Figure 3. A prescheduled harbor traffic configuration is considered under various wind conditions, two nominal wind speeds (5 and 10 knots) and two wind directions (135º and 270º from the east). The wind speed is set to the nominal wind speed in the open area and is less than the nominal wind speed in the protected harbor areas. Figure 3 shows a view of the simulation environment under the 5 knots nominal wind and a direction of 270º (south to north).

DYNASIM can also simulate ship traffic subjected to combined environmental conditions. Environmental factors affect the potential for accidents substantially. DYNASIM can quantify the likelihood of collision depending on vessel hydrodynamics, traffic density, navigation channels geometries, and environmental conditions. Using this simulation tool, harbor designers and port managers can evaluate new waterway designs, modifications (e.g. ship size, characteristics, harbor obstacles, ship schedule, etc.), implementation of safety measures under simulated traffic and weather conditions. This simulator can be useful also for maneuvering training, harbor traffic planning, and waterway management.

http://www.dynaflow-inc.com/Products/Software/DynaSIM/DynaSIM.htm

Reederei Claus-Peter Offen Selects ABS Nautical Systems



ABS Nautical Systems announced the implementation of its NS5 Enterprise software suite has begun on Reederei Claus-Peter Offen's fleet of container vessels. Based in Hamburg and one of the world's largest suppliers of modern container tonnage, the company will be using three modules from ABS Nautical Systems' integrated software solution. Reederei Claus-Peter Offen purchased the Maintenance & Repair, Purchasing & Inventory and Voyage Management modules for its fleet of 103 vessels. These modules provide the tools to track maintenance expenses, upcoming drydocks and repairs, inventory replacement needs, fuel consumption and cargo operations across their entire fleet.

"We needed technology that offered both a centralized and standardized solution, and was user-friendly," said Lutz Miesen, Project Engineer for Reederei Claus-Peter Offen. "Our engineers and crew wanted a one-for-all solution for their day-to-day workloads and ABS Nautical Systems' software suite has provided that."

Shipping's CO2 Tipping Point

Managing Carbon Emissions is Essential for Commercial Success

By Helena Athoussaki, CEO, Carbon Positive

Market fundamentals and impending emissions regulation demand that shipping takes the next step in formalizing and professionalizing its approach to sustainability, reflecting its increasing importance as a business-critical asset. As bunker prices rise, difficult market conditions persist and regional carbon emissions regulations strengthen, minimizing carbon management risk and encouraging shipping to become more sustainable and share this transparently with all key stakeholders will be critical to securing a competitive advantage.

The connection between sustainability and commercial success is strengthening and although the shipping industry is gradually preparing for imminent regulation, this focus must increase. DNV recently stated that as few as 10% of shipowners are implementing energy efficiency initiatives , and the market stalemate on regulation, lack of clarity surrounding emissions management best practice and sheer volume of information around this in the market has hindered action.

While no specific mechanism is yet confirmed, further emissions regulation and a price on carbon in some form is a certainty. So taking the appropriate action now will ensure that shipowners are better prepared with a strong commercial advantage once compliance is made mandatory. Without a well-structured and formal reduction program, revenue can be at risk or lost from carbon costs.

Managing carbon emissions risk is therefore the crux of the challenge facing shipowners, who need expert support to navigate the strategic management of carbon emissions, which can be complex. Understanding the ways that carbon management can affect your business is a knowledge curve that must begin now, taking into consideration operational factors, mandatory regulation - such as EEDI and SEEMP - and CSR, as carbon has the potential to impact the bottom line in a variety of ways.

Adopting a process at an early stage that takes a holistic approach, encompassing all options starts with monitoring and reporting, as this will be required for any European policy, and implementing a standardized process is crucial for the environmental effectiveness of any successful carbon reduction scheme. The first step is to accurately measure carbon footprint, starting with every vessel and port. This vital data will be used to set baselines and therefore emissions reduction targets. Not only is creating transparency the absolute foundation of any successful emissions reduction program, but on an industry-wide level it is particularly crucial for an emissions trading system. Secondly, using the latest and most effective technical and operational measures to reduce emissions in line with current regulations will result in genuine cost savings and better performance that can be monitored and reported.

The last step is for the ship owners to voluntarily offset their carbon emissions and prepare for further regulation, while responding to sustainable shipping in a responsible and professional way.

Shipping must collectively look to assist the regulator to develop a cost-efficient process and take a longer-term view. This will establish the industry's current carbon footprint based on true and current data that can be used to benchmark success and set achievable reduction targets, which of course will be absolutely critical for any carbon emission reduction scheme.

From an organizational perspective, while sustainability is rightly increasingly taken seriously at board level, a formal process is essential to enhance this progress further by articulating the clear-cut commercial benefits of investing in both technical and operational measures, ensuring a competitive advantage and minimizing risk. Taking a strategic approach to carbon by aligning this with stakeholder expectations, business strategy and the vision for your organization will eventually become second nature to shipping companies as it is within other industries. Having a healthy

While no specific mechanism is yet confirmed, further emissions regulation and a price on carbon in some form is a certainty. Taking action now will ensure that shipowners are better prepared with a strong commercial advantage once compliance is made.

Helena Athoussaki, CEO, Carbon Positive

awareness of the operational, regulatory and reputational risks that carbon presents and turning those into opportunities to build commercial advantage will benefit both the environment and the bottom line.

Not only do efficiency measures simultaneously reduce fuel consumption and therefore spend, at the same time the world's focus on shipping's stance against climate change continues to sharpen. Stakeholders across the global supply chain are all placing greater importance on carbon emissions management. Major retailers are driven by consumer interest in sustainability, for example, and for financial institutions climate change CSR is now a key criterion on which banks such as ABN Amro evaluate future funding.

Where the financial institutions lead, charterers follow closely as they are also attracted to more efficient vessels. Communicating your sustainability credentials to these stakeholders in a way that is standardized and accredited by an independent, third-party organization is another element of a formal emissions reduction program. Being able to show that a vessel is part of a carbon reduction programme will become an additional asset that adds genuine value and return on investment for your organization.

Essentially, investing in efficient vessels means investing in a long-term carbon emission strategy. Guided by experts and based on a three-phase program of measuring, reducing and offsetting carbon emissions, this will prepare shipowners to weather the introduction of competition further regulation and fluctuating fuel prices. While we wait for further regulation to be agreed, the shipping industry must focus on understanding that carbon has a price, as well as the proactive measures that can be taken to realize the value that it presents both now and in the years to come.

This is a pivotal time in the development of global carbon measure for shipping. Now, more than ever, ship owners need support to understand and capitalize upon this new era of emissions regulation and the positive impacts that this can bring to the market.

Changing of the Guard

At Tidewater, CEO Jeff Platt Steps in for Retiring CEO Dean Taylor

By Susan Buchanan

Dean Taylor bid farewell to his post as Tidewater Inc.'s chief executive officer on May 31, following a prosperous, far-flung career of 34 years at the New Orleans-based company. COO Jeff Platt, who has worked side by side with Taylor for 15 years, took the helm. And Jeff Gorski was named the new COO. In his decade as chief, Taylor guided Tidewater's fleet expansion. The company has poured hundreds of millions of dollars yearly into an energetic building-and-acquisition effort. Tidewater owns 342 vessels, the world's largest fleet serving the global, offshore-energy industry. Taylor is modest about his record, however, and said in late May "my biggest accomplishment as CEO won't be known for some time. I believe the company will benefit from our investments in people and equipment, but the results won't be truly evident for awhile."

Tidewater has nearly 7,700 employees, with corporate HQ in New Orleans, sales in Houston and a number of overseas offices. Its fleet works in more than 60 countries, with the Gulf of Mexico providing just six percent of total revenues. The firm operates Quality Shipyards, a wholly-owned subsidiary, building and repairing vessels in Houma, La. During Taylor's tenure, Tidewater had three, consecutive years of record revenues from 2007 to 2009. The company's stock reached an all-time high in mid-2007. This year, Tidewater's profits for the fiscal quarter ended in March 2012 exceeded expectations. And the company has managed to avoid accidents and injuries, keeping its insurance costs in check. Taylor started as an assistant manager at Tidewater in mid-1978 in Morgan City, La., after serving as a U.S. Navy officer for seven years. A series of rapid promotion at Tidewater took him and his family to posts around the world.

"To date the biggest growth area for Tidewater has been West Africa, and we've had good opportunities in the Middle East, Far East, South America and Mexico," Taylor said. "Other opportunities will continue to evolve in the immediate future because of increased demand for offshore drilling since last year."

In the quarter ended in March, the company's Sub-Saharan Africa-Europe regional operations contributed nearly half of the company's profits from vessels. Another lucrative area was the Americas, followed by Asia-Pacific and the Middle East-North Africa.

Taylor said "the healthiest part of the global marine industry is the offshore segment. Most other segments are plagued by overcapacity and under-utilization of equipment. Offshore isn't in that situation yet, though it could be if it overbuilds."

"A major risk for any capital-intensive business is having too much supply," Taylor said. "But, in our case, the supply of offshore ships is not excessive for the demand at hand."

SPANNNING FIVE CONTINENTS

Taylor was appointed GM of Tidewater's business in Italy in 1979, and in 1981 was named GM of its Brazilian activities. He was promoted to Regional Manager for the Middle East, India and East Africa in 1985. He directed Tidewater's joint ventures and businesses in Mexico starting in 1986, and began steering its Venezuela activities in 1992.

Taylor was designated corporate VP in 1993. In 1995, he directed Tidewater's business in the Americas south of the Rio Grande, including the Caribbean. He was promoted to Executive Vice President in late 2000, with ongoing operations responsibilities in Brazil, Mexico, Trinidad, Venezuela, Angola, West Africa, Nigeria and the North Sea. He steered all international sales activities. In October 2001, Taylor was named President, and in March 2002 he took over as CEO from William O'Malley. He has been a member of Tidewater's board since 2001, and was appointed Chairman in July 2003 (and will remain non-executive Chairman through 2013.)

Taylor was at the helm when Hurricane Katrina closed the company's corporate office in New Orleans for three months in 2005, sending employees to Amelia, La., and Houston. In a momentous event during his watch, the company's vessel Damon B. Bankston in late April 2010 rescued all 115 survivors from BP's Deepwater Horizon well explosion.

Assessing his record, Taylor said, "I think any CEO is only as good as the successors who follow him. I'm confident Jeff Platt and his team will do a great job." He added "if I haven't done a good job preparing them, then results of my efforts won't be as good as they could have been. My biggest accomplishment will be if Jeff Platt and team have a remarkable run as leaders of this company."

PLATT AT THE HELM

After a 15-year career with Schlumberger Well Services and Rollins Environmental Services, Jeff Platt joined Tidewater in 1996 as GM of business in Brazil, and soon moved up the ranks and around the world. Platt said "one of my biggest accomplishment at Tidewater to date is participating in an effort led by Dean Taylor to renew and expand our fleet, while still maintaining our financial discipline. The company today has the newest and largest OSV fleet in the world."

When asked about challenges for Tidewater in the next few years, he said "we'll continue to concentrate on fleet modernization, continue adding to the fleet and expanding our service offerings. Dean has left the company in great shape, operationally and financially." Platt said the company has grown during a period of financial turbulence around the world. "That has strengthened Tidewater, giving us lots of opportunities in the future," he said. "We'll find ways to build on our opportunity, build our

"It's been a privilege to work for such a wonderful company for most of my career ... The company and industry have been a love affair for me."

Dean Taylor (left)

"I have big shoes to fill following Dean. He is a remarkable man, very genuine, a truly great guy and a great personal friend of mine."

Jeff Platt

market share and capabilities so we can continue to grow the company."

"All international companies face the challenges of understanding the countries we operate in, conforming to local laws, tax regimes and national content requirements. Getting the right structure in place is key to our continued success."

During his Tidewater tenure, Platt lived overseas for 3.5 years, mostly in South America. In September 2001, he was put in charge of Tidewater's business and JVs in Mexico. In November 2001, Platt was promoted to Vice President, managing the company's activities in South America, Mexico and the Caribbean. In March 2004, he was named Senior Vice President, responsible for operations in the Americas, Middle East and India.

In July 2006, Platt became Executive Vice President, overseeing the company's day-to-day, marine operations, domestically and internationally. In March 2010, he was promoted to Chief Operating Officer.

Platt lives in Mandeville, La., with his wife Sandra and their two sons, and works out of New Orleans. He is a 1979 graduate of the University of Pittsburgh, with a BS degree in Electrical Engineering.

As for his new role, Platt said "I am very honored the Board chose me to replace Dean Taylor. I have big shoes to fill following Dean. He is a remarkable man, very genuine, a truly great guy and a great personal friend of mine."

Looking back at his 34 years at Tidewater, Taylor said "it's been a privilege to work for such a wonderful company for most of my career. I'm grateful to John Laborde and Bill O'Malley for putting my set of skills to work, and for the opportunities I was given. The company and industry have been a love affair for me."

John Laborde retired in 1994 as Tidewater chief, and was followed by William O'Malley, before Taylor took over in 2002.

Taylor will kick off his retirement with a trip to Normandy and Paris with his family in early June. "I have a wonderful wife, five daughters, a son and three grandchildren, and plan to spend more time with them."

He plans to keep up with friends in nearly every part of the world. "I'm looking forward to traveling and using languages at a pace that's different from business," he said

Taylor speaks Italian, Spanish and Portuguese fluently and reads French. How did he learn those languages? "I've worked at it," he said. "You can't learn by buying lots of books. People get discouraged partway through books one, two and three and give up on each of them. My advice is to buy one book and stick with it to the finish."

He added "I think there's an inverse relationship between the number of language books you buy and how much you learn."

Taylor lives with his family in Kiln, Miss. in what he said is a ramshackle farm where timber's the best business. "In the yard, we have pretty, fat and sassy horses that aren't very functional," he said. "I call them yard ornaments."

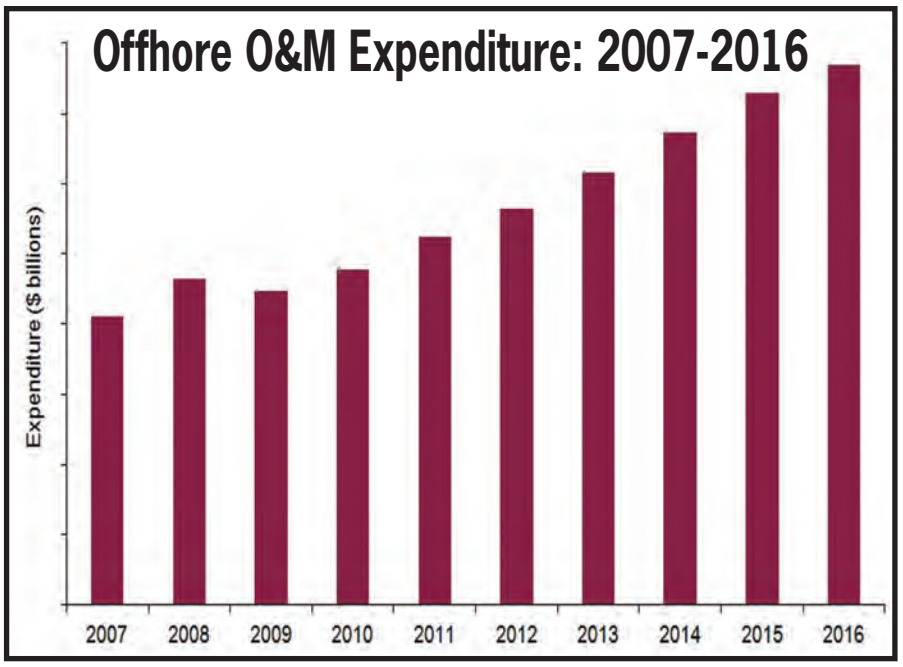
"We also have a house 14 miles away in Bay St. Louis, where I love to fish," he said. "Between family, friends, hobbies and Board duties, I don't expect to have much idle time." end

Offshore Ops & Maintenance

Strong Growth in Offshore Ops & Maintenance Expenditure Forecast

By Jennifer Harbour, Douglas-Westwood

More than $335 billion worth of expenditure is expected over the next five years on offshore oil & gas operations & maintenance (O&M), according to a new report, *The World Offshore Operations & Maintenance Market Forecast 2012-2016*, by Douglas-Westwood (DW). Growth of 8% in expenditure is forecast annually 2012-2016, with O&M markets considerably less vulnerable to downturn than their capital-led counterparts.



Capex by Region Historic and Forecast

	'07-'11	'12-'16
Africa	36,742	57,645
Asia	32,274	51,309
Australasia	7,038	11,593
Eastern Europe & FSU	8,005	13,827
Latin America	28,867	47,625
Middle East	25,710	39,572
North America	43,378	51,313
Norway	17,236	20,133
Rest of Western Europe	7,739	10,616
UK	25,457	31,389
Total	**232,445**	**335,022**

Source: *The World Offshore Operations & Maintenance Market Forecast 2012-2016*, by Douglas-Westwood (DW)

GLOBAL ENERGY DEMAND

The underlying driver for all activity, both onshore and offshore, is the growth in global energy demand which, for the medium term at least, means demand for hydrocarbons (predominantly oil and gas). Over the long term, the trend towards increasing energy consumption is clear. This has more than tripled over the past fifty years, driven mainly by demand growth in the developing economies of China and India. Inversely, 2008 saw primary energy consumption decrease in a number of countries due to a combination of the global financial crisis and growing environmental concern. Despite improvements in energy efficiency, usage growth in the developing countries is expected to maintain an upward pressure on demand.

OIL SUPPLY PRESSURES

At the end of 2011 there were 230 countries and territories in the world; 43% of these (100) now produce oil and natural gas liquids, have produced them in the past or are expected to produce them in the future (at commercial levels). However, 66 countries including the UK, USA and Russia are already well past their production peak (greater than five years) while the remainder will see peak within the next 25 years. The impact of this is that we are likely to see global oil production limit within the next decade (DW estimate 2016).

COST INFLATION & OIL PRICE

O&M markets are more robust than those led by capital expenditure. Oil price fluctuations do not generally have the same level of impact on O&M expenditure compared to capital expenditure related activities such as drilling and field development. This is mainly due to O&M expenditure being vital to ensuring ongoing production levels, the principal revenue stream for offshore operators, are maintained. As a result DW expect that the majority of the markets covered in the World Offshore Operations & Maintenance Market Forecast are considerably more robust than those relating to the initial development of oil and gas fields with any significant up or downturns in global expenditure being driven principally by industry cost inflation (or deflation).

Despite this a number of the services covered in this report such as well stimulation, wireline operations, subsea well intervention and platform drilling are highly price sensitive and their economic viability is dependent upon a number of criteria including oil price, vessel/unit/rig rates and potential upside in oil or gas flowrates.

Buoyant oil prices have caused rampant cost inflation in the upstream oil and gas sector over the past five years: Since the turn of the 21st century global energy demand has grown rapidly, driven largely by the modernisation of the large Asian economies of China and India. This growth in demand coupled with concerns of future oil supplies resulted in rapid growth in oil prices. In turn, this upward trend in prices drove a flurry of field development activity, placing significant constraints on the available infrastructure and capacity in the market, leading to rampant cost inflation in all sectors of the oil and gas industry.

Post 2008 oil prices slumped following the global recession of the same year. As commodity prices dropped so too did demand for oil and gas related services such as drilling and intervention work, which in turn has seen a downturn in pricing for equipment and services. Industry costs have recovered and are expected to continue to grow over the next five years, but DW expect the operator community to exert far more influence on pricing in order to prevent a repeat of the extreme inflation of the 2003-2008 period.

As onshore reservoirs continue to mature and new prospects become few and far between, a greater proportion of oil and gas production will be met by the offshore sector. Since 1945 offshore production has taken an increasing proportion of global supply, however, it was the oil crises of 1973 and 1979 that really emphasized both the necessity and importance of diversification. Where previously the Western world had depended heavily on Middle Eastern oil, the results of the OPEC embargo and Iran-Iraq conflict over the 1973 and 1981 period highlighted the dangers of over-reliance on politically volatile states. As a result the Western world began to look closer to home for oil, sparking a boom in both North American drilling activity and North Sea oil production.

Since the 1980s the focus on offshore production has become less political and more of a necessity as onshore reservoirs continue to mature and new prospects become increasingly scarce. The move to deeper waters in West Africa, Latin America and the Gulf of Mexico will also play a key role in meeting future demand for oil. **DW believes that by 2018, 37% of global oil supply will come from offshore with 11% coming from deep water.** Gas is growing in importance as its potential production peak is in 2032, much later than that of oil. The abundance of natural gas, coupled with its relative environmental soundness, its multiple applications across the electricity generation, residential, commercial and industrial sectors and its growing value in the transport sector, means that it will play a progressively more central role in meeting global demand for energy over the next two decades.

Today, much natural gas production is a by-product of oil production. In remote offshore areas such as West Africa, E&P companies will often flare associated gas as they lack the necessary infrastructure to process and produce it. As natural gas becomes more important in the global energy mix we expect the current appetite for flaring to diminish leading to a boost in offshore natural gas production over the next ten years. Offshore oil & gas O&M covers a variety of sectors. Operations relate to services required for ongoing production, including the supply of labour and raw materials. Maintenance is related to ongoing inspection, repair and upkeep of installed infrastructure, in-

cluding protective coatings, electronics, and process systems, valves and flowlines equipment, and the maintenance of production wells.

PLATFORM DRILLING & WELL INTEGRITY

Drilling is often regarded as a Capital Expenditure and whilst the majority of offshore drilling activity is performed through Mobile Offshore Drilling Units (MODUs) a significant proportion is carried out from the actual production platform. By its very nature most platform drilling occurs after hook-up and production has commenced and as such it has been included in our operational expenditure forecast. Platform drilling is not solely development, new breakthroughs in directional drilling have seen many sidetracks (extensions of existing wellbores) being used to gather geological data from the surrounding area and has opened up the potential for exploration drilling to discover stranded reserves in the immediate vicinity.

PRODUCTION SERVICES

Production services relate to expenditure incurred as a result of hydrocarbon production ranging from reservoir management, stimulation activities such as perforation & fracturing through to waste management of produced water. Production services are therefore a combination of well intervention and services that include wireline operations such as production logging to coiled tubing work such as fracturing and other pumping services. DW's market forecast for production services includes: power generation, produced water services, wireline services and stimulation services (proppant fracturing and acidization).

REGIONAL FORECAST

In 2011 demand for offshore operations & maintenance services totalled over $52 billion, having grown at a compound rate of over 6% over the past five years. Over the next five years we expect a greater level of growth as the market recovers from the effects of the global downturn of 2008-2009. This will be driven by a combination of high oil prices, buoyant offshore development activity and rampant price inflation for equipment and services. O&M markets are considerably less vulnerable to downturn than their capital-led counterparts. Whilst global offshore drilling activity dropped by a estimated 14% between 2008-2009, total offshore production (the principal driver for all operational activity) grew by 1%. The global offshore O&M market fell, but only slightly, despite widespread price deflation for equipment and services. Historical dominance of mature western basins is to be challenged. Between 2007-2011, 40% of global demand was accounted for by Western Europe and North America. Although we expect market growth in all regions (despite the UK and Rest of Western Europe regions facing terminal production decline) we expect the Western Europe and North American share of global demand over the forecast period to drop by a few percent. This shift will be driven by a combination of increasing offshore production in regions such as the Middle East and the movement towards deepwater in less mature regions such as Africa and Latin America.

CONCLUSIONS

Production services dominate O&M market expenditure. Over the 2007-2011 period demand for production related services accounted for 44% of global O&M demand. These services are directly associated with production levels from offshore facilities and are intensified as an oil or gas reservoir matures and requires additional effort to sustain production. The inevitable maturing of offshore fields will drive compound growth of over 7% in the production services sector as operators struggle to come to terms with decreasing downhole pressure and increasing water cuts.

The Asset Services market is set to outgrow all other market sectors. For example, the trend towards leasing of floating production systems has led to substantial growth. Between 2012 and 2016 136 new units are expected to be installed of which over half are likely to be leased which will drive significant growth in the Asset Services market over the next five years.

About the report & the author

The World Offshore Operations & Maintenance Market Forecast 2012-2016 contains:

- **Unique and proprietary data**
- **Regional forecasts**
- **Macro-economic overview**
- **Competitive landscapes**

Jenny Harbour joined Douglas-Westwood in 2011 as a Researcher, having previously worked within the field of industrial energy generation, distribution and efficiency measures. She is a graduate from the University of East Anglia's School of Environmental Sciences.

U.S. Navy

U.S. Navy still the World's "preeminent maritime force," but Treading water on Shipbuilding

By Captain Edward Lundquist (Ret.)

At the 200th anniversary of the War of 1812, and with a new Chief of Operations at the helm, the U.S. Navy continues to provide credible combat power with persistent presence around the world. Chief of Naval Operations Adm. Jonathan Greenert has set forth his "Sailing Directions" and "Navigation Plan" for the Navy, which sets forth priorities and informs the budget and acquisition process. Meanwhile, the demand signal for the capabilities provided by the Navy and Marine Corps remains strong, and shows no signs of abating.

"Today our Navy is the world's preeminent maritime force," said Greenert. "On any given day we have about 50,000 sailors and 145 ships underway, with about 100 of those ships deployed overseas."

Our global fleet operates forward from U.S. bases and partner nation places around the world to deter aggression, respond to crises and, when needed and when called upon, to win our nation's wars," Greenert said.

The global reach and flexibility that are hallmarks of a forward deployed Navy have done everything from launch missiles into Libya, to providing humanitarian assistance and disaster relief in Japan after the quake and tsunami, to protecting merchant ships from pirate attacks, to shielding our nation and our friends from ballistic missile attacks. Yet the Navy finds itself being used in untraditional roles. The U.S. naval forces at sea in the Central Command area of operations (AOA) are joined by another 10,000 Sailors on the ground, who are mostly serving in support roles in Afghanistan.

The Navy continues to build and maintain partnerships. For example, USS Blue Ridge (LCC 19), USS Chafee (DDG 90) and USNS Safeguard (T-ARS 50) recently conducted exchange activities with the Vietnamese People's navy in Da Nang, Vietnam; while USS Simpson (FFG 56) and 10 vessels from 12 West African and European nations successfully completed the 2nd annual Exercise Saharan Express 2012, a regional maritime exercise focused on improving the communications and interoperability of West African countries.

The shipbuilding program continues on course, but even as new ships join the fleet, older ships are being retired and the size of the fleet is not growing, and is not likely to reach the stated goal of 313 ships any time soon. There are currently 288 ships counted—up from 274 in March of 2007—but that number will still be 288 five years from now.

However, Secretary of the Navy Ray Mabus told the Senate Armed Services Committee hearing on the Proposed Fiscal 2013 Defense Authorization, the "fleet of 2017 will include more more-capable ships equipped with state-of-the-art technology and manned as always by highly skilled people."

Greenert has communicated his priorities through his "Sailing Directions" and "Navigation Plan."

"Sailing Directions assist mariners in planning a long voyage by describing the destination, providing guidance on which routes to take, and identifying the conditions, cautions, and aids to navigation along the way," the XX 2012 publication states. "CNO's Sailing Directions likewise provide a vision, tenets, and principles to guide our Navy as we chart a course to remain ready to meet current challenges, build a relevant and capable future force, and enable and support our Sailors, civilians, and their families."

From the September 2011 Sailing Directions comes the April 2012 "Navigation Plan," which draws from Sailing Directions to describe how Navy's budget submission for Fiscal Year (FY) 2013-2017 pursues the vision of the CNO's Sailing Directions. "It highlights our investments that support the missions outlined in the new defense strategic guidance, Sustaining U.S. Leadership: Priorities for 21st Century Defense, viewed through the lens of my three tenets: Warfighting First, Operate Forward, and Be Ready. The Navigation Plan defines the course and speed we will follow to organize, train, and equip our Navy over the next several years. To help identify our long-term destination, we are conducting assessments of the number and type of ships and aircraft required to implement the defense strategic guidance," the plan states.

Greenert said the plan acknowledges "a dynamic security environment and fiscal challenges,"

"These factors may cause our intended plans to change or cause us to experience some 'set and drift' to our course," he said. "To ensure we stay on track, I will depend on feedback from the fleet to take a fix each year or when conditions require. I will use each fix to evaluate our track and, as needed, issue updates to the Navigation Plan."

WARFIGHTING FIRST

"Our warfighting investments directly support the missions outlined in the new defense strategic guidance," Greenert says.

The Navy's FY 2013 – 2017 budget submission seeks to maintain the Carrier Strike Group (CSG) with its embarked air wing and the Amphibious Ready Group (ARG) with its embarked Marine Expeditionary Unit (MEU) as the main instruments to deter and defeat aggression and project power. That Navy will sustain 11 carriers and 10 air wings, one each in Japan; and 10 ARGs, including one in Japan.

To improve the Navy's near-term mine warfare capability, the Navy will move ahead with the Quickstrike mine; the Seafox Mine Neutralization System; up-

"Today our Navy is the world's preeminent maritime force," said Greenert. "On any given day we have about 50,000 sailors and 145 ships underway, with about 100 of those ships deployed overseas."

Chief of Naval Operations (CNO) Adm. Jonathan Greenert

(U.S. Navy photo by Mass Communication Specialist 1st Class Peter D. Lawlor/Released)

graded MCM-1 class ship sonar, hull, and engineering upgrades; and Unmanned Underwater Vehicles (UUV) for shallow and bottom mine detection.

The service will continue to keep the aging patrol coastal (PC) ships combat relevant against fast attack craft with enhanced gun and surface-to-surface missile systems, as well as for the new Littoral Combat Ship (LCS), as well as laser-guided rockets for helicopters and Unmanned Aerial Vehicles (UAV).

The service will continue its plan to acquire new but proven warships and aircraft, including the Arleigh Burke-class destroyer, San Antonio-class amphibious ship, Virginia-class submarine, MH-60 R/S helicopter, F/A-18 Super Hornet, E/A-18 Growler, and E-2D Hawkeye.

New platforms currently under development and construction will move to the Fleet, including LCS, the Gerald Ford-class aircraft carrier, America-class amphibious assault ship, Zumwalt-class guided missile destroyer, P-8A Poseidon maritime patrol aircraft, Joint Strike Fighter, and Broad Area Maritime Surveillance (BAMS) UAV.

The Navy awarded a $2.38 billion contract to Huntington Ingalls on May 31 to build LHA 7—the next USS Tripoli—at Pascagoula.

Nevertheless, the navy has decided to retiring seven Aegis cruisers instead of modernizing them, and is delaying the start of the SSBN(X) Ohio replacement program or the by two years.

Greenert says the Navy will "Improve the reach of today's platforms through new payloads of more capable weapons, sensors, and unmanned vehicles to include: SM-6 missile, submarine-launched conventional strike weapon, long range surface-to-surface weapon, Air and Missile Defense Radar, Firescout UAVs, and the Unmanned Carrier–Launched Air Surveillance and Strike vehicle."

He also says the Navy will "maintain our warfighting edge and implement the Navy/Air Force Air-Sea Battle Concept through innovation in our CONOPS and tactics, and integration of the next generation of weapons, sensors, and unmanned vehicle payloads for our current ships and aircraft."

The Navy will continue to dominate the undersea environment with a combination of Virginia-class submarines, Virginia-class Payload Modules, improved torpedoes such as the Mk-54 lightweight torpedo and P-8A High-Altitude ASW Weapon Capability, and Large Displacement UUV, Greenert says. "We also strengthen our defense against submarine threats with additional periscope detection systems and new torpedo countermeasures."

The Navy will fully exploit cyberspace and the electromagnetic spectrum as warfighting domains with upgrades to Ship's Signal Exploitation Equipment and the SLQ-32 surface electronic warfare system, and continued development of the Next-Generation Jammer for airborne electronic warfare, he says.

But even with the most advanced technology, superiority still translates to people. "Every day our Sailors around the globe demonstrate their commitment to our Maritime Strategy through vigilance, exercises with allied partners, and ability to respond whenever and wherever they are needed. Our Sailors truly are the backbone of our Navy, and we are committed to equipping them with the tools they need to maintain maritime superiority and execute our nation's tasking, both now and in the future," said Vice Adm. William R. Burke, Deputy Chief of Naval Operations for Warfare Systems.

To view the CNO's Sailing Directions, visit ttp://www.navy.mil/cno/cno_sailing_direction_final-lowres.pdf
To view the CNO's Navigation Plan, visit http://www.navy.mil/cno/Navplan2012-2017-V-Final.pdf

United States Navy Ships Under Construction

LITTORAL COMBAT SHIPS

Hull/Yard	LCS 3/M	LCS 4/AU	LCS 5/M	LCS 6/AU	LCS 7/M	LCS 8/AU	LCS 9/M	LCS 10/AU	LCS 11/M	LCS 12/AU
Name	**Fort Worth**	**Coronado**	**Milwaukee**	**Jackson**	**Detroit**	**Montgomery**	**Little Rock**	**Gabrielle Giffords**	**Sioux City**	**Omaha**
Builder	MMC	Austal	MMC	Austal	MMC	Austal	MMC	Austal	MMC	Austal
Homeport	San Diego,CA	San Diego,CA	San Diego,CA	San Diego,CA	San Diego,CA	San Diego,CA	TBD	TBD	TBD	TBD
Award Date	3/23/2009	5/1/2009	12/29/2010	12/29/2010	3/17/2011	3/17/2011	2/24/2012	2/24/2012	2/24/2012	2/24/2012
Start Fab	4/21/2009	10/16/2009	8/5/2011	8/29/2011	4/11/2012	TBD	TBD	TBD	TBD	TBD
Lay Keel	7/11/2009	12/17/2009	10/27/2011	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Launch/Float Off	12/4/2010	1/10/2012	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Christening	12/4/2010	1/14/2012	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Delivery	6/6/2012	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Commissioning	9/22/2012	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

JHSV & MLP

JHSV 2/AU	JHSV 3/AU	JHSV 4/AU	JHSV 5/AU	JHSV 6/AU	JHSV 7/AU	JHSV 8/AU	JHSV 9/AU	JHSV 10/AU	MLP 1/N	MLP 2/N	MLP 3/N
Choctaw County	**TBD**	**Fall River**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**Montford Point**	**John Glenn**	**Lewis B. Puller**
Austal	Austal	Austal	Austal	Austal	Austal	Austal	Austal	Austal	NASSCO	NASSCO	NASSCO
2009	2009	2010	2010	2011	2011	2012	2012	2013	2011	2011	2012
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1/28/2010	1/28/2010	10/29/2010	10/29/2010	6/30/2011	6/30/2011	2/24/2012	2/24/2012	TBD	5/27/2011	5/27/2011	02/26/12
9/13/2010	9/12/2011	TBD	TBD	TBD	TBD	TBD	TBD	TBD	6/24/2011	TBD	TBD
11/8/2011	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	1/19/2012	TBD	TBD
TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

VA CLASS

Hull/Yard	P/C	SSN 782/EB	SSN 783/NNS	SSN 784/EB	SSN 785/NNS	SSN 786/EB	SSN 787/NNS	SSN 788/EB	SSN 789/NNS	SSN 790/EB	SSN 791/NNS
Name		**Mississippi**	**Minnesota**	**North Dakota**	**John Warner**	**Illinois**	**Washington**	**Colorado**	**Indiana**	**South Dakota**	**TBD**
Builder		EB	NNS	EB	NNS	EB	NNS	EB	NNS	EB	NNS
Award Date		1/1/2004	1/1/2004	12/22/2008	12/22/2008	12/22/2008	12/22/2008	12/22/2008	12/22/2008	12/22/2008	12/22/2008
Start Fab	C/*P	2/19/2007	2/19/2008	3/2/2009	3/2/2010	3/2/2011	9/2/2011	3/2/2012	TBD	TBD	TBD
Lay Keel	C/*P	6/9/2010	5/20/2011	*5/1/2012	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Launch/Float Off	C/*P	10/13/2011	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Christening	C/*P	12/3/2011	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Delivery	C/*P	5/13/2012	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Commissioning		6/2/2012	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

DDG51

Hull/Yard	DDG 113/I	DDG 114/I	DDG 115/B	DDG 116/B
Name	**John Finn**	**Ralph Johnson**	**Rafael Peralta**	**Thomas Hudner**
Builder	Ingalls	Ingalls	BIW	BIW
Homeport	TBD	TBD	TBD	TBD
Fleet	TBD	TBD	TBD	TBD
Award Date	6/15/2011	9/26/2011	9/26/2011	2/28/2012
Start Fab	TBD	TBD	TBD	TBD
Lay Keel	TBD	TBD	TBD	TBD
Launch/Float Off	TBD	TBD	TBD	TBD
Christening	TBD	TBD	TBD	TBD
Delivery	TBD	TBD	TBD	TBD
Commissioning	TBD	TBD	TBD	TBD

DDG1000

Hull/Yard	DDG 1000/B	DDG 1101/B	DDG 1002/B
Name	**Zumwalt**	**Monsoor**	**Lyndon B. Johnson**
Builder	BIW	BIW	BIW
Homeport	TBD	TBD	TBD
Fleet	TBD	TBD	TBD
Award Date	2/14/2008	9/15/2011	9/15/2011
Start FAB	2/11/2009	10/29/2009	4/4/2012
Lay Keel	11/17/2011	TBD	TBD
Launch/Float Off	TBD	TBD	TBD
Christening	TBD	TBD	TBD
Delivery	TBD	TBD	TBD

CVN LHA

Hull/Yard	CVN 78/NNS	CVN 79/NNS	LHA 6/I	LHA 7/I
Name	**Gerald R. Ford**	**John F. Kennedy**	**America**	**Tripoli**
Builder	NNS	NNS	Ingalls	Ingalls
Homeport	TBD	TBD	SDG	TBD
Fleet	TBD	TBD	PAC	TBD
Award Date	9/10/2008	TBD	6/1/2007	5/31/2012
Start Fab	8/1/2008	TBD	12/8/2008	TBD
Lay Keel	11/14/2009	TBD	4/27/2009	TBD
Launch/Float Off	TBD	TBD	TBD	TBD

CVN LHA (CONT)

Christening	TBD	TBD	TBD	TBD
Delivery	TBD	TBD	TBD	TBD
Commissioning	TBD	TBD	TBD	TBD

LPD17

Hull/Yard	LPD 23/A	LPD 24/I	LPD 25/A	LPD 26/I	LPD 27/I
Name	**Anchorage**	**Arlington**	**Somerset**	**John P. Murtha**	**TBD**
Builder	Avondale	Ingalls	Avondale	Ingalls	Ingalls
Homeport	SDGO	NORVA	SDGO	NORVA	TBD
Award Date	6/1/2006	11/6/2006	12/21/2007	4/1/2011	TBD
Start Fab	10/23/2006	8/27/2007	6/16/2008	5/16/2011	TBD
Lay Keel	9/24/2007	5/26/2008	12/11/2009	2/6/2012	TBD
Launch/Float Off	2/12/2011	11/23/2010	4/14/2012	TBD	TBD
Christening	5/14/2011	3/26/2011	TBD	TBD	TBD
Delivery	TBD	TBD	TBD	TBD	TBD
Commissioning	TBD	TBD	TBD	TBD	TBD

TAKE

Hull/Yard	P/C	T-AKE 14/N
Name		**Cesar Chavez**
Builder		NASSCO
Homeport		N/A
Award Date		2/26/2010
Start Fab	C/*P	10/21/2010
Lay Keel	C/*P	5/9/2011
Launch/Float Off	C/*P	5/5/2012
Christening	C/*P	5/5/2012
Delivery	C/*P	TBD
Commissioning		N/A

Data & Statistics courtesy of the U.S. Navy, as compiled by the Author

Construction Milestone on Virginia-Class Sub Minnesota

Huntington Ingalls Industries said that the Virginia-class submarine Minnesota (SSN 783) is "pressure hull complete," signifying that all of the submarine's hull sections have been joined to form a single, watertight unit.

Minnesota will be the 10th Virginia-class submarine and the fifth delivered by HII's Newport News Shipbuilding (NNS) division.

"This is a key milestone in the construction of the submarine," said Jim Hughes, NNS' vice president of submarines and fleet support. "Our shipbuilders and our partners at Electric Boat have put a lot of hard work into this boat, and it shows. Construction progress on Minnesota is two months ahead of where USS California, the last Virginia-class submarine delivered by NNS, was at pressure hull complete."

Pressure hull complete is the last major milestone before the submarine's christening this fall and delivery in 2013. The contract to build Minnesota was awarded in 2003, and construction began in February 2008 under a teaming arrangement between NNS and General Dynamics Electric Boat. Minnesota is 81% complete.

LPD 23 Completes Trials

Huntington Ingalls Industries said that the company's seventh amphibious transport dock, Anchorage (LPD 23), returned from builder's sea trials in the Gulf of Mexico. The ship is currently under construction at Ingalls' Avondale facility. "The LPD 23 team just finished one of the most successful builder's trials of any LPD so far," said Doug Lounsberry, Ingalls' vice president and program manager, LPD 17 Program. More than 200 test events took place during the four-day sea trial, including anchor handling, flight operations, ballasting and deballasting the well deck, and compartment air balancing.

The ship will now prepare for acceptance sea trials to demonstrate the same tests and seaworthiness to the U.S. Navy's Board of Inspection and Survey (INSURV). The ship is scheduled to be delivered to the Navy this year. The LPD 17-class ships measure 684 x 105 ft. and displace approximately 25,000 tons. Their principal mission is to deploy the combat and support elements of Marine Expeditionary Units and Brigades. The ships can carry up to 800 troops and have the capability of transporting and debarking air cushion (LCAC) or conventional landing crafts, augmented by helicopters or vertical take-off and landing aircraft such as the MV-22.

WORTH 10

00 WORDS

MR's 2nd annual photo contest attracted 1,472 images from more than 21 nations.

Welcome to the 2nd annual photo contest in the 70 year plus history of *Maritime Reporter & Engineering News*. The contest was conceived following the untimely death of long-time contributor **Donald Sutherland**, who many of you encountered over the years or in the pages of MR or sister-publication *MarineNews*. Don was a colleague, a friend, and a fierce proponent for the maritime industry and mariner, delivering to us hundreds of indelible images and tens of thousands of words, whether it was covering the maritime response in New York City in the wake of the terrorist attacks of September 11, 2001; spending three weeks in the Gulf to record the aftermath and impact of Hurricanes Katrina and Rita; or his 'everyday' coverage of the people, boats and companies in and around the Northeast U.S.

This years photo contest again attracted a variety of quality images from around the globe, and comes with sincere thank you to **Susan Evans Grove**, for here special assistance in weeding through this year's entrants. Evans Grove is an American artist living and working in New Jersey. She graduated from the School of Visual Arts in NYC with a BFA in Photography. Her work has been exhibited in the United States, Europe, and Japan. Susan also serves as Publications Director at The Society of Naval Architects and Marine Engineers.

http://www.susanevansgrove.com

WINNER, VESSELS
Sea Reliance inbound Long Beach, Ca. — Santa Barbara Channel, Calif.
Photographed 2011

Gabor Gardonyi, Lyle, Washington

WINNER, MARITIME SCENES

Sydney Harbor, Sailing, Solway Lass

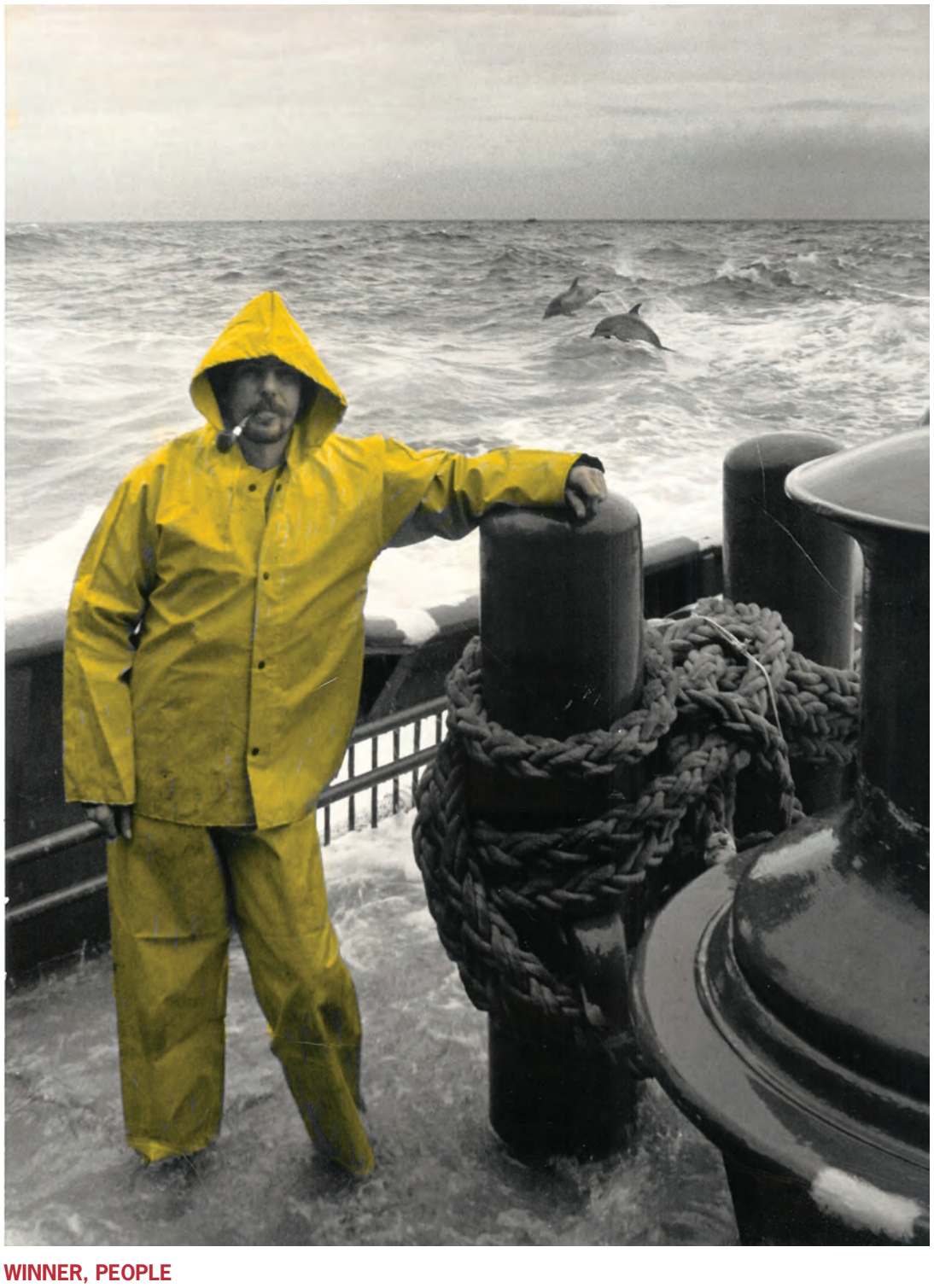
Photographed October 2011Terry Toland Vancouver, Washington

RUNNER UP, PEOPLE
Welders on deck tug Retriever

Photographed 2011

Jan Berghuis Verlengde, Terschelling, Netherlands

MARITIME REPORTER AND ENGINEERING•NEWS
2nd Annual Photo Contest



WINNER, PEOPLE
Dolphins play along side the Tug Rebel on a stormy day in the Gulf of Mexico.
Shot in Black and White, colored in rain slicker

Mark R Boudreau
Hartford, Tennessee

OFFSHORE STRUCTURES
Rowan Gorilla IV adding legs at Rowan's Sabine Texas yard
Photographed 2012 David Byrnes, Beaumont, Texas

MARITIME REPORTER
AND ENGINEERING•NEWS

2nd Annual Photo Contest

WINNER, WEATHER
55 MPH gales while towing. Big storm coming in over Lake Michigan
This photo was not edited in any way.

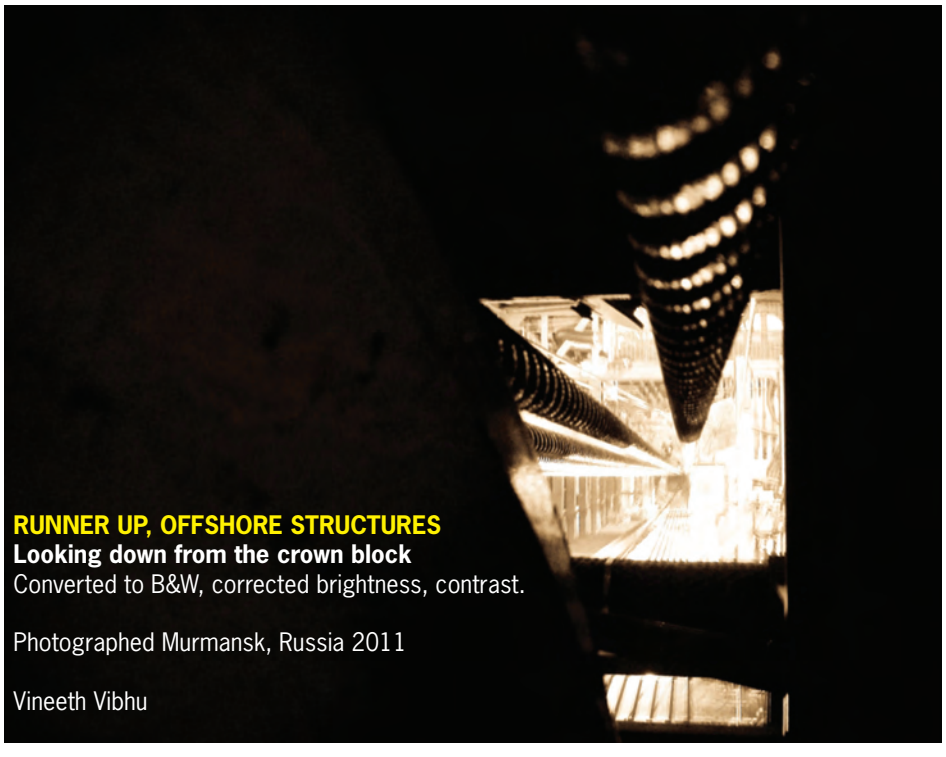
Photographed 2012

Albert Bartkus, Chicago, Illinois

RUNNER UP, MARITIME SCENES
Clearing Storm - An APL container vessel makes its way out of the Port of Los Angeles.

Photographed 2012

Tim Rue, Long Beach, CA



RUNNER UP, OFFSHORE STRUCTURES
Looking down from the crown block
Converted to B&W, corrected brightness, contrast.

Photographed Murmansk, Russia 2011

Vineeth Vibhu

SHIPS
USNS Howard O Lorenzen first Drydock.

Photographed at Signal Ship Repair

James Goodheart, Mobile, AL

MARITIME REPORTER AND ENGINEERING•NEWS
2nd Annual Photo Contest

MARITIME SCENES
New ice on the Arctic Ocean

Photographed December 2011

Thomas O'Brien, Massachusetts

MARITIME REPORTER AND ENGINEERING•NEWS

2nd Annual Photo Contest

SHIPS & BOATS

Casco's at night

Danny Cornelissen, Rozenburg, Netherlands

PEOPLE

Adding a DC Plug to the underside of a hull.

Photographed Honolulu Harbor, 2012

David Collins, Honolulu, Hawaii

PEOPLE
Crew working the ropes

Danny Cornelissen,
sRozenburg, The Netherlands

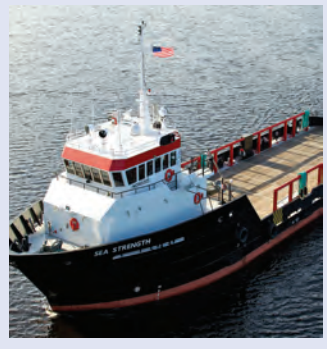
This was dubbed as ***"The World's Largest Inauguration: 1.4 million Strong for AIDA Ship Parade."*** The latest cruise ship of the AIDA fleet – AIDAmar – was inaugurated on the evening of May 12, 2012 with an extravaganza at the Port of Hamburg, accompanied by her three sister ships.

NEW & NOTABLE

Two Wind-Farm Support Vessels Delivered

Renaissance Services subsidiary, Topaz Engineering, a UAE-based full service ship building, ship repair and engineering services company, has completed the delivery of two wind farm support vessels (WFSV) to ASP Work Boats Ltd, part of the global ASP Ship Management Group. The contract, signed on September 19, 2011 was for the design and construction of two DNV +1A1 HSLC R1 Windfarm Service Category 1Vessels. The two boats meausure 18 x 7.5m with a lightship displacement of 43 tons. Both are powered by two Scania 700hp engines and can operate up to 150 miles offshore at cruising speeds of up to 25 knots. The vessels were built in Topaz Marine Engineering's NicoCraft Aluminium Boat Building Facility in Abu Dhabi

St. Johns Ship Building Delivers Sea Strength



St. Johns Ship Building of Palatka, Fla. delivered the offshore service vessel (OSV) Sea Strength to A. R. Singh Contractors of Point Fortin, Trinidad. The 157-ft. vessel is currently undergoing owner inspections and is available for work in the Caribbean offshore market. A. R. Singh Contractors Ltd. has served the local Trinidad market since 1978 and provides marine transportation, pipe laying and offshore construction services. A. R. Singh Contractors Ltd. operates a fleet of approximately 20 vessels including tugs, barges, crew boats and supply boats.

Ulstein *Delivers*

The ULSTEIN designed platform supply vessel CBO Pacifico left the Estaleiro Alianca yard on May 10, 2012. The newbuild went straight into contract for Petrobras. The vessel is the second of the PX106 design delivered to CBO this year. Ingar Kaldhol at Ulstein Design & Solutions worked closely with the yard's project team throughout the building process of the first two of totally six ULSTEIN designed X-BOW platform supply vessels to be constructed in Brazil.

These first two PX106 vessels are relatively small vessels that comply with Petrobras' PSV 3000 tender. The next four are of the larger PX105 design that complies with the PSV 4500 tender. All vessels will be working on eight-year contracts for Petrobras.

CBO Pacifico measures 76.3 x 16m, with a depth to main deck of 7.5m. The cargo deck area is 660 sq. m. Three of the tanks are multitanks of the Cargomax system. She has diesel electric propulsion and azimuth propellers, and can keep a speed of approximately 15 knots. CBO Pacifico complies with the CLEAN notation from DNV. The four PSVs of the PX105 design will be delivered during 2012–2013. From before, CBO already has two PSVs of P106 design from ULSTEIN in their fleet, delivered in 2006 and 2007.

The platform supply vessel CBO Pacifico, designed by ULSTEIN, was delivered from Estaleiro Alianca in Brazil. CBO Pacifico is here seen outside Macae with sister vessel CBO Atlântico, delivered earlier this year. Being PX106 designed vessels, they are purposed for efficient and flexible transportation of bulk and general cargo to installations offshore.

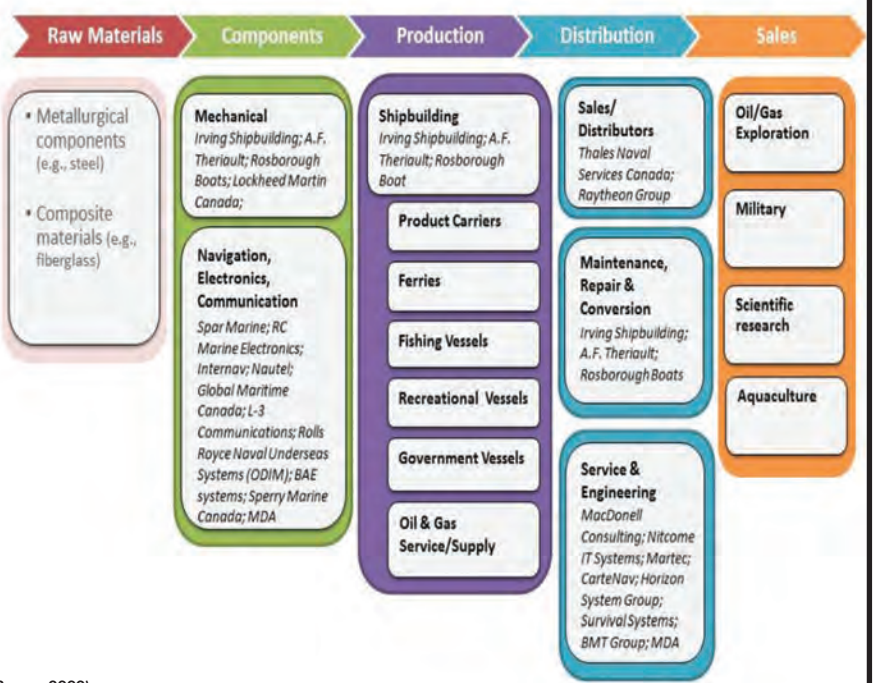
(Photo courtesy of ULSTEIN/Thomas Bigset)

Shipbuilding in Nova Scotia

By Joonkoo Lee & Lukas C. Brun, Center on Globalization, Governance & Competitiveness, Duke University

Irving Shipbuilding's successful C$25 billion bid for the combatant portion of the National Shipbuilding Procurement Strategy (NSPS) illustrates the strength of Nova Scotia shipbuilding industry. Under the program, Irving Shipbuilding, Inc. (ISI) will build six to eight Arctic/Offshore Patrol Ships and 15 Canadian Surface Combatants for the Department of National Defense (DND) over the next 20-30 years. The NSPS contract is in addition to ISI's contract to build nine mid-shore patrol vessels for the Canadian Coast Guard, valued at C$219 million, and to refit seven Halifax-class navy frigates, valued at C$549 million. This article, excerpted from a recently completed report on Nova Scotia's ocean technology sector by the Duke University Center on Globalization, Governance and Competitiveness, reviews Nova Scotia's shipbuilding capabilities and emerging market opportunities.

Fig. 1: Shipbuilding & Enabled Service Providers



(Source: CGGC)

SHIPBUILDING IN NOVA SCOTIA

Nova Scotia's shipbuilding industry is based on three key features: a strong shipbuilding tradition and infrastructure, an emerging ocean technology sector, and continued large-scale federal shipbuilding projects.

Strong shipbuilding tradition and infrastructure: Nova Scotia and Halifax, in particular, have a history in shipbuilding dating to the 1880s. Irving Shipbuilding, the centerpiece of the region's shipbuilding, has built 80% of Canada's current surface combat fleet, including icebreakers. The company, owned by J.D. Irving, has in Nova Scotia two shipyards (Halifax and Woodside), one repair facility (Shelburne), and one support service affiliate (Fleetway). With 470 full-time equivalent employees in 2009, ISI's Halifax Shipyard is a full-service shipyard, offering a range of services from fabrication to machine shops. It also provides access to a large and extensive local subcontractor community. Currently, ISI has contracts under way to build nine mid-shore patrol vessels for the Canadian Coast Guard (valued at C$219 million) and to refit seven Halifax-class navy frigates (valued at C$549 million). Beside ISI, several smaller shipbuilders are also in operation in Nova Scotia, including A.F. Theriault and Rosborough Boats. These large and small shipbuilders and suppliers make up valuable infrastructure for shipbuilding and repair.

Table 1: Canada's ship and boat exports by destination and province (C$ '000)

By Export Destination	2007	2008	2009	2010	2011
United States	562,682	449,033	270,037	209,931	290,339
Brazil	7,940	17,199	19,713	15,210	25,837
Australia	20,256	31,192	23,817	24,983	22,914
Belgium	15,578	26,331	24,058	19,073	14,391
India	21	99	207	145	7,910
Russia	12,407	18,837	8,754	2,110	6,500
Finland	3,161	4,750	3,774	3,212	4,924
Japan	8,528	9,607	8,643	6,813	4,915
Argentina	534	2,149	2,004	2,794	3,936
South Africa	6,038	3,675	2,692	2,914	3,823
Rest of the World	110,390	86,703	107,547	69,445	60,513
By Province					
Quebec	509,328	523,136	330,927	256,159	317,895
British Columbia	129,359	60,944	100,756	53,347	60,917
Ontario	68,143	54,892	29,414	36,728	50,946
Nova Scotia	6,740	5,502	8,667	4,252	10,718
Alberta	1,472	1,614	455	3,371	3,964
Newfoundland and Labrador	28,967	353	616	457	644
New Brunswick	3,221	1,876	288	1,769	610
Prince Edward Island	156	329	71	366	307
Manitoba	84	6	8	35	1
Saskatchewan	66	922	44	145	-
Total Exports	**747,535**	**649,575**	**471,246**	**356,628**	**446,002**

Source: Industry Canada Trade Data Online

Nova Scotia's shipbuilding assets also include its ability to develop a skilled workforce. Higher education institutions, including the Nova Scotia Community College and Dalhousie University, are continuing to develop a workforce with the skills required in the marine construction and transportation industry. Demand for a range of shipbuilding skills, from welders to software engineers, is provided by the presence of large-scale shipyards like the Halifax Shipyard. Nova Scotia has maintained a nice balance in both the supply of and demand for a skilled shipbuilding workforce.

Emerging ocean technology sector: Ocean technology (OT) firms provide goods for ocean-related industries, ranging from marine robotics to electronic navigation equipment. They also provide services such as enhanced engineering and environmental and computer knowledge for marine industries. Nova Scotia, along with Newfoundland, represented over 80% of the OT firms in Atlantic Canada. A 2006 report estimated that the annual sales of the OT sector in Atlantic Canada were C$329.2 million based on sales figures in 2003-05. When indirect economic activities are included, the sector was responsible for close to 5,298 person-years of employment, C$201.8 million of household labor income, and C$280.9 million of gross domestic product on an annual basis. These economic impacts are largely the result of small- and medium-sized enterprises (SMEs) with high rates of investment in research and development (R&D).

Nova Scotia has a great number of SMEs specializing in various ocean technologies, from naval architecture to software engineering. These SMEs are mainly supported by the presence of a robust aerospace and defense cluster that serves the government sector, the biggest customer of the OT sector in Atlantic Canada. 45% of Canada's military assets and a significant part of its defense R&D are present in the province. The defense cluster includes over 200 companies, 6,000 employees, and generates about C$600 million annually in Nova Scotia. Major defense multinational corporations in the province include Lockheed Martin Canada, L-3 Communications, General Dynamics, MacDonald, Dettwiler & Associates (MDA), Raytheon Canada and Ultra Electronics Maritime Systems.

The OT sector in Nova Scotia has the potential to play a key role in global shipbuilding. Figure 1 presents the shipbuilding and enabled service providers in

Nova Scotia in the shipbuilding value chain. Nova Scotia's firms are particularly strong in the high value-added portions of the shipbuilding value chain, specifically navigation, electronic and communications equipment sub-systems, and shipbuilding engineering and support services, including integrators.

Federal shipbuilding projects: The presence of this large-scale, long-term federal project in Nova Scotia will provide several benefits to the Nova Scotia shipbuilding sector. First, it will ensure a steady demand for shipbuilding for an extended period. Most of the smaller shipbuilding sectors outside East Asia, due to unstable demand, tend to suffer from the frequent loss of accumulated local infrastructure and skilled labor. NSPS will ensure long-term stability in shipbuilding in Nova Scotia. Second, the project will generate new investments in the region. ISI has already invested C$90 million in the past few years in expanding its infrastructure, and the company is expected to invest tens of millions of additional dollars as the largest portion of the NSPS program develops.

It will help upgrade infrastructure and stimulate employment across the region. Finally, NSPS will help the region attract large and small firms, skilled workers, and engineers from other Canadian provinces and foreign countries, making the region's shipbuilding and OT cluster diverse and dynamic.

A number of opportunities exist for Nova Scotia's companies in the global markets for shipbuilding and OT value chains. Although Nova Scotia does not account for a large percentage of Canadian ship exports relative to Quebec and Ontario, it is well-positioned to take advantage of three opportunities in the shipbuilding sector.

(See Table 1, previous page.)

First, the increasing importance of modularization and high-tech systems offers companies in Nova Scotia opportunities to enter into global shipbuilding supply chains. Emerging economies are good candidates for expanding Nova Scotia's exports, particularly to countries experiencing recent growth in trade, oil production, per capita income, or requiring enhanced security of their ports and territorial waters, notably Indonesia, Turkey, Vietnam and United Arab Emirates. These countries are keen to develop local shipbuilding but not yet capable of developing integrated high-tech systems, to which Nova Scotia firms can contribute. Second, the increasing demand for Arctic vessels presents new opportunities to Nova Scotia firms. Refitting ships for Arctic conditions, in particular, appears a promising activity for firms in Nova Scotia, and the province has several companies already active in this business. In addition, Nova Scotia companies could find opportunities to collaborate with East Asian shipbuilders. East Asian shipbuilders, compared to their Northern European peers, are not particularly strong in harsh climate technology and research. As they attempt to upgrade into high value-added ships, such as icebreakers, they are requesting R&D and technology assistance from Canada. International partnership could provide opportunities for firms and researchers in Nova Scotia to participate in large commercial projects oriented to global markets.

Third, a rapidly changing environment in energy demand and use can provide new market opportunities for Nova Scotia firms. As one of Canada's major offshore oil and gas industry bases, Nova Scotia can benefit from the need of the growing offshore oil and gas sector for specialized ships, such as platform service vessels and anchor handling tug supply vessels. Furthermore, as environmental standards tighten in the marine sector, there is a growing demand for energy-efficient ships or ships that use alternative sources of energy. This latter opportunity will introduce a new area for technological innovation in ship design and building.

Joonkoo Lee, Ph.D. is a postdoctoral research scholar at the Duke University Center on Globalization, Governance and Competitiveness (CGGC). His research at CGGC focuses on ocean technology value chains and global agri-food value chains. He is a co-author of the Nova Scotia Ocean Technology report from which excerpts were taken for this article. He received his Ph.D. in Sociology at Duke University in 2011. Lee can be contacted at [jl121@soc.duke.edu].

Lukas Brun is a senior research analyst at the Duke University Center on Globalization, Governance & Competitiveness (CGGC), and co-author of the Nova Scotia Ocean Technology report from which excerpts were taken for this article. He has more than 10 years of experience in economic analysis and economic development-related contract research. Brun can be contacted at [lukas.brun@duke.edu].

Seaspan Builds for the Future

Canada's west coast shipbuilding industry powers forward

Edited by Greg Trauthwein

When news got out that Seaspan Marine Corporation had won an $8 billion contract to build non-combat vessels for the Canadian Coast Guard and the Royal Canadian Navy under Canada's National Shipbuilding Procurement Strategy (NSPS), celebration broke out at Seaspan's three shipyards—Vancouver Shipyards, Vancouver Drydock and Victoria Shipyards. That was back on October 19, 2011, and the positive energy generated that day continues to feed the mood in the yards today.

A serious windfall for the west coast shipbuilding industry, **the NSPS contract calls for the construction of three offshore fisheries science vessels, one offshore oceanographic science vessel, two joint support ships, and one polar icebreaker.** In February 2012, the umbrella agreement that outlines the program was signed, making it all official. Seaspan operates three shipyards located in southwestern British Columbia (BC), Canada. Vancouver Shipyards and Vancouver Drydock are located in North Vancouver, immediately across the harbour from Canada's largest port—Port Metro Vancouver; and Victoria Shipyards is located across the Strait of Georgia on the southern tip of Vancouver Island, in the provincial capital city of Victoria. Both locations offer deep-sea terminals and provide new construction and repair work on a variety of vessels.

"We're focused on building an efficient and flexible shipyard that will allow us to bring value to Canada by efficiently building NSPS vessels, but also be flexible enough to build, as capacity allows, for other customers."

Brian Carter, President, Seaspan Shipyards

SERVING THE CANADIAN NAVY

Situated on Canada's west coast, Seaspan has a long history of providing and maintaining vessels for the Government of Canada. Incorporated in 1902, Vancouver Shipyards built crash boats, minesweepers, Fairmiles and supply ships used in World War I. Currently, Victoria Shipyards is continuing that tradition through two large upgrade and conversion projects for the Canadian Navy—the Frigate Life Extension (FELEX) and Victoria Class In-Service Support Contract (VISSC) programs. In February 2012, they started a large refit of the Navy's west coast supply ship, the HMCS Protecteur.

FELEX

The FELEX Canadian Navy program aims to modernize 12 Canadian patrol frigates. Victoria Shipyard's portion of the program includes two simultaneous major contracts; the FELEX contract with Canada and the Combat System Integration (CSI) Subcontract with Lockheed Martin. These contracts will keep Victoria Shipyards busy through 2016 and engage a workforce of approximately 300 tradespeople and 30 staff.

VISSC

Focused on servicing four, 2400-ton diesel-electric submarines that the Canadian Navy purchased from Britain's Ministry of Defence, the VISSC program involves the planning, estimating and execution of all third-line maintenance work, consisting of refits also known as Extended Docking Work Periods (EDWPs). Seven EDWPs are scheduled for Victoria Shipyards, each lasting approximately two years.

While the current mix of work at Victoria Shipyards is focused on maintenance and repair, they've also completed several new construction projects, including the Seabus (a passenger-only ferry that is part of Vancouver's transit system), vessels for the Canadian Coast Guard, as well as eight ORCA-class training vessels for the Royal Canadian Navy.

VANCOUVER SHIPYARDS & VANCOUVER DRYDOCK

Vancouver Shipyards is unique in that it's the homeport of the Seaspan tug and barge fleet (which includes more than 100 vessels) and is also where the fleet is repaired and maintained. Brian Carter, President of Seaspan Shipyards, believes there's an advantage to being both a dedicated homeport and a repair facility. "It does give us a leg up as we design and construct vessels, because one of the things we can really do that adds value to Canada is to design and build ships that can be efficiently serviced later on," says Carter, who was originally hired to provide guidance on the company's bid to win the NSPS contract and quickly became an integral part of the winning team. Carter assumed the role of President on a full-time basis in January 2012.

Though Vancouver Shipyards' current projects range from commercial new construction and repair of the smaller vessels in Seaspan's fleet, to third-party repair work, it will eventually be the site for approximately 95 percent of the NSPS work. By 2016, when the project reaches its apex, the number of staff at the yard is expected to expand from over 200 employees to 1,000. Vancouver Drydock is currently focused on providing ocean-going ship repair for vessels that call on the region and occasional mid-life upgrades for vessels such as the BC Ferries fleet. It's not uncommon for impressive vessels to be spotted there; currently work is underway on a cruise ship and prior work has included repairs to vessels like the Sea Launch Commander (the command ship for Sea Launch, an oil-rig turned rocket launcher based in Long Beach, California).

Responsible for delivering the long-term strategic plans for all three of Seaspan's shipyards, Carter foresees a shift in focus across the three shipyards as a whole, saying "Overall I would say we're a repair company that does some new construction work. We will become a new construction company that does some repair work once NSPS is underway."

$200 MILLION IN MODERNIZATION

The NSPS contract brings with it some unique challenges, not the least of which will be to construct the Joint Support Ships, which once constructed, will be the largest ships ever built on Canada's west coast. In order to prepare for this construction, Seaspan is investing $200 million in a shipyard modernization project to bring the yards to the current level and standard of shipbuilding technology.

The investments and upgrades aren't intended to in-

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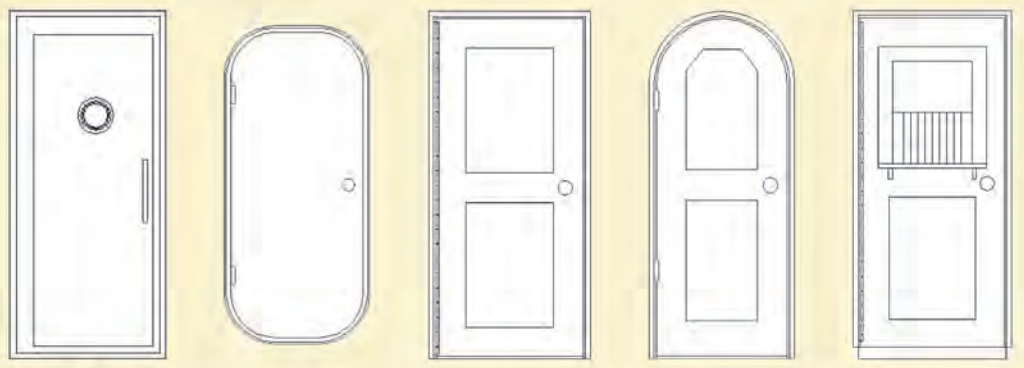

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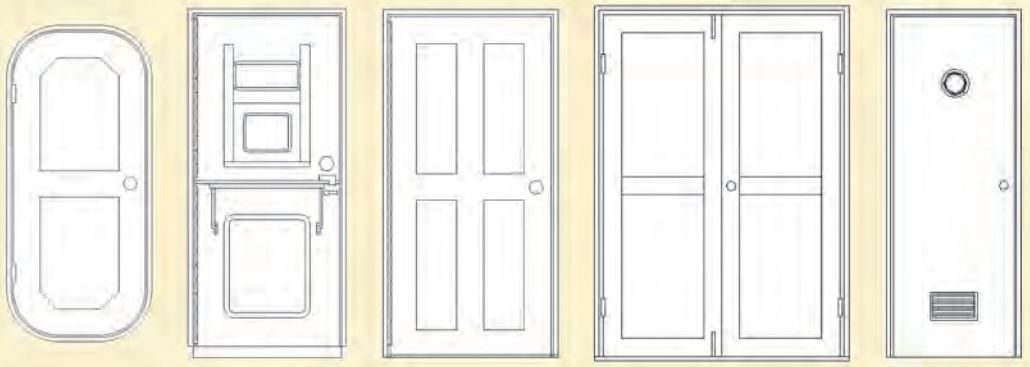

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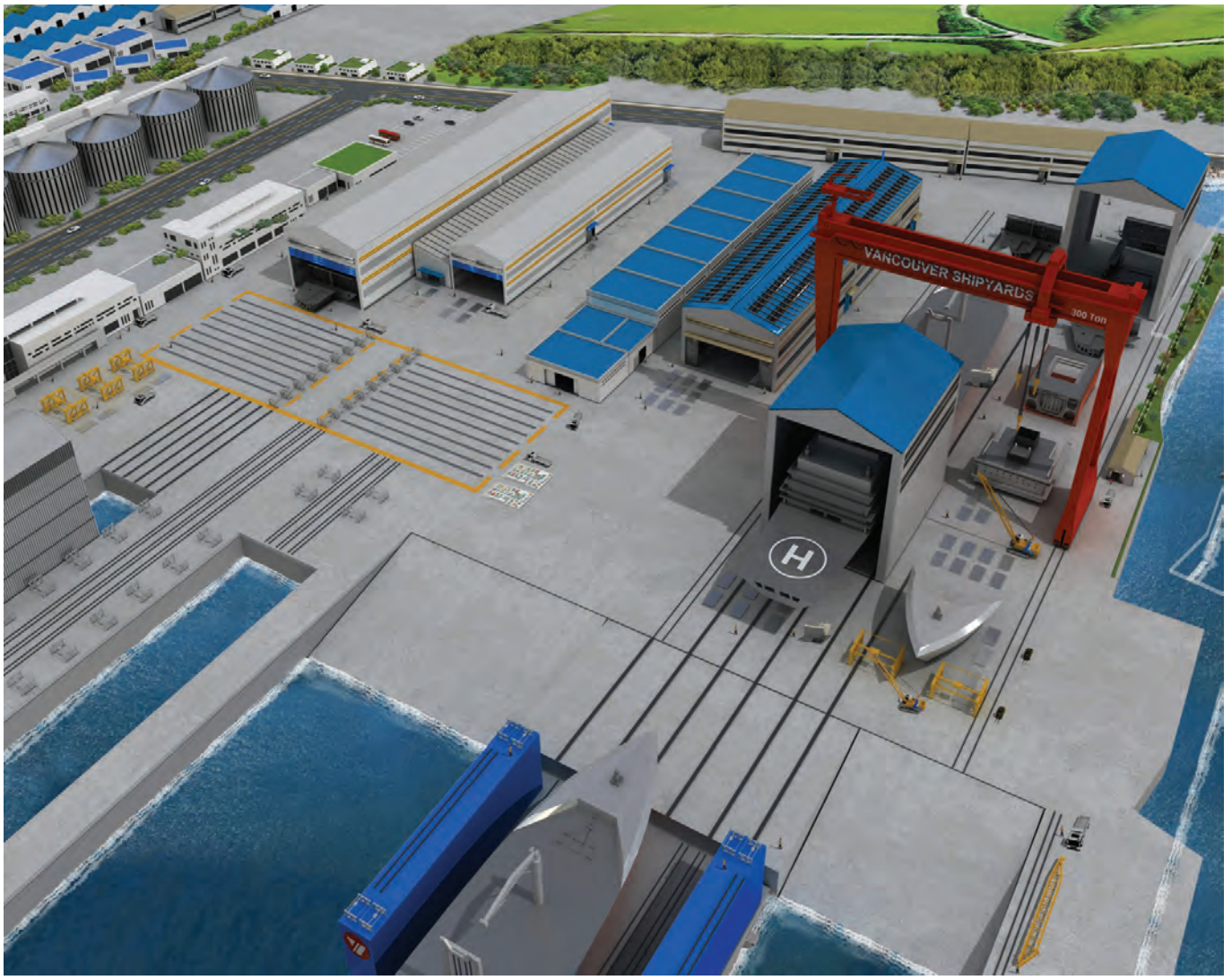

Rendering of future Vancouver Shipyards design by STX Offshore & Shipbuilding. Seaspan is investing $200m in the shipyard modernization project.

troduce cutting-edge technology that hasn't been tested in the shipbuilding industry. Carter believes that new technology isn't necessarily the answer to maximizing efficiency. "Advancing technology or installing wild or advanced concepts would just be a risky thing for us to manage," says Carter. "And really, shipbuilding gains and efficiency come from the shop floor and are largely process-related and are very incremental. Little things add up to bigger savings. So we'll focus on being smart about repeatable processes. We're focused on building an efficient and flexible shipyard that will allow us to bring value to Canada by efficiently building NSPS vessels, but also be flexible enough to build, as capacity allows, for other customers – either other governments or commercial customers."

PARTNERSHIP WITH STX OFFSHORE & SHIPBUILDING

To help with the shipyards' modernization project, Seaspan hired STX Offshore & Shipbuilding Co., one of the largest shipbuilding companies in the world. Leveraging past and existing relationships, Seaspan chose STX because of their excellent track record. For Carter, it's all about creating a facility that speaks to efficient shipbuilding well into the future. It was important to Seaspan to partner with an organization that had prior knowledge of Seaspan's distinct operation in being both a homeport and a repair facility. Says Carter, "We knew what we were getting when we went with STX. They have a business model that supports these types of relationships. They have designed many shipyards around the world in the last 10 years. So we wanted to tap into that experience and their overall knowledge."

The STX experience will allow Seaspan to continue to focus on what it does best while preparing for the first phase of the NSPS contract. Carter is aware of the need to tread carefully in terms of maintaining an efficient, profitable business while ramping up to complete the large NSPS contract. "One of the positives is that the existing business that we do today, we do very well. It's going gangbusters in Victoria, and Vancouver Drydock is doing extremely well this year. So we just want to make sure we're supporting the needs of those organizations as they're executing without disrupting that."

STAFFING UP FOR NSPS

Building a production workforce up from 200 to 1000, as Seaspan will do at Vancouver Shipyards, can be a challenge for any organization, especially in an industry that has not had a large role in

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British Columbia's economy recently. It's a challenge that Lisa Bumbaco, Vice President of Human Resources for Seaspan, has seen before. "We've experienced [that sort of growth] already in Victoria with some of the naval work that's going on there," she says. "So it can be a bit daunting to think about that kind of growth, but it is growth that we've experienced in the past."

The current focus is on growing the leadership and management team to reflect the shift towards new construction. This includes leadership in engineering, program management, supply chain and all the technical areas of shipbuilding, as well as all the support services in IT, HR and training. Although the yard growth won't start happening until 2013, Seaspan is already working closely with the trade unions to ensure they've got accurate projections about what the trade mixes are going to be and to make sure there's going to be adequate staffing. Most of Seaspan's production workers come through a hiring hall with a local union group.

ATTRACTIONS FOR EMPLOYEES

When there's a shortage of talent, employers need to be creative with how to attract employees. Says Bumbaco, "The fact that we're going to have steady employment for a long period of time is an attraction to this industry which hasn't been quite so much like that in the past. Also, the fact that our economy is strong right now could be an attraction factor as well." Vancouver itself is a huge draw. People familiar with the city know that it boasts metropolitan urban amenities and is surrounded by ocean, mountains and all the recreational opportunities they afford. But outside of Canada, there's limited awareness of the temperate climate found on the West Coast. Relates Bumbaco, "We don't get those harsh winters that they tend to get back east, which I think is a draw for a lot of people who are coming from climates where they're not ready or wanting to move somewhere that's going to have that as an issue."

While Seaspan is happy to reap the benefits of these external factors, they're also taking matters into their own hands to shape the organization into a positive workplace. In addition to reviewing compensation and benefits offered, Seaspan has implemented health and wellness programs as well as strengthened its training programs, features that Bumbaco believes set them apart from their competitors.

GLOBAL SOURCING

Management and technical employees are being sourced from both inside and outside North America. Ann-Britt Everett, Manager, Talent Acquisition at Seaspan, says, "There isn't a lot of this type of skill set developed in Canada in the last few years. A lot of Canadians are actually out there looking to come back to Canada and continue their careers in shipbuilding. So that is something that we continue to work hard on — getting that awareness out globally."

While there are Canadian expats working in shipbuilding around the world, repatriating them is not Seaspan's only focus. Says Everett, "We have very strong collaboration from the province to bring in the right management skill set to support the project, no matter their nationality. So we're feeling confident that we'll find these people wherever they are." Supporting people who are new to the region has been an area Seaspan has paid close attention to. "We have relocation and settlement consultants to help people choose neighborhoods and schools for their kids. We want to ensure that they're really ready to come and have a smooth transition, because moving is always very challenging," says Everett.

CULTURAL FIT

Seaspan's core values are safety, efficiency and care, and as part of their recruitment efforts, they're looking for people who fit in with and will reflect those values. "We're not just hiring for technical skills, we want to hire the right people who are going to be good leaders and that others will want to work for. Shaping the culture is as important to us as finding the people with the right technical abilities," says Bumbaco." And so far we're not compromising on that."

In addition to emulating Seaspan's core values, employees can expect to join a workforce that is infused with pride. "Shipbuilding has been a traditional industry on the west coast a long time and I think people who are here are very proud to be a part of that industry," continues Bumbaco. "We're going through a re-birth in terms of an industry where a lot of people have had their fathers and grandfathers work in. So there is a sense of pride."

EMPLOYEE RETENTION

As for keeping the employees they've already got, Bumbaco and her team are focused on bringing up their apprentices, streaming them into the right areas and setting them up for a positive career progression. Succession planning has also been a key area that Bumbaco has targeted. "We're not looking at the same sorts of layoff cycles as maybe we've had in the past, and that allows us to do a lot more things around growing peoples' careers in-house," Says Bumbaco, who herself has been with the company since 2003.

A COMPANY IN TRANSITION

With the NSPS contract comes both opportunity and change, and in this case, both are enormous. Brian Carter describes their approach as "very disciplined." Building the right team is their first priority, next allowing that team to develop the right processes and then finally planning and executing those processes. According to Carter, understanding and respecting the constraints and integration that has to happen with the existing Seaspan business is critical to Seaspan's approach, and it's being managed very closely.

It could be a very daunting task which could strike fear or apprehension in the most seasoned of leaders, but not for Carter who's thriving on the excitement. According to him, the mood is "all positive--it's a very exciting place to be right now."

Sea Launch Commander in Vancouver Drydock for repair

Floating Production Systems Strong Fundamentals Fuel Growth

IMA has just completed an analysis of the floating production market. Highlighted below are some key findings of the study. Underlying market fundamentals are very strong – With world oil demand growing around 1% annually, meeting demand in 2035 will require gross capacity additions of 47mb/d crude supply – more than half the current global oil output level. These capacity additions will require new sources of crude oil, with deepwater fields high among the expected new sources. ExxonMobil recently projected the "biggest gains will come from global deepwater production, which more than doubles through 2040." According to ExxonMobil, by 2025 deepwater production will supply 10% of global liquids fuels supply.

Inventory of production floaters now at 257 units – This figure is 30% greater than five years ago, 90% higher than ten years back. FPSOs comprise 62% of the existing systems. The balance is comprised of production semis, tension leg platforms, production spars, production barges and floating regasification/storage units. Of the total production floater inventory, seven units (all FPSOs) are off field and available for reuse – resulting in an overall utilization rate of 97.3%. Another 100 floating storage/offloading units (without production capability) are in service.

Order backlog will increase the production floater inventory by 25% – Current order backlog consists of 67 production floaters – 45 FPSOs, 5 production semis, 3 TLPs, 3 spars, 2 FLNGs and 9 FSRUs. In the backlog are 36 units utilizing purpose-built hulls and 31 units based on converted tanker hulls. Of the production floaters being built, 37 are owned by field operators, 30 are being supplied by leasing contractors. Brazil continues to dominate orders for production floaters. Of the 67 production floaters on order, 28 units are being built for use offshore Brazil – 42% of the order backlog.

Number of floater projects planned or under study has been growing – We have identified 216 projects now in the bidding, design or planning stage that potentially require a floating production or storage system. The pipeline of planned floating production projects has been growing. Last November we identified 210 floating production projects in the planning or bidding stage. A year ago, 194 projects were identified. Five years ago, 109 projects were identified.

According to Jim McCaul, head of IMA, "the growth in number of planned projects reflects the solid fundamentals underlying the floating production sector." McCaul adds that "150 drill ships and deepwater drill semis ordered since 2005 have removed a bottleneck constraining exploration and development in deepwater, resulting in a dramatic increase in floater projects in the planning pipeline." Three regions account for 62% of planned projects. Brazil, with 51 potential floater projects in the planning cycle, is the major region for future floating production projects. In second and third place are Southeast Asia and West Africa. Brazil is also clearly the leading location for ultra-deepwater projects – with 45% of projects in water depth exceeding 1500 meters located offshore Brazil. Orders for 130 to 190 production floaters are forecast over next five years – FPSOs are expected to account for ~75% of future production floater orders. The remaining 25% will be production semis, spars, TLPs, FLNGs and FSRUs. Orders for 25 to 35 FSOs are also expected over the next five years.

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Containership Conundrum

A rate war pulling prices down one year followed by soaring freight rates in defiance of a weak demand the next. Welcome to the container shipping business.

By Greg Knowler, Hong Kong

Talk about ups and downs. In 2009, the container shipping industry lost $16 billion. In 2010, it made a profit of $20 billion, and last year was back in the red ink business with an $8 billion loss.

This year? Break even is about the best prediction available even with a surge in freight rates as general rates increases (GRIs) imposed by the carriers in the first few months have largely stuck.

By May, shipping lines on the Asia-Europe trade saw rates surge to 2010 levels with solid spot increases being reported on the transpacific. But the outlook for the rest of the year has industry observers worried. For market analyzing SeaIntel's Lars Jensen, the problem is straightforward: Too much capacity coming online too fast.

"There is nothing wrong with getting the big ships, but they are coming online faster than the market can absorb them," Jensen said. "For the next couple of years it is all going to come down to the carriers' ability to cascade capacity, and also to idle some capacity or accept that they cannot have the utilization they would like. If they can live with the lower utilization levels, rates will stay high, but I don't know if they can live with it."

Ship utilization was very much on the mind of Maersk Line's new head of south China, David Skov. He said shipping lines were realizing that the model of the business was changing.

"In the old days, the most expensive cost was the ownership of your assets and carriers wanted to utilize them to the highest degree possible," he said.

"But now with bunker fuel being so expensive we are entering a time when the highest utilization may not be the model that gives a liner operator the best economy.

"Lines will have to work out what makes sense. Look at the successful GRIs from March – it makes sense for a ship to

The 13,100 TEU Hanjin Sooho ties up at Eurogate Terminal in Hamburg during its maiden voyage. It is the largest vessel in the Hanjin fleet.

sail with a lower utilization of, say, 70 percent at those rates than to sail 100 percent full at the old rates.

"The calculation has to be made by individual lines, but it could be a potential alternative to lay-ups," Skov said.

But with the drive to regain profitability, the thought of accepting lower cargo loading could be asking too much, and the pressure to deploy vessels of over 10,000 TEUs will grow with the delivery of each ship.

Between now and 2014, 80 percent of all the ships that will be delivered will be VLCCs or ULCCs (ultra large container ships), according to Aplhaliner. The market intelligence provider said 26 ships of that size were delivered in the first four months of the year and another 29 will be delivered before the New Year celebrations.

As operating expenses rise, lines are vigorously seeking greater economies of scale to bring down unit costs. Leading this drive is Maersk Line. Next year the first of its 20 EEE series 18,000 TEU ships will float into service.

Ships of this size are limited to operating on the Asia-Europe trade, and as they come online shipping companies have to cascade capacity down to the other trades, keeping rates under pressure.

This profit-sapping surfeit of capacity is giving liner executives grey hairs.

"The boiling overcapacity concern is indeed frustrating the industry, as the global tonnage supply has not been responsibly managed by some shipping lines over the past few years," said an Evergreen Marine spokesman.

The top Taiwan carrier was one of the few companies to maintain a conservative approach to newbuildings, keeping its orderbook closed for years as competitors pushed theirs out.

However, it now has 35 vessels of 8,800 TEUs on order that will basically see one ship delivered a month for the next three years starting from July this year.

"The ship orders were planned and contracted with proper timing ahead based on Evergreen's own development scheme, rather than inflaming the rate war when the market was very fragile during the past few years."

Another line that has chosen to abandon its long-maintained conservative approach to ship orders is Orient Overseas Container Line (OOCL). The Hong Kong-based carrier last year placed orders for ten 13,000 TEU ships at a cost of more than $1.3 billion. They will be the biggest ships in the fleet when delivered in 2013 and 2014.

Stephen Ng, OOCL director of corporate planning, said the decision to invest in larger vessels was part of the line's

Sealntel's Lars Jensen said:
"There is nothing wrong with getting the big ships, but they are coming online faster than the market can absorb them."

drive to remain competitive while meeting operational efficiency goals.

"Apart from larger vessels that provide better economies of scale, we have also been investing in our box fleets as well as container shipping infrastructure to improve our efficiencies across the operational spectrum so that we can better serve our customers and fulfill their needs," he said.

Asked whether OOCL was confident the mega ships would be fully utilized, Ng said that would depend on the development of the global economy and the possible phasing out of the older and less efficient vessels, "which are all important factors that are very difficult to predict".

"OOCL will be working with our partners through the Grand and G6 alliances to maximize the utilization according to what is sustainable on the respective trades where these vessels will be deployed."

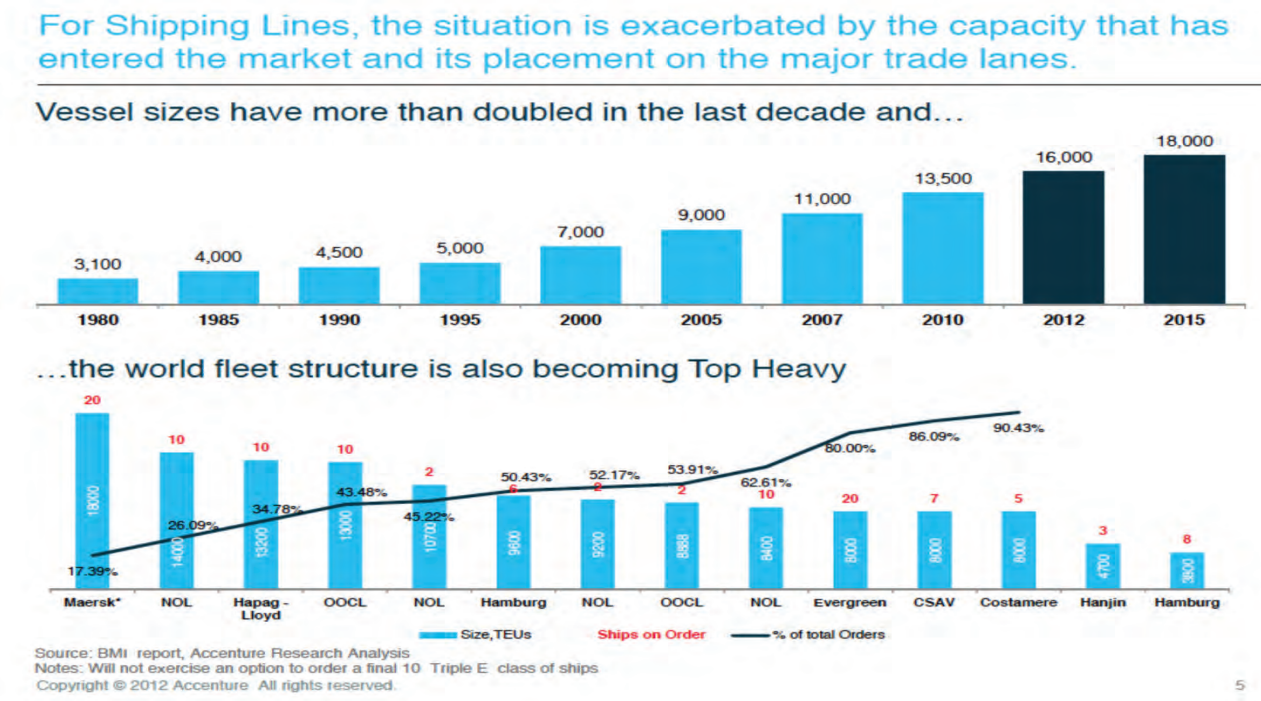
While shipping lines are understandably cautious about expressing their overcapacity concerns and the impact of excess tonnage on rates, most industry watchers have been sounding the klaxons for some time.

Alphaliner, like Jensen, believes carriers are starting to undercut rates.

"Carriers will face a much harder battle to maintain the momentum for further rate increases in the face of rising capacity supply," Alphaliner said in a report.

The May 1 GRIs, coming after several previous Q1 hikes that increased spot rates on Asia-Europe from $490 per TEU to $1,934 per box, were not well received by shippers.

Alphaliner expects capacity increases to tilt the demand-supply balance against the carriers as demand growth is expected to be flat or mildly negative in the next three months on the trade.



Stephen Ng, OOCL director of corporate planning, said: "We have also been investing in our box fleets as well as container shipping infrastructure"

Lines on the transpacific have a different take and expect to see demand for space building through the summer months as retailers stock up on back-to-school items.

They are optimistic that 2012 will bring a return of the once traditional peak season for containerized imports into the US and have instituted plans to turn the increased demand into profits via a hefty peak season surcharge (PSS).

A surcharge of $600 per FEU will be imposed from June 15 and is the highest peak levy in five years, equal to 25 percent of the May rate of shipping an FEU from China to the US. It will probably remain in force until October as retailers continue to build inventory for Christmas and the New Year.

Asia-Europe lines are also imposing a PSS, but with the EU in meltdown mode, few believe it will stick.

Transpacific Stabilization Agreement (TSA) executive administrator Brian Conrad said the member carriers saw a strong outlook for the coming months, with utilization already in the 95 percent range. Improving profitability was top of their agenda.

"They continue to dig out after a long period of serious financial losses, and want to be sure they are well-positioned to ramp up services as the trade rebounds," Conrad said.

The TSA partly based its peak season prediction on positive findings by the National Retail Federation, which show the US economy is on the mend.

"Consumers are spending despite gas prices and other economic concerns, so retailers are stocking up to meet the demand," NRF vice-president for supply chain and customs policy Jonathan Gold said.

"These numbers show imports growing through the back-to-school season and even into beginning of the shipping cycle for the holiday season. That's a sign that retailers are expecting a good year."

The cyclical nature of container shipping means the good years come and go, and the industry will take heart from an HSBC prediction that global trade will grow by 86 percent in the next 15 years.

But no carriers can afford to sit and wait for the good times to return. Rising bunker prices are hiking operating costs and as trade volume slumps, lines have been forced to focus on trimming costs and improving efficiency.

The Evergreen spokesman said as volatility in the business became normal, every incumbent carrier had to be flexible and maintain "a sense of responsibility", both of which were crucial to long-term sustainability.

"Our strategy is constructive inward rather than offensive outward and we keep all available resources highly utilized through scrupulous cost control or cooperative service partnering to minimize impacts from volatile demands or uprising expenses," the spokesman said.

OOCL's Ng said the carrier would leverage its relationships with partners in the Grand and G6 alliances, using larger container vessels on the main trade routes to lower operational costs per slot.

He said the ups and downs over the past 10 years had taught the Hong Kong carrier that it was important to maintain quality services that met the needs of shippers.

The line has also invested in its IT systems, allowing the global flow of cargo around the world to be more efficiently managed and to be more visible. Maersk's Skov said the short-term focus of balancing capacity to demand was the first priority, but long term the real focus of lines had to be how to differentiate them and how to add value to customers in order to capture that elusive sustainable profit.

Sea Tel *Long History on the Cutting Edge*

By Raina Clark

Not only does Sea Tel manufacture marine antennas for satellite communications, the company and its people have been deeply involved in the development of the industry for the past 34 years. Founder Robert J. "RJ" Matthews was an electro-mechanical engineer for COMSAT when he oversaw the development of the first maritime stabilized satellite communications system. Later, Sea Tel's Chief Technology Officer, Peter Blaney, helped develop the regulatory standards for maritime satellite terminals and worked with both the U.S. Federal Communications Commission (FCC) and the European Telecommunications Standards Institute (ETSI) to establish industry norms for frequencies.

"When you look at the large players today, there's a history of them working with Sea Tel back in the 90s," when the commercial maritime satellite communications market really took off, said Rick Pearson, Sea Tel's General Manager. Having been established well before the 1990s, Sea Tel has been around to the see the maritime business world change dramatically with the growth of satellite communications.

"No more of that guy who was always the first off the cruise ship at every port so he could upload the business, crew and passenger information from a shore computer," said Michael Needham, Sea Tel's Product Documentation Manager. "It's all done real-time from the ship during transit now."

Demand for crew entertainment has also changed Needham said. "As shoreside communications get faster, expectations grow out at sea," and this provides incentive for advancements in satellite communications.

FROM THE FOUNDING FATHER'S GARAGE TO THE NATIONAL GEOGRAPHIC CHANNEL

When RJ Matthews was a design engineer at COMSAT, the maritime satellite communications industry was being incubated by the government for military applications. In 1978, Matthews decided the technology was ready to be expanded to the commercial and leisure markets and he founded Sea Tel out of his garage in Martinez, Calif.

"Simplicity, conviction and tenacity were at the heart of RJ's personal and professional life," said Wes Schenck, Technical Sales Manager for Sea Tel. "RJ is a very practical engineer and always applied the KISS principle to all of his designs. … More than anything else, if the vision is right RJ's motto was 'press on regardless' irrespective of the setback."

After a few years, Sea Tel began delivering satellite communication systems to commercial buyers. Today, many of the antennas delivered in the mid to late 80s are still in service. "They were very popular and very robust," said Needham. "We're still replacing bearings and motors on those first Sea Tel antennas," but the antennas themselves have withstood the test of time.

In 2003 Sea Tel was purchased by Cobham, an international company engaged in the development, delivery and support of sophisticated aerospace technology for military and civil systems. Sea Tel's focus remained unchanged as it became the only series of maritime products in the parent company's portfolio.

Being a pioneer in commercial satellite communications, Sea Tel has been involved in some historic ventures. These include James Cameron's recent exploration of the Mariana Trench, the deepest point on Earth, featured on the National Geographic Channel. Sea Tel's dealer Acutec supplied and installed Sea Tel VSAT antenna systems on the Mermaid Sapphire and SS Barakuda, Cameron's deep-dive support boats. For video transmission Acutec provided a Sea Tel 9707 2.4m C-Band antenna system with 200W BUC and radome air conditioning. A Ku-Band Sea Tel 4010 was installed on both vessels for two-way internet and voice services. These systems enable teams of scientists, engineers and film-makers to communicate effectively and send high-definition video to shore-based media networks in real-time.

Sea Tel was also part of a first for the U.S. Navy during the 1991 Gulf War. Before being deployed for Desert Storm in January that year, the aircraft carrier USS Ranger used morale funds to install a Sea Tel C-Band satellite TV system, the first satellite TV antenna to be installed aboard an aircraft carrier. As the war was waged, the TV signal turned out to have more than morale implications as the vessel command and the entire crew was able to watch the conflict unfold in real-time while tuning into news channels like CNN.

FROM SCIENCE FICTION TO ENGINEERING FACTS

"Science fiction author Arthur Clarke first wrote in 1945 that three satellites orbiting Earth could provide global communication," said Needham. "Here we are so few years later with hundreds of

That was then: Sea Tel Founder "RJ" Matthews (back) and Chief Technology Officer Pete Blaney (front) testing equipment in 1994.

(Image courtesy Sea Tel)

That was then: Sea Tel Chief Technology Officer Pete Blaney today.

(Image courtesy Sea Tel)

satellites in orbit."

Satellite communication has become accessible to even the standard American household, but satellite communication at sea is another story. The problem is that the satellite antenna has to point to within 0.2 degrees of the right satellite in orbit in order to maintain the signal. On a rocking vessel, this is not an easy proposition, especially with a different satellite positioned about every two degrees. The antenna must be mounted to a three-point axis in order to maintain its target, while the boat moves underneath.

When Matthews started out in the 70s, they already knew how to keep shipboard weapons trained on a single point using gun mounts on flywheels. He and his colleagues borrowed this direct mechanical technique to create a gyroscopic effect for satellite antennas. But this technology was heavy and responded slowly to the movement of the ship. When electronics came into the picture, sensor chips replaced the flywheels. Three chips are placed 90 degrees apart on the base of the antenna to sense motion. These chips send electronic signals to a computer controlling motors that adjust the angle of the antenna. Motors wear out however, and taking it a step further, today's Sea Tel antennas use precise balancing so that 90% of the work is done by inertia instead of the motors. This allows the use of smaller motors that don't need to work as hard and suffer less from wear and tear.

INNOVATIVE SYSTEMS FOR CHANGING FREQUENCIES

Technology is developing the ability to generate higher and higher frequencies on which satellite communications can operate. Higher frequencies are more challenging to develop equipment for, but they provide alternatives to the already crowded lower frequencies in use today.

Ku and C-Band frequencies are the most common in commercial maritime applications. C-Band was the first frequency band allocated for commercial ground-to-satellite communications. A typical C-Band satellite antenna receives 3.7 to 4.2 GHz and transmits 5.925 to 6.425 GHz and must be relatively large in size. Ku-Band satellite communications have a wider frequency allocation and a Ku-Band antenna receives roughly 10.7 to 12.75 GHz and transmits about 13.75 to 14.5 GHz. Because Ku-Band satellites typically have higher transmitted power and stronger receive signal, smaller receiving dishes can be used. One of Sea Tel's most recent innova-

Sea Tel's 4012 GX "future proof" antenna which starts in Ku-Band and is easily upgradable to Ka-Band.

(Image courtesy Raina Clark)

Michael Needham, Business Ethics & Compliance Manager, and Rick Pearson, General Manager, on the floor of Sea Tel's Concord, Calif. facility.

tions is a satellite communications system that can switch between bandwidths, the Quadrature Oriented Reflectors antenna system (QOR). The QOR features two independent antenna systems on one stabilized pedestal, one for receiving C-Band signals and another for Ku-Band signals. The switch over from one frequency to another is done electronically as the vessel moves between satellite footprints.

In June 2010, the satellite communications services provider InMarsat announced plans to launch a set of Ka-Band satellites, operating on an even higher frequency bandwidth. The Ka-Band hasn't yet been adopted by the maritime world, but this satellite constellation, scheduled to be fully deployed by the end of 2014, is expected to change that. With a higher frequency and shorter wave length, the Ka-Band will require an even smaller, less expensive antenna to receive the signal – a significant benefit aboard a ship. The Ka-Band has a large amount of bandwidth allocated and its basic frequency range is 18 to 43 GHz.

In response to the new Ka-Band satellites, Sea Tel spent a year developing its "future proof" 4012 GX antenna which starts in Ku-Band and is easily upgradable to Ka-Band when that option becomes a reality. The major elements of this new design include a more efficient reflector surface, improved layout of the power amplifier and a spherical radome. The 4012 GX system can also be adjusted or repositioned via the internet.

"It turns out if you have the right design of the dish, feed tube and antenna, you can make it work with just a few watts," said Pearson.

SEA TEL'S EYE ON THE MARKETS

The macro trend in the satellite communications industry is "more and more bandwidth for less money," said Atul Chawla, Sea Tel's Product Marketing Manager. More antennas are being built today than ever before and the new Ka-Band systems will add to this trend and the downward pressure on price. Sea Tel focuses on various vertical markets, including oil and gas, cruise lines, fishing, commercial shipping, leisure boating, megayachts and military.

"The oil and gas market is very strong," Chawla said, as it responds to oil prices which have done well in the past few years. Fishing fleets have also been a stable market with crew welfare remaining a big issue and an increase in the number of factory ships.

The cruise ship market was doing well, he said, until the Costa Concordia incident. Following a drop in bookings, cruise operators have pulled back investments in vessel services.

(Image courtesy Raina Clark)

From closest to farthest: Nathen Gonderman, Production Assembler III; Felnor Lincer, Production Assembler III; Lamont Pollard, Production Assembler II. Sea Tel's Concord, Calif. facility is a lean factory, designed to get antennas out the door quickly. All manufacturing and testing stations are on wheels, allowing the entire layout of the factory floor to be reconfigured for any type of order.

Sea Tel Title Test Technician II, Fred DeMinico, testing satellite link with antenna.

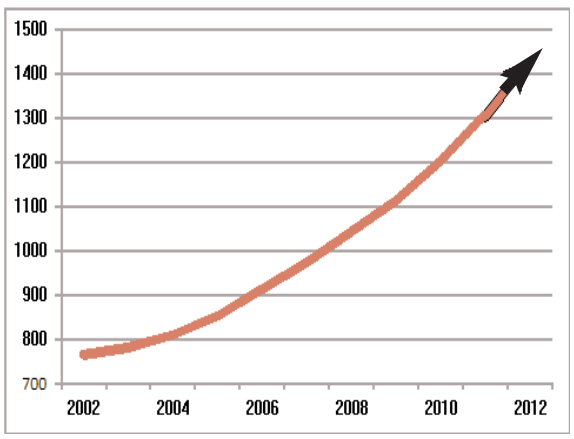
"There are mixed feelings about the commercial market because profits for many shipping companies are non-existent," especially container vessels, which really took a hit with the recession, Chawla said. "I'd like to see it come back because it's such a big market." At this point, however, these companies don't have much margin for making investments while the oversupply of vessels is still keeping profits thin.

The leisure market has also yet to make a comeback since the economic recession hit and gas prices are keeping boat owners down.

However, he said "megayachts are still doing well." Even though megayacht newbuilds have slowed, the resale market is active and new owners often upgrade antennas. The military market is also holding strong even as government budgets shrink because satellite communications are still a strategic priority.

Markets may all react differently, but fortunately for Sea Tel, its products are "very market agnostic," Chawla said. Sea Tel antenna systems can be used across all maritime sectors and the company offers a wide range of products from 14 inches to 3.6 meters. "We also have 350 global dealers, one of our strongest points," he added.

WORLD FLEET DEVELOPMENT

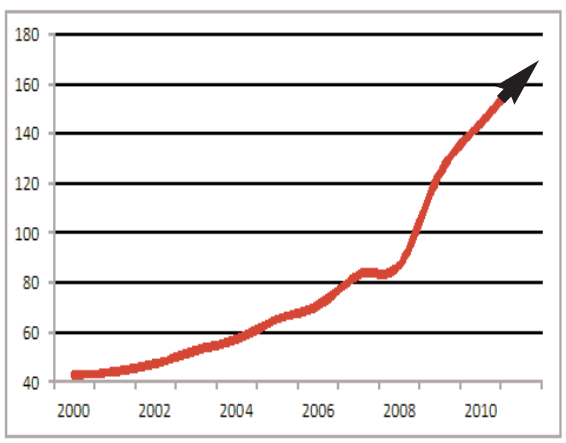


Year	Tankers	Chemical Carrier	Bulk Carrier	Combined Carrier	Others	Total
2002	268.0	22.7	287.4	13.8	174.7	766.7
2003	270.7	23.1	295.0	12.6	181.2	782.6
2004	279.1	25.0	303.3	12.1	189.6	809.1
2005	295.0	25.7	320.7	11.6	200.5	853.5
2006	317.7	26.9	341.9	11.6	213.3	911.3
2007	334.7	29.0	365.1	11.2	232.5	972.6
2008	352.3	31.7	392.9	11.2	254.2	1042.3
2009	369.0	34.0	420.8	10.4	278.3	1112.5
2010	396.2	35.8	459.2	9.6	300.0	1200.8
2011	413.1	3.1	533.	6.8	315.1	1304.6
2012	439.0	36.5	615.0*	*	337.8	1428.3

*From 2012 combined carriers are included in bulk carrier fleet.

(Source: The Platou Report 2012, RS Platou Group • www.platou.com)

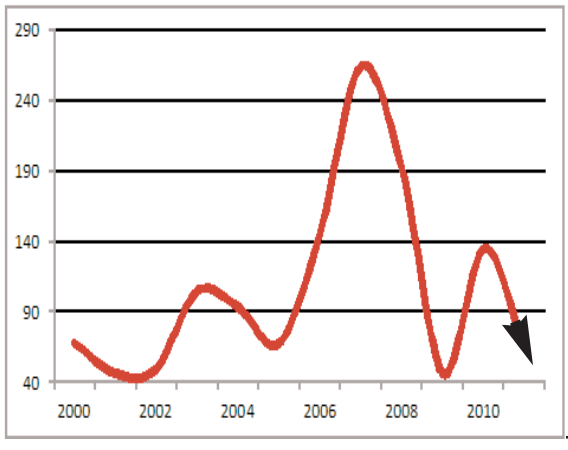
DELIVERIES



Year	Tankers	Chemical Carrier	Bulk Carrier	Combined Carrier	Others	Total
2000	19.2	1.7	13.6	N/A	8.5	43
2001	13.1	0.2	20.6	N/A	10.5	44.4
2002	22.7	0.8	13.6	N/A	10.4	47.5
2003	27.9	2	11.8	0.2	11.2	53.1
2004	26.4	0.8	18.3	N/A	11.9	57.4
2005	28	1.5	22.3	N/A	13.8	65.6
2006	23	2.4	25.5	N/A	20.3	71.1
2007	28.7	3	28.6	N/A	23	83.3
2008	33.2	2.9	22.9	N/A	28.4	87.4
2009	45.7	2.2	48.3.	-	28.4	124.7
2010	38.9	1	99.2	0.6	22.7	144.5
2011	39.7	1	99.2	1	22.7	163.6

(Source: The Platou Report 2012, RS Platou Group • www.platou.com)

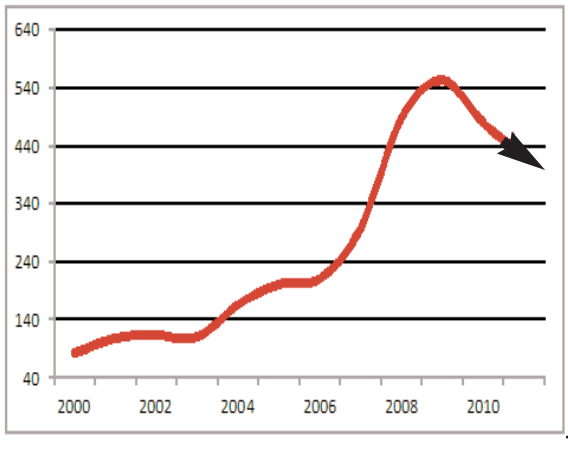
NEW ORDERS



Year	Tankers	Chemical Carrier	Bulk Carrier	Combined Carrier	Others	Total
2000	34.9	0.9	14.5	0.2	17.5	67.9
2001	26.2	0.7	8.7	N/A	10.5	46.1
2002	17.7	1.6	21.9	N/A	8.4	49.6
2003	47.9	1.4	27.9	N/A	27.5	104.7
2004	34	2.2	28.8	N/A	28.1	93.1
2005	24	0.9	16.8	N/A	25.9	67.6
2006	74.7	6.8	39	N/A	25.7	146.2
2007	42.1	10.1	161.6	N/A	50.5	264.3
2008	47.4	2.7	91.4	N/A	50.5	192
2009	10.3	0.8	33.6	N/A	1.5	46.2
2010	38.5	1.6	83.5	N/A	10.8	134.4
2011	9.2	0.5	28	N/A	25.7	63.2

(Source: The Platou Report 2012, RS Platou Group • www.platou.com)

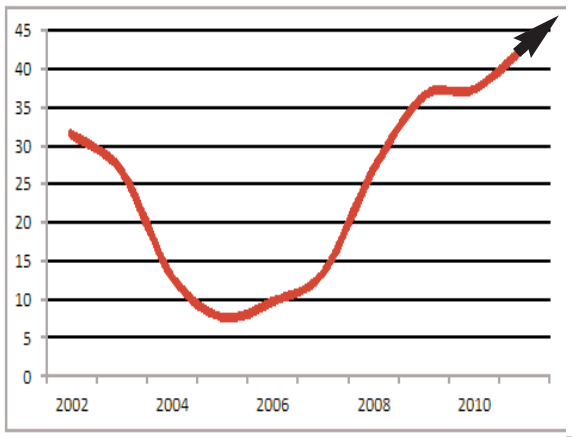
ORDERBOOK



Year	Tankers	Chemical Carrier	Bulk Carrier	Combined Carrier	Others	Total
2000	24.8	10.4	30.5	N/A	15.5	81.2
2001	39.3	9.5	34.3	0.2	24.5	107.8
2002	52	10	22.4	0.2	27.9	112.5
2003	45.3	10.8	30.3	0.2	22.9	109.5
2004	65.1	10.2	48.4	N/A	41.2	164.8
2005	72	11.6	60.6	N/A	56.2	200.4
2006	76.5	3.3	61.4	N/A	68.1	209.3
2007	128.7	11	78.9	N/A	80	298.6
2008	147.7	19	216.1	N/A	105.7	488.5
2009	164	11.3	286.3.	N/A	92.2	551
2010	120.6	13.9	268.7	3.4	70.5	477.1
2011	113.4	9.7	24.5	2.76	53.7	426

(Source: The Platou Report 2012, RS Platou Group • www.platou.com)

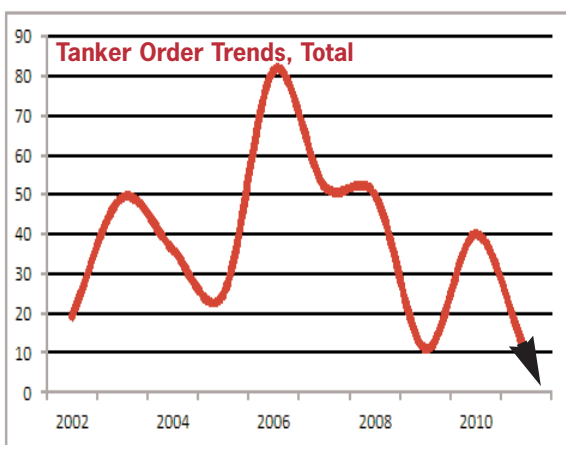
TONNAGE SOLD FOR SCRAPPING



Year	Tankers	Chemical Carrier	Bulk Carrier	Combined Carrier	Others	Total
2002	20	0.4	6	1.2	3.9	31.5
2003	19.5	0.1	3.5	0.7	2.8	26.6
2004	10.6	0.1	0.8	0.5	1	13
2005	5.3	0.3	1.2	0	1	7.8
2006	6	0.2	2.2	0.3	1.1	9.8
2007	11.1	0.4	0.7	0	1.4	13.6
2008	16.6	0.5	4.7	0.8	4.3	26.9
2009	18.4	0.5	9.9	0.9	6.7	36.4
2010	22	1.3	6.3	0.1	7.7	37.3
2011	13.8	0.6	21.5	1.8	5.1	42.7

(Source: The Platou Report 2012, RS Platou Group • www.platou.com)

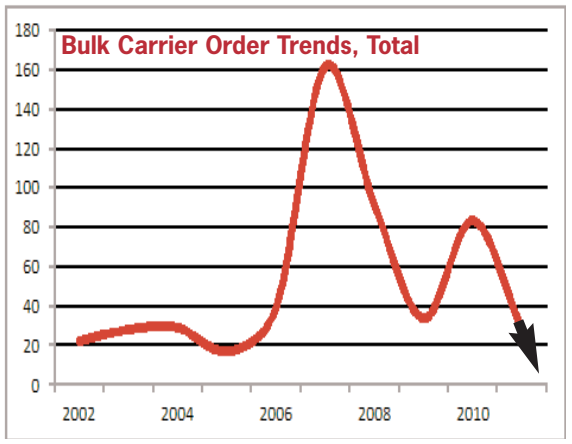
NEW ORDERS OF TANKERS BY SIZE



Year	10 - 69,999	70 - 119,999	120 - 199,999	200,000+	Total
2000	4.4	6.2	5.8	19.3	35.7
2001	5.8	10.2	3.3	7.6	26.9
2002	5.8	6.8	2.8	3.9	19.3
2003	10	15.2	8.7	15.5	49.3
2004	7.8	10.9	4.5	13	36.2
2005	7	5.8	1.1	11	24.9
2006	16.2	21.6	13.3	30.3	81.5
2007	15.4	13.5	8.3	15	52.2
2008	6.3	5.3	5.8	32.8	50.1
2009	1	1	3	5.8	11.1
2010	2.1	6.8	11.3	19.9	40.1
2011	2.7	1.9	2.8	2.2	9.6

(Source: The Platou Report 2012, RS Platou Group • www.platou.com)

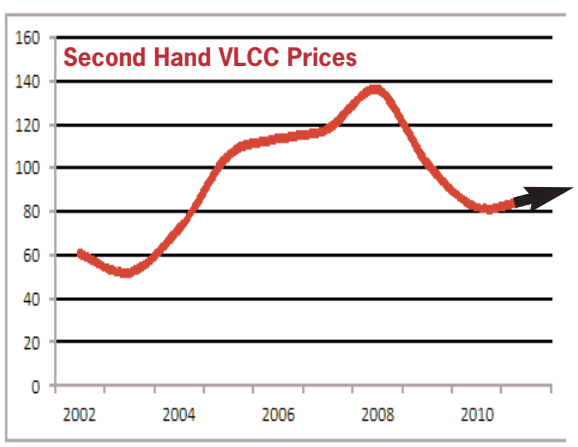
NEW ORDERS, BULKERS, BY SIZE



Year	10 - 59,999	60 - 79,999	80,000+	Total
2000	6.5	3.7	4.3	14.5
2001	3.5	2.2	3	8.7
2002	7.7	4.8	9.4	21.9
2003	7.7	7.7	12.6	27.9
2004	9.5	4.5	14.8	28.8
2005	6	1.8	9	16.8
2006	14.6	2.3	22.2	39
2007	38.6	7.1	115.9	161.6
2008	31.7	5.1	54.6	91.4
2009	11.8	3.4	18.4	33.6
2010	21.1	6.3	56	83.5
2011	16.2	8	3.8	28

(Source: The Platou Report 2012, RS Platou Group • www.platou.com)

2ND HAND PRICES, 5Y OLD TANKERS



Year	MR Product	Aframax	Suezmax	VLCC
2000	19	24	35.5	53
2001	25.5	41	49	70
2002	20.5	31	38	60.5
2003	21	28	37	52
2004	28	38	48	72
2005	39	56	71.5	106
2006	45	61.5	75	113.5
2007	45	64	81	118
2008	50	68	93	136
2009	38	53	71	102
2010	25	40	56	82
2011	27	40	58	85
2012	27	35	45	62

(Source: The Platou Report 2012, RS Platou Group • www.platou.com)

ORDERBOOK, TANKERS

		Delivery Schedule		
Size	Total on Order	2012	2013	2014+
10 - 69,999	9.8	5.9	3.2	0.7
70 - 119,999	13.3	8.6	3.8	0.9
120 - 199,999	16.6	10.1	6.5	0
200,000+	36.7	21.1	13.3	2.2
Total		45.6	26.8	3.9

(The Platou Report 2012, RS Platou Group • www.platou.com)

ORDERBOOK, BULK CARRIERS

		Delivery Schedule		
Size	Total on Order	2012	2013	2014+
10 - 59,999	42.6	30.5	10.8	1.2
60 - 79,999	20.1	14.9	4.5	0.6
80,000+	126.1	93.4	24	8.7
Total	188.7	138.8	39.3	10.5

(The Platou Report 2012, RS Platou Group • www.platou.com)

ORDERBOOK, CONTAINERSHIPS

		Delivery Schedule		
Size	Total on O	2012	2013	2014+
Below 1,000	3.5	2.6	0.9	0
1,000 - 1,999	1,089;.8	67.7	40.4	1.7
2,000 - 3,999	251.7	103.7	140.8	7.2
4,000+	3830.4	1406.4	1418.9	1005.1
Total	4195.5	1580.5	1600.9	1014

(The Platou Report 2012, RS Platou Group • www.platou.com)

Fuel for Thought

LNG as Marine Fuel: The question is no longer "if", it's "When and How Many"?

The push for liquefied natural gas as a marine fuel is gaining steam. While in reality the use of LNG aboard marine vessels is a shade below miniscule, the drivers for its future are abundant and ubiquitous, including historically low prices for natural gas (and projections for a continued major price advantage for a generation); new, emerging and ever-more-restrictive emission regulations at home and abroad; and generally a maturing of the technology that is making it acceptable and accessible on nearly every level.

Yet there remains a palpable hesitation among conservative vessel owners, as the infrastructure for refueling is prohibitive, limiting the solution to well and regularly travelled routes with existing refueling points. Perhaps even more importantly is the question of cost, as depending on the vessel type and age (if considering refit), the extra investment can quickly escalate from the millions to the tens of millions of dollars, pushing Return On Investment far beyond the comfort level of many.

By Greg Trauthwein

LOOKING TO 2020

Norwegian classification society Det Norsk Veritas has been a long, loud proponent of LNG as fuel, engaging the maritime community not simply in idle chit-chat but rather hard R&D and participation on several high-profile international projects. Perhaps the most prominent project to date is that of the offshore supply vessel Viking Lady, an LNG-fuelled vessel owned by Eidesvik Offshore (and the cover of the April 2012 edition of *Maritime Reporter & Engineering News*), a project which is currently evolving into a true hybrid vessel, soon to sport a new Corvus battery pack for energy storage.

DNV has never been a shrinking violet in the bold proclamation department, and it recently unveiled its vision on the future of LNG as a marine fuel via its "Shipping 2020," a broad-stroke market report which examines a host of market factors, from system cost to fuel cost and supply, to regulatory, such as the emerging EEDI regulations, the global introduction of new sulfur limits coming after 2020, and expansion of Emissions Control Area (ECA). According to the report, presented earlier this month by DNV's president Tor Svensen:

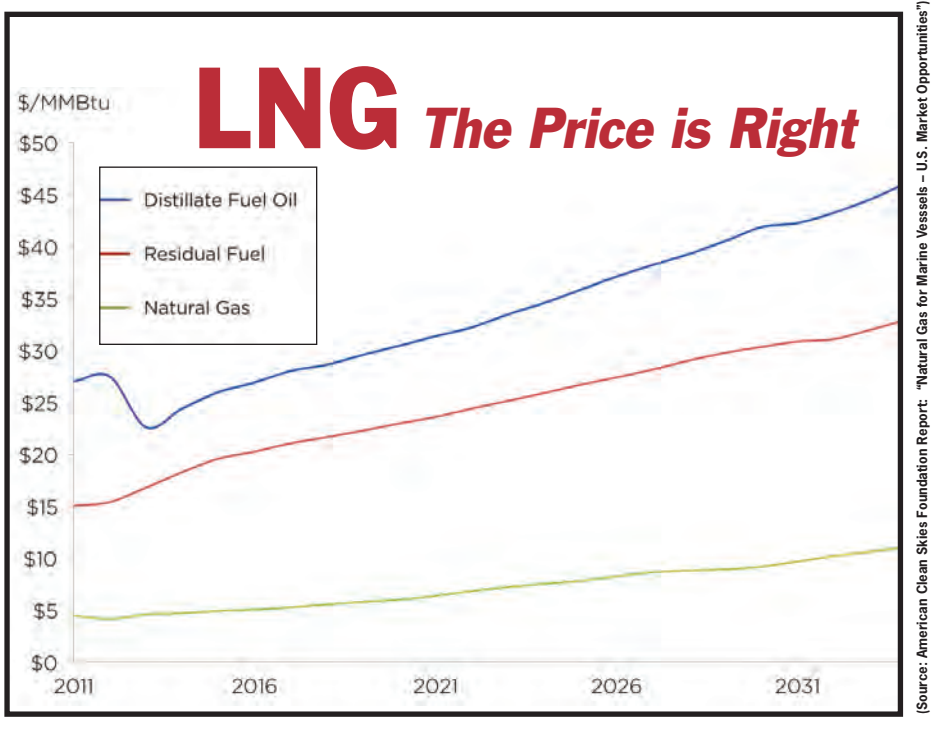
- **Distillate is a more likely option than scrubbers for most ships towards 2020.**
- **By 2020, it is expected that new tankers, bulkers and container vessels will be up to 30 percent more energy efficient than today's newbuildings.**
- **Between 10 and 15 percent of newbuildings delivered up to 2020 will have the capacity for burning LNG as fuel. This equates to about 1,000 ships.**
- **A gas-fuelled engine can be justified if a ship spends about 30 percent of its sailing time in ECAs.**

Interestingly, Svensen said that it appears distillate fuels will be a growing clean fuel option to 2020. While current

In the U.S., there has been no bigger splash for the 'LNG as Fuel' concept than the deal whereby **Harvey Gulf contracted Trinity Offshore to build four LNG-fueled OSVs.**

(courtesy Harvey Gulf)

In comparison, as shown in the chart on the right, **Natural Gas has a Significant Price Advantage** today over both residual (70% less) and distillate (85% less) fuel, and is projected by EIA to hold this price advantage through 2035.



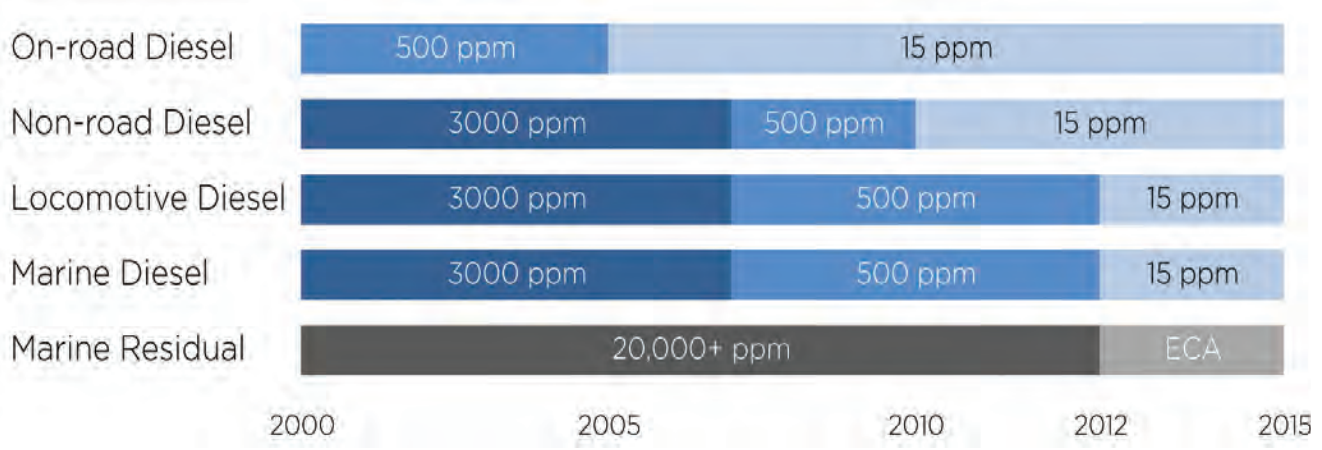
(Source: American Clean Skies Foundation Report: "Natural Gas for Marine Vessels – U.S. Market Opportunities")

annual demand for distillate fuels is around 30 million tons, DNV projects this could rise to 45 million tons when the 0.1 percent limit comes into force in ECAs and will be around 200-250 million tons by 2020. Conversely, the demand for heavy fuel oil will plummet from around 290 million tons in 2019 to 100 million tons once expected global emissions regulations enter into force in 2020.

CLOSER TO HOME

In the U.S., there has been no bigger splash for the 'LNG as Fuel' concept than the deal whereby Harvey Gulf contracted Trinity Offshore, LLC, in Gulfport, Miss., to build four LNG-fueled OSVs. These ecologically-friendly boats will be designed to meet ABS ENVIRO+ standards, and they will have dual-fuel capabilities and when running in gas mode, will produce no sulfur oxide emissions since gas doesn't contain sulfur. Nitrogen oxides will be slashed compared with diesel operations, and CO2 emissions will be lowered. Natural gas produces almost no particulates. Though technologically ahead of many of its larger competitors, Harvey Gulf's Shane Guidry did admit in a recent interview with sister-publication *MarineNews* that

Allowable Sulfur Content of U.S. Diesel Fuel



Type	Size (tons)	Engines	Engine Cost	Fuel System Cost	TOTAL CONVERSION COST
Tug	150	2 x 1500 HP	$1.2 million	$6.0 million	$7.2 million
Ferry	1000	2 x 3000 HP	$1.8 million	$9.0 million	$10.8 million
Great Lakes Bulk Carrier	19000	2 x 5000 HP	$4.0 million	$20 million	$24 million

ABOVE: Order of Magnitude Costs to Convert Typical Marine Vessels to LNG Operation

BELOW: Fuel Usage of Modal Vessels.

Type	Fuel	Annual Demand (gal)	Annual Equivalent LNG Demand (gal)	Annual Energy Demand (Therm)	Present Value 10-year Fuel Savings (7% Discount Rate)	Net Present Value of the Project
Tug	Distillate	424,000	768,221	583,848	$6.9 million	-$0.28 million
Ferry	Distillate	678,400	1,229,154	934,157	$11.1 million	$0.27 million
Great Lakes Bulk Carrier	Residual	2,080,064	4,097,179	3,113,856	$20.6 million	-$3.4 million

(Source: American Clean Skies Foundation's Report: "Natural Gas for Marine Vessels – U.S. Market Opportunities")

" LNG is still new and slow to catch on. I have only four of them being built."

It is argued that vessels running regular, predictable routes would be the first to benefit from LNG as fuel, as one of the main constraints – existing refueling infrastructure – would be easier to address. Last month a story came across our desk – direct from the *Fleet & Fuels ShowTimes Daily*, dated April 15, 2012, regarding Lake Michigan Carferry, which reportedly received a $75,000 grant from the Wisconsin State Energy Office to, in conjunction with LNG boiler vet G.R. Bowler, to begin the engineering work to convert the historic, coal-fired S.S. badger from coal to LNG power. The 410-ft. vessel entered service in 1953 and runs a regular route across Lake Michigan from Ludington and Manitowoc, Wisconsin, able to transport 180 cars and 600 passengers. According to the story in the *Fleet & Fuels ShowTimes Daily* the Wisconsin funding follows news of an $800,000 federal grant to the Great Lakes Maritime Research Institute, also to study the use of LNG on Great Lakes vessels

Regarding the S.S. Badger project, G.R. Bowler founder and president Gary Bowler was quoted as saying the choice was simple: repower at a cost of about $25 million or switch to LNG for existing boilers for about $5 million.

CLEAN FUEL, CLEAN ENVIRONMENT

A recent study prepared for the American Clean Skies Foundation and released April 2012 entitled *Natural Gas for Marine Vesssels – U.S. Market Opportunities*, found that based on current forecasts, natural gas delivered for production of LNG is now at least 70% less

Diesel Engine Conversion for LNG Fuel: Worth Doing?

A 25,000 dwt product tanker, Bit Viking became the first vessel in the world to be equipped with a fully mechanical propulsion system powered by LNG as a primary fuel when the plant was converted by Wärtsilä last year. Looking at the operating period, owners Tarbit can start to say if the conversion was worth it.

A purpose built tankship for coastal deliveries of petroleum products, on time charter to Statoil since delivery, Bit Viking is employed in a trade from Mongstad refinery to oil terminals along the Norwegian coast; a route that gives ready access to LNG bunkers. Designed by Wärtsilä Ship Design, built by Edwards Shipbuilding in Shanghai and launched in 2007, Bit Viking was equipped with twin-screw propulsion with each propeller powered by Wärtsilä 6L46 engines running on heavy fuel oil (HFO).

Tarbit initiated the engine conversion project in cooperation with Statoil primarily to reduce emissions, obtaining a 75% contribution of the costs from Norway's 'Næringslivets Hovedorganisasjon (the Confederation of Norwegian Business and Industry). With the conversion to LNG fuel the operators would also gain qualification for reduced government NOx emission payments tax.

Modification of the existing Wärtsilä L46 engines to the 50DF configuration included:

- Honing out the cylinder bores from 46 to 50 cm,
- Replacing the cylinder heads
- New cylinder liners and anti-polishing rings
- New upper sections to the engine's connecting rods
- Fitting dual-needle injection valves
- New engine turbochargers for DF operation
- Camshaft components for DF Miller-valve timing
- A new UNIC engine control system

The aim was to elminate SOx emissions, reduce NOx 95%, reduce particulate matter emissions 99% and CO2 25%. Anders Hermansson, Tarbit's Technical Manager told Wärtsilä recently there had been a reduction in fuel consumption, adding: "During six months of more or less trouble free trade we have gained a cleaner engine room. We have closed down all the fuel separators, we don't have any smoke from the funnel and the crew are quite happy."

Excerpted from a post filed by George Backwell, May 19, 2012 on MaritimePropulsion.com

expensive on an energy equivalent basis than marine residual fuel, and 85% less expensive than marine distillate fuel, a relative price advantage that is project by the EIA to continue, and perhaps extend, through 2035. While the potential savings on fuel is an enormous lure, the cyclical nature of the global energy markets make betting on that factor alone foolhardy at best, particularly given the high cost of conversion, which according to the American Clean Skies study is driven by the cost related to conversion of the vessels engines (one-sixth); with the balance including installation of LNG storage tanks and related safety systems and ship modifications (See related chart, to the left). In real dollars, this can cost up to:

- **$7 million to convert a medium sized tug**
- **$11 million to convert a large car and passenger ferry**
- **$24 million to convert a Great Lakes bulk carrier.**

According to the study, in the U.S. approximately 70% of domestic shipping relies on distillate fuel oil, with the remaining 30% using residual fuel oil. Stark in contrast when you consider that more than an estimated 90% of international shipping is fueled by residual fuel oil. At the time of the study, distillate fuel delivered for industrial purpose averaged about $3.71 per gallon, and according to the EIA an annual projected increase of 3.2% would make it $6.51 per gallon by 2035. In contrast, at the time of the study, residual fuel averaged $2.25/gal., and with EIA's projected 4.8% per annum price increase on this heavier fuel, operators are looking at a projected price of $5.06 per gallon in 2035. In comparison, as shown in the graphic on page 69, natural gas has and is projected by EIA to hold a significant price advantage over both distillate and residual fuel through 2035. The decision to convert – or to build new – an LNG-fuelled vessel includes a host of vessel and operational detail that is unique to each project, each company, and ultimately each vessel. But with (according to USCG records) nearly 1,000 U.S. flagged tugs larger than 100 tons; 65 ferries larger than 500 tons; and 43 Great lakes bulk carriers, there appears to be an ample supply of potential conversion candidates in North America to help power the use of LNG as fuel further, faster.

U.S. Flagged Tugboats, Push Boats & Ferries

Tugboats

Size (tons)	Number	Average Horsepower for Size Class
0-25	390	453
26-50	369	885
51-100	832	1765
101-200	889	3664
201+	100	5020
No weight listed	26	1595
Total	**2606**	

Location	Count
East Coast	590
West Coast	379
Great Lakes	243
AK/HI/Territories	139
Gulf	949
Inland	155
Not Listed	151

Pushboats

Size (tons)	Number	Average Horsepower for Size Class
0-25	323	417
26-50	468	683
51-100	950	1133
101-200	545	2043
201+	516	4807
No weight listed	29	556
Total	**2831**	

Location	Count
East Coast	181
West Coast	81
Great Lakes	378
AK/HI/Territories	11
Gulf	1363
Inland	757
Not Listed	60

Ferries

Size (tons)	Number	Average Horsepower for Size Class
0-25	59	269
26-50	97	966
51-75	198	2083
76-100	39	2445
101-500	67	1683
501-2000	52	4775
2000+	13	9972
No weight listed	54	1532
Total	**579**	

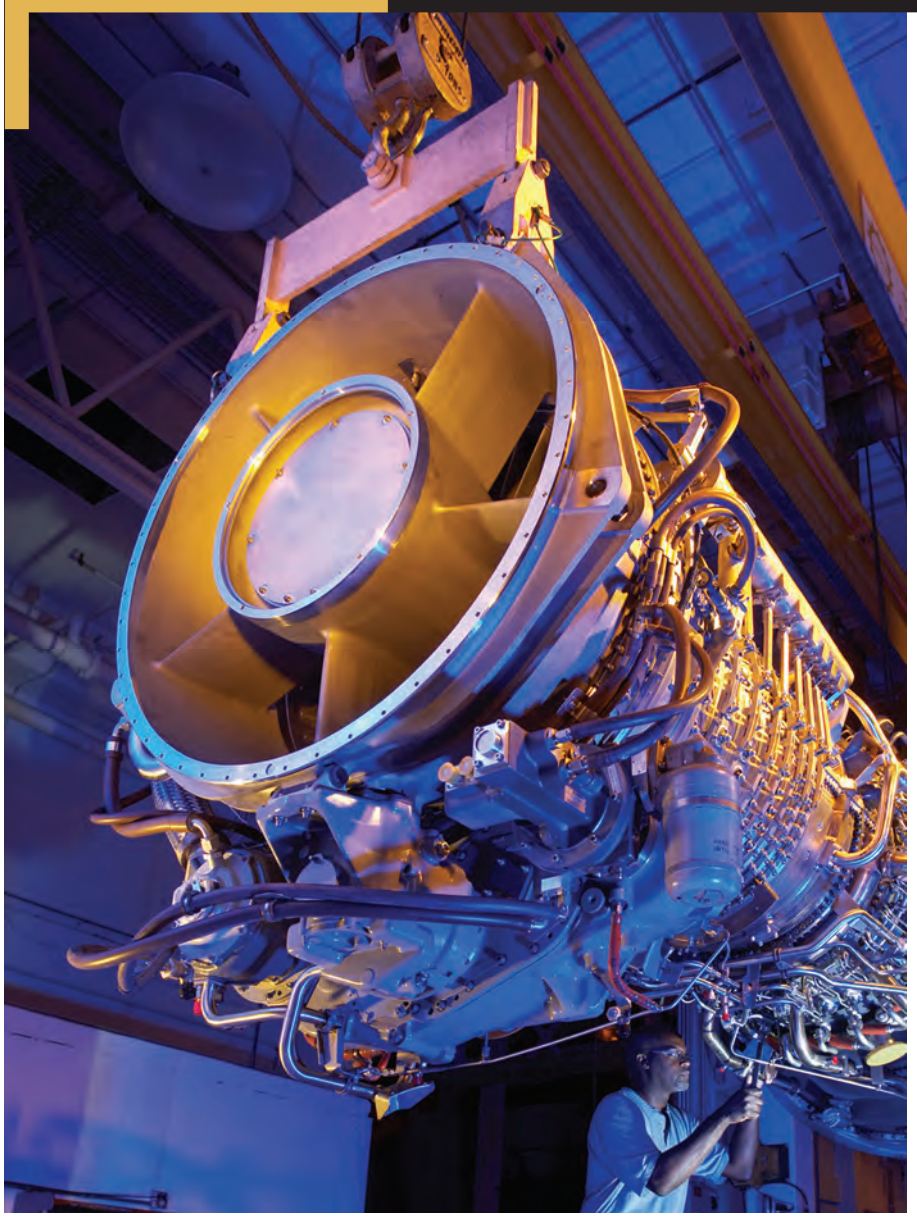
Location	Count
East Coast	246
West Coast	97
Great Lakes	83
AK/HI/Territories	55
Gulf	63
Inland	35
Not Listed	0

Table 9
Summary of Great Lakes Bound Vessels

Vessel type		Count	Average size (tons)	Average horsepower
Dry-bulk carriers	Self-propelled	43	19,248	9,546
	Tug-barge	7	12,316	6,626
Cement carriers	Self-propelled	2	7,493	3,750
	Tug-barge	3	7,179	6,267
Supply boat		1	53	190
Car ferry		1	4,244	7,000

Fuel Type	Count
Distillate Oil	41
Residual Oil	13
Coal	1

(Source: American Clean Skies Foundation's Report: "Natural Gas for Marine Vessels – U.S. Market Opportunities")



GE Gas Turbine

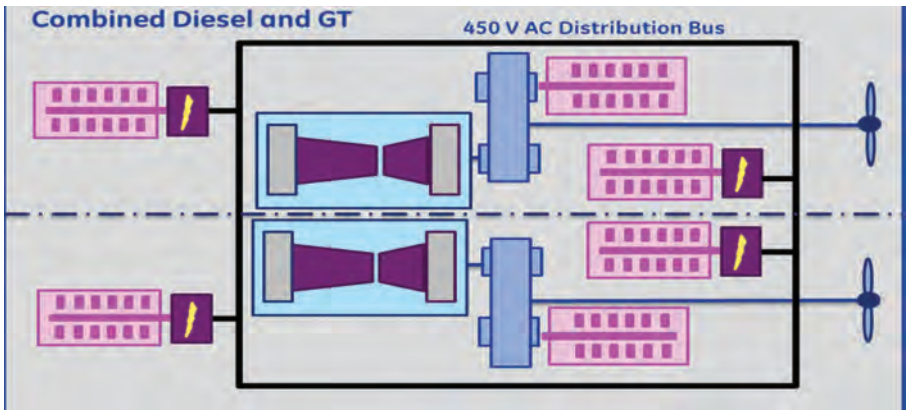
Hybrid Electric Drive Arrangements

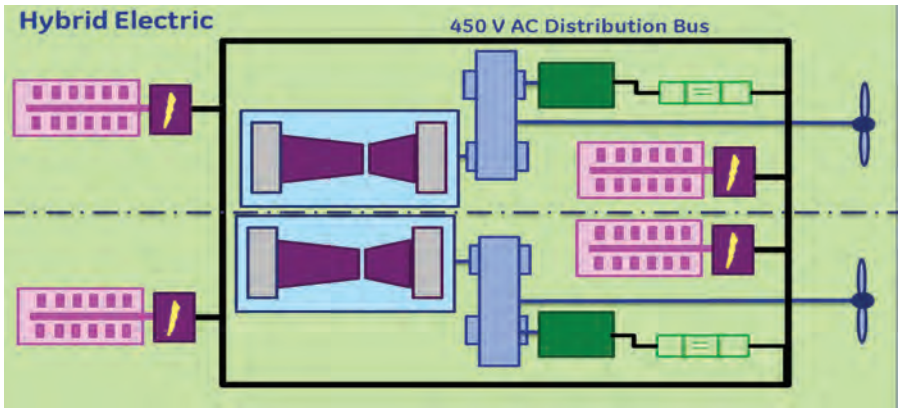
GE Marine offers hybrid electric systems for military and commercial marine customers based on its LM aeroderivative gas turbines, motors and drives, to help reduce noise and improve fuel economy. Hybrid electric arrangements cross-connect the ship service power system with the propulsion system by placing an electric motor and its associated motor drive in the drive train. At lower speeds, the propulsion system, such as engines, are turned off and the electric motors provide cruising power.

GE has provided components on seven gas turbine hybrid or electric powered ship classes in service or under construction, including the propulsion system on the United States Navy's LHD 8 USS Makin Island. GE offers a family of LM2500 gas turbines from 22 to 32 MW for twin or single gas turbine hybrid plants. In addition to the LHD 8-class ships, GE LM2500s are used on a variety of hybrid propulsion plants, including the German Navy's F124 and F125 frigates, and the Italian and French FREMM frigates. In new designs – particularly frigates from 3,000 to 7,000 tons – a hybrid electric arrangement is designed to improve efficiency. The traditional COmbined Diesel Or Gas turbine (CODOG) or COmbined Diesel And Gas turbine (CODAG) frigates have two gas turbines and two diesels for propulsion and typically four diesels for ship service power. With GE's hybrid electric arrangement, the two propulsion diesels can be eliminated and replaced by electric motors. This arrangement can reduce ship construction, propulsion equipment, and maintenance costs while helping reduce noise and improve combat capabilities.

GE's LM2500 gas turbines, for instance, can be applied in a dual gas turbine hybrid arrangement versus a single gas turbine configuration to provide the lowest technical, cost, schedule and operational risk. If incorporated into an existing LM2500 CODOG ship design, GE believes a dual gas turbine configuration requires the fewest ship modifications such as changes to bulkheads, uptakes, stability, the second platform level, and the deckhouse.

GE's dual gas turbine system configuration has two completely independent shaft lines to provide significant redundancy and survivability.





Siemens
Wins Prestigious Maersk Order

The Siemens Drive Technologies Division won a contract worth tens of millions of Euros from Daewoo Shipbuilding and Marine Engineering (DSME) for a propulsion and power generation system in containerships designed to reduce transit costs CO2 emissions. Apart from administering shaft generator motors and a power generation system, Siemens will also furnish the company with know-how in power management and Waste Heat Recovery Control (WHR).

In February 2011 the company entered into a contract with A. P. Moller-Maersk Group (Maersk Line) to build 20 Triple-E class vessels, the world's largest (and purportedly most efficient) containerships designed to carry 18,000 TEU. The first 10 vessels are scheduled to be delivered in 2013 and 2014 and the second set is expected to be delivered in 2014 and 2015.

The power generation systems from Siemens Drive Technologies that are enabled with Waste Heat Recovery System (WHR) will play a role in enhancing the propulsion of these ships and improve the heat recovery methodology available. Through the WHR the exhaust gas from the engine is captured and used to run the combined exhaust gas/steam turbine genset which generates electrical energy. Capitalizing this energy the total power generation can be run with lesser fuel consumption and at the same time CO2 emissions are significantly reduced by approximately 12%.

Cummins
High HP, Dual Fuel Porduct for O&G

Cummins plans to produce dual fuel engines from 800 to 3500 hp (597-2610 kW) for high-horsepower markets. The first in the product portfolio, QSK50 Tier 2 for oil and gas well servicing applications, will begin production in midyear 2013, with other QSK Series engines to follow, including engines capable of meeting upcoming EPA Tier 4 Final emissions regulations.

Cummins high-horsepower dual fuel engines will operate with common integrated controls, making a seamless transition from diesel fuel to dual fuel operation.

By default, an engine will run on diesel fuel until the operator selects the option on the control panel to run the engine on a blend of diesel and natural gas fuel. The engine will switch to dual fuel mode and automatically select the substitution rate for the operator.

In traditional operating conditions, a maximum substitution rate of diesel fuel with natural gas of 70 percent can be expected, with average substitution rates of greater than 50 percent, depending on application and duty cycle.

The Cummins dual fuel solution will be applicable to both new QSK family engines and a retrofit on existing QSK family engines in the field today. Cummins global distribution network will handle up-fit, commissioning and warranty on dual fuel solution engines.

WFR Save 2% on Fuel

In the best of times prudent shipowners micromanage fuel consumption and vessel efficiency. In the worst of times, as fuel prices rise and freight rates fall, only the worst run operation eschew modern fuel management products and systems.

With high oil prices, bunker fuel oil accounting for around 60% of a vessel's operating costs, and increasingly stringent emission controls, a fuel strategy and ways to cut fuel bills are at the top of the agenda for most ship owners and operators.

As anyone in the transport sector can say, sustained high energy costs are here to stay, and it is the companies that efficiently manage these costs that ultimately will survive. According to a recent EIA study, distillate fuel for marine applications is about $3.71 per gallon, projected to rise 3.2% per annum for the next 25 years, making it $6.51 per gallon by 2035. The picture is similarly bleak for heavy fuel, as increasingly strict emission regulations effectively phase it out of the market. Hovering at around $2.25/gal., residual fuel is projected to rise 4.8% per annum, putting it in the $5.06/gal. range by 2035.

There are many of potential solutions, ranging from the operational, which includes slow steaming; to the technical, including modern machinery designed to burn cleaner, cheaper fuel (read LNG); to the design, which includes optimized hull design. When a company of Alfa Laval's stature offers a solution it tends to garner headlines, and last month the company touted the latest in its line, **PureDry, which the storied marine supplier touts as saving shipowners 2% in fuel costs.** The high-speed separator is designed to recover re-usable fuel from waste fuel oil. With an unconventional design, the separator recovers energy by recycling the heavy fuel oil fraction in the waste fuel oil tank, leaving only super-dry solids that can be landed as dry waste. The separator also incorporates what the company describes as "a solids removal twist."

Alfa Laval sees waste fuel recovery (WFR) as a game-changing application for the global shipping industry. It touts its PureDry solution as a technically and

Since installation in November 2010, PureDry has recovered more than 150 cu. m. of oil, which has been returned to the bunker tanks for re-use, a significant reduction in fuel costs

Mats Göras, Chief Engineer, Baltic ferry MS Silja Symphony

PureDry on Silja Symphony

150 Tons of Fuel Oil

In November 2010, the Baltic ferry MS Silja Symphony installed PureDry. Symphony's Chief Engineer Mats Göras relates that since commissioning, the unit has recovered more than 150 cu. m. of oil, which has been returned to the bunker tanks for re-use. "With bunker oil at today's prices, this has meant a significant reduction in fuel costs for us," says Göras, "we have also cut our costs for landing waste oil."

MS Silja Symphony is a 58,377 grt cruise ferry, delivered in 1991 and owned by the Tallink Group. The ship is equipped with four Wärtsilä-Vasa 9R46 diesel engines for propulsion, rated at 32.5 MW, and auxiliary engines rated at 7.3 MW. In service on the Helsinki-Stockholm route, Silja Symphony consumes some 50 tons of fuel oil every 24 hours, sailing approximately 50% of the time.

The PureDry high-speed separator was installed onboard in November 2010 and went into full operation in January 2011. Waste fuel oil from settling and day tank bottom drains, fuel oil filters, fuel oil separators and the diesel engines is separated from other waste oils and collected in a dedicated waste fuel oil tank.

"We produce roughly 8 cu. m. of waste fuel oil every 6 days" said Göras. "Since the PureDry was commissioned we have recovered more than 150 cu. m. of re-usable fuel oil and saved a significant amount on the ship's fuel bill. To be sure that the recovered oil was within bunkering limits, we sent samples to DNVPS for analysis and they confirmed that it was suitable for use."

Göras said Silja Symphony has also achieved significant savings on waste oil disposal. "We pay 7.5 EUR/ton to land waste oil in Helsinki, regardless of the mix of oil and water. PureDry has reduced the amount of waste oil landed by about 450 cu. m. per year."

economically efficient method of recovering waste fuel from fuel oil residues. With waste fuel recovery a direct saving of up to 2% on fuel. Here's how it works.

Waste fuel oil comes from settling and day tank drainages, leakages, filters and purifiers and is today collected in the waste oil tank and subsequently landed or incinerated.

Alfa Laval's WFR concept involves installing two waste oil tanks, one each for lube oil (LO) and fuel oil (FO), respectively. Although to the observer the waste fuel oil tank appears to contain just black oil, it is actually oil polluted water containing 20 – 30 % energy in the form of recoverable fuel oil. The remainder is oil polluted water 70 - 80% and, accumulating at the bottom, suspended solids approx 1%.

According to Alfa Laval, the PureDry separator recovers the fuel oil from the oily water in the waste FO tank and it is returned to the fuel oil bunker tank for reuse after normal treatment, resulting in a reduction of up to 2% in the total volume of fuel oil consumed and a corresponding reduction in the ship's fuel bill.

In addition, the process reduces the volume of waste oil by 99%, producing typically 5-15 kg per day of non-pumpable "super-dry" solids that can be landed as dry waste and disposed of in the same way as oily rags and used filter cartridges. There are no oil losses and no additional wastes are generated. The separated water, now with an oil content of less than 1,000 ppm, is pumped to the bilge water system.

"A large container vessel or cruise ship sailing 52 weeks per year typically burns 1,000 tons of fuel per week," said Pauli Kujala, Senior Business Manager, Oily Waste Treatment Systems, Alfa Laval Marine & Diesel Equipment. "Now, with PureDry recovering fuel that would otherwise be treated as waste, it will be possible to cut the ship's fuel bill by up to 2%, which amounts to at least $500,000 per annum at today's bunker prices."

Alfa Laval calculates that once an existing vessel has been retrofitted with the PureDry system and separate FO and LO tanks, during the first year alone the ship owner's fuel savings will pay for both the equipment and the tank installation. For a newbuilding, the profit will be even higher since it mainly involves the capital cost of the PureDry system.

PROBLEMS ELIMINATED

In addition to the purported savings on fuel, PureDry also is designed to help solve the problem of the waste oil tank filling up. The waste oil is treated instead of being stored for subsequent incineration or landing. If the oily water separator (OWS) does not function properly, the bilge water goes into recirculation and fills up the bilge water tank. When this is full it is usually pumped to the waste oil tank. When the waste oil tank has no more capacity the ship has a problem. Incineration of the waste oil means burning up to 80% water and to do this it is necessary to add diesel fuel.

There are also issues surrounding landing of waste oils. Specifically, in many ports it is difficult. For instance, California is not prepared to handle waste oil. If landed, it has to be transported by road tanker to a neighboring state for disposal, adding significant costs.

www.alfalaval.com

Faster Broadband at Sea

Broadband for applications at sea is an area that is experiencing rapid growth and one that demands increasingly fast data transfer speeds. Levels of use are blossoming as communication, control and monitoring are increasingly being carried via onshore operative nodes.

Gothenburg-based Satcube AB is in the process of developing terminals to handle the next generation of satellite capacity. "These satellite terminals need to be more accurate and demonstrate greater efficiency than the old L-band system terminals they replace," says Jakob Kallmér, Satcube's CEO. "Availability and robustness requirements continue to be extensive. However, customers aren't prepared to pay much more for the hardware. That's why you need to take a new approach when developing this type of terminal," he said.

Satcube has developed a high efficiency antenna system in order to drive down the cost of the equipment's active components. Using an innovative platform, the antenna is able to maintain position in relation to a satellite without the need for expensive optical gyros. The platform also features an active dampening system, which eliminates shocks and vibrations, minimizing service interruptions and the number of system failures. Kallmér said.

The company plans to release a beta version of the system this winter to test the concept in the demanding operational environment of the North Sea. It is expected that a fully industrialized product will be available by mid-2013.

Dutch Invention Prevents Towline Failure

The Rotterdam based shipping company Rotortug and ASD Ship Design from Alblasserdam have invented a tugboat technology to prevent towline failures from chafing against a tugboats fixed towing point. The invention of Mr. Ton Kooren (Rotortug) and Mr. Arie Aalbers (ASD Ship Design) is the azimuth friction free towing point.

Conventional towing point designs are usually fixed bitts fitted with polished and stainless steel cladding in line contact areas guiding a towline to a towing winch. Using state-of-the-art towing winches, towlines are winched in and out automatically by using a pre-set line force to prevent both dynamic overloads and slack wires. Synthetic towlines can easily fail due to chafing and friction with increased risks for safety.

Fast in and outgoing movements of a towline with these winches cause high temperatures in especially the inner core of synthetic towlines. This is an even bigger issue at high outdoor temperatures. The fiction and the high result temperature cause much wear and, at the end, failure of a towline connection.

Thomas Gunn Launches New Generation Voyager

Voyager 4 is the latest incarnation of the highly regarded automated chart management system from Thomas Gunn Navigation Services. The Voyager Series has earned a reputation for innovation, reliability and responsiveness to customers' needs – and Voyager 4 is no exception. Packed full of new applications, Voyager 4 offers the mariner an easy to use, cost effective and high quality database of navigational data neatly displayed using an interactive map interface with Admiralty information overlay which can be customized to individual voyage requirements.

As part of the service provided by Thomas Gunn, subscribers to the Voyager system will automatically receive the new Voyager 4 software. Voyager's state of the art file compression technology ensures easily delivery of weekly updates for British Admiralty Notices to Mariners and Tracings, and Admiralty Vector Chart Service and Admiralty Raster Chart Service updates. To ensure that the mariner continues to have the most up to date port information available to them, any amendments available will also be included in the weekly Voyager updates service.

BALPURE BWTS Earns BV Type Approval

The Type-Approved BALPURE ballast water treatment system from Severn Trent De Nora has received type approval from classification society Bureau Veritas (BV) for its full range of standard ballast water treatment systems that can treat ballast water flow rates of up to 5,000 cu. m./h. Standard systems can be supplied as multiple sets to treat higher flow rates.

The type approval was granted by BV following stringent review of the BALPURE system per BV rules and guidelines along with the guidelines contained in the IMO Resolution MEPC.174(58). This involved a thorough review of land-based and shipboard testing results, corrosion testing results as well as hydrogen gas dispersion risk analysis by Glosten Associates.

Severn Trent De Nora is in the process of obtaining type approval from other classification societies including ABS, DNV, GL and LR. With the US Coast Guard (USCG) Final Rule published on 23 March 2012, Severn Trent De Nora has also been actively pursuing Alternate Management System status with the USCG, with an objective to be one of the first ballast water management systems with the UCSG Type Approval.

UltraJet JetMaster 2

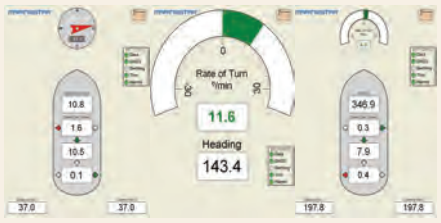
Ultra Dynamics in partnership with South Boats and Rotec Hydraulics announced the introduction of the New UltraJet JetMaster 2 DNV Class approved electronic control system for South Boats Wind Farm Support vessels (WFSV). The New UltraJet JetMaster 2 electronic control system can be seen down on the Pontoon on 19m South Catamaran WFSV's named Seacat Endeavour and Offshore West Hinder and are two of the 7 WFSV to be fitted with this new system this year.

JetMaster 2 can be configured to meet any service provider's exact control requirements. JetMaster 2 ship control and management system features integration of diesel engine, transmission, waterjet and interceptor functions into a single intuitive vessel control system.

OMNIPURE Series 55 Marine Sewage Treatment System

Severn Trent De Nora offers the OMNIPURE Series 55 marine sewage treatment system, to provide effective electrolytic treatment of both black and gray water while providing a safe and sanitary method of handling solids. The OMNIPURE Series 55 system is the only marine sewage treatment system that oxidizes sewage through an electrolytic process as well as generates sodium hypochlorite for the disinfection of the sewage streams. The OMNIPURE Series 55 systems incorporate an advanced electrolytic process that imposes certain physical and chemical changes to the wastewater stream as it passes through the treatment system, resulting in wastewater effluent quality that is well below the new MEPC.159(55) requirements. The systems have received Bureau Veritas certification per IMO Resolution MEPC.159(55) and USCG Certificate of Approval to MEPC.159(55).

Multi-Function Navigation System Approved



The Marinestar Maneuvering System (Marinestar MS) designed by Fugro in Norway has been approved by the BSH marine test house in Germany as both a Speed and Distance Measuring Equipment (SDME) and Transmitting Heading Device (THD). This means that Marinestar MS can be installed as an alternative to a doppler speed log in order to meet the requirements of SOLAS for ships over 50,000 gross tons to have the ability to measure speed over the ground in both the forward and athwartships direction. The system can equally act as an alternative to one of the gyro compasses. In fact Marinestar is more accurate than most gyro compasses and is therefore not only a low maintenance gyro alternative but a more accurate source of heading information.

Erma First Receives BWTS Type Approval

Erma First said that its Ballast Water Treatment System (BWTS) manufactured by Erma First ESK Engineering Solutions S.A, has received Type Approval according to IMO resolution MEPC.174(58) from the Greek Administration, granted May 11, 2012. Erma First Ballast Water Treatment System uses a 200 micron self-cleaning pre-filter, a 20 micron hydrocyclone technology exhibiting outstanding performance in very high sediment loads and advanced energy efficient electrolytic cells. It is lready installed on board Containership M/V Cosco Guangzhou, with running orders for Offshore and Mega Yacht Vessels, and in final negotiations for numerous Bulk Carriers and Tanker Vessels in Far East.

New Yanmar Engine

Yanmar America offers the 12AY series High-Speed Commercial Workboat diesel engine. The purpose-built 12AY is ideal for offshore support vessels, ferries, tugs, commercial fishing craft and other demanding applications.

A key element of the improved performance and efficiency is a new staggered injection nozzle and patented combustion chamber design. They allow a very wide rpm range with low fuel consumption and emissions.

The 40L, 12-cylinder turbocharged diesel engine is available in five power ratings across three models. The 12AYM-WST models produce 1,200 mhp(882 kW) @ 1,850 rpm and 1,400 mhp(1,030 kW) @ 1,900 rpm. The 12AYM-WET versions have outputs of 1,550 mhp(1,140 kW) @ 1,840 rpm and 1,659 mhp(1,220 kW) @ 1,900 rpm. The 12AYM-WGT produces 1,822 mhp(1,340 kW) @ 1,940 rpm.

A new V cylinder block configuration offers improved rigidity compared to previous models, with inspection ports providing easy access to connecting rod assemblies. A mechanical engine governor control and Yanmar's own fuel system components further enhance reliability.

CS Unitec's 9-in. Pneumatic Circular Saw

CS Unitec's new pneumatic circular saw is designed to dry cut steel plate up to 3/8" thick, as well as non-ferrous metal, plastic, grating, composite and corrugated materials. Portable and lightweight (19 lbs.), the Model 5 1115 0020 metal cutting saw is ideal for foundries, petrochemical, nuclear, marine, demolition and fabrication industries or other applications where pneumatic power is the norm. The 2 HP pneumatic motor operates at 90 PSI using 60 CFM air volume and has a 1/2" Female NPT air connection. This 9" circular saw has an overall cutting depth of 3-1/4" at 90˚ and 2-1/8" at 45˚.

www.csunitec.com

OMEGA's New General Purpose Solid State Relays G3NA Series

Omega introduces its new series of general purpose solid state relays which are used to control large resistance heaters in conjunction with temperature controllers. This CE compliant solid state relay with LED operation indicator is capable of millions of hours of operation and has a built-in varistor to absorb external surges. The G3NA SSR is available for both AC and DC loads and control voltages, in current ratings up to 50 amps. Ideal for the Chemical, Plastics and Food industry.

E-mail: info@omega.com

WESMAR Sonar

WESMAR completed the installation of its high-definition, long-range sonar on the 164-foot arctic expedition ship M/V QUEST. Managed by International Shipping Partners, the QUEST joins a number of vessels that have already installed WESMAR's advanced technology searchlight sonar for navigational capability and safety. WESMAR's new sonar system, which is designed for cruise ships and excursion vessels such as M/V QUEST, offers unmatched navigational and security aid, in both shallow and open water. With the ability to scan a full 360 degrees around the vessel as well as profile the bottom underneath the ship, the WESMAR sonar offers unparalleled protection.

Fast Find 220 Personal Locator Beacon

McMurdo extended its range of emergency distress beacons with the launch of the new Fast Find 220 PLB (Personal Locator Beacon). The Fast Find 220 satellite PLB is a versatile 406 MHz GPS emergency beacon with GPS as standard, enabling a typical positional accuracy of +/- 62m. The 220 also benefits from new contemporary styling, including retro reflective detailing for improved visibility in low light, a six year battery storage life and float pouch included. The beacon is also small in size weighing just 5.4oz and measuring 1.34" x 1.85" x 4.17", and features a LED flash light to assist with rescues at night or during limited visibility.


Cropper


Efstathiou (right)


Hatley

ABS

Cropper New President of Cal Maritime

The California State University Board of Trustees named Thomas A. Cropper, Rear Admiral, U.S. Navy, as president of California Maritime Academy. Cropper was among the finalists for the position to succeed retiring President William B. Eisenhardt, who has served as president since 2001. He is expected to begin in his new role as president on July 1 following retirement from active duty.

For the past two years, Cropper has directed education and at-sea training for ships and aviation squadrons deploying to the western Pacific and the Middle East. From 2008 to 2010, Cropper led and managed 24,000 people in combat operations as the deputy commander of the U.S. Fifth Fleet in Bahrain. He also served on the Joint Chiefs of Staff Strategy Working Group at the Pentagon where he headed a select senior officer team working with representatives of each U.S. armed forces chief, the Joint Staff, the State Department and agencies within the cabinet.

Cropper earned a bachelor's degree in Engineering Operations from Iowa State, and three master's degrees in Aviation Systems (University of Tennessee), National Security and Strategic Studies (U.S. Naval War College) and World Politics (Catholic University).

Efstathiou Joins SpecTec Americas

SpecTec has appointed Evan Efstathiou as Executive Director of SpecTec Americas. Efstathiou worked in Veson Nautical as the Director of Client Services for more than years. Efstathiou graduated from MIT and Harvard School of management and worked the last 11 years in the Maritime and Oil & Gas worlds.

INTERTANKO: New MD, 5-Year Plan

INTERTANKO's Council unanimously confirmed the appointment of its current Deputy Managing Director, Katharina Stanzel, as Managing Director of INTERTANKO effective July 1, 2012. The Council noted that Joe Angelo will return to his previous position of Deputy Managing Director and Director for Regulatory Affairs and the Americas.

INTERTANKO is in the process of finalizing a five year strategic plan, whose main objectives are to look ahead and ensure that, given the realities of today's regulatory and economic climate, the Association is well-positioned to face the challenges expected.

The Council agreed that the most likely scenario the tanker industry would face in the coming five years would be one of strong environmental concern within an unstable geopolitical state, and that the major issues confronting our Members during this period would be:

1. Sustainability of the tanker industry;
2. Human element
3. Tanker safety and performance
4. Global maritime security threats
5. Greenhouse gas emission reductions
6. Air emission reductions
7. Ballast water management

Wärtsilä's Hatley Honored by SNAME

In a reception hosted by The Society of Naval Architects and Marine Engineers (SNAME), John Hatley, Americas Vice President Ship Power, Wärtsilä North America, was announced as the 1st place author in "The Winning Authors of Best Papers Presented at 2012 Offshore Technology Conference (OTC)." Hatley's paper titled, "New Marine Era for Gas", was presented during the technical program at OTC.

Kriner Joins Resource Power Group

Engine sales and service company, Resource Power Group (RPG) has appointed Michael Kriner as the company's Houston Branch Manager. The focus of the Houston branch of the MaK and large bore engine business will be Texas and the Gulf of Mexico territories. Kriner is a graduate of the US Merchant Marine Academy.

New MD at Imtech Marine Singapore

As of May 21, 2012 Imtech Marine has appointed Gennaro Pipoli in the position of Managing Director of Imtech Marine Singapore, a further step in realizing the global ambitions of Imtech Marine and more specifically in the Asia region.

Webb: $100k in Scholarships from ABS

Presentation of the check to Webb, pictured left to right are Chairman of the Webb Board of Trustees R. Keith Michel, Webb President RADM (Ret) Robert C. Olsen, the first ABS Scholar Jonathan Soja Webb Class of 2013, ABS CEO Christopher J. Wiernicki, and Dean of Webb Richard P. Neilson.

Webb Institute received $100,000 in annual scholarships from the American Bureau of Shipping (ABS). The ABS Scholarship Program provides financial support to deserving engineering and naval architecture students based on GPA, class rank, leadership ability and recommendations.

Webb presented the first $50,000 scholarship on May 10, 2012. The presentation of this scholarship preceded a special lecture entitled "Titanic Revisited, 1912-2012,"given by Dr. Stephen M. Payne. The second scholarship will be awarded in the fall of 2012 for the 2012-13 academic year. The first ABS scholar, Jonathan Soja '13, was announced by Christopher J. Wiernicki at a reception hosted on the campus of Webb Institute in Glen Cove, NY.

ClassNK: First in Class to Hit 200mgt Mark

ClassNK announced that its register had passed the 200mgt mark on May 28, 2012. ClassNK Chairman and President Noboru Ueda announced the historic achievement at a party celebrating the 50th anniversary of the establishment of the London office, which was attended by many of the leaders of the maritime community, including IMO Secretary General Koji Sekimizu and IMIF Chairman Jim Davis CBE.

Founded in 1899, the growth of ClassNK's register has steadily accelerated over the years. ClassNK broke the 100 million gross ton mark in 1997, before becoming the world's largest classification society in 1999. Just 10 years later, ClassNK became the first class society to exceed 150 million gross tons on its register in 2007. As of 31 May 2012, the ClassNK register accounts for 7,847 ships totaling 200,804,781 gross tons. As ClassNK's register surpassed more than 190 million gross tons at the end of September 2011, some 10 million gross tons have joined the Tokyo-based class society's register in just the past eight months.

Obituary

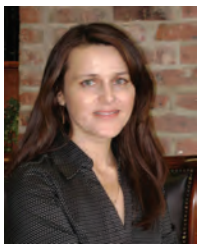
Idar Ulstein

Idar Ulstein, who was CEO and Chairman of the board of ULSTEIN for many years, passed away April 29, 2012. Ulstein entered the company first as a 14-year-old in 1948, when his father died. After completing naval architect studies in 1962, he reentered the company as head of design. The company was growing, and when Molde yard was purchased in 1964, he became manager of the new companies. In 1974, after the merger with Hatlø mechanical workshop, he became CEO of Ulstein Hatlø. In 1985, the holding company Ulstein Holding was founded and he became CEO. In 2007 he resigned as CEO and became chairman. He was chairman until summer 2011.

Idar developed a relatively small company to a large international group, which at the end of the 1990s had 4,500 employees in more than 30 countries. The company, which started business with insertion of engines and repair of fishing boats, eventually, developed its own ship design, divided into series. Equipment and equipment packages were also an important part of the activities. The company was listed on the stock exchange in 1997, and all activities except for shipbuilding, was acquired by Vickers and later Rolls-Royce in 1999. Idar continued as chairman of the new Ulstein Group, and two of his children became managers. The company of today employs about 800 employees in several countries and has activities within shipbuilding, design and solutions, power and control and shipping.


Lasker


Troy


Azimova


Foye & Cranston


Camarena


Damen Shipyards Group

Troy Container Line Promotes Three

Troy Container Line Ltd. appointed three key personnel to management positions. Svetlana Azimova has been named Assistant Vice President of Troy Container Line's Freight Cashier Department; Jonathan Lasker has been appointed Assistant Vice President of the company's Import Department; and Michael C. Troy II is now the Global Account Manager of Troy Container Line's Sales Department.

Officials Visit Bayonne Dry Dock

Bayonne Dry Dock and Repair Corporation President Michael Cranston held a press conference on Tuesday, May 8, 2012, on the top side of Bayonne Dry Dock, to highlight the economic and environmental punch of the dry docking business on the Port of New York and New Jersey and its positive impacts on homeland security. Following the press conference, Cranston led a tour of the facility where the U.S.N.S. Watson, a military ship that carries supplies to troops overseas, is currently undergoing repairs.

Attending the press conference and tour were Port Authority of New York & New Jersey Executive Director Patrick Foye, Michael Van Wagner, Acting Executive Director - Business Action Center, Office of Governor Christie, Al Coutinho, Assemblyman for NJ Legislative District 29 and Chair - Commerce and Economic Development Committee, Tom Bracken, President – New Jersey Chamber of Commerce, Maria Nieves, President and CEO - Hudson County Chamber of Commerce, Elizabeth (Bette) Spinelli, Executive Director - Hudson County Development Corporation, Jerry Keenan, Executive Vice President - NJ Alliance for Action along with employees of Bayonne Dry Dock and members of the community.

HAL Taps Camarena For Fleet Post

Lance Camarena joined Holland America Line and Seabourn as director, fleet training and performance management. He is responsible for the fleet training program of deck and engine staff, performance management and developing technology solutions that support fleet performance. Camarena will oversee the deck and engine fleet training team and report to Michiel Versteeg, director, safety and environmental compliance.

Camarena previously spent 14 years with Holland America Line from 1995 to 2009. During this tenure, he developed the first corporate-wide leadership training program, upgraded the original SS Jakarta to the ms Nieuw Jakarta training center in Indonesia and established the Manila Training Center in the Philippines.

Rolls-Royce Wins Turkish Navy Contract

Rolls-Royce won an order to supply propulsion equipment for three new ships commissioned by the Turkish Navy. Istanbul Shipyard will design and build one Submarine Rescue Mother Ship (MOSHIP) and two Rescue and Towing Ships at their yard in Tuzla. Rolls-Royce will supply tunnel thrusters and retractable thrusters for all three vessels. In addition Rolls-Royce Azipull main propulsion thrusters will be supplied for the MOSHIP. This is the first order for thrusters that Rolls-Royce has received from the Turkish Navy, which is planning a significant ship building program in the coming years.

Damen Shipyards acquires Swedish Yard

On May 16, 2012 Dutch shipbuilding and repair company Damen Shipyards Group has taken over the shares of Swedish ship repair and maintenance yard Oskarshamnsvarvet in Oskarshamn. The acquisition was prepared in close cooperation with the owners and includes the full continuation of the repair yard, both as to current operations and personnel. Oskarshamnsvarvet is a ship repair yard on the south-east coast of Sweden. It is specialized in the maintenance and repair of vessels up to 80 m and has built, repaired and maintained a substantial part of the Swedish coastal fleet since 1863.

Apart from a floating dock, the company operates a slipway covered by a portal crane of 100 tons. In addition to shiprepair the company is active in industrial activities.

Asian Shipowner's Send a Message!

Tarbit

ABS "Connect"

SOS: Asian Shipowners Unite on Piracy

Shipowners from Asia gathered to form a massive human SOS as a demonstration of their support for the international SOS SaveOurSeafarers campaign. The gesture was photographed during the meetings this week in Australia of the 21st Asian Shipowners Forum (ASF) which had piracy at the top of their agenda. In the last 7 years, 62 seafarers have died as a result of pirate actions, and getting on for 4,000 have been held hostage on some 200 ships hijacked by Somali pirates. " http://www.saveourseafarers.com

Dyneema Max Technology

DSM, producer of Dyneema, introduced DM20, a new fiber designed for the production of incredibly strong ropes that provide unrivalled strength, stiffness and durability. According to the company, DM20 is a fiber that completely redefines the capability of HMPE ropes and forms the basis of Dyneema Max Technology. This technology is developed for the production of deepwater mooring ropes for oil and gas production facilities. Deepwater mooring rope specialist Lankhorst Ropes Offshore Division is the first company to use Dyneema Max Technology. The company has developed Gama 98, a new generation of high molecular weight polyethylene (HMPE) mooring ropes suitable for use in permanent deepwater moorings beyond 2,000 m water depth.

ABS to Class Advanced Drillships

Ensco plc selected ABS as the class society for its ultra deepwater drillship to be built at the Samsung Heavy Industries, Co. Ltd (SHI) Shipyard in Geoje, South Korea. The ENSCO DS-8 will be the sixth Samsung DP3 drillship in the fleet and will extend the benefits of Ensco's fleet standardization strategy. With drilling capabilities in water depths to 12,000 feet and a total vertical drilling depth of 40,000 feet, this new vessel will meet the demands of ultra deepwater drilling.

AWT, Transas Team for Bridge Solution

Applied Weather Technology and Transas Marine announced an integration of two key onboard tools – AWT's BonVoyage System (BVS) with Transas' Electronic Chart Display Navigation System (ECDIS) – to help Captains fully optimize their voyage planning. With this union, Captains can transfer data from BVS to Transas Navi-Sailor ECDIS and vice-versa to efficiently and safely navigate their voyages.

BVS is used by captains aboard more than 4,000 ships to identify the safest and most time-efficient or fuel-efficient routes to their destinations, given the latest weather and sea conditions as well as vessels' specifications. BVS 6.0 has features designed to help ship Captains and fleet managers reduce fuel costs and curb CO2 emissions. It also provides other innovations such as 16-day forecasts updated four times daily, and 10 years of historical climate data for planning voyages longer than 16 days.

Bit Oktania Enters Swedish Repair Yard

Damen Shiprepair Götaverken (Gothenburg, Sweden) has taken an interest in the new rebuilding requirements that come into force in 2015, as recently the tanker 'Bit Oktania' from Tarbit Shipping is in one of its dry docks for regular maintenance. At the same time the vessel is being upgraded via the installation of a catalyzer system to meet the new environmental demands.

"We try to keep installation costs at the lowest possible levels to mitigate the high costs experienced by ship owners due to new environmental demands," says Jos Goris, Managing Director of Damen Shiprepair Götaverken.

'ABS Connect' Mobile Apps

ABS launched a suite of products that are desgiend to improve information transfer between the classification society and its clients around the world. ABS Connect looks to streamline communications, placing more in-depth information in the hands of industry. During a press conference in London ABS Chief Technology Officer Todd Grove introduced the company's new mobile interface for its website at www.eagle.org along with the ABS Bookshelf application. Currently available for download (at no charge) from Apple's App Store, ABS Bookshelf is a mobile library of ABS' extensive publications, including the more than 100 Rules and Guides available electronically and used in the design, construction and maintenance of vessels and offshore structures to ABS classification.

Schaefer Ventilation Acquires Americ

Schaefer Ventilation designs, manufactures and markets fans and other ventilation equipment to agricultural, industrial, commercial and rental customers in the US and abroad. Americ Corporation has been manufacturing and marketing a leading line of confined space ventilation fans and accessories to industrial and equipment rental markets in the US and abroad for over two decades.

Schaefer has acquired the Americ brand, product designs, customer lists and other assets and will merge the Americ fan business with its own ventilation business.

LIEBHERR Delivers Cranes to Paranagua, Brazil

LIEBHERR Container Cranes Ltd. recently delivered two Ship-to-Shore Container Cranes to TCP Paranagua, Brazil. The container cranes have a waterside outreach of 52.50m., span of 18m. and landside backreach of 15.00m. Total lift height under spreader is 38m.

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Compliance Manager
Job Location: USA, Houston

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Manages and coordinates regulatory compliance issues associated with daily operations, construction, repairs and modifications to rig fleet

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Interfaces with Regulatory Agencies (USCG, ABS and MMS) and Flag State Administrations (USA, Panama, Liberia & Vanuatu) to manage compliance of rig fleet
Interfaces with Rig Managers, Rig Superintendents, Rig Crews, other departments and third party contractors on compliance issues

Tracks, schedules and coordinates all regulatory inspections and surveys with Regulatory Agencies, Rig Managers, Rig Superintendents, Rig Crews, other departments and third party contractors
Attends and supervises regulatory inspections and surveys on an as needed basis
Coordinates with Regulatory Agencies and rig crews in order to clear all deficiencies and outstanding requirements issued
Interfaces with Project Managers for assistance in repairs associated with regulatory inspections
Manages repairs as defined in duties of Project Manager, if applicable
Develops Authorization for Expenditure (AFE) for regulatory inspections and surveys and submits them for approval when required
Interfaces with the Technical Assistant for development, submittal and approval of regulatory drawings
Prepares annual budgets for regulatory inspections and surveys
Maintains all compliance documents, drawings, manuals and (etc.) through interface with the Technical Support Administrator

Interfaces with Project Managers for submittal and approval of drawings, calculations, (etc.) that apply to rig repairs, upgrades or retrofits to regulatory agencies
Manages and approves regulatory cost expenditures according to delegation of authority

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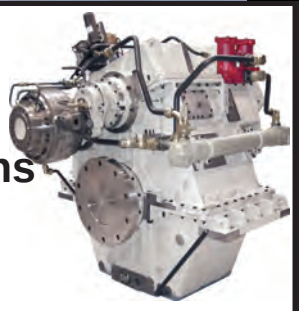

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