Welcome to Hamburg!

The SMM 2012 sets to convene again in Hamburg, Germany, in early September, and pictured here is an indelible sight on the Hamburg waterfront, the Blohm + Voss Repair in Hamburg on the River Elbe.

On the occasion of our SMM edition, and in conjunction with our “Shipyards” coverage, MR interviews Jan Kees Pilaar, managing director, Blohm + Voss, starting on page 44.

ON THE COVER

44 Pictured on the cover is an Austal USA aluminum welder working on USS Independence (LCS 2). Thirty pages of Shipyard coverage starts on page 44.

ALSO IN THIS EDITION

10 EDITORIAL

74 BUNKER FUEL MANAGEMENT

76 MARINE ELECTRONICS

86 PEOPLE & COMPANY NEWS

94 PRODUCTS

106 BUYER’S GUIDE

112 ADVERTISER’S INDEX

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contents

14 INTERVIEW: ANDREW MAK, COO, TRIYARDS

With yards in Vietnam and Houston, TRIYARDS is a specialist in a broad spectrum of engineering and fabrication solutions.

by Greg Trauthwein

16 SHIPPING & SANCTIONS

Economic sanctions, imposed by national and international governments for a variety of political reasons, can be snare traps for unsuspecting maritime enterprises.

by Dennis L. Bryant

18 LNG MARKET PROSPECTS TO 2016

Douglas-Westwood’s new LNG Market report examines new prospects for liquefaction & regasification (import) terminals and LNG carriers.

by Murray Dormer, Douglas-Westwood

22 EXPORT CONTROL REFORM

Inter-agency effort to reform the U.S. export control regime has resulted in specific proposals to transfer oversight to the Department of Commerce’s Bureau of Industry and Security (BIS).

by Barbara Linney & Kevin Miller, Miller & Chevalier

24 MARITIME ... OR NOT?

What constitutes a Maritime Contract under U.S. Law & why you should care.

by Thomas H. Belknap, Jr., Blank Rome

26 SHAKE, RATTLE & ROLL

Study of effects of whole body vibration on crew and passengers aboard fast craft.

by John Haynes

30 WAVE ADDED RESISTANCE

MARIN unveils some secrets of wave added resistance.

by Patrick Hooijmans

32 MARINE INSURANCE: READY FOR THE WORST

Marine insurance and making effective catastrophe plans for hurricane zones.

by Kirk Rider & Charlie Pugliese

34 TORQUE MARINE IPS

While many view investments in new technology as an expense, rules regarding emission reduction can actually pay back via fuel consumption reductions.

by Peter Pospeich

40 THE CORVUS POWER PLAY

Corvus Energy has created a revolutionary battery for the maritime market, a power source with power density, longevity and durability that has led to the company’s rapid ascension.

by Greg Trauthwein
Move to Green

Perry agrees with the assessment that the maritime industry is inherently conservative, averse to adopting new technologies until they are well proven in the field. But there is a twist on the notion of “green.”

“The marine industry is averse to new technology, and I wouldn’t have put anything in my boats that wasn’t proven for 10 years,” Perry said. But when talk turns to “green” in the marine industry, the first of mind thought is energy efficiency and emission reduction. Perry contends, too, there is a stronger “green” pull today.

“But while the industry may be conservative on adopting new technology, the marine industry, too, is all about money ... more accurately saving money and improving reliability. If we can prove to them that we can save them money, they will participate. I won’t take a job on if I don’t think we can improve the performance of their operations.”

In fact, Perry sees the users of Corvus Technology as not simply customers, rather as business partners, and he and his team are not simply looking to push batteries out into the market place, rather evaluate each individual company and initiative as a project on its own merits. It is this holistic, project-based approach which gives him the backing to enter only projects where the payback on incorporating the system has a payback of 5 years or less. Today he sees the ferry, tug and Offshore Service Vessel as particularly ripe for the hybrid solution, as well as a major push into the subsea market – where power consumption and integrity are the definitive limiters in the expanded use of subsea robotics – as the major forces of activity in the near term.

But while saving green (cash) is indeed nice, saving the other green (environment) offers tangible benefits, too, fitting in with the Corvus Energy mantra of looking at the whole picture rather than a few pixels. Corvus Energy batteries are the key to hybridizing heavy equipment such as harbor tugs, ferries and OSVs, which due to duty cycle and fuel consumption lend themselves to dramatic fuel reductions. These fuel reductions translate into large cost savings – particularly with the skyrocketing costs of all fuel and pending legislation that will make marine fuel significantly cleaner and more expensive by 2020 – and provide return on investment in very short time frames. In turn, the fuel saved also provides huge reductions in carbon, particulate and NOx emissions. Particulate matter is reduced most significantly as most of the fuel savings is incurred at low engine speeds when the engines are operating at least efficiency and producing most soot.

References

In any industry it seems that a company’s prowess is best told by the references it holds, and Corvus has no shortage of high-profile marine references, serving some of the biggest, most progress names in the business, including Foss, Eidesvik Offshore and KOTUG, many of which have been covered in our pages in volume, and will be briefly recap here.

Corvus and Foss are inextricably linked as they have together with many other industry partners designed, built and delivered a series of hybrid tugboats to serve the west coast U.S. market, one of the world’s more stringent areas of operation in terms of environmental initiative and...
National Shipbuilding Research Program

Navy, Industry partner for research; sharing costs, risks, and rewards to reduce total ownership costs

By Edward Lundquist

America’s shipyards are fierce competitors, but they can also be close collaborators. The National Shipbuilding Research Program (NSRP) is a cooperative effort for American shipbuilders and the U.S. Navy, with the aim of improving efficiency and economy to reduce the cost of Navy ship construction and repair in American shipyards.

According to the Navy’s NSRP program manager Connie Bowling of the Naval Sea Systems Command, the program seeks to reduce the cost of building, operating and repairing Navy ships by improving productivity and quality through advanced technology and processes.

NSRP seeks to share and rapidly implement manufacturing best practices, take advantage of breakthrough technologies and processes with the entire shipbuilding industry through government and industry collaboration.

Projects have been awarded to more than 200 entities from 37 different states. Resource allocation decisions are made by the industry-led Executive Control Board, after consideration of input from Navy sponsors. “Navy and industry set the strategic focus and direction, but the initiatives have to come from industry,” Bowling says.

NSRP has a budget of about $30 million a year, split between the Navy and industry. “We require a cost share for the products,” Bowling says.

The NSRP research program is not subject to Federal Acquisition Regulations (FAR), but project funding decisions are supported by a competitive process characterized by independent third-party evaluation of project proposals. NSRP calls for the resulting work to be shared across the shipbuilding industry and not be held as proprietary to a single entity. “We can quickly award projects to the companies, and each of the Navy shipyards. The Coast Guard is also involved. “All of the key factions of the Navy and our shipbuilding industry are working together to make better ships at a more affordable price,” Bowling says.

NSRP is focused on more than just controlling acquisition costs, but reducing total ownership costs (TOC), as well. The program complements, and has proven successful in leveraging, other programs such as Office of Naval Research (ONR) Manufacturing Technology (ManTech) and SBIR (Small Business Innovative Research), the latter providing smaller companies and organizations the opportunity to contribute and benefit. In addition, each of the PEOs has a research and development program that is coordinated with NSRP activities.

NSRP opened the aperture for academic programs as well as small and new companies. Even college courses and relatively small projects can have a big impact. A relatively low-cost NSRP-supported project created a mobile, autonomous, robotic welding platform to replace manual welding processes in order to realize substantial savings in time, set-up requirements, safety and overall cost in naval ship construction.

The robotic welder, created in a basement workshop as a modest NSRP project involving a small business and the University of Tennessee, is a success story. Bowling says four shipyards are now employing the welder for use on the Navy’s DDG 1000, DDG 51, LPD 17, the Coast Guard’s National Security Cutter, and tank barges, and others are purchasing the system to introduce at their yards. “We’ve saved 88% reduction in setup time, 93% reduction in removal/disassembly time and 30% reduction in total time on the job. And that’s just the easily measured stuff.”

Connie Bowling, Navy’s NSRP Program Manager, Naval Sea Systems Command

“We’ve saved 88% reduction in setup time, 93% reduction in removal/disassembly time and 30% reduction in total time on the job. And that’s just the easily measured stuff.”

The shipbuilding industry is highly competitive. Risks can be high and margins low. So shipbuilders are not known for sharing their technological advancements with each other. “It took a long time for them to get comfortable with this model,” said Bowling.

But, Bowling says, the industry understands the value of working together to help the nation and the Navy spend their limited shipbuilding and repair dollars wisely. “Industry gets that. The Navy gets that. Ideas and projects are flowing in, and this program is hitting its stride.” At NSRP’s inception, it required significant creativity to establish the mechanisms and business practices across NAVSEA/PEOs and industry to avoid anti-trust violations. “We have gained effectiveness over the past decade after figuring out the legalities and processes to do what we intended - focus on results,” Bowling said. “Once we determined our common objectives, and got through the business aspects, with proper accounting rules and audit trails in place, and established equitable meeting scenarios, we were able to become productive,” she said. “Now the focus is on the greater good. We can determine what’s broken, what needs to be improved, and how quickly can we get there.”

(Continued on page 50)

Maritime Reporter & Engineering News
Smart Growth at Marinette Marine

Scott A. Wellens (right), the director of facility and process improvement for Marinette Marine Corporation (MMC), a Fincantieri company, is a member of the NSRP executive board. The Wisconsin shipyard is busy with several projects, including the Navy’s Littoral Combat Ship. That means updating the infrastructure and bringing in new workers.

“We had to grow,” Wellens says. “We will essentially double the size of our physical plant in just a few short years. Rarely, do you ever get a chance to do everything in a short period of time. We couldn’t stop production because we had to keep building ships as we were expanding. With our process improvement efforts, we want to make the buildings work for us so we can improve the efficiency of building the ships. We needed to create a sequence that improved our flow and reduced the travel time from one stage of construction to the next. We’re balancing our work stations and leveraging the learning curve.”

“We knew we would be hiring a number of people because our existing workforce was about 600 to 700 people, and we have to grow to between 1,300 and 1,400 people,” Wellens says. “That’s more than double the work force.”

“We’ve set up programs with University of Wisconsin at Marinette for some of the drafters, designers, and those types of professional positions,” Wellens says. Aaccording to University of Wisconsin at Marinette Dean and Campus Executive Officer Paula Langteau, the school has been working with MMC for the past five years to help the shipyard meet their growing need for qualified shipbuilding designers, thanks to funding from NSRP to develop the curriculum. “In 2007 we developed a classroom continuing-education course called ‘Applications of Modern Shipbuilding Design’ for Marinette Marine,” Langteau says. “We also started offering the course online for the rest of the industry.”

Based on the initial success, UW-Marinette developed four follow-on classes in specific disciplines, such as structure, electrical, piped and HVAC, and design for production. All five courses are now offered online in a certificate program which is available to the entire industry. “This package of courses made UW-Marinette the first institution in North America to offer fast-track, distance-delivered courses in a full certificate program in modern shipbuilding design,” she says.

Today MMC is not just sending designers to the course. Langteau says the company has begun to send production staff through it. “We are told they can be more productive if they have an understanding of the full design concept.”

Training people for professional positions was a good project for NSRP because what works at Marinette could be applied to the shipbuilding business as a whole, she says. “Our delivery platform is unique as well,” Langteau explains, “enabling students to connect remotely from anywhere in the world to access our courses.”
National Shipbuilding Research Program & Marinette Marine Corp.

(Continued from page 48)

NSRP projects are targeted at engineering planning, production, environmental issues, education and training, facilities, technology, and regulatory compliance for shipbuilding, including new construction and repair, and more. “We’re focused on the critical factors that impact acquisition and TOC, so we can make the most out of our investment,” says Bowling.

For example, an industry proposer can recommend an industry-wide problem to be solved, or a technology that can be matured—such as in design, welding, or painting—with a cost proposal and a team to do the work. If the industry board and the government agree that the project addresses program strategic objectives the project can compete with other proposals for funding. “We’re trying to address similar problems at similar shipyards. Industry tells us collectively what they think should happen. We look to see if that recommendation could be used on a Navy ship, could meet a military specification or requirement, or further the development of a needed technology,” she says.

NSRP projects have addressed coatings, modular construction, welding techniques and processes, reduction of rework, production planning, exchange and interoperability of data, materials, standardized procedures, safety and health issues and environmental concerns, and more.

For example, a single-coat primer and coating system for voids and tanks that will last the life of the ship has been developed and tested; saving money that otherwise would have to be spent on difficult and expensive process during overhauls.

“Many of these ideas have a long return on investment,” she said. “But when these ideas are looked at for their total ownership costs over the life cycle of a ship, they’re no-brainers.”

Focus on Marinette Marine Corporation

Located on the Menominee River in Marinette, Wisconsin, Marinette Marine Corporation (MMC) was founded in 1942 to support the shipbuilding needs of America during World War II. The shipyard was privately held, and was acquired by The Manitowoc Company in 2000. In 2008, the company was acquired by Fincantieri Marine Group Holdings in 2008. Fincantieri has shipyards in Italy building both commercial and naval ships, from cruise ships and mega-yachts to aircraft carriers, frigates and submarines. MMC has built three of New York City’s landmark Staten Island ferries, Guy V. Molinari, Senator John J. Marchi, and Spirit of America.

A number of ships for the Navy and Coast Guard have been built here at the MMC facility on the Menominee River. The Coast Guard’s 16 juniper-class 206-ft. and 14 Keeper-class 175-ft. seagoing buoy tenders were built at MMC, as was the 3,500 ton Great Lakes icebreaker, USCGC Mackinaw (WLBB 30), along with several of the Avenger-class mine countermeasure vessels; torpedo weapons retrievers and Yard Patrol Craft for the U.S. Naval Academy. More recently, the yard built the Improved Navy Lighterage System (INLS) self-powered causeway sections for offloading elements of the sea base to the shore.

Today, Wellsen says the focus at Marinette is on building LCS. MMC is a partner on the Lockheed Martin-led team responsible for the Freedom-class variant for LCS, one of two variants being built for the Navy. The other is the Independence-class being built at Austal USA in Mobile, Ala.

MMC started construction on the first LCS in 2005. USS Freedom (LCS 1) was launched in 2006 and commissioned in 2008 at Milwaukee. Construction on Marinette’s second LCS, Fort Worth (LCS 3) began in 2009, and was delivered to the Navy two months early. The Fort Worth is scheduled for commissioning in September 2012.

In addition to LCS, two other ships are being built at Marinette now. On June 16, the yard celebrated the launch of the fisheries survey vessel Reuben Lasker for the National Oceanic and Atmospheric Administration.

Shipyard Signal International

Signal invests $40m in Orange, TX shipyard; Building ATBs currently for Kirby Ocean Transportation Co.

Signal can handle marine construction and repair needs with three dry docks: Dry Dock 1 is Panamax size with a lift capacity of 22,000 tons; Dry Dock 2 has a 4500t lift capacity and the Dual Carrier, a heavy lift dry dock, boasts a 400 x 200 ft. footprint with a lift capacity of 30,000 tons. Signal offers both offshore and technical services such as leg-up, quaters mods, platform installations and 3D modeling and 3D laser scanning.

Signal is currently building two ATBs for Kirby Ocean Transport Company (KOTC) in Orange, Texas. The 488 x 90 x 36 ft. barges will use the Autocouple coupling system to connect to ocean tugs, which are also being built by the Orange shipyard. The vessels have been designed by Robert Hill and Ocean Tug & Barge Engineering Corp., and the 6,000 hp tugs will each measure 125 x 42 x 22 ft., powered by two EMD 12-710 main engines with Reintjes reduction gears, outfitted with Nauticnozzles and triple rudders. The tugs are classed to ABS Maltese Cross, +A1 Ocean Towing Service standards. The barges are based on Ocean Tug & Barge’s Costwise Class AT/B barges, designed to reduce resistance and enhance maneuvering. In particular, the stem design of the barges is the result of extensive model testing and CFD studies.

Signal made a strategic decision over three years ago to close its overhaul and repair yards in Texas and concentrate on new construction at its Orange shipyard using modular construction and world-class manufacturing techniques. This decision resulted in an investment of about $40 million and a complete revamping of the Orange yard, which sits on 80 acres and has almost 500,000 sq. ft. (46,452 sq. m.) of covered building halls and shops.

The core of the effort is a formal Continuous Improvement Program based on Lean Manufacturing principles. Changing the workflow and a complete rethinking of how to reduce costs and improve schedules with no sacrifice in safety or quality was undertaken by our Industrial Engineering Department and the workers themselves.

Virtually all aspects of Signal’s engineering, procurement and manufacturing processes were affected.

The general term we use for the new process is Continuous Flow Manufacturing. The Pascagoula East Yard has similar investments to improve automation as well as dredging a deep hole 500 x 300 x 60 ft. deep dockside. Signal Ship Repair in Mobile, AL has recently added its Panamax floating dry dock, made quayside improvements and added new Administration, Estimating, Personnel and Port Engineer offices.
the National Oceanic and Atmospheric Administration (NOAA). The ship is extremely quiet so it won’t disturb marine life, and features advanced navigation systems, acoustic sensors, and scientific sampling gear to conduct research on fish, marine mammal and turtle populations. The Arctic Region Research Vessel (ARRV) Sikuliaq is currently being built alongside LCS. Sikuliaq is sponsored by the National Science Foundation and will be operated by the University of Alaska Fairbanks to conduct science mission on behalf of the University-National Oceanographic Laboratory System (UNOLS) community.

New way to train new workers

This past year, UW-Marinette again teamed up with Marinette Marine and ShipConstructor Software for the development of a new Shipyard Orientation Program course. Along with other contributors, the team created a virtual shipyard to get a basic understanding of shipyard layouts and functions. SOP is an immersive, virtual 3-D shipyard training model for new-comers and non-shipbuilders that provides self-paced instruction to achieve a basic understanding of shipyard layouts and functions. Students can go into buildings and perform tasks to learn about safety, reveal properties of ship systems and components, and become familiar with processes of ship construction and maintenance.

The concept for this course was to create a 3D virtual shipyard that coupled with a shipyard orientation curriculum enables new employees to fly an avatar around to explore the virtual shipyard, click on items, and learn about the interconnectedness of processes and production, at their own pace. This time, the course was designed to be offered fully online, in a 24/7, on-demand, instructor-less platform. The virtual, 3D yard addresses the industry need for a standardized, cross-discipline orientation program that is both cost-effective and shipyard neutral. This model is generic, and represents various items seen in any shipyard and is not just modeled after one shipyard. But Langteau says the program can also be customized for any shipyard, with their particular layout, rules and procedures. There are other local educational synergies. Northwestern Wisconsin Technical College has a facility that’s walking distance from the shipyard. “The technical college system in Wisconsin is a model because they work well with local industry as to what our needs are,” says Wellens. “The State of Wisconsin awarded us a grant to develop that curriculum. NWTC has subject matter experts with shipbuilding experience—some former employees of Marinette Marine in the areas of electrical, welding, pipe fitting and ship fitting.”

Wellens also says tours of the yard have been conducted for area high school students, and they can take vocational courses that earn dual credits leading to their high school diploma as well as the technical college. “Working with area high schools and colleges, we’re aligning the vocational curriculum through education and employment with concentrations in shipbuilding trades.”

NSRP funding available for research using two different vehicles

A Research Announcement (RA) project is a major initiative project. In general, they are higher dollar value and from one to three years in durations. A panel project is generally under $100-150k and short—up to 12 months—in duration.

RA projects also bring together a cross functional team to solve a problem and usually more time and testing to resolve or mature. The panel vice the major project (the RA) path is available to solve a more immediate problem or to determine viability of a bigger problem. “Our panel projects are key to NSRP success,” says Bowling. “We have subject matter experts from across the industry—(shipbuilders, centers of excellence, technical warrant holders, small business, etc.—who gather to solve or address a functional issue, such as welding, safety, painting or surface preparation, or education, to give a few examples.”

Examples of RA and Panel projects can be found at www.NSRP.org

Energy savings through integrated solutions?

Certainly.

With fuel costs representing an increasing share of a vessel’s operating expenses, we at ABB Marine and Cranes believe that the future frontrunners in the shipping industry will be the companies that attain competitiveness through energy-efficient and environmentally-friendly ships. ABB’s global marine and cranes organization offers pioneering technologies to cut vessel energy consumption and reduce emissions. We are the leading supplier of total electric power, propulsion and automation solutions, including optimization and fleet-wide management systems. ABB provides innovative energy-efficient solutions to keep you ahead of the competition. www.abb.com/marine