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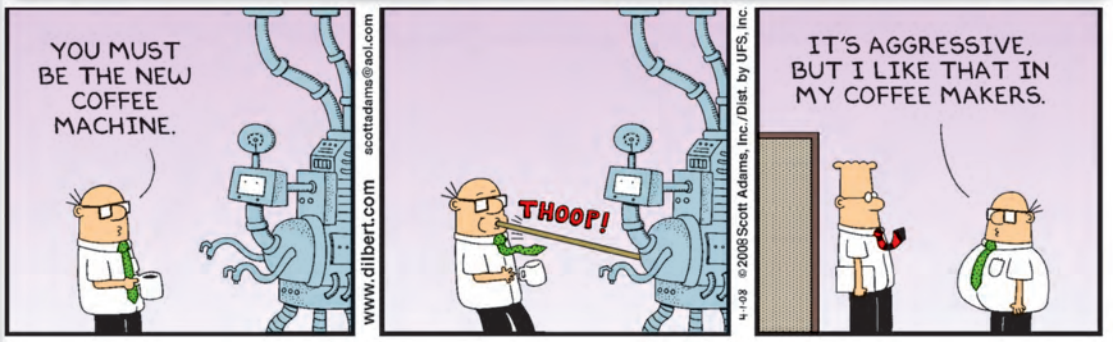

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contents

"What Goes Up, Must Come Down"

Whether these words evoke Sir Issac Newton & gravity or the popular "Blood, Sweat & Tears" '60s hit "Spinning Wheel", in the maritime world vessel slamming, particularly on small, fast craft, is a serious issue demanding serious solutions.

For more on the topic turn to page 24

ON THE COVER

58

Bollinger delivered last month the first of two new Ocean Class DP2 boats for Crowley.

By Joeseph Keefe

(Photo Credit: Bollinger)

ALSO IN THIS EDITION

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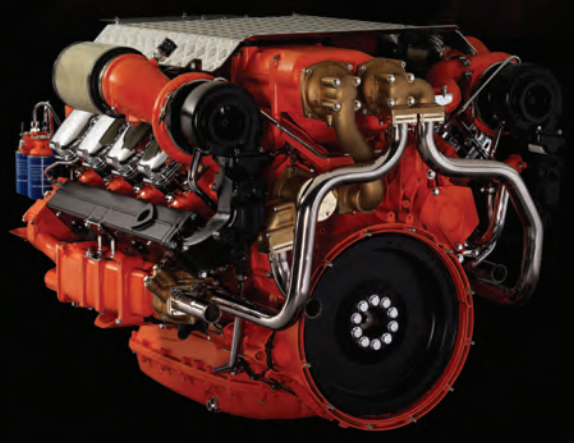

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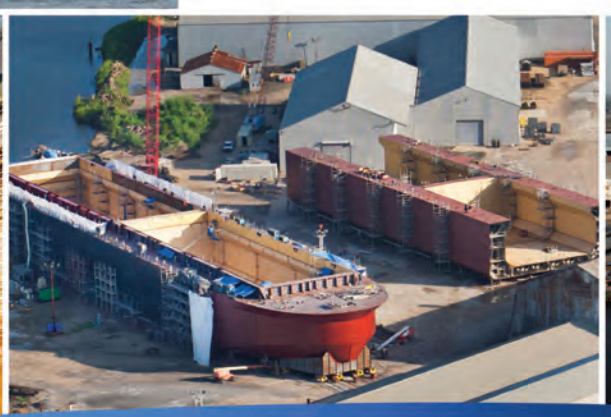

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Fuel for Thought

At the age of 46 I have just experienced my first real fuel shortage; complete with hours long waits in mile-long gas station lines; complete with police presence at nearly every pump; complete with modification of my driving habits in and around New York to conserve fuel. (For the record, I am not counting the fuel shortages of the mid 70's … I was alive and aware, but I was 8, and did not really care!)

Mind you, I'm not complaining in the least, as I consider myself, my family and that of my immediate colleagues here at Maritime Reporter & Engineering News quite lucky. Unlike tens of thousands of metro-area New Yorkers who literally lost everything in the devastation and aftermath of Hurricane Sandy, we personally rode out the storm relatively well, with the blip of a power outage and requisite closure of our lower Manhattan office for one week. In addition, on numerous occasions I have lived vicariously through colleagues in our Florida office, and friends and business partners throughout the Gulf of Mexico area who more regularly have their lives and businesses disrupted by Mother Nature.

However, it did provide much time of reflection, particularly on the issues of power and fuel, as there's not much else to do while waiting in line for hours to get some. This being our Annual Workboat edition – starting out with the cover which depicts Crowley's incredible new Ocean Wave and Joe Keefe's follow up report on builder Bollinger in the wake of his visit there last month for the christening (starting on page 58) – the edition is packed with stories on the boats, the owners, the builders and the technologies that make the sector vibrant. But as is the case with nearly every single edition of MR that I've had a hand in producing over the last 20+ years, there is another recurring, underlying theme emerging within: Fuel.

Now I understand that in November 2012 reporting that fuel – quality, price, supply and the host of technical and legal offshoots that ensue – is hardly transcendent. Chatter on the topic is neither new or news. However, it is developing as ***THE*** topic that will help shape and define this market, from the deep draft to the shallow draft, commercial to naval, for a the coming generation. Pick your topic:

- *Slow Steaming;*
- *LNG as fuel;*
- *Emission monitoring and control;*
- *Distillates*

… the list is growing longer every day, and each topic has its own extensive list of financial, technical and legal sub-sectors.

Classification society DNV delivered its own take on the topic with its "Shipping 2020" report unveiled earlier this summer, a report that outlined the challenges facing vessel owners in the coming decade in regards to emission reduction and energy saving technologies. The central theme? You guessed, it: Fuel. By 2020 DNV estimates that 30% of newbuilds will be delivered with gas engines. More enlightening, though, is its projections on the use of distillates, as Tor E. Svensen, President, DNV, explained:

"The Shipping 2020 report predicts that demand for marine distillates will be 200-250 million tons by 2020, versus today's demand of about 30 million tons per year. To put this in perspective, 200 to 250 million tons per year equals the entire distillate consumption of the United States in 2010: This is a huge increase."

Coming full circle to my recent hours wasted waiting in line for my rationed $40 worth of gas, there are enough technical and legislative nuances surrounding marine fuel to fill dozens of volumes of this 132-page size edition of Maritime Reporter & Engineering News. But the recurring, gnawing issue that has everyone on edge is the *potential shortage* of fuel to meet new environmental limits from the IMO and the U.S. EPA.

Last month the International Chamber of Shipping (ICS), whose members represent more than 80% of the world merchant fleet, expressed dismay at a decision by the IMO to reject its call to accelerate a critical study into the global availability of low sulfur fuel for ships.

ICS contends that fuel is by far the largest operational cost for ship owners and has already increased in price by about 400% since 2000. ICS went on to say that the current 50% price differential between low sulfur distillate and the residual fuel oil that is currently in use is predicted to increase even more if the new demand that will be created by the requirements is not matched by increased supply.

In short, there is a palpable fear, many years out, that there will be legislatively induced 'gas lines' for the commercial maritime market — or that lack of supply will conspire to make legislatively mandated fuel prohibitively expensive — a theorized event that if turned to reality, would serve to bring global commerce to a screeching halt, and make the just past economic meltdown look like a ripple.

Maritime Global News

Gregory R. Trauthwein, Editor & Associate Publisher
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31 October 2012 — VV Mini Matrix - Weekly Change

Built	Tankers					Bulkers				Containers			
	Vlcc	Suez	Afra	LR1	MR	Cape	Pmax	Supra / Hmax	Handy	Post Pmax	Pmax	Handy	Fmax
2012	-3.6% 310k	+0.0% 160k	+3.0% 110k	-1.8% 75k	-2.7% 50k	-0.2% 180k	-8.4% 80k	-1.2% 60k	-3.5% 30k	-1.6% 7,000	-1.8% 4,250	-0.9% 1,400	+0.0% 750
2007	-3.8% 310k	-0.5% 160k	+1.9% 110k	-3.0% 75k	-1.7% 50k	+1.0% 180k	-11.6% 75k	-4.0% 55k	-4.5% 30k	-2.0% 7,000	-1.9% 4,250	-0.7% 1,400	+0.0% 750
2002	-5.1% 305k	-0.7% 155k	-2.6% 105k	-6.0% 70k	-0.7% 45k	-0.5% 175k	-12.7% 75k	-5.6% 50k	-4.3% 30k	-2.4% 6,500	-1.9% 4,000	-1.1% 1,400	-1.1% 750
1997	-6.4% 300k	-1.4% 145k	-2.3% 105k	-8.6% 65k	+0.0% 45k	-3.8% 170k	-13.3% 75k	-5.8% 48k	-5.8% 30k	-2.6% 5,500	-2.5% 4,000	+0.0% 1,400	-2.3% 750
1992	+2.3% 285k	+2.9% 145k	+3.8% 100k	+3.4% 65k	+0.0% 40k	+4.3% 150k	-12.3% 70k	-5.8% 45k	-6.5% 30k	+6.2% 4,500	+5.5% 3,750	+3.3% 1,400	+0.0% 750
1987	+3.2% 250k	+3.1% 130k	+2.6% 95k	+3.4% 65k	+2.4% 40k	+5.7% 140k	+3.8% 65k	-4.4% 42k	-6.8% 30k	N/A –	+5.3% 3,750	+3.2% 1,400	+6.3% 750

2nd Annual Event set for Ritz-Carlton Amelia Island

WorkBoats Exchange

What	Work Boats Exchange
Where	Ritz-Carlton, Amelia Island, FL
When	April 1-4, 2013
Why	Fleet engineering, tech services, maintenance and ops teams & commercial marine suppliers get a direct, personal & cost-effective way to connect, network and develop relationships.
Email	kkelly@exchangeevents.com
Web	www.workboatsexchange.com

Global Exchange Events is once again helping to redefine the commercial marine industry B2B landscape with the announcement of the second annual Work Boats Exchange, which will be held April 1-4, 2013 at the Ritz-Carlton Amelia Island.

"We were thrilled by the success of last year's event," said Karen Kelly, EVP of Work Boats Exchange. "The commercial marine market is built on relationships and Work Boats Exchange provided a perfect venue to augment and develop those critical interactions."

Maritime Reporter & Engineering News will once again act as the exclusive sponsoring publication of Work Boats Exchange. "The support of New Wave Media and their innovative publications can't be overstated," continued Kelly. "Rob Howard (Senior VP, New Wave Media/Marine Link) and his team continue to do an amazing job of creating new connections between the Exchange and their readership."

"We are very excited to be a part of this amazing new format for B2B events in the maritime industry," said Rob Howard, Senior VP, New Wave Media. "Work Boats Exchange is about more than just sales; three focused days of networking and meetings will positively affect the entire industry and we're looking forward to spending time with so many highly respected fleet owners and suppliers."

(Photo: Shell)

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Joe Bekker, President, Thrustmaster of Texas

From 85 hp *to* Infinity

> Those are nice orders, because a drillship typically has six 5MW thrusters; and semi submersibles generally have eight 4MW thrusters, and they're all identical so that's nice business for us.

Talk to Joe Bekker for five minutes and you know he's living the "American Dream." Bekker, the founder, owner and president of Thrustmaster of Texas, came to Houston from The Netherlands in 1979 and has never looked back. An innovator and entrepreneur, Bekker has helped Thrustmaster of Texas evolve from its initial contract – a single 85 hp outboard propulsion unit for the U.S. Army Corps of Engineers in the early 1980s – to a $150 million company today: here's how.

By Greg Trauthwein, editor

The maritime industry is replete with interesting stories, and Thrustmaster of Texas and its founder Joe R. Bekker are no exception. Bekker moved from Holland to the U.S. in the late 1970s, gainfully employed at the time but clearly itching to make his own mark in what he viewed as the land of opportunity.

"I came to the U.S. in 1979; I came to Houston from Amsterdam, and at the time I was working for Byron Jackson Pump Company. And at this time, Houston was an amazing place. It was a booming market for the oil industry in general. You couldn't help but be successful in Houston at that time. After two years, I figured that this was a great place to start your own company, to do your own thing," Bekker said in a recent interview in his office, located at 6900 Thrustmaster Drive in Houston.

"I started first as a trading company, and it was fairly successful, but in fact I got a little bored with it as I always enjoyed manufacturing. I was looking for an opportunity to start my own manufacturing business, and I got the opportunity when we received an order (through the trading company) for the U.S. Army Corps of Engineers for a small 85 horsepower outboard propulsion unit."

And so was born, unbeknownst to Bekker at the time, Thrustmaster of Texas and a leading player in supplying powerful thrusters – up to 8 MW each – for some of the most sophisticated and high-value ships in the world, modern deepwater drillships.

Government Contracting 101

The initial ordered product from his company, the 85 horsepower outboard propulsion unit, was targeted for a small lock and dam maintenance barge. When Bekker won the contract, he freely admits: "At the time, I didn't even know what an outboard propulsion unit was."

The plan was to procure the product form a European supplier, but once the order was place, the European supplier

Did you hear the one about the guy who fell asleep on the bridge?

It wasn't funny.

The USCG states that thousands of preventable maritime accidents are caused by operator inattention, citing this twice as frequently as the next leading factor. Understandably, the International Maritime Organization is requiring the installation of Bridge Navigational Watch Alarm Systems (BNWAS) aboard mandated vessels to monitor operator fitness.

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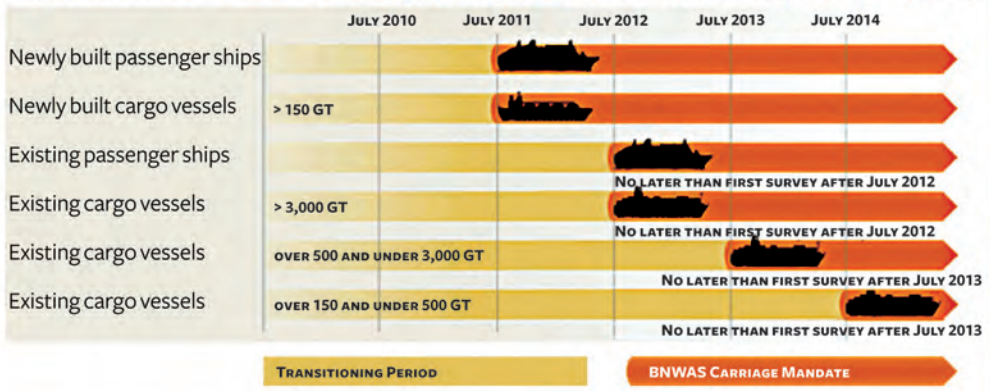
BR500 BNWAS

Implementation Schedule of Bridge Navigational Watch Alarm System (BNWAS)



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Thrustmaster invested in and opened an ultra-modern production facility three years ago; clean, orderly, and producing mammoth thrusters — among other products — for some of the worlds largest and technically sophisticated drillships and semi-submersibles.

literally disappeared, meaning Bekker and company had no means to fulfill its contract. He reached out to various suppliers, but was unsuccessful in finding anything that would cost them less than the value of the contract with the Army Corps of Engineers. So Bekker reluctantly went back to the contractors to inform them that he was unable to fulfill the contract, and that they should proceed to the next lowest bidder instead.

He was in for a rude awakening, and the birth of Thrustmaster of Texas.

"The Army Corps of Engineers representative explained to me that I didn't understand," Bekker said. "They explained that if I had a contract with the government of the United States, I had an obligation to perform it. And if I chose to not perform on the contract, I would be found in default, and under the Federal acquisition regulations I would be found liable for the additional expense that the U.S. Army Corps of Engineers would incur in buying it someplace else, and possibly incur some delay charges. In addition, I was certainly going to be put on a black list and would never be able to sell to the government again."

Startled but not dissuaded, Bekker soldiered on. "So I said, 'well, let me take another look at that contract,' and I went back to the office and decided to build it myself," he said.

Birth of the Manufacturer

Bekker had always been enamored with manufacturing, and he decided to build it hydraulically.

"We bought a little Detroit 353 diesel engine, a pump and we mounted it on the engine. We bought a propeller and drove it with a hydraulic motor, and designed and built the structure. And after it was complete, I thought it was a great idea. It seemed to work fine, and I decided to start marketing the concept of these hydraulically powered outboard propulsion units."

The concept evidently had legs and started to take off, though not exactly like a rocket, Bekker said. "The early years were struggling, but it was enough to keep me busy and out of trouble. We built four 200 hp units for the US Navy, and then we won a contract for the US Army, and then the Exxon Valdex oil spill happened while we had the Army units under construction," he said.

So the fledgling company with the fledgling product line requested – and obtained – approval from the Army to divert the use of the 250 hp deck-mounted hydraulically powered outboard propulsion units to the oil spill response effort, essentially to help power barges that worked close to shore and sprayed hot water on the rocks flush the oil down so they could skim it up off the water.

"After this job, things started going a little better for Thrustmaster."

As with any new, small company, the challenges in the early years are multiple, and in many cases, lethal. But not in the case of Thrustmaster.

"The biggest challenge in the early days was the lack of resources, lack of people, lack of engineering resources, lack of complete work and quality systems, lack of production equipment so I was heavily dependent on subcontractors," Bekker said. Though the challenges came in multiples, so too did the opportunities, and Bekker was never hesitant to explore new markets, including the booming gambling boat business in the late 1980s and early 1990s – many vessels which had hydraulically driven Z-drives, bowthrusters and paddlewheels. "That was a good time for us," he said.

Growth Abroad

Thrustmaster of Texas is unique in another aspect, in that it regularly sells and ships its finished products to customers in China. "The U.S. marine market is not that large of a market," said Bekker. "Currently about 75% of our business is outside of North America … primarily to Southeast Asia, but also, Africa, Australia and Europe.

Clearly Bekker's business is driven by the hunt for offshore energy, as the move for finding oil and gas moves into increasingly deeper waters, demanding Dynamically Positioned drillships, semi submersibles, and even supply vessels … all of which are potential customers for Thrustmaster's propulsion units.

In assessing the company's prospects today, Bekker still sees offshore drilling as the main driver, as it gets increasing business to supply its mammoth 4 and 5MW thrusters for some of the world's most sophisticated drillships. "Those are nice orders, because a drillship typically has six 5MW thrusters; and semi submersibles generally have eight 4MW thrusters, and they're all identical so that's nice business for us."

In addition to this, Bekker sees ample opportunities in the pipelay and subsea construction business, as well as the offshore wind industry, which he sees as strong in Europe and emerging in China, and hopefully soon evolving to U.S. shores.

Invest to Grow

Thrustmaster of Texas believes that investing in people, facilities and equipment is central to its long-term health and welfare, and the edict is far more than company mantra, rather company action. Proof foremost is its gleaming fabrication facilities located at 6900 Thrustmaster Drive in Houston, a facility that was custom designed and built by the company just three years ago – at the height of the global economic meltdown – to handle new loads of business.

The facilities are impeccably laid out and maintained, and in fact Bekker has on the drawing boards to open a new sand blast and paint shop in 2013, and depending on the final results and prospects at the end of 2012, to start plans for an entirely new fabrication building.

Among its latest investments:

- A Zeiss Computerized Coordinate Measuring Machine is installed as QC continuously improves manufacturing feed back program, what Bekker calls one of the largest CMMs in the U.S.
- A $1.5m Hancook machine, which is a Vertical Machining Center with a 12-foot rotary table.
- And a new $2m German make very large horizontal boring mill, using 6.5 or 7" inch boring bar with a ram to extend the boring bar further while maintaining tight tolerances.

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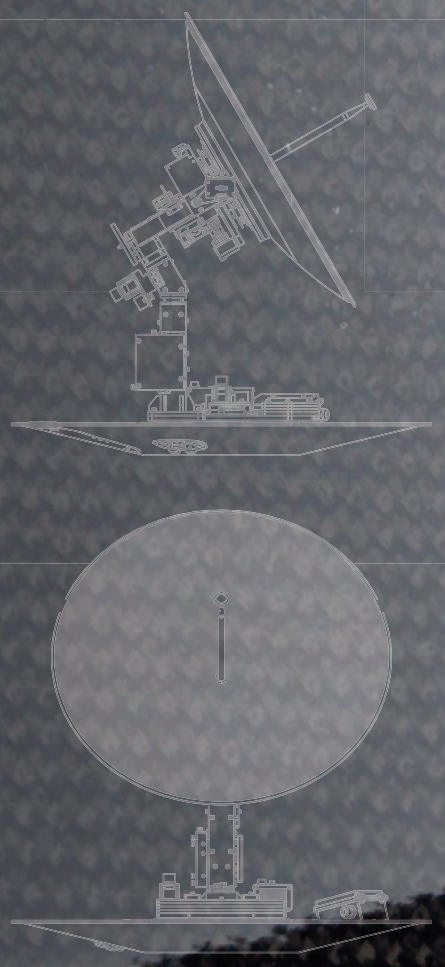

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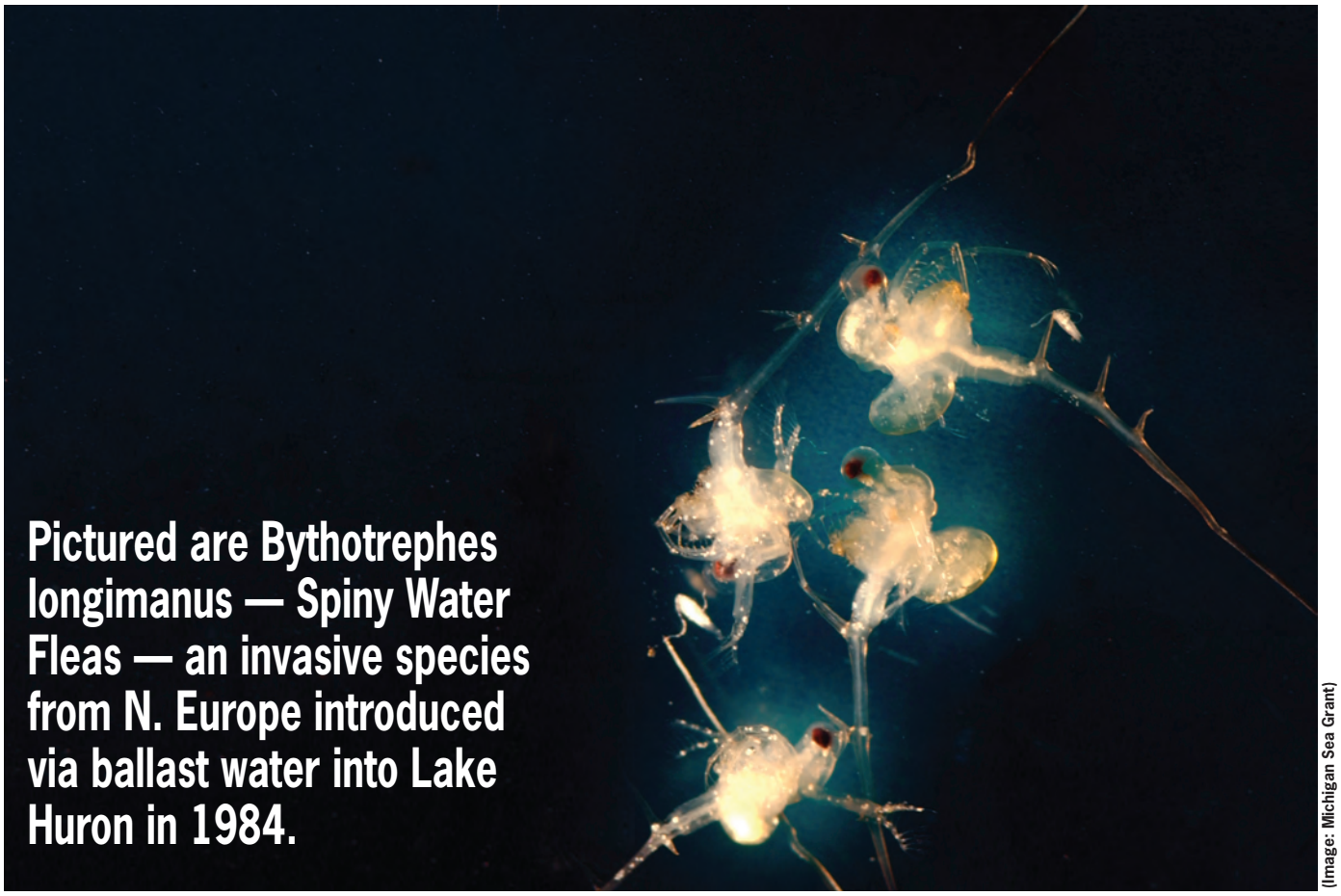
BWMS Looms Large

Suggested Ballast Water Management Systems Regulatory Changes

After many years of negotiation, the International Convention for the Control and Management of Ships' Ballast Water and Sediments was adopted on 16 February 2004 by an international conference sponsored by the International Maritime Organization (IMO). The Ballast Water Management (BWM) Convention was a major step forward in reducing the risk of the introduction of non-indigenous aquatic species into local marine ecosystems by means of the discharge of ballast water from ships arriving from distant locations. For a variety of reasons, though, the BWM Convention has yet to garner sufficient ratifications to allow it to enter into force.

The importance of remedial measures to address potential aquatic invasive species was highlighted by the 1988 discovery of zebra mussels in the Great Lakes of North America. The most likely vector for introduction of zebra mussels from their native habitat of the Black Sea was through the discharge into the Great Lakes of ballast water by freighters arriving to load grain to carry back to the Soviet Union. Having no natural predators in North American waters, the filter-feeding zebra mussels have proliferated, clogging water pipes and other underwater structures. Removing the zebra mussels from vital structures is estimated to cost in excess of $100 million annually. Other aquatic invasive species have also been introduced around the world by means of ballast water discharges. Although ballast water discharge is not the sole vector for such unintended species transfers, it is the most visible.

The initial reaction of governments and the maritime industry was the adoption of high seas ballast water exchange. This was always seen as an interim approach. Ballast water exchange, where high salinity ocean water is used to replace fresh or brackish water, will kill most aquatic species that might set up residence in a new port, but some critters can survive the exchange process. In addition, discharging ballast water while underway on the high seas can be dangerous to the ship and its crew, as evidenced by the near loss of the car carrier Cougar Ace off the Aleutian Islands in July 2006.



Pictured are Bythotrephes longimanus — Spiny Water Fleas — an invasive species from N. Europe introduced via ballast water into Lake Huron in 1984.

(Image: Michigan Sea Grant)

The preferred solution was a technical approach, but this presented numerous difficulties. No one had ever filtered the volumes of water in the time required to make it commercially practicable for merchant vessels. Ballast water is inherently dirty. Aquatic invasive species are almost always small. There was no universal agreement on how clean the discharge water had to be. Some jurisdictions (California and Michigan come to mind) proposed that the discharged ballast water should ultimately have no living organisms (e.g., sterile water). Somewhat surprisingly though, the IMO and the US federal government were able to arrive at a consensus. Thus, the standard for approved discharge of ballast water is the same under both the BWM Convention and the regulations promulgated by the US Coast Guard and the Environmental Protection Agency (EPA). The international maritime community has never been thrilled with the BWM Convention. Their objections, though, have been somewhat vague until recently. Now, they are raising some specific, and largely valid, concerns. The first concern relates to the implementation schedule. For some reason, the drafters of the BWM Convention assumed that the Convention would enter into force promptly. Relying on that assumption, they inserted into the Convention hard dates for when vessels would be required to install BWM systems. The Convention was adopted in 2004. It provides, in pertinent part, that any covered vessel with a ballast water capacity of 5,000 cubic meters or less must have installed an approved BWM system by 2009 (more than three years ago). This absurd result could have been avoided if the compliance dates had been calculated from the entry-into-force date.

Various marine industry groups have proposed that the implementation dates for the BWM Convention be delayed. The International Chamber of Shipping (ICS) proposes that existing ships should be defined as those having been constructed prior to entry into force of the Convention. ICS further proposes that existing ships not be required to retrofit BWM systems until their next full five year survey, rather than the next intermediate survey should this be sooner. This would have the effect of spreading implementation over five years, rather than two or three. INTERTANKO is just as emphatic about the need for changes to the implementation schedule, but less specific about how this should be accomplished.

In its final rule on standards for living organisms in ships' ballast water discharged in United States waters, issued on March 23, 2012, the US Coast Guard adopted a middle position. It defined existing vessel to mean any covered vessel constructed before December 1, 2013. All new vessels must have an approved ballast water management system. Existing vessels must retrofit an approved ballast water management system not later than the vessel's first scheduled drydocking after January 1, 2014 (for vessels with a ballast water capacity of between 1,500 and 5,000 cubic meters) or the first scheduled drydocking after January 1, 2016 (for all other vessels). Provision is also made for an extension of compliance for up to one year under limited conditions.

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INTERTANKO has rightly expressed concern about the process by which ballast water management systems are approved under the BWM Convention. While the laboratory testing of proffered systems under current IMO guidelines is reasonably consistent between BWM system models, it is not overly rigorous. It is important that the BWM system, once installed on a ship, operate at the required level as port states have regularly asserted that they will be testing the ballast water discharges of vessels calling at their ports. Ship owners deserve a relative level of comfort that the ballast water management systems that they purchase and install will pass muster with port state control (PSC) inspectors.

Only the United States has adopted a program to test BWM systems under rigorous conditions. The Environmental Technology Verification (ETV) program, administered by the Environmental Protection Agency (EPA), combines the active involvement of stakeholders, including technology buyers, sellers, regulators, consultants, and financiers. To ensure transparency, test procedures, technology performance reports, and verification statements are posted on the internet. The US Coast Guard has incorporated into its BWM regulation the requirement that a BWM system must have successfully passed the ETV protocol in order to be approved. The only fly in the ointment is that the regulation is new (published on 23 March 2012, with an effective date of 21 June 2012) and only one independent testing facility has been certified so far for BWM system testing under the ETV protocol. As of the date of this writing (October 2012), no BWM system has been approved by the US Coast Guard.

As an interim measure, the Coast Guard has stated that it will allow the manufacturer of a BWM system approved under the BWM Convention process to request a Coast Guard determination that its BWM system is an alternative management system (AMS) that can be used by vessels calling in US waters in lieu of using high seas ballast water exchange. The use of an approved AMS by a vessel will be allowed for up to five years after the vessel is required to comply with the USCG BWM regulation.

Both the IMO and the US Coast Guard have painted themselves into corners, although the Coast Guard will have less difficulty extracting itself. The IMO must do a better job of clearly communicating to the maritime sector that it will not place ship owners, operators, and masters in an impossible position. It must, at the earliest possible opportunity, publicly state that the BWM system compliance schedule will be extended to account for the delay in the coming-into-force of the Convention. It must also adopt protocols, similar to the EPA ETV program, to ensure that BWM systems being sold to ship owners actually perform at the required standards. These steps may be difficult as the IMO lacks the ability to directly amend a Convention that is not yet in force, but a clear statement of intent on the part of the IMO should suffice in the interim.

As for the US Coast Guard, it has included in the BWM regulation a provision allowing individual ship owners to apply for a one-year extension of the compliance date in the event of impossibility. Certainly, the lack of an approved BWM system would qualify for such an extension, but it makes no sense to require each ship owner to submit a separate application to address an industry-wide situation. In addition, the delay may exceed one year in length. Rather, the Coast Guard can, and probably will, issue a blanket deferral of the compliance date until approved equipment is available and can be installed. It is suggested that the Coast Guard consider changing the definition of new vessel to mean any covered vessel delivered 30 months after the Coast Guard announces that adequate approved commercial BWM systems are available. It is also suggested that the compliance date for existing vessels be changed to 60 months after such an announcement.

No one doubts the importance of the ballast water management program. There are practical and engineering obstacles delaying full implementation. It is hoped that the regulators can make the systemic changes necessary to address these obstacles.

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Trash Talk

Are You Prepared for the New MARPOL Annex V Garbage Regulations?

New regulations addressing garbage management go into effect on January 1, 2013 pursuant to action taken by the Marine Environment Protection Committee (MEPC) at its sixty-second session in July 2011 after a comprehensive review of MARPOL Annex V. The new regulations impose stricter garbage management procedures and documentation requirements for all vessels and fixed and floating platforms which will have major implications for industry, as discussed below. The revised MARPOL Annex V, contained in MEPC.201(62), is available on the IMO's website for the Marine Environment Protection Committee (MEPC), 55th session at **http://www.imo.org/OurWork/Environment/PollutionPrevention/Garbage/Documents/201%2862%29.pdf.**

The most significant change in the new regulations is its general approach to garbage management. Under the current regulations, discharge of garbage into the sea was generally allowed unless specifically prohibited or limited. This concept is reversed in the new regulations, which impose a general prohibition on the discharge of all garbage unless the discharge is expressly provided for under the regulations. To aid in identifying the categories of garbage which may be discharged, the new regulations include a host of new definitions, such as for "animal carcasses," "cargo residues," "cooking oil," "domestic wastes," "fishing gear," "food wastes," "incinerator ashes," and "operational wastes." The new regulations allow the limited discharge of only four of these categories: food waste, cargo residues and certain operational wastes not harmful to the marine environment, and carcasses of animals carried as cargo. Combined with the general prohibition on the discharge of garbage outside these limited categories, the new regulations greatly reduce the amount of garbage that vessels will be able to dispose of at sea. Below is a simplified overview of the new discharge provisions that is posted on the IMO website.

Any garbage permitted to be disposed of at sea must be discharged while the vessel is "en route." Per the definitions, "en route" means that "the ship is underway at sea on a course or courses, including deviation from the shortest direct route, which as far as practicable for navigational purposes, will cause any discharge to be spread over as great an area of the sea as is reasonable and practicable."

Stricter regulations will pose a number of operational challenges. The increase in the quantity of garbage required to be retained onboard and disposed of ashore is likely to create a host of logistical problems for vessels and port authorities with regard to storage, equipment, and sanitation. Indeed, many existing ships will not be able to handle the amount of garbage requiring incineration and many port authorities will not be able to handle the large amounts of dunnage without substantial investment and planning. Vessels will incur higher port garbage service charges which will have to be taken into account in chartering agreements. In addition, greater limitations on the discharge of cargo residue and wash water will affect if, how, and where the cleaning of holds and external surfaces may be conducted. For example, any cleaning agents used to wash exterior surfaces may be discharged only outside special areas and the vessel must have evidence from the producer of the product that it meets certain criteria for not being harmful to the marine environment.

The new regulations also expand documentation requirements for vessels and offshore platforms. Garbage management plans must be revised to reflect the new regulations. The IMO published guidelines for the drafting of new garbage management plans, MEPC.220(63), available at **http://www.imo.org/OurWork/Envi-**

Simplified overview of the discharge provisions of the revised MARPOL Annex V which will enter into force on January 1, 2013

Type of Garbage	Ships Outside Special Area	Ships In Special Area	Offshore Platforms (more than 12 nm from land and all ships within 500 m of such platforms
Food wasted comminuted or ground	Discharge Permitted: ≥ 3 nm from the nearest land, en route and as far as practicable	Discharge Permitted: ≥ 12 nm from the nearest land, en route and as far as practicable	Discharge Permitted
Food waste not comminuted or ground	Discharge Permitted: ≥ 12 nm from the nearest land, en route and as far as practicable	Discharge Prohibited	Discharge Prohibited
Cargo residues(1) not contained in wash water	Discharge Permitted: ≥ 12 nm from the nearest land, en route and as far as practicable	Discharge Prohibited	Discharge Prohibited
Cargo residues(2) not contained in wash water		Discharge Permitted: ≥ 12 nm from the nearest land, en route and as far as practicable & subject to two additional conditions (2)	Discharge Prohibited
Cleaning agents & additives (1) contianed in cargo hold wash water	Discharge Permitted	Discharge Permitted: ≥ 12 nm from the nearest land, en route as far as practicable & subject to two additional conditions (2)	Discharge Prohibited
Cleaning agents & additives (1) contianed in deck & external surfaces wash water		Discharge Permitted	Discharge Prohibited
Carcasses of animals carried onboard as cargo & which died during voyage	Discharge Permitted as far from the nearest land as possible and en route	Discharge Prohibited	Discharge Prohibited
All other garbage*	Discharge Prohibited	Discharge Prohibited	Discharge Prohibited
Mixed garbage	When garbage is mixed with or contaminated by other substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply		

(1) These substances must not be harmful to the marine environment.

(2) According to regulation 6.1.2 of MARPOL Annex V the discharge shall only be allowed if: (a) both the port of departure and the next port of destination are within the special area and the ship will not transit outside the special area between these ports (regulation 6.1.2.2); and (b) if no adequate reception facilities are available at those ports (regulation 6.1.2.3).

*Includes: Plastics, syntehctic ropes, fishing gear, plastic garbage bags, incinerator ashes, clinkers, coooking oil, floating dunnage, lining and packing materials, paper, rags, glass, metal, bottles, crockery and similar refuse

ronment/PollutionPrevention/Garbage/Documents/220%2863%29.pdf, which outlines items that should be covered by the plans. The requirement to have a garbage management plan is expanded to include all vessels of 100 gross tons or greater, whereas under the current regulations garbage management plans are required for vessels 400 gross tons or greater. Fixed and floating platforms must also have a garbage management plan under the new regulations. In addition, the Garbage Record Book on all vessels must be replaced. The new version of the Garbage Record Book includes revised categories and requires entries to be itemized by category, if possible. Fixed and floating platforms must also maintain a Garbage Record Book under the new regulations. Finally, the requirement to post placards is extended to offshore platforms. Placards currently in place on all vessels must be replaced as well.

The IMO published "2012 Guidelines for the Implementation of MARPOL Annex V" to aid governments, ports and terminal operators, ship owners and operators, vessels' crews, and equipment manufacturers in complying with the new regulations. The guidelines outline a number of recommended waste minimization and handling techniques, including that vessels minimize taking on material that could become garbage. A number of tactics are suggested in the guidelines, such as ordering supplies that come in bulk packaging as much as possible, avoiding the use of disposable dinnerware and towels, and utilizing reusable cargo coverings, dunnage, and packing materials. The guidelines also suggest multiple garbage sorting practices, emphasizing the need for careful planning of garbage handling under the new regulations as more garbage will need to be stored onboard until it can be properly disposed of ashore. An analysis as to the advantages, disadvantages, and effectiveness of grinders, compactors, incinerators, and other garbage handling equipment is provided to aid in garbage management decisions. As the new regulations will increase the quantities of garbage offloaded to shore based reception facilities, the guidelines further provide suggestions for garbage management decisions for port reception facilities and encourages consideration of alternative reception facility methods, such as the use of barges or self-propelled vessels as floating plants for garbage collection. Revised sample placards targeting crew, offshore platforms, and passengers are located at the end of the guidelines. The guidelines, MEPC.219(63), are available at **http://www.imo.org/OurWork/Environment/PollutionPrevention/Garbage/Documents/219%2863%29.pdf**.

Vessels operating in the United States have experienced increasingly heightened enforcement of, and penalties under, oil pollution prevention requirements under MARPOL Annex I and, more recently, air pollution prevention requirements under MARPOL Annex VI. It is unclear, however, at this time when the Coast Guard will publish enforcement guidance on what to expect when the revised MARPOL Annex V goes into effect shortly. In conclusion, owners and operators of vessels, offshore platforms, and port authorities have precious little time remaining to prepare for these new requirements not only from a logistics and equipment standpoint but also from a training standpoint.

The clock is ticking—are you ready?

Underwriting Workboats

Tugs Take on Different Jobs but Underwriting Elements Are the Same

By **Charlie Pugliese**, Ocean Marine Hull & Liabilities Practice Leader, Travelers Ocean Marine

Moving 30 barges at once takes the sure hand of a tugboat pilot who knows how to maneuver a flotilla through the twists and turns of the Mississippi River. Lashed together, three across and 10 long, the barges cover more than twice the surface area of a modern aircraft carrier.

Most would agree that the best river pilots are artisans, deeply skilled in methods to meet the challenges of that particular job. Equally skilled, however, are the tugboat captains in a crowded ocean harbor, jockeying into port a ship that towers above them, dwarfing their own vessels and offering just as many challenges when it comes to maneuverability as the river barges.

These widely disparate jobs are both part of the workboat world, the segment of the ocean marine industry that makes its living by pushing or towing other vessels, moving oil platforms, serving as icebreakers and performing salvage operations. While the risks each of these businesses face are different, the approach for determining the right insurance coverage for them is similar.

When seeking insurance protection, the goal for workboat owners or operators should be to find the most suitable coverage at a competitive price to protect their assets and their business viability. Start by seeking out an insurance agent with ocean marine expertise who understands the quality of insurance companies with long experience in the industry.

A critical step beyond finding the right agent is to understand what an insurance company will be looking for before a new policy is issued. To get the most value for their insurance dollars, workboat owners and operators will want to put their best foot forward, manage their risks wisely and make sound insurance decisions.

(Photo: Greg Trauthwein)

Four Aspects of Underwriting Workboats

When an insurance company is considering taking on a new account, its underwriters carefully review risks and exposures by assessing the business, which typically includes examining these four aspects:

1 **Hull**. Much like someone considering the purchase of a used car who looks under the hood, kicks the tires and tests mechanical components, the underwriter will try to thoroughly understand the characteristics of each workboat. He will take note of a number of factors: How well is it maintained? Are the engine and other mechanical parts in good repair? Is the safety equipment stowed on board where it should be, and is it adequate for the vessel? Even the overall cleanliness and tidiness of the boat can be an indicator of how high the owner or operator has set the bar for taking care of his equipment.

2 **Crew**. One indication of a crew's suitability is having Coast Guard licenses and certificates that reflect training. Beyond that, the underwriter wants to see signs that the crew is skilled and knowledgeable. This includes time in grade, familiarity with the company's vessels and business operations, and breadth of experience beyond the current job. A crew member can have the right paperwork, but it is often the time on task that builds their level of expertise and experience – and which can reduce the likelihood of errors that can lead to accidents or other problems.

3 **Operations**. There are two sides to operations – land and water – and the underwriter will want to look at both. Shoreside, the business may have employees operating vehicles, or the owner/operator may use outside vendors that open the door to contractual liability. There may be real estate and other property that should be secured, and other business practices that can lead to different liability exposures.

On the water side, the underwriter wants to know about the type of business the workboat is involved in. Are the operations focused on pushing barges up a river, pulling ships into port, towing ocean-going vessels, or moving yachts from one location to another? Different businesses involve different risks that must be taken into account when considering the type and level of coverage.

4 **Navigation area.** Finally, what is the geographic area of operation? Does the workboat operate in a short stretch of one particular river, or is it an ocean-going tug with a wide area of operation? There is a big difference between pulling a tandem tow across the North Pacific and moving a single barge up a small waterway.

Risk Management Practices

Even after all of the "hard" data has been gathered, there are still "soft" nuances that an owner or operator can use to demonstrate the quality of their operation.

For example, while no one expects a business to be risk-free, a business that is open to improving its risk management practices – such as increasing the level of safety training, or implementing better maintenance procedures – can be a much more desirable customer than a business that has no interest in learning new ways or changing bad habits. By working closely with its agent, a business can identify ways to improve its risk analysis and get better value for its insurance purchase.

Once an insurer understands all four aspects of a workboat business, the insurer and agent can work together to create the right mix of coverage and liability limits. An agent who is well versed in the nuances of ocean marine insurance can help make sure the coverage is properly aligned with any shore side property and casualty insurance that is in place.

It may sound complex, but in the end, the formula for making sure a company has the right insurance is straightforward. Deal with an agent who understands not only the ocean marine business but also the key factors that are involved in an underwriting assessment. Insist on having an insurer that is experienced in ocean marine coverage and has a good track record of meeting the needs of ocean marine businesses. And finally, be a customer that is involved in every step of the process, from having the best risk management practices to making sound decisions about coverage and limits.

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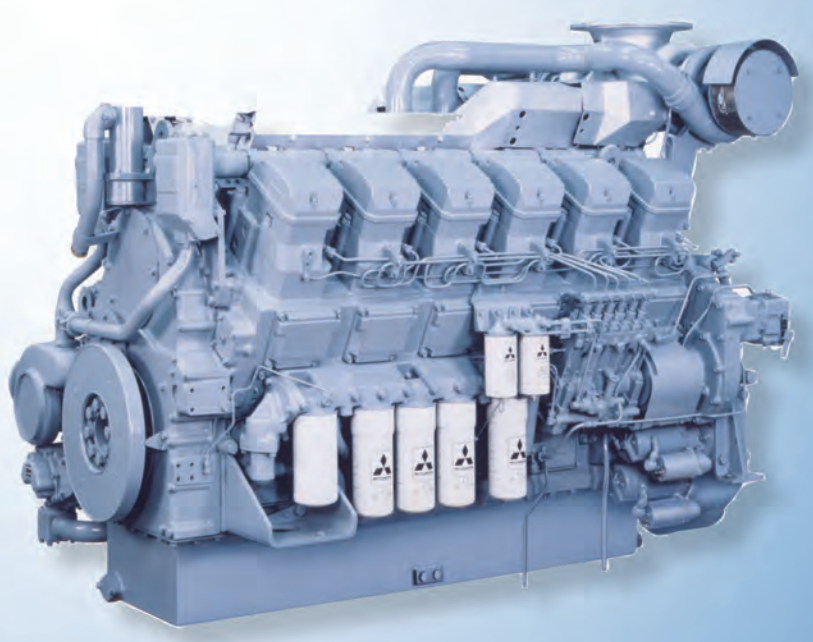

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The Weakest Link

As High Performance Boats Evolve Man Is The Weakest Link

The world is changing fast and this is especially true in the fast boat sector. Since the millennium, rigid hull inflatable boats (RHIBs) and high speed craft (HSC) have been at the cutting edge of maritime operations for everything from homeland security and law enforcement to extreme weather rescue.

For over 30 years specialist organizations around the world including the RNLI (UK lifeboat), Royal Marines, US Navy and US Coast Guard have driven the evolution of fast craft. They know what has worked in the past and know what boats they want for the future. The questions when selecting a new boat used to be simple - how long, how many engines and what type of fuel? Naval architects and boat builders rose to the challenge, producing high performance boats in aluminium, FRP and composites engineered to withstand the resulting forces.

Although maritime organizations use RHIBs and HSC to perform a wide range of operations the consistent objective is that crews and passengers arrive safely at their destination ready to do a job, or in some cases 'fit to fight.' With the arrival of unbreakable boats plus a surplus of engine power, man is the weakest link. As boats get lighter and faster it is time to step back from pure technology gains to consider the individuals who have to go to sea in rough conditions and put themselves into harm's way. The big question for the next generation of boat builders is - how do you build fast boats that protect the crew from injury?

As part of the 'changing world' scenario there is now a move away from large ships to fleets of high performance small craft. The numerous roles are shared between RHIBs, foam collar craft and hard boats. A RHIB has air filled sponsons, a foam collar craft has closed cell foam filled sponsons attached to an aluminium, FRP or composite hull. The main advantage of foam is that it can be cut, perforated or shot but will not deflate. Hard boats do not have a collar. Open boats up to 30 ft. (9 m) are selected for launching from larger craft, patrolling coastlines, law enforcement, fisheries inspection, ship boarding plus inshore search and rescue roles. Boats over 30 ft. may have a cabin and are selected for extended patrolling, maritime security, plus offshore search and rescue roles.

Photo: Murray Martin

As boats get lighter and faster it is time to step back from pure technology gains to consider the individuals who have to go to sea in rough conditions.

In the commercial sector fast response craft are now used for many traditional 'displacement' roles including pilot boats, dive boats, crew boats and offshore support. Tasks range from boom deployment, environmental sampling and hydrographic survey to fire fighting. All these roles require people, time is money and fast transport of personnel is a core commercial objective.

Extreme high speed craft are constantly evolving as counter-terrorism and enforcement roles change in the military, coast guard and police sector. Top speeds are rarely disclosed for extreme operations craft which may have ballistic protection and stealth characteristics to reduce radar and heat signature. An Interceptor needs to combine high speed performance, excellent sea keeping characteristics and most importantly protection for the crew.

Professional RHIBs and HSC can be powered by up to four outboard engines. Multiple inboard diesel engines can be combined with stern drive, water-jet or surface piercing propellers. In the past the US marine industry approach to engine size was install maximum horsepower then use the engines at lower revs, with plenty of power in reserve. Modern engines are designed to be used at higher revs so downsizing is part of reducing weight, increasing range, reducing fuel bills and improving environmental footprint.

Patrolling may be at low speeds, interception is not. Hull and equipment breakages used to limit how fast and for how long a boat could run in rough seas. To run multi engine rigs at full power pro users discovered that they needed stronger steering systems, more responsive throttles, high performance exhaust systems plus drives that transfer horsepower into thrust. The high performance components industry that evolved from the racing and go fast community has developed engineering upgrades that are suitable for professional sector boats. The old technology limits and breakages that helped to protect the crews are gone.

The professional sector now needs a shock mitigation strategy or crews will not be capable of doing their job when they arrive at their destination. The definition of shock mitigation is, 'to make a violent collision or impact less intense.' With an effective shock mitigation strategy the helmsman, crew and passengers benefit from increased comfort and reduced injury while the organisation has increased operational efficiency. Technical shock mitigation solutions need to include efficient hull forms, responsive controls, ergonomic work station layouts and improved crew seating. Training coxswains and crews to understand the forces involved and to work with, not against, the sea should be the basis of any fast boat operation.

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Photo: Custom Marine

High performance exhaust

Besides many roles in the military and commercial sector RHIBs make excellent personnel carriers. With modern inboard and outboard engines top speeds can exceed 60 knots which can be anywhere from exciting to dangerous for passengers. Fortunately professional boats have an expected cruising speed and optimum fuel range, most operate in the 30 to 40 knot range with top speed as a rarely used option. Operators also need to identify what sea conditions could be encountered during open sea transits, then ensure that the type and size of craft are suitable for the purpose. With correct craft and equipment selection professional RHIB and HSC operators can maximize crew performance, increase sea time and protect employees from injury.

Seating on fast boats needs to provide a good ergonomic position for helmsman, crew and passengers. Seat designs should allow space for PPE, lifejackets, webbing and sometimes body armor. From watching the evolution of high performance seating over many years it is interesting to see the diversity of potential seating solutions. In the past the US had more hard boats and padded

Photo: Shoxs

Suspension seats

leaning posts were the usual seating. In Europe there were more RHIBs and padded jockey seats, also known as straddle seats, were the norm.

Due to higher operational speeds many organizations using RHIBs and HSC are now realizing that they need to specify suspension seats to give adequate protection to personnel. Tolerable discomfort is now an expression that can be measured! The objective of a suspension seat is to isolate the occupant from the effects of vibration and impact at sea. RHIB and HSC suspension seating may have 'feet on' or 'feet off' the deck. Seat and suspension designs are constantly evolving to meet the users changing requirements. Suspended decks and helm stations are now available that suspend instruments, controls and seating in one unit.

Computers have been part of digital GPS navigation and chart plotters for many years. ECDIS type systems can be miniaturized and waterproofed. Next generation electronics include camera systems with laser imaging that is designed for use on fast, open boats. But what about the crews that need to use these systems - can they read them and

Photo: John Haynes

Safe Boat engines

more importantly can they operate them?

Experienced boat operators know that the combination of excellent components and equipment creates an excellent craft but it is people that make it work. Human factors need to be considered for all electronics tasks performed on a planing craft. Are the buttons big enough? Is the font size readable? Touch screens work on land but do they work at night with one hand holding a grab rail and the other wearing gloves?

In some situations the potential for injury is simply so high that you have to take the man off the boat. The maritime world is starting to realize that an unmanned craft may be the ultimate shock mitigation solution. Computer gaming skills are used to fly unmanned aircraft but there are still many challenges for unmanned surface craft, including the international regulations for preventing collision at sea that requires vessels to keep a look out at all times. Crews avoiding collisions on their own craft should still be the best lookouts.

International maritime policy needs a culture of shared information, plus crew training that encourages interoperability. Many tasks benefit from shared information between law enforcement, customs, border and rescue agencies. The modern law enforcement boat crew needs access to the same information that their colleagues have in a police car. The military have had tough mil-spec computers for many years and within the next year marine grade laptops, tablets and smart phones will be standard equipment on professional boats.

Looking to the future, navies and coast guards around the world will make financial, environmental and operational decisions to use fewer ships and more boats. RHIBs and HSC will become even faster, multi-role craft with the same systems that are found on a ship's bridge. These craft will have modular design features that allow then to vary their layouts for different mission profiles. To keep the oceans safe, professional boat coxswains and crews will need to develop specialist skills to operate fast response craft effectively in this rapidly changing environment.

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New Fuels, New Rules

& New Tools to help the Maritime Community adapt to strict emission regulations

What has changed during 2012 in the maritime world and how has it impacted industry? It is recent IMO Marine Environment Protection Committee (MEPC), changes. IMO has adopted amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL). These changes will have a vast and fundamental impact on the maritime industry and the world over the next few years. With new IMO regulations pertaining to emission control areas, fuels, sewage, and garbage rampant and coming into effect throughout the world how will and do shipping companies survive and prosper?

Fundamentally for successful companies it will be a thorough and comprehensive strategic plan that will allow implementation of these new rules and regulations. Much will have to go into these plans so that maritime companies can adopt a systematic time based methodology that will allow them to effectively complete a seamless transition.

What are the key elements that shipping companies will need to be prepared for due to the recently adopted IMO amendments to MARPOL:

1. Designated the United States Caribbean Sea as a new Emission Control Area (ECA), Annex VI.

2. Designated the Baltic Sea as a Special Area with respect to pollution by sewage from ships, Annex IV.

3. Adopted a revised Annex V related to the control of garbage.

4. Adopted mandatory measures to reduce emissions of greenhouse gases (GHGs) from international shipping.

5. Designated the Strait of Bonifacio as a Particularly Sensitive Sea Area (PSSA) and adopted the first-ever international recommendations to address bio-fouling of ships, to minimize the transfer of aquatic species.

6. Approved a number of ballast water management and ship recycling conventions.

On July 15, 2011, the IMO officially designated waters around Puerto Rico and the U.S. Virgin Islands as an area in which stringent international emission standards will apply to ships. For this area, the effective date of the first-phase fuel sulfur standard is 2014, and the second phase begins in 2015. Stringent nitrogen oxide (NOx) engine standards begin in 2016.

While ships are operating in the US Caribbean Sea ECA, the sulfur content of fuel oil used on board ships shall not exceed 1% micrograms/milliliter (m/m) (weight) on and after 1 January 2014, and 0.10% m/m on and after 1 January 2015.

For ships, built on or before 1 August 2011 that are powered by propulsion boilers that were not originally designed for continued operation on marine distillate fuel or natural gas, the above sulfur requirements may not be applied prior to 1 January 2020.

Ships constructed on or after 1 January 2016 shall comply with the NOx emission limits when operating within the US Caribbean Sea ECA.

IMO has additionally designated waters off both North American coasts as areas that will have stringent emissions standards for vessels. In these areas the effective date for sulfur fuel or sulfur oxide-(SOx) and Particulate Matter (PM) emissions has gone into force on August 1, 2011 and has been effective as of August 1, 2012. A second phase begins in 2015.

Annex VI regulations include caps on sulfur content of fuel oil as a measure to control SOx emissions and, indirectly, PM emissions (there are no specific PM emission limits). However in the future could we see the Environmental Protection Agency (EPA) or IMO regulating PM within the US ECA?

Alternative options are also permitted in the SOx ECAs and globally to reduce sulfur emissions, such as through the use of exhaust scrubbers. For example, in lieu of using the 1.5% sulfur fuel in SOx ECAs, ships can fit an Exhaust Gas Cleaning System (ECGS) or use any other technological method to limit SOx emissions.

Another major switch would be finding an alternative fuel source such as LNG/Natural Gas or bio-fuels. Some recent developments in these areas include:

A Louisiana-based marine transportation company, specializing in towing drilling rigs and providing offshore supply and support vessels for deep water operations in the U.S. Gulf of Mexico, signed a contract in late 2011 to build 3 LNG powered clean running vessels characterized by state-of-the-art technology and outfitted beyond normal regulatory requirements. This appears to further strengthen the case and trend for new builds to use clean fuels.

The U.S. Coast Guard Cutter Henry Blake refueled recently, using a 50/50 blend of petroleum and hydro-processed renewable diesel derived from algal oil, becoming the first Coast Guard cutter to use renewable diesel as part of an operational evaluation. Successful evaluation of this fuel mixture can potentially help further the development of alternative fuels in America, while reducing or eliminating the United States dependence on foreign oil.

IMO has given some reprieve on the nitrogen oxide or NOx after treatment emission requirements by not putting them into force until January 1, 2016. This was specifically done as NOx Tier III requirements per Annex VI would go into effect at that time. All vessels construction on or after January 1, 2016 is to have diesel engines (2-Stroke and 4-Stroke) installed that meet Tier III requirements.

NOx emission limits are set for diesel engines depending on the engine maximum operating speed in RPM's. Tier I and Tier II limits are global, while the Tier III standards apply only in NOx Emission Control Areas (ECA's).

Tier III standards will require dedicated NOx emission control technologies such as different forms of water induction into the combustion process (with fuel, scavenging air, or in-cylinder), exhaust gas recirculation, and selective catalytic reduction.

Under the new global standards, NOx emissions will be reduced, and the fuel sulfur cap will drop to 5,000 ppm in 2020. Under the new geographic standards, ships operating in designated ECA's will be required to use engines that meet the most advanced technology. These standards for NOx emissions begin in 2016, and will require fuel with a sulfur content not exceeding 10,000 ppm in

The Strait of Bonifacio is the strait between Corsica and Sardinia named after the Corsican town Bonifacio. It divides the Tyrrhenian Sea and the western Mediterranean Sea. The strait is notorious among sailors for its strong currents, shoals and weather patterns as well as other obstacles.

Since a tanker disaster in 1993, the passage through the Strait of Bonifacio has been prohibited for only French and Italian flag tank ships.

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the first phase of the program, and 1,000 ppm in the second phase of the program.

An additional area of major concern is Black Carbon. Studies are underway to address the impact of black carbon emissions from vessels in the Arctic, as well as how to measure black carbon emissions from vessels and how to implement appropriate measures to reduce the black carbon emissions footprint in the Arctic.

A common definition of Black Carbon is that it is a strongly light-absorbing carbon material produced by incomplete combustion of fuel oil and emitted as a solid primary particulate matter. It differs from sulfur dioxide (SOx) emissions as it is classified as a secondary particulate matter pollutant. Black carbon has significant effects on climate change and when deposited on snow and ice in the Arctic and lower latitudes, it darkens light surfaces and absorbs energy, causing snow and ice to melt.

Amendments to MARPOL Annex IV Prevention of Pollution by Sewage from ships were adopted including the potential of establishing special areas or zones for the prevention of pollution from passenger ships including the Baltic Sea.

IMO adopted the revised MARPOL Annex V Regulations for the prevention of pollution by garbage from ships. The amendments will go into force on 1 January 2013.

Comprehensive changes include the following: a new requirement specifying that discharge of all garbage into the sea is prohibited, except as specifically provided otherwise (what is permitted under certain conditions includes food wastes, cargo residues, water used for washing deck and external surfaces containing cleaning agents or additives that are not harmful to the marine environment), and additions to the requirements for placards and garbage management plans to fixed and floating platforms engaged in exploration and exploitation of the sea-bed.

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MEPC designated the Strait of Bonifacio as a Particularly Sensitive Sea Area (PSSA). What this entails is that mariners are requested to exercise extreme care if they are to navigate in the PSSA bounded area as the region has a unique ecosystem that has been prone to accidents. Many prudent mariners that ply the Mediterranean Sea believe this was long overdue.

Initial international recommendations to address bio-fouling of ships, to minimize the transfer of aquatic species were proposed by MEPC. Instructions for the control and management of ships' bio-fouling to minimize the transfer of non-native or non-indigenous species will address the risks of introduction of dangerous aquatic species.

Bio-fouling is a significant mechanism for species transfer by vessels. A single organism has the potential to regenerate many thousands of times. Reducing or eliminating bio-fouling will significantly reduce the risk of transfer of non-native or non-indigenous species.

MEPC approved a number of ballast water management systems and adopted guidelines related to the implementation of both the ballast water management and ship recycling conventions. These new methods will provide the ability to reduce or prevent risks arising from the transfer of dangerous environmentally unfriendly non-native or non-indigenous species.

Approval was granted to two and basic approval to seven ballast water management systems that make use of active substances.

What are all these changes leading to? It is readily apparent that one must have the ability to constantly change and adapt and it is of paramount importance today in the maritime industry. Ship's do need to become maritime lean (similar to lean manufacturing) while removing all fat or excess and staying sustainable, green and environmentally friendly. The alternatives are that outdated and non-compliant vessels will incur penalties and fines and end up in the scrap yard. This is only the precursor for a reduction in the number of shipping companies. Mariners additionally need to be well trained and fully cognizant of the changing seascape of rules and regulations. They must be prudent and knowledgeable mariners that are able to use their expertise and skills to successfully manage their vessels in this globally regulated market.

CDR Emil A. Muccin, USMS is an Assistant Professor in Nautical Science/Marine Transportation at the United States Merchant Marine Academy. The views expressed in this article are the author's own and not those of the U.S. Merchant Marine Academy, the Maritime Administration, the Department of Transportation or the United States government.

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Lessons Learned

From the North American ECA

With the North American ECA (Emission Control Area) now in force, Hans Staal, Branch Manager, OW Bunker USA explains the lessons that must be learned and why collaboration within the shipping supply chain is going to be key to meeting new regulatory challenges.

Since the outset, the introduction of the North American Emission Control Area (ECA) in August 2012 has been an issue of some concern for many ship owners and operators. Concerns over price, technical issues, supply and demand, as well as the practicalities of enforcement, have been widely debated. While these concerns were not completely unfounded, they have contributed to an overall malaise that has left many on the backfoot.

Many of these issues are of course more pertinent to short-sea shipping within North American waters, as well as for container lines and the cruise industry, which are most exposed to the regulation.

However, while the landmark regulation in the USA has caused some consternation throughout the industry, the change is nothing that we have not seen before. The reaction to the 1.0% sulfur emissions regulations in North American waters echoes the earlier introduction of the Baltic and Northern Europe ECA, both in its challenges and how the shipping industry has since responded. But with several key emissions regulations scheduled for implementation in the coming years, the industry must take heed. We must look at how to better manage change and adapt to new challenges in the future.

The key learning that we must take from the implementation of the ECA zones is that with fuel prices remaining high, there must be a transparent relationship between fuel suppliers and their customers. This is particularly important in creating a support structure to weather financial pressures that many in the industry find themselves in, where liquidity and credit lines are becoming increasingly squeezed.

In this environment it is up to the suppliers that have a robust business model and the financial strength to extend good credit terms – based on commercial prudence - to customers that are prepared to engage in an open and transparent way. While it is a risk for fuel suppliers to do this, if it is based on sound knowledge, analysis and good business principles, it is a risk worth taking for the benefit of the wider industry. However, in providing credit, it is only reasonable that the fuel supplier takes a margin. It is important that all parties within the shipping supply chain generate profits, which is the key to business survival.

In adapting to new regulations, it is vital that ship owners and operators engage with their fuel suppliers at the earliest opportunity to develop an appropriate fuel procurement strategy that is right for their business. This ensures operational and cost efficiencies, as well as compliancy best practice. There needs to be an understanding of how often they transit ECA regions and what methods for compliancy they want to adopt. There must also be an understanding of their appetite for risk in setting out a procurement strategy that locks in costs and maximizes profitability when fuel prices continue to remain high.

Currently, one of the greatest challenges in relation to the North American ECA is over demand for low sulfur fuel, and the lack of infrastructure and facilities, particularly on the West Coast, to meet increased low sulfur requirements. Across North America demand for low sulfur fuel is expected to increase significantly over the coming year, outstripping the current supply of fuels brought to market. As widely discussed before the implementation of the ECA, the predicted imbalance between supply and demand has created a considerable price differential between low sulfur and high sulfur residual fuels. This was predominantly caused by unwillingness on the part of the refiners to risk the development of large quantities of low sulphur product without a precise understanding of market demand.

A key benefit to planning a fuel procurement strategy is that insight is gener-

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-ated into the level of demand for low sulfur fuels that is needed to operate within an ECA. With this knowledge, the refiners may be more prepared to invest in more production, which will ensure that there is enough product to meet demand.

With a current premium in the region of $200-350 between low and high sulphur fuel oil at US West Coast ports, the increased burden placed on owners and operators who must operate within ECA waters is considerable. Many container lines have recently announced low sulfur fuel surcharges.

The Westbound Transpacific Stabilization Agreement rates are set at $11 per 40-foot container from West Coast ports and $38 per FEU for East and Gulf routes. While this does lessen the strain, passing on additional costs is not going to be a universal or sustainable solution in the longer term.

On a positive front, there have been some developments that suggest the market will begin to stabilize.

For the longer term, more compliant product is slowly coming to market across North America and Asia, to meet increased demand where it is most pronounced. However, significant improvements are not likely to be seen in the short-term. By working in partnership with fuel suppliers, owners and operators can stay informed of market developments and can implement a bunkering solution that ensures cost and operational efficiency savings aimed at protecting their bottom line.

The other challenge that owners and operators face is making sure that the right documentation is in place to prove compliance. Under regulation 18.2 of MARPOL Annex VI, owners and operators must demonstrate that all required measures have been taken to obtain compliant fuels; particularly important if none could be secured. A ship's master must be able to produce a range of documentation; everything from bunker delivery receipts to written procedures covering fuel oil change operations. And if they haven't been able to secure low sulphur fuel oil, they must submit a fuel oil non-availability report upon inspection.

Non-compliance is a serious matter. Failure to comply with the regulations can result in a civil penalty of up to $25,000 per day, with an additional $5,000 if false records are submitted. Again, a robust fuel procurement and technical management strategy can mitigate this risk.

Looking forward, when it comes to impending regulations in 2015 and the potential establishment of other ECAs, such as Hong Kong, Singapore and, as recently suggested, Australia, we must ensure that we are all on the front-foot. This can be aided through more open dialogue between refineries, suppliers and owners and operators. All parties must take responsibility for ensuring that there is a clearer understanding of market demand, and that issues surrounding supply infrastructure, technical limitations and the industry's ability to absorb any additional costs are clearly addressed and resolved.

ECA regulation has shown us that the shipping industry has an ability to adapt to new pressures, but there is only so much room for maneuver. It is important that all factions of the shipping supply chain work together to ensure the future sustainability of the industry.

Hans Staal is the Branch Manager for OW Bunker USA, headquartered in Houston, Texas. OW Bunker is one of the world's leading independent suppliers and traders of marine fuel and lubricants.

Containership Design

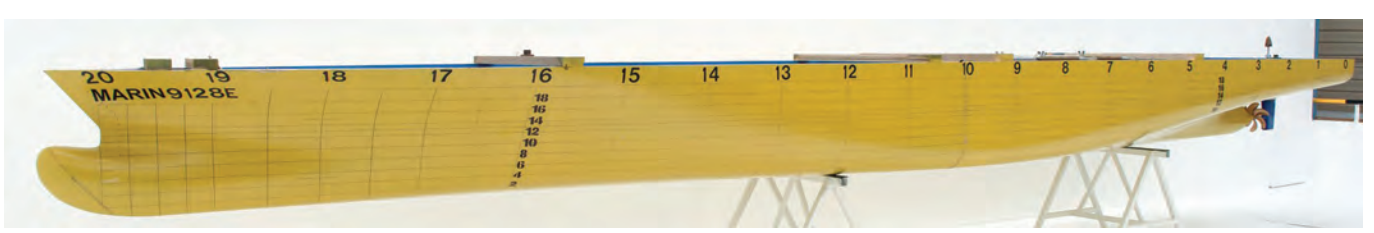
Setting New Standards

Seaspan Saver, a 10,000 TEU container vessel is setting new standards in container ship design. MARIN and Marine Design and Research Institute of China (MARIC) developed the hull lines of this unique vessel, which has been entirely designed with a low operational cost profile in mind. Canadian owner Seaspan requested a hull form that facilitates very low fuel consumption in the operational speed range, but at the same time it had to be able to keep an acceptable top speed. This approach is in stark contrast to previous ideas, which have focused on having the highest possible top speed. With the current slow steaming trend and upcoming EEDI regulations this new approach is favorable. With the aid of extensive CFD calculations and close cooperation, a well-balanced container ship design was created.

However, it was undoubtedly a challenge to balance a low operational speed range and acceptable top speed, particularly whilst taking multiple operational draughts into account. By using fast potential flow calculations and even more accurate (but time consuming) RANS calculations, a very good hull was designed. MARIN used its experience of having optimized over 30 single screw container vessels with a length of more than 300 m, in combination with full-scale speed trials data from these very large container vessels at the normal ballast trial draught and, even more importantly, at design draught.

After the optimization of the hull lines a large ship model was manufactured. For large container vessels up to 20,000 TEU, hull models up to 13 m in length are used with propeller diameters close to 300mm. This avoids scale effects as much as possible. Following the initial model tests with a propeller from MARIN's own stock – which contains several thousand propellers – a propeller was finally designed by Japan's Nakashima and a twisted leading edge rudder design was made by the German company Becker Marine Systems. The final model tests showed that the propeller was highly efficient.

Cavitation was checked by high-speed video observations.



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Floating Production

Expenditures are Set to Double

Douglas-Westwood forecast that between 2013 and 2017, $91bn will be spent on floating production systems (FPS) – an increase of 100% over the preceding five-year period. A total of 121 floating production units are forecast to be installed – a 37% increase. This growth is driven by multiple factors, such as a larger proportion of newbuilds and conversions compared to redeployments, a greater degree of local content which often results in a higher cost base and general offshore industry cost inflation.

Market Forecast

FPSOs represent by far the largest segment of the market both in terms of numbers (94 installations) and forecast Capex (80%) over the five-year period. FPSSs account for the second largest segment of Capex (10%) with TLPs third (7%).

Latin America accounts for 29% of the 121 installations forecast and 37% of the projected Capex, with the majority of these being FPSOs. The difference between the two figures is due to Latin America having higher than average capital costs compared to some other regions, due to a higher proportion of expensive deepwater projects.

Africa is the second largest region, with forecast Capex of $18.2bn (20%). Like Latin America, a large proportion of the African installations will take place in deepwater.

Although Asia, has more installations (24) forecast than Africa (18), it is due to account for only $12.5bn, a smaller proportion of global Capex (nearly 14%). This is due to the majority being located in relatively shallow water and benign environments, requiring more straightforward FPS designs, sourced from converted vessels which are usually cheaper than newbuilds.

Although a predominantly shallow water region where fixed platforms are utilized, Western Europe is expected to see a respectable number (20) of FPS installations over the next five years. Some of these projects revolve around the rejuvenation of mature producing areas.

Key Demand Drivers

Three main factors are driving the sustained growth of the FPS sector:

- Move to deepwater
- Development of complimentary production technologies
- Marginal field development and early production systems

As shallow-water opportunities become increasingly scarce, the development of deepwater reserves will accelerate rapidly. For a field in deepwater, FPS is the development method of choice, since fixed platforms are often ruled out on technical and/or economic grounds.

Floating production expenditure in deepwater is expected to total $58bn over the 2013-2017 forecast period, equating to 63% of the value of the global FPS market. The deepwater market distribution for the next five years shows the continued dominance of Latin America and Africa, with Latin America expected to increase its share of forecast Capex from 30%.to 50%,

The subsea sector has developed at a remarkable pace in recent years enabling the economic development of fields in deeper waters further offshore. Furthermore, subsea processing technology is maturing and is now enabling production to FPSOs from challenging reservoirs including heavy oil.

Considerable versatility enables FPSs to be used for a variety of different applications besides conventional life-of-field production. These include Extended Well Testing (EWT), Early Production Systems (EPSs) and Rejuvenation Projects.

FPSOs are also an attractive solution for marginal field developments, particu-

Shell celebrates the first steel cut for the first steel cut for the Prelude floating liquefied natural gas project's substructure. The sheet of steel weighs 7.6 tons, is 4.3m wide, 13.8m long and 16.5 mm thick.

(Photo: Shell)

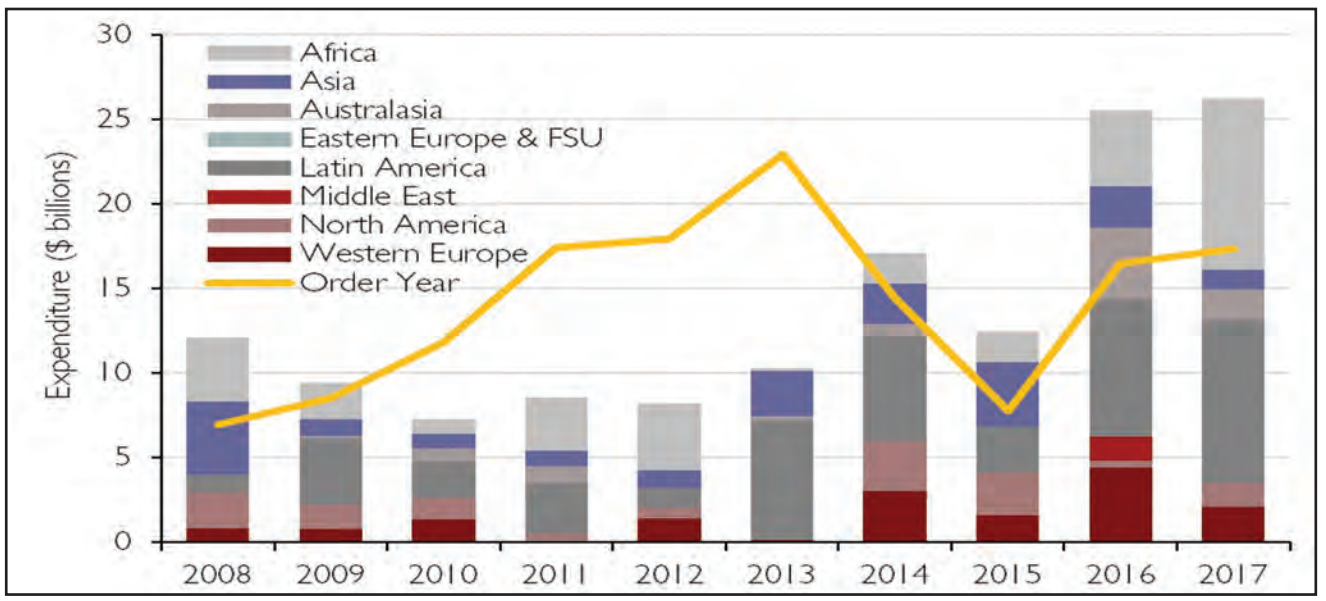

Figure 1

Global FPS Installation Capex by Region 2008-2017

(Source: Douglas-Westwood)

larly where an existing unit can be renovated, modified and redeployed at a significantly lower cost than a newbuild.

Supply-side Considerations

Three main factors will affect the supply of units in the FPS sector:

- Financing
- Local content
- Leasing

Financing remains a challenge for leasing contractors and smaller E&P companies as a result of the debt crisis in Europe. At the same time local content requirements are pushing up prices and extending lead times, particularly in Brazil.

For the oil company field operator, FPS ownership becomes the more cost-effective option where production extends over a long period. Alternatively, the decision to lease an FPS can be seen as a trade-off between the lower up-front Capex and the increased Opex as a result of the leasing charges. However, leasing also brings advantages in terms of the cost of field abandonment (Abex).

The top three leasing contractors are BW Offshore, MODEC and SBM Offshore, which collectively account for 34% of the leased fleet. The FPSO leasing sector remains weak with 85% utilisation at present compared to 89% at the time of the 2011 edition of this report. Contractors are reporting poor returns on existing projects and write-downs on new projects due to cost over-runs.

Conclusions

The FPS sector recovery, following the 2008/2009 downturn, continues steadily. A total of 25 units were ordered in 2011 vs. 24 in 2010. We note that orders in 2012 are 13 units as of September, suggesting that this year is unlikely to show spectacular improvement without a surge of orders in Q4. Analysis of the order

book shows 51 FPSs in-build at present – a slight increase compared to last year's edition of the Douglas-Westwood report. However, over the entire forecast period, the outlook is considered positive with the value of annual installations is projected to grow from $10.2bn in 2013 to $26.2bn in 2017.

The E&P industry is mature and needs to access offshore and deepwater reserves. Energy demand is growing as a function of population and economic growth. The upstream E&P business is increasingly reliant on offshore reserves to achieve incremental production as most of the easy-to-access reserves onshore have already been exploited.

Floating production systems are a key enabler for offshore production in deepwaters and for economically-marginal fields.

The lingering European sovereign debt crisis presents two significant risks to the sector. First, that projects do not go ahead due to lack of available finance for either the FPS contractor or the operator. Second, that the crisis will bring further economic downturns and depress oil demand and prices – in turn impacting new E&P activity. The technological complexity of field developments is increasing and this will benefit oilfield equipment suppliers. Deeper waters, challenging reservoirs (e.g. very high or low pressure, sour hydrocarbons, high water content), and ageing fields will all present problems for operators of FPSs and opportunities for OEMs and engineering firms.

Local content requirements are causing delays in project execution and cost overruns. The ambition of creating value and employment locally will need to be balanced with the need to have an efficient, competitive and competent supply chain. These ambitions may continue to prove to be mutually exclusive.

The FPS leasing sector needs a sustainable business model. Poor financial performance from leasing contractors is being blamed on taking similar downside risk to operators (e.g. reservoir performance, construction risk, political risk) but without any of the upside that operators are exposed to (e.g. high oil & gas prices and total production being greater than forecast). Lease contractors need to work with operators to find sustainable contractual arrangements for mutual long-term benefit.

Political risk has always been present in the E&P business and this is unlikely to change. Boundary disputes, threats of civil unrest and war and changes in taxation regimes are all ever-present challenges that the oil and gas industry is well-used to encountering. A 'portfolio approach', avoiding excessive exposure to a single risk area is likely to continue to be the approach for E&P and oilfield services companies.

The medium and long-term outlook is however very positive. Douglas-Westwood are confident that the underlying long-term growth drivers will overcome the near-term issues. We are tracking over 200 potential future FPS deployment opportunities and over the period to 2017 we forecast that 121 installations will occur, with associated Capex spend doubling compared with the previous five year period.

This is a complex, dynamic industry that is exiting a period of weakness and is now entering a new up-cycle. DW's five-year outlook vs. the 2011 edition of our report shows an improvement in market size of some $23.6 billion – a 35% uplift. In terms of timing, the next 12 months could present a superb entry opportunity to FPS-related business sectors.

Hannah Lewendon joined DW as a researcher after graduating from the University of Southampton with a first-class degree in Economics and Finance. She has carried out extensive research on the floating production sector and Hannah is the lead author of the *'The World Floating Production Market Forecast 2013-2017'.*

Report details:
Now in its 11th edition, Douglas-Westwood's *World Floating Production Market Forecast 2013-2017* has been tracking and analysing the industry for over a decade.

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OSV Tech Today

Modern Offshore Service Vessels come in a variety of shape, size and technical outfit, dependent largely on their intended area of operation. But as offshore assets are constantly mobile and global, finding work where work is to be had, there is an increasing trend towards larger, steadier platforms that are multipurpose and able to shift seamlessly from the Gulf of Mexico to the North Sea to offshore Africa, Asia or Brazil … and back again. Following here are some of the more significant OSV developments in recent months.

(Photo: Tony Hall)

As necessity Is the mother of invention, the West Coast of Norway has time and again been a breeding ground for some of the world's leading edge offshore service vessel technologies. The tip of the spear in this regard has been the Ulstein Group.

Ulstein Group, Eidesvik Offshore and Subsea 7 recently joined forces to develop a next generation Inspection, Maintenance and Repair (IMR) vessel to tackle the most demanding environments, and built to the most demanding market specifications. Long-term charterer Subsea 7, working under contract with Statoil, is now looking forward to the delivery of a truly unique vessel, the Seven Viking.

The landmark ship, an ICE-C class vessel with a crew capacity of 90, is co-owned by Eidesvik and Subsea 7 under the newly created joint concern Eidesvik Seven AS. It will operate in the harsh climate of the North Sea, carrying out a multitude of diverse tasks for Statoil, including inspection, maintenance and repair of subsea oil installations, alongside scale treatment and RFO operations.

"The specifications for this vessel were as unique as the environment it will operate in," said Stuart Fitzgerald, VP Norway, Subsea 7. "Statoil asked us to adhere to a set of rigorous contract requirements and we, alongside our project partners at Ulstein and Eidesvik, used all our collective experience to deliver 100% on those specifications. The fruit of those labors is the 'Seven Viking' – a ship that is tailor-made for IMR operations and like nothing else that is on the market."

The prototype vessel incorporates the Ulstein X-BOW design to reduce motion in transit and give increased stability in the potential five meter swells that sometimes characterize the North Sea. This is actually a compact variant on ULSTEIN's SX148 design, measuring 106.5 x 24.5 m wide. This nimbleness, enhanced by a top speed of 16 knots, designed to allow the Seven Viking to maneuver easily in confined spaces, such as between platforms, accessing difficult to reach areas.

"It is a truly optimized design for its array of tasks," said Fitzgerald. "The ability to carry all the necessary maintenance equipment on board the vessel ensures that it can operate continually and meet any challenge, absolutely minimizing operational downtime. In addition, it features a separate accommodation unit – positioned away from all active work areas – to ensure that the crew can rest without any disturbances. We think we have created a modern, efficient and also comfortable working environment, which, of course, helps contribute to safe operations."

As is expected of modern offshore vessels, particularly with the high bar demand of oil majors in having zero tolerance for time lost for safety violations, the vessel offers a number of features to keep it operating safely and efficiently, said Vidar Øvstedal, Subsea 7's Offshore Manager.

"All the best solutions were developed to ensure safe and efficient operations", he notes with satisfaction, "including a customized module handling system (MHS) integrated in the ship's hangar for the safe launch and retrieval of subsea modules weighing up to 70 tons."

He continues, "Cooperation and communication are obviously essential in tough sea environments, so the design gathers all operational personnel in one area directly above the hangar, with panoramic windows in the control room giving a full overview of this key activity area.

"Also, the ship has been developed to meet the highest working environment standards. She is a comfort class COMF-V (3) vessel, with low noise and vibration levels.

"We have achieved minimal noise levels in the hangar by opting for electric winches for the ROVs, the MHS and util-

Hornbeck Offshore exercised two of its 24 option, HOSMAX310 Offshore Support Vessels with Eastern Shipbuilding.

ity equipment etc. Meanwhile, to minimise working at heights and manual handling, man-riding baskets and utility cranes will be installed in the hangar area. The vessel also has a high freeboard, which provides additional safety for the deck crew."

Øvstedal adds that several notable environmental initiatives have been taken when designing the vessel, which also carries the Clean Design notation. These include the diesel electric propulsion, which reduces atmospheric emissions, while the ship's electrical winches mean there will be absolutely zero emissions of hydraulic oil.

"As befitting Statoil's requirements, which were detailed in a stringent specification, the 'Seven Viking' is a vessel of unmatched technical and operational capacity within this sector," he said.

"We have been working together to find tailored solutions for the client's demands and have come up with a next generation vessel that makes incremental steps forward in IMR ship development.

The vessel is scheduled to launch in December 2012, marking the beginning of a new Viking age on the North Sea's most tempestuous waters.

HOS Signs HOSMAX310 OSV Options with Eastern Shipbuilding

Hornbeck Offshore Services exercised two of its 24 option, 302 x 64 x 26-ft. HOSMAX310 Offshore Support Vessels with Eastern Shipbuilding. Eastern is now under contract to construct 10 of these vessels for Hornbeck. The two additional option vessels are being built to the STX SV310 design from STX Marine. These vessels have been designated as the HOSMAX series by Hornbeck and are USCG, ABS, SOLAS, DPS-2, AC Diesel-Electric powered, twin Z-drive propelled OSVs. The vessels feature four CAT 3516C 16-cylinder turbo-charged Tier III diesel generator engines that are rated 1825 kW at 1,800 rpm. Main propulsion power is provided by two GE Energy furnished Hyundai 2500 kW 690VAC motors driving two Schottel SRP 2020 FP Z-Drives with nozzles rated at 2,500 kW at 1,025 rpm each for a total of 6,704 Hp. Schottel also provides two STT 4 fixed pitch tunnel thrusters rated at 1,180 kW at 1,170 rpm, each with direct coupled Hyundai 690VAC electric motors. GE Energy provides the complete system integrated diesel electric package, including the propulsion and thruster drives, motors, control systems, DP system, switchboards, motor control centers, automation and navigation/ communication electronics. The vessel is capable of a maximum speed of 14 knots with a cruising speed of 12 knots.

All 10 of the HOSMAX vessels under contract are USCG, SOLAS, ABS Classed •A1, Offshore Support Vessel Ocean Service, Loadline, •AMS, •ACCU, •Circle E, , with additional ABS Class notations UWILD, ENVIRO, •DPS-2 and FFV-1.

The total below-deck capacities of the HOSMAX310 include 285,645 gal. of diesel fuel, 610,137 gal. of drill/ballast water, 21,509 barrels of liquid mud, 14,347 cu. ft. of dry-bulk mud, 2,212 barrels of methanol and 62,538 gals. of potable water.

STX Marine with offices in Canada and the United States provides the design based on the very successful and proven Eastern Shipbuilding "Tiger Shark Class" series. Five (5) other offshore supply vessels in this series have been delivered to Eastern's clients; these vessels are already proven themselves in worldwide operations. The fully integrated bridge is arranged for increased visibility and fea-

tures the latest technology in navigation, communication equipment.

Damen-design PSVs for Wilson Sons Ultratug Offshore

Damen Shipyards enhanced its penetration in the Brazilian offshore market with six Platform Supply Vessels (PSVs), type PSV 4500, built under license by Wilson Sons (Santos, Brazil) for Wilson Sons Ultratug Offshore (WSUT). Two vessels have been recently delivered; the other four will be delivered in 2013.

Damen and Wilson have had a business relationship for 20 years and the new vessels will be supplied to WSUT, a joint venture between Brazilian operator Wilson, Sons and the Chilean Ultratug group for long term charter to Petrobras. To date Wilson, Sons has built 16 Damen PSVs, all for their own fleet.

In Brazil local manufacturing is a key factor and the service through Damen Technical Cooperation (offering ships in kit form for completion locally) ensures the shipbuilder complies with the 60% local content threshold imposed by the government.

Wilson, Sons is the largest operator of harbour tugs in Brazil and already has a large fleet of Damen vessels comprising Azimuth Stern Drive (ASD) tugs and Platform Supply Vessels (PSV).

The 4500 dwt vessel measures 87 x 16 m with a 6.2m draft, offering a large deck area amounting to 840 sq. m. A diesel electric propulsion system comprising four Caterpillar 3512C generator sets, each of 1,570 ekW at 1,800 rpm, power two Rolls-Royce azimuth thrusters of 2,500 kW. Fixed pitch propellers of 2,800 mm diameter, with nozzle, deliver a speed of 13 knots (at 5 m draft). A Caterpillar C9 genset of 238 ekW at 1,800 rpm is for emergency use. Twin bowthrusters are outfitted to aid in maneuverability and the vessel has a dynamic positioning DP2 classification. There is accommodation for 14 crew and up to six passengers.

Currently Damen is engaged in the design of a new range of PSVs, which will cover five models, the 3300 (the number relates to the vessels' deadweight), the smaller 1600 and 2500 and the larger 4000 and 5000, which are currently being designed. Together with Wilson, Sons, Damen is developing several other vessel types for the Brazilian offshore market, such as Anchor Handlers, ROV Support Vessels and Well-stimulation Vessels.

Bollinger Wins Six OSV Conversions from Hornbeck

Bollinger Shipyards won a contract by Hornbeck Offshore Services (HOS) to convert six 200 class DP1 offshore supply vessels (OSV's), to 240 class DP2 OSV's, following an announcement by HOS on September 4, 2012, saying they decided to implement a retrofit program

Artist rendering of the Hornbeck S240 following conversion at Bollinger.

to stretch and upgrade six 200 class DP-1 OSVs into 240 class DP-2 OSV's. The designated vessels for the program are six of Hornbeck's 10 Super 200 class DP1 units, four of which are the vessels that recently completed two-year charters with Petrobras in Brazil.

To meet the delivery schedule, Bollinger will carry out the conversions at two separate Bollinger facilities, Bollinger Larose and Bollinger Morgan

Brazilian OSVs to have Rolls-Royce DNA

Rolls-Royce won a $38.4 order to design and equip four platform supply vessels (PSVs) for Brazilian ship owner Bravante Group, former Navegação São Miguel Ltda. The UT 775 SE PSVs will b designed to carry deck cargo, pipes and diesel oil to and from offshore oil and gas platforms. They will be chartered by Petrobras. Bravante Group will build the vessels at their ship yard in Niteroi, Brazil, as they have done for previous orders.

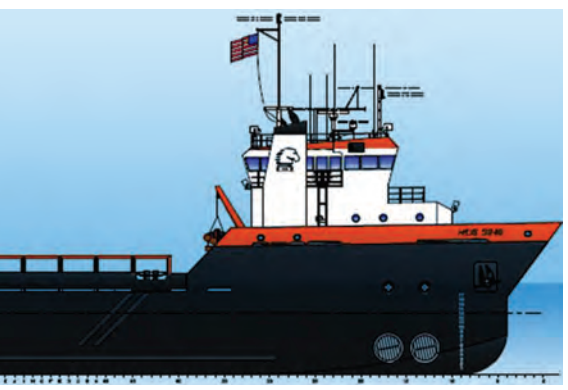
In addition to the design, Rolls-Royce will supply its Azipull and bow thrusters, deck machinery, a bulk handling system, Active Front End (AFE) frequency converters, automation and control systems and a dynamic positioning system.

Grandweld Delivers 42m Crew Boats

In early October Grandweld Shipyards won a contract to build 42M Aluminum Crew Boat for Wesal Shipping, a contract which follows the delivery of the 41M Aluminum Crew Boat that Grandweld delivered to Wesal early in October 2010. The 42M Aluminum Crew Boat is a heavily modified version of the 41M, and is designed to reach a speed in excess of 25 knots and includes luxury seating, accommodation for VIP guests, larger deck space and enhanced comfort for the crew. The vessel features a total seating capacity for 83, 110 sq. m. loading area for over 90 Tons of deck cargo, in addition to the capacity of carrying large amount of fuel and freshwater.

In addition, Grandweld signed a deal in August 2012 to deliver another 42M Crew Boat for Global Marine.

Grandweld has recently opened its 55,000sqm facility at Dubai Maritime City which is expected to expand the annual capacity in terms of number of new builds. Its current orderbook includes more than 20 vessels of both steel and aluminum including: Seismic Support vessels, Anchor Handling Tug Supply Vessels with DP2 capability, Work Maintenance vessels, Fast Intervention Supply vessels (FISV), Crew Boats and many more.



Cool Under Pressure in Harsh Environs

GC Rieber Shipping, the Norway-based harsh environment shipping specialist, has charged ULSTEIN with developing a high-capacity subsea vessel based on its SX121 design. This $141m million ship, ordered in June 2012, alongside an option for a sister vessel, has been commissioned in response to strong market desire for offshore construction support vessels (CSVs) for deep and harsh environments. Alongside state-of-the-art features, equipment and performance figures, the vessel will give GC Rieber Shipping maximum operational availability – a vital characteristic for both the company and those chartering the ship. Downtime will be minimised thanks to the 'operation+' feature, an evolution of GC Rieber Shipping's own 'fail-to-safe' design approach.

'Operation+' allows the vessel to continue to operate even if it has experienced a significant failure. Bjørn Valberg, GC Rieber Shipping's Technical Director, explains more:

"Fail-to-safe means that even if a ship encounters a failure it is rendered in a safe condition. Our objective with this ship is to take that philosophy a step further," Valberg comments.

"In the case of this vessel a single failure – such as a failure of a generator set, a single thruster or even an entire switchboard section (operating two generators and two thrusters) – will not threaten the redundant continuation of operations, giving charterers real peace of mind."

Valberg illustrates this with a real-life scenario involving subsea flex pipe laying – an operation the new vessel is optimised for – where, if a single failure was encountered, a 'standard' ship would be forced to terminate operations as redundancy would be jeopardised.

"And of course," he states, "if you are in deep waters with a substantial length of product, such as flex pipe, hanging from the ship, abandoning that operation is, well… it's quite obvious how difficult, time-consuming and expensive that is.

"This new vessel, thanks to 'operation+' is protected against that scenario – it could continue with its assignment. That's a hugely important characteristic of that vessel, helping the charterer meet the demanding expectations of the market."

ULSTEIN's design and solutions team has been working to turn this concept into reality and deliver the Holy Grail of minimal operational downtime and maximum efficiency and reliability.

Geir Sivertstøl, principal engineer electrical systems at ULSTEIN, says the vessel, equipped with three main thrusters and three side thrusters (for stationkeeping during pipe laying), is fully optimised for carrying out assignments without interruption.

He notes: "The switchboard system, propellers and diesel motors can be configured in groups of two, three or four. In case of an AUTR operation (i.e. the occurrence of a single major failure), the

(Photo: Tony Hall)

Members of the technical design team in ULSTEIN in front of an SX121 tank test model displayed in ULSTEIN's corporate exhibition, from left Per Arne Riksheim, Ann Katrin Barstad, Geir Sivertstøl and Terje Våge.

The operational flexibility of the SX121 design enables the owner to operate in a wider range of market segments.

(Illustration: Ulstein Group)

vessel will only lose one third of its installed power package and propulsion, and will be able to complete the operation with two thirds of its capacity."

"This," he stresses, "in combination with the highest standards for dynamic positioning, DYNPOS-AUTRO, will ensure that charterers can look forward to operational standards that are custom made to tackle the world's harshest - and potentially most resource rich - environments."

Equipped, flexible, compelling

GC Rieber Shipping's version of the SX121 (yard number 300 at Ulstein Verft) has been equipped to meet the most diverse requirements, in the most demanding of conditions.

The 130-m long, 25-m wide vessel can accommodate a crew of 130 and cut through deep waters with a top speed of 14.5 knots, while meeting all the latest environmental standards.

She is equipped with a powerful 250 ton AHC (active heave compensated) offshore crane, perfect for lifting and lowering heavy equipment to and from subsea environments. A large cargo deck creates the optimal environment for a variety of operations, ensuring that the vessel is well placed to meet the hugely diverse demands of the offshore construction market. It also offers the ability to carry two ROVs (remotely operated vehicles) — one that will be launched from the starboard side and the other through a moon pool. In addition, the ship has been designed with SURF (subsea umbilical riser and flowline) capabilities and is prepared for the installation of a below-deck basket/ carousel with a 2500 ton capacity, as well as a 250 ton VLS (vertical lay system) for deployment through the moon pool. It is, as Valberg stresses, a compellingly comprehensive package: "One of the main reasons for choosing the SX121 design from ULSTEIN was its inherent flexibility, which allows several types of operations and enables us to operate in a wider range of market segments.

The fact that we can utilize the 250 ton crane to the maximum of its capability both in offshore and subsea lifts on this vessel was another deciding factor."

GC Rieber Shipping's vessel is, according to Tore Ulstein, deputy CEO in Ulstein Group, the 'perfect project' for ULSTEIN to show its renowned design and shipbuilding pedigree. Tore Ulstein notes that the business is well accustomed to developing and producing vessels that have the capability to minimise operational downtime, maximizing customers' profits.

He commented: "Our organization has broad expertise in developing advanced high-capacity offshore vessels together with customers, so this project suits us perfectly." The SX121 is scheduled for delivery in the first quarter of 2014, boosting GC Rieber Shipping's fleet (which was fully booked at the conclusion of 2011) of 18 advanced special purpose vessels, 12 of which are owned by the company. CEO of GC Rieber Shipping, Irene W. Basili, has imparted that the new addition to the company will "strengthen our position in the high-end subsea segment" and that she is looking forward to receiving "a top-class vessel from ULSTEIN" – a sentiment that potential charterers will no doubt agree with.

www.ulstein.com

OSC

Offshore Simulator Center opens in Aalesund, Norway

By Henrik Segercrantz

A new Offshore Simulator Center (OSC) is being finalized in Aalesund, Norway to provide advanced training in offshore ship operations. The new facilities are located in a 'Norwegian Competence Center building' next to the Aalesund University College.

The building contains several futuristic constructions, such as a 13.5m diameter aluminium dome for the offshore operations simulators, and two 4m diameter spherical domes for crane simulation. When finalized, the new centre will consist of one Offshore Operation Simulator, with a full 360 degree Offshore Vessel bridge, four Deck Personnel stations, a Crane Simulator, a Winch Simulator, an Engine Room Simulator, a ROV Simulator and a 360 degree 'Visualization Theatre', intended for various simulation and visualization projects, located on the lower floor of the large dome. In addition, the center will have several 'brief-/debrief rooms' with advanced audiovisual equipment that enable live transmission of sound and video from the simulators. In all, the simulators will use 70 professional grade projectors and close to 100 PCs/servers. The simulators can be operated separately or in an integrated mode, enabling advanced team training across several roles, positions or vessels.

The training courses will be provided by AAUC Maritime Operations. "This new center will enable Aalesund University College to increase the scope of simulator training, taking the training concepts to a new level. It also demonstrates some of what OSC is capable of delivering, both regarding facility design and simulator technology," Arne Monsholm, CEO at OSC told Maritime Reporter. The simulators will provide training starting mid-August this year.

Mr Monsholm described the background and business model of OSC. "Our business idea is that we want to contribute to improving the safety of the personnel through simulation and visualisation of demanding offshore operations." He describes how there is a lot of competence in offshore operations in this part of Norway, around Aalesund. OSC was founded in 2004 by Farstad Shipping, Rolls-Royce, the University College of Aalesund, and Marintek in Trondheim, each with a 25% shareholding. The first simulator was established in 2005, after which more simulators have been added. Now the entire facility is moving into new facilities.

The initializing factor of OSC was a fatal offshore accident, which took place due to a lack of knowledge and right training, in Brazil. Anchor handling was really the initial activity when the simulator center was funded. Anchor handling involves several roles and a several different actions that can go wrong. There has been fatal accidents both onboard vessels and entire vessels that have capsized. We are focusing on the operation of the offshore activities. The deck personnel has an equally important role as the people on the bridge in manoeuvring the ship. Another area OSC focuses on is supply vessel operations. "They are not as dangerous as anchor handling, because there are not as many things that can go wrong, but still, it can be a challenging operation from a coordination and a collaboration point of view." This simulation includes the lifting operation, loading and offloading of cargo, the coordination of hoses and stuff between the rig and the supply vessel. There are a lot of tasks that

> "Our business idea is that we want to contribute to improving the safety of the personnel through simulation and visualisation of demanding offshore operations."
>
> Arne Monsholm, CEO at OSC

are important for the crew to understand." The third area OSC focuses on is crane simulation or lifting operations. There are both rig crane simulators, relevant for supply vessel operations and also subsea crane simulation, for positioning subsea equipment down on the seafloor.

The deck personnel play an important role in the simulators. They are operated like in a computer game doing the real tasks required using a joy-stick. The personnel is seen live from thosee on the bridge and they communicate like in real operations.

A large portion of the revenue of OSC is spent on research and development. Mr Monsholm presents a slide showing growing revenues reaching some NOK 41m oin 2011, of which the R&D investments represent some NOK24m. The other parts are cost of goods, when we deliver simulators to other companies, and administration. "So far, the owners say that they have not invested in OSC in order to make money. That was not the intention." OSC has 17 employees in Aalesund, and owns 60% of a company in Holland, Ivory Lake B.V., which does the graphics needed for the simulators based on a gaming engine Quest 3D owned by Act-3D B.V. holding the remaing shares in that company. OSC does its

The Offshore Simulator Center in Aalesund, Norway, with the smaller Crane Simulator domes seen behind the big Anchor Handling Simulator.

company. OSC does its own software development. "We are connecting up DP systems, manouvering handles touchscreens, mapping systems, radars, all kind of hardware and software that typically is onboard a ship. We connect thast into our simulators and read the signals from those and send them signals back so that they believe they are onboard a real vessel." This software is combined with the virtual world of the 3D game engine. "The difficult thing is producing the mathematical modeling, not the 3D world," Monsholm said.

The design department designs the visualization system, or how the visual world is going to be presented. To provide realism, there are 50 projectors in the large dome, of which 27 for the upper bridge, in order to provide a full 360 deg. view. OSC has developed technology to develop and combine the images so that they look correct, although the surface they are projected on is non-linear, also providing edge blending. The simulator also includes an instructor station where everything is controlled, including weather and wave conditions, time of day, etc. The trainig scenario is directed from the station, with eventual failures provided to add realism in the training scenario. In the server room there will be between 80 and 100 computers serving the simulators.

The training concepts used for the simulator training have been developed by OSC and Aalesund University College, and are recognized worldwide as the market-leading solution for team-based simulator training for offshore operations. There are two persons in the instructor station, a Ship's Master in charge

of the entire simulation, and another person looking at the human factors, the team performance, focusing on the psychology part. "This concept with two instructors and strong focus on team performance, has been a success for us," Monsholm said. Half of the crew is actively observing the operations of the other half of the crew, from the observer room. After a debriefing, they switch.

OSC designs and supplies simulators for external companies and institutions. These also include crane simulators and small onboard trainers for safer deck operations, called SDO trainers. Every time Rolls-Royce sells an anchor handling deck crane, OSC supplies a simulator onboard the vessel. DP simulation stations and visualization can be supplied with the equipment from several suppliers, such as Rolls-Royce, Kongsberg, L3 Communications, and Marine Technologies.

External Simulator Deliveries

OSC has, sofar, delivered Anchor Handling Simulators to Bourbon in Marseilles and Singapore, the Farstad Shipping in Perth, to Rolls-Royce in Aalesund, and a number of Crane Simulators and smaller installations. "We have not reached the critical mass yet (regarding external sales), but are not that far from it," Monsholm described.

In December last year OSC completed the world's largest Offshore Simulator Centre, as part of Farstad Shipping's new offshore training in Perth, Australia. The center is one of the biggest and most advanced offshore training centers in the world, with two offshore operation simulators for anchor handling and platform supply vessel operations, a crane simulator, a winch simulator, six deck personnel stations, an engine room simulator and a complete dynamic positioning (DP) training facility.

The Offshore Operation Simulator consist of two full mission offshore bridges with 360 degree field of vision, located inside a large dome construction delivered by Spitz Inc., USA. The visual system in the dome consists of 38 professional grade projectors from Projection Design, Norway. Together with OSC's top-notch 3D graphics and next-to-real simulation functionality, the solution gives unprecedented realism for personnel being trained in the simulators.

The Center also includes an Engine Room simulator, supplied together with Polish company Unitest. It consists a full 3D walk-through engine room including a control room with controls, and switchboards using touch screen technology.

Another recent delivery is the Offshore Simulators for the new Rolls-Royce Marine Technology and Training Centre in Aalesund, Norway. The delivery includes a full 360-degree Offshore Vessel Bridge and 4 stand alone Winch Simulators based on the OSC Small Dome visualization solution.

The vessel bridge solution includes a bridge house construction with a curved fiberglass projection screen wrapped around it, 22 professional grade projectors, an instructor station and more than 30 PCs/servers. The solution has been approved by Nautical Institute as a Class B DP Bridge. Rolls-Royce Marine will be using the new simulators for Rolls-Royce Marine product training.

The latest development of OSC includes joint simulation scenarios, called integrated operations, with several simulators which can be located anywhere. This could be, for example, combining two anchor handlers, the rig bridge and rig crane simulator into one big scenario.

According to Mr Monsholm, there are worldwide two, perhaps three competitors in anchor handling simulation. In the crane simulation area there are many, at least five. OSC is the only simulator combining bridge simulation with real simulated deck operations.

(Photo: Martin Meissner)

MetalCraft Marine

Small Company with Big Ambitions Celebrates 25 Years

On the occasion of Metal Craft Marine's 25th anniversary, Maritime Reporter & Engineering News ventured north, to the boat builder's Kingston, Ontario headquarters, to discover the secret to its success.

By Greg Trauthwein

Metal Craft Marine is well regarded in maritime circles for designing and building high performance craft outfitted for the most demanding work conditions. While the company is diverse in its work scope and capability, its history lies in high-performance jet boats and its current core competency lies in the construction of tough fire boats and military boats for worldwide use.

Like many small boat builders in its genre MetalCraft has a colorful story to tell. It literally starts with the company's location, in Kingston, Ontario, Canada, on the northeast bank of Lake Ontario, where there has been a boatbuilding operation dating to 1676.

MetalCraft Marine Inc. is slightly younger than that, born in 1987 when Monty Smith, the founder, bought out Kingston Aluminum Yachts. In the beginning it was Monty and Tom Wroe, the general manager and President, who had worked together at Kingston Aluminum Yachts. "They were building these magnificent sailing yachts, beautiful boats," said Bob Clark, contracts manager, MetalCraft Marine. But that business was short lived. According to Clark it was the proceeds from a lucrative real estate deal that enabled Smith to purchase the company from Kingston Aluminum Yachts, and soon thereafter they changed the name to Metal Craft, as well as the direction toward the patrol and workboat market. "Boat number one was Tom's first power boat design," said Clark. "And believe it or not, it is the hull shape of the 70 (the company's new 70-ft., 40+ knot fireboat) that we were just on. It has been an amazingly successful hull shape for the company."

While MetalCraft certainly enjoys a successful business today – including the fact that it is the only Canadian commercial aluminum boat company to have a U.S. GSA contract (GSA contract No. GS07F0084J) – steady business and financial success were not always a given, as Clark explained. "The company was so poor then (at the beginning, with the delivery of its first government boat contract) that the inspector upon trialing the first boat said 'I told Tom I am never going to do sea trials on a boat again that doesn't have a windshield!' And it was December."

Clark joined the company as a consultant in 1991 when it had only four employees. "The primary problem for small companies is that when the same guy designs the boat, and the same guy builds the boats, it's hard to find time to actually

(Photo: Greg Trauthwein)

> “We are very concerned right now that you can’t see any reality on (U.S.) government spending for 2014-15,” said Clark. “The Canadian government spending on marine is miniscule, and the government rules to work with are much harder than the U.S. rules. Canadian rules are very confusing. I’ve asked plenty of U.S. competitors to come and bid here, but when they read a spec, they simply say ‘garbage.’”
>
> **Bob Clark, Contracts Manager, MetalCraft**

sell the boat.”

“So I went with Tom to see Lachine Rapids Boat Tours in Montreal, which is a very successful boat tour operator owned by two brothers from Pittsburgh,” Clark said. “We were trying to sell them the first boat for Niagara, and during the discussion I am literally kicking Tom under the table because he’s about to give something away – and this is still something we do to this day. From that meeting we walked away with a $20,000 check and a commitment for a $130,000 boat, and we ended up building five or six of them, and we’re great friends with these guys to this day.”

Humble beginnings helped to lay the foundation, and MetalCraft's adherence to high technical standard and sound financial principle have helped it grow to 130 employees at three locations, with a penchant for success in designing and building high speed Patrol and Search & Rescue craft. In 2013 it will deliver its 600th boat, and for 2.5 decades it has been a leader in jet boat design introducing its first power boat ever, the Kingston, as a jet drive boat in 1987. In fact the company's Kingston jet design was selected by the U.S. Navy for the Force Protection Program and served in the War on Iraq.

MCM, BCGP Win USCG High Speed Patrol Boat Contract

MetalCraft Marine US Inc. (MCM) and partner Brunswick Commercial and Government Products (BCGP) won a contract for the design and production of the new generation LRI II for the USCG, a five year contract is valued at $10.1m. LRI II is powered by twin Cummins Tier III 6.7L 480 hp diesel engines and Ultra 305 water jets, through ZF 280 PL Transmissions with electronic joystick controls. The engines are JP-5 or alternative Bio-Fuel optional and have a five-minute run dry feature.

All systems are designed for equatorial and arctic conditions, and each patrol boat has a fully integrated standard Coast Guard Furuno electronics package. The high speed LRI II patrol boat has a range of 236 nautical miles on plane and can reach 42 knots. The boats have the ability to operate up to Sea State 5 and can carry 15 crew or passengers in ergonomic suspension seating from Shoxs and Bostrom. The hull structure is designed to ABS High Speed Naval Craft standards, and all systems are designed to ABYC and CFR 46 standards.

From Canada to the U.S.

In 2007, MetalCraft Marine U.S. Inc. began operations in Clayton, NY, a move facilitated by its desire to pursue and win Jones Act and U.S. Government work. "We had to get a site in the United States because the boats (for the Coast Guard) have to be built in the U.S.," Clark said. Though it was established in New York to attract government work, the first contract signed for the New York facility was for the Whirlpool Jet Boat Tours operating in Niagara. The company has built many boats in New York, with the latest being eight specialty towboats for the U.S. Navy and a 36-ft. pilot boat for the State Pilots Association.

In addition, MetalCraft Marine U.S. Inc. is building boats for the U.S. Coast Guard, and have recently commenced building a pilot boat for Key West, Fla. While the move to New York was strategic, it soon became evident that the facility in Clayton was too small, with a 3,500 sq. ft. shop and literally no room to grow. "it was right on the water, an old factory with multiple levels," Clark said. "It's hard to build boats on multiple levels."

The answer is a short drive up the road, 11 miles to Cape Vincent, that had two beautiful buildings that simply needed updates and a few custom upgrades. In addition, there is a 10,000 sq. ft. building on the Cape Vincent site, which the company has started renovation for future work. The expansion to Cape Vincent means an expansion in hiring, as well, with the addition of skilled craftsman such as aluminum welders, marine mechanical and electrical systems technicians and metal fitters and finishers. Even with the new facility MetalCraft is seemingly busting at the seams, but the company is cautious of too much too soon, eyeing the cyclical nature of the boatbuilding business and the carcasses of boat builders who have bitten off more than they could chew.

When asked his thoughts on what might trigger further expansion, Clark said, "It would probably be one of the multi-year contracts that we have out on bid. We have two Navy contracts out there that are not awarded yet; there's a Middle Eastern contract; if we win one of the multi-year contracts, that would likely trigger the construction of additional buildings in New York."

Government Rules

While prospects are generally bright, there are a few storm clouds being eyed by MetalCraft and the entire marine industry, namely the result of the U.S. election and the direction of government spending in the U.S. "We are very concerned right now that you can't see any reality on (U.S.) government spending for 2014-15," said Clark. "The Canadian government spending on marine is miniscule, and the government rules to work with are much harder than the U.S. rules. Canadian rules are very confusing. I've asked plenty of U.S. competitors to come and bid here, but when they read a spec, they simply say 'garbage.'"

While the Canadian rules are onerous according to Clark, with its insistence on low-price evaluation "that has effectively killed the ability to build boats profitably for the Canadian government," he said that the situation looks to be changing with the current conservative administration.

"They had a report written by Price Waterhouse last year called the Jenkins Report, it was a report on R&D spending for the government, and it essentially said that the government wasn't getting its full bang for the buck," Clark said. "In this report they specifically cited that our government purchasing is not supporting new technology, because it is so insistent on low price."

Business in Hand

To date MetalCraft Marine has delivered 564 boats, and with 18 under construction (about 60% of them fireboats, as well as several crewboats for Panama), it is on course to deliver its 600th boat next year. While quality boats with minimal warranty items are crucial, Clark believes that customer service – specifically treating customers better than anyone else – is ultimately the pivotal point in gaining, building and retaining a loyal customer base over the long run.

"I remember in the early years that we received 12 inquiries, and I closed on seven of them. And I remember thinking 'Wow, we received a lead a month,'" Clark said. "Today, the phone literally doesn't stop ringing. Last year at the Workboat Show I walked away with eight solid leads, and your first inclination when you return is to get your package out to everyone. The week after the show, we received an additional $35m in business leads that were in no way related to the show; they hadn't even been to the boat show; they didn't even know about the boat show. It was unbelievable."

"(Right now our business is) about 60% fire; we have the crew boat project for Panama; we have a pilot boat project and the LRI project on in New York; and we have a couple of small patrol boats building for Nigeria, and we are just closing a nice deal in Kuwait for fire and workboats," Clark said.

The latest addition to the MetalCraft line-up is the 70-ft. fireboats; large, fast boats with high pumping capacity. Currently there are five in operation with three under construction.

"The 70 footers, each one of them has been a world record holder," Clark said. "As a planing boat, there are very few fireboats that size that are

A 70-ft. Fireboat under construction at MCM's Kingston, Ontario facility.

planing boats, but it's their pumping numbers – 17,000 gpm – that are the highest in existence for a boat that can go that speed. The Jacksonville boat was the fastest (70 footer) at 41 knots, and we are expecting the Houston boat to be 43 to 44 knots courtesty of more horsepower, as well as bigger pumps capable of an estimated 18,000 gpm.

Clark explains that the three boat, $15m deal for the Houston boats is a particularly interesting project, and currently there are ongoing discussions to add a fourth back-up boat to the fleet, given the vast expanse of operation and the critical petrochemical industry in the Houston Ship Channel to protect.

"There are so many places in the world that can use fast, high pumping capacity boats," said Clark. "Typically they use old tug type displacement vessels travelling at 12 knots. The boats Houston are replacing are old, and the cost of maintenance was approaching $100,000 per boat, per year to keep them running 90% of the time."

The final fit and outfit of any vessel is of course depending the particular client's need, but Clark highlight the speed and the pumping capacity as central to their success. In addition, the Houston vessels feature a data link camera system that is designed to work with local police, police helicopters and other first-responder agencies, in order to deliver a homogenous and consistent picture of the situation to all parties, and to allow the crew to gather data and initiate preparation enroute.

The 70 foot fireboats are a step up from MetalCraft's 50-foot fireboats, which are 35 knot boats wih pumping capacities in the 7,000 to 8,000 gpm range. "Simply put, there physically was no more space to put pumps on the 50 foot boat," Clark said.

Future Challenges

While MetalCraft has enjoyed a good run, it is not immune from standard challenges to running an efficient company, and according to Clark the company's challenges are hardly unique in this sector: The finding and retention of qualified technical talent. While the challenges may not be unique, some of the solutions employed certainly are, including:

A 4-Day Work Week

• "We went to a 4-day week this year. The concept behind it is greater retention of employees; as it really helps out young families that don't make a fortune to save money on child care, for example."

Health Care

• "We still don't have a health plan in NY. Our company (in Canada) pays 0.98% of payroll to cover the basic health costs for our employees. On top of that we have a benefits package that covers their drug plan, their dental and vision ... and it costs a family $50 for coverage."

Training

• "A Training program that we did with St. Lawrence College was a unique as it was an R&D program as well as a training program on new technology welding machines. We didn't feel that we were maximizing the high technology capabilities of these machines, so we conducted a study and re-wrote all of our welding procedures, which are in accordance with ABS standards" and trained its workers to the new standards

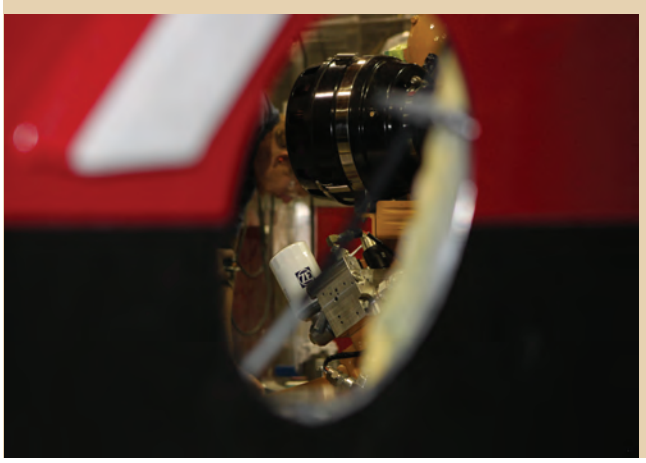
Apprenticeship Program

• Another big thing that we just started was the New Zealand Boat Builders Apprenticeship program. We started just this month, but to get it rolling it took 1.5 year in planning.

We hired a course instructor that works part time; he's a wooden boat builder and lives on Wolfe Island (Wolfe island is the home to MetalCraft Marine's R&D center, situated and connected by ferry two miles from the Kingston, Ontario facility, and a half-mile from the Cape Vincent, NY facility). We set up a classroom on Wolf Island making it equally accessible for U.S. and Canadian guys. Today we have 17 enrolled, with a maximum capacity of 20 to 25 for now."

ZF & MCM: A Strong Parntership

ZF gears pictured onboard an impressive new 70 ft. fireboat under construction at MetalCraft Marine.



ZF Marine is a leader in marine propulsion systems, and it has enjoyed a long and mutually beneficial relationship with Kingston, Ontario based MetalCraft Marine in providing transmissions for the boats they build. In fact ZF has built its marine business on a strong presence in the high speed, high performance boat market, and this extends to a long cooperation with the U.S. Coast Guard, and most recently its FRC project.

"ZF has a long history of supplying mairne propulsion systems to the Coast Guard," said David Santos, ZF Marine. "The 12 vessels under construction at Bollinger are very important to us. Being part of the U.S. defense is an honor for us." Earlier this year, the USCG vessel Bernard C. Webber, the first of the new 154-ft. Sentinel Class Fast Response Cutters (FRC), was commissioned at Coast Guard Sector Miami. ZF Marine provided two ZF 23560C Marine Transmissions for each vessel. The ZF 23560C is only the latest in a long line of ZF Marine transmissions that have served the US Coast Guard over the last 27 years. The first were installed in the 110-ft. Island Class patrol vessels back in 1985. Since then, ZF Marine has supplied transmissions to the US Coast Guard for nearly 10 more vessel applications. Today more than 200 US Coast Guard boats and cutters are sailing with ZF Marine transmissions.

"Future growth for govt. business is a major part of ZF's strategy in the marine industry. We believe there is a good opportunity," said Santos.

Bollinger Means Business

Chris Bollinger sets the table for an exciting 2013 & beyond.

By Joseph Keefe

Maritime Reporter caught up with Chris Bollinger on a recent trip to the Gulf Coast for the October 26, 2012, christening of Bollinger's latest newbuild; the first two of four tugboats in Crowley Maritime's ocean class series, Ocean Wave and Ocean Wind. Directly on the heels of those two hulls are the next in series; Ocean Sun and Ocean Sky. The event, attended by more than 250 guests and employees from both the Crowley and Bollinger families, underscored the upbeat mood at the diverse, Gulf Coast shipbuilding and repair group.

The most visible manifestations of the recent uptick of business at Bollinger include the U.S. Coast Guard Fast Response Cutter (FRC) program, the ongoing Crowley series newbuild effort and the recently announced Hornbeck Marine retrofit program, a project that will upgrade and stretch six of its 200 class DP-1 new generation OSVs into 240 class DP-2 OSVs. The Bollinger group, spanning 10 different U.S. Gulf Coast locations, clearly has its hands full, but Chris Bollinger, Executive Vice President, isn't complaining. "I haven't been this excited about domestic shipbuilding in a long time."

Above
Crowley Ocean Class DP2, Boats 3 & 4, Ocean Sun and Ocean Sky coming down the erection lane at Bollinger Marine Fabricators

Manufacturing Efficiency & Productivity

Bollinger said that shipbuilding at the companies yards has evolved into "manufacturing." He explains, "Bollinger has been building ships for over 65 years and we have continuously focused on improving our processes to increase efficiency and productivity. In our shipyard we define the manufacturing process through the many manufacturing workstations that allow us to progressively build our vessels. Each workstation has a very specific function where we attempt to standardize the work content at that workstation. By taking this approach it allows us to capitalize on moving the work to our people, rather than moving people to the work." He adds, "We determined that once we established a standard way of manufacturing a component of a vessel, regardless of type or size of the vessel, we could eliminate waste and reduce man-hours, which is the most critical aspect of the manufacturing process."

The manufacturing process at Bollinger is clearly an important ingredient to its success. Chris Bollinger concedes, however, that workforce development may well be the most important part of his business plan. "It is true that the development of a skilled workforce is our most important focus today in order to meet the future demands," he said, "and at Bollinger we are always exploring new opportunities for workforce development. We begin this process by visiting with middle schools, high schools and vocational schools to inform students and get them interested in a career with Bollinger Shipyards."

The company's recruitment efforts include participation in the development of a standardized ship fitting boot camp, the National Maritime Education Council, administering apprentice programs for adults and for high school students that teach skills necessary shipbuilding skills, providing extensive paid on the job training for skill development and working with Louisiana Economic Development's Fast Start division as well as other government agencies to explore other opportunities to attract and develop and retain a skilled workforce.

Casting a Wide Net

Bollinger Shipyards perhaps have one distinct advantage in the competitive Gulf Coast build and repair game. In terms of geographic presence alone, Bollinger may have no rival, giving the firm opportunities to serve a wide range of what Chris Bollinger characterizes as "opportunity jobs." That, by itself, itself isn't enough, and Bollinger knows it. "Our 10 facilities service a diverse customer base, ranging from the Coast Guard to inland operators to offshore operators in the Oil & Gas industry, as well as bluewater operators. Our 28 drydocks alone give us the ability to accommodate customers in a variety of marine industries. Our facility utilization is directly affected by the activity in the industry, and we do see an uptick in our utilization and

backlog, based on predicted increase in activity in the Gulf of Mexico."

Bollinger aims to continue that trend. He adds, "We continue to invest in the future, replacing aging tonnage, modernizing facility infrastructure, and working with our customers to better understand their needs. Our Quality and HSE programs are paramount, and we use this as a precision tool with our customers to insure that we get it right, the first time." He reports that its Fourchon location was active with inquiries and commitments for several vessels and jack-up rigs scheduled to enter the facility for repairs.

Upbeat about the Uptick

Chris Bollinger's optimism is well-founded, as he explained. "The shipyard industry experienced a lack of orders for domestic shipbuilding after the BP accident, and customers were hesitant to place new orders due to political climate and Administration's policies. Deepwater and shelf optimism has returned, and many of the operators have placed multiple contracts for multiple large OSV's. Other markets such as the Inland waterways and River market continue to replace tonnage. Markets such as the oil transportation sector once again are looking at future transportation modes and the development of the fleets for the future. With all of this positive activity, domestic shipyards are filling their capacities with backlogged work into the foreseeable future."

The "S" Word

Sequestration, or as Gulf Coast shipbuilders call it, the "S" word, is the proverbial 600-pound gorilla in the room. It costs money to put together a competent bid, and when awards don't materialize as promised, it can cripple a firm too closely tied to government work. Bollinger is well aware of these realities, and brought up a few more. "First of all, sequestration is a huge concern for all involved in government contracting. This will not only impact shipbuilding, but can cripple our defense and homeland security departments' abilities to perform their duties in protecting our nation. For the last 30 years, Bollinger has been blessed with steady work from both the commercial and government markets. Much of the balance is dependent on customer needs at that time. Government contracts tend to have long lead time from development of need, to proposal effort, through to award and construction. Plenty of time and money are involved in the Government proposal effort. On the other hand, commercial proposals and contracts can be developed and awarded much quicker. It is nice to have a balance of both government and commercial work. There have been times when our entire backlog was all Government work, and other times when it was all commercial work. A unique capability of Bollinger is our ability to perform Government and Commercial work in the same yard at the same time."

OPC: Bollinger, the Quiet Company

The race to build OPC is on, but Bollinger, having announced its team, isn't saying much else. Where others have been increasing vocal about their entries, Bollinger has taken a noticeably lower key approach. The Bollinger team, nevertheless – Damen (proven, durable hull forms) and Gibbs & Cox for design (extensive U.S. government, Coast guard and U.S. Navy experience) – will present a formidable case to the Coast Guard's decision team. Bollinger would say only, "We are excited about the OPC program and our team, but it is hard to comment too much as there is a competition going on."

Notwithstanding the tight-lipped position on OPC at Bollinger, the Gulf Coast boatbuilder appears to be as well-positioned as anyone for the prize. Looking at the FRC program, for example, and with 18 hulls under contract, three already delivered, and 10 more in production, Bollinger is more than proving its mettle in the race.

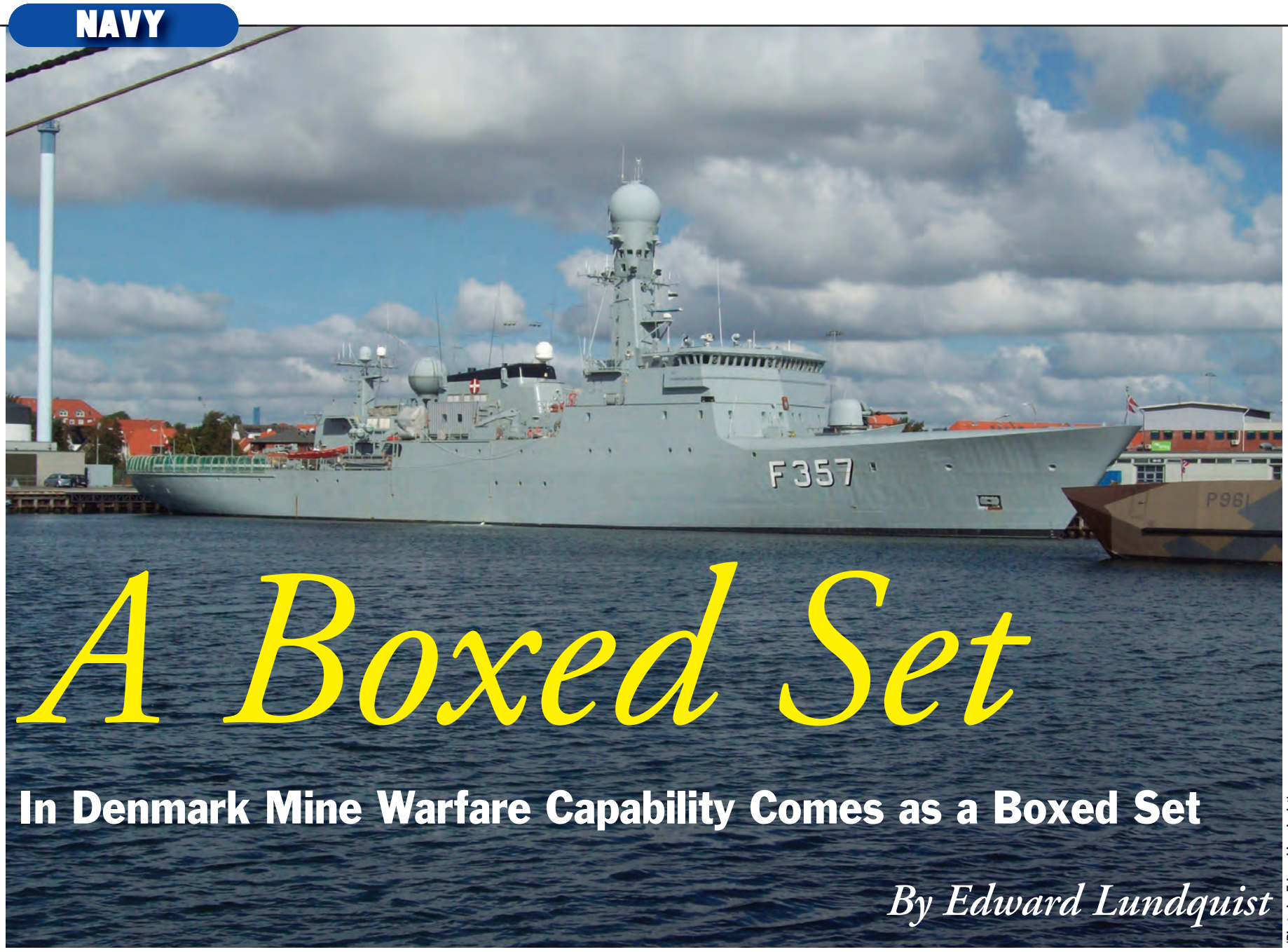
Family Business

A prominent theme that emerged during October's Ocean Class christening ceremony was the "Family" metaphor shared by both the Crowley and Bollinger families. For example, Chairman and CEO Boysie Bollinger talked of building a family "Brand," leveraging the longevity of both firms. For his part, Tom Crowley made sure that the officers and crew of both vessels had a special and prominent place in the day's festivities. After the ceremony, Chris Bollinger reflected on those values and offered, "Bollinger Shipyards is about family. Not only a Bollinger family business, but our employees and customers are our families. This is the atmosphere created by my grandfather, and this philosophy continues today. It's about treating people with respect. It's about ethics and values. It's about character – doing the right thing when no one else is looking."

Internally at this Bollinger, that philosophy seems to alive and well; paying dividends on a daily basis.

"I haven't been this excited about domestic shipbuilding in a long time."

Chris Bollinger



(Photo by Edward Lundquist)

A Boxed Set

In Denmark Mine Warfare Capability Comes as a Boxed Set

By Edward Lundquist

The Danish Navy is the expert when it comes to flexible, modular combat capability. It created the StandardFlex modules for the Flyvefisken class of patrol vessels in 1995 that was built specifically to operate with the containerized modules. But Denmark is no longer facing a Cold War threat to its waters. Instead, it is assuming a broader role involved in international partnerships and coalitions. The Flyvefisken-class has been retired. Today, the new ships of the Danish Navy, including the Absalon class of flexible support ships, Iver Huitfeldt-class-frigates and Knud Rasmussen-class Arctic patrol vessels are all designed for combat capability in containers. In some cases, they are the very same containers that sailed about the Flyvefisken-class.

ABOVE
HDMS Thetis, a Danish frigate normally assigned tio inspection patrols off Greenland and the Faeroe Islands, is carrying two modules for MCM Denmark. The Command and Control (C2) Module is seen here just below the red circle with the white cross.

Mine warfare is still important to Denmark. So while the Flyvefisken-class fitted out with MCM mission packages is no longer operating for the Danish Navy, the capability is still available to be utilized aboard other platforms.

Lieut. Cmdr. Kristian Hansen is the commanding officer of MCM Denmark, and is responsible for mine countermeasures against mines and ammunition at sea. The Danish Navy uses containerized command and control (C2) facilities, diving equipment, specialized surface craft and unmanned underwater vehicles to conduct mine warfare as part of MCM Denmark. "We conduct operations to fulfill our national and international obligations," Hansen says. "But we must be able to do our own MCM in home waters." The last of the Flyvefisken-class STANFLEX 300 ships, which performed mine warfare missions, were decommissioned three years ago. Today, the Danish Navy has taken a new approach to mine warfare.

Hansen's MCM Denmark command includes the MCM Staff, and two 14-person detachments, Team Alfa and Team Bravo. It includes specialized ships, 20-foot containers with command and diving capabilities, and their offboard systems to find and destroy mines. "I am in command of all the people, the containers, the ships, and the systems."

The MCM system is operated from a 20-foot C2 module, which can be fitted aboard a host ship. For the purpose of the recent DANEX / NOCO 2012 exercise, Hansen's command center —along with a diving module—is aboard HDMS Thetis, one of Denmark's inspection frigates used for patrolling the remote waters around Greenland and the Faeroe Islands. "These two containers, one on each side of Thetis, are the only two we have at the moment."

The command can provide four different packages. It can bring the entire package with the CTU (commander task unit) staff, along with its command module and diving module, as well as the MSF ships with sidescan sonar and the MSD ships with the remotely operated vehicle (ROV), called the mine demolition vehicle (MDV).

"With package 2 we can operate from another platform, without the staff or command module," Hansen says. "With the third package, we can place the module on land and operate from shore. We work with Danish EOD, who can work in very shallow water, inside the harbor, for example, while we use our vehicles outside the harbor within the approaches to the port, with command and control from land. Our fourth option is to bring our MSD or MSF ships to operate independently." In that case, we're on our own," Hansen says. The ships have a range of about 500 miles. If needed outside of Danish waters, it's possible to transport them on a heavy lift ship for international operations. The MSD and MSF ships are small but have comfortable accommodations. The CO has a single, all other s are two bunks to a stateroom. They have a small galley for "self cooking."

Remote Control of Mine Hunting Vessels

MCM Denmark currently has two MSDs and four MSFs. The 95-foot, 98-ton MSDs each carries a remotely oper-

(Photo by Edward Lundquist)

"Things are happening very fast on these small ships."

Lieut. Cmdr. Kristian Hansen,
Commanding Officer of MCM Denmark

ated MDV. They are known as the Holm class, with the two ships being the Hirsholm and Saltholm. The MSF is 104 tons and 79 feet long.

The MSDs and MSFs can work in teams, directed by the command element in the modules aboard ship. Both the command and diving module can be installed on the Absalon, Thetis, Sea Supply, Knud Rasmussen- classes, the transport HDMS Sleipner, chartered vessels fitted with container positions, or mounted on trucks. The C2 container can control up to two MSFs at one time, and each MSD can control one MSF at a time. "We can link the MSF with the MSD up to about 16 km. With a satellite we can get a better link, and operate a further distance from the mother vessel and keep us out of the danger areas," says Hansen. The ships can operate with all-enlisted crew. "The crew members are familiar with all of the boats, and could go out on any one of them based on mission requirements and crew and vessel availability."

The boats have a pair of 8-cylinder Skandia diesels, as well as two auxiliary diesels, and two Azipod propulsion systems. "On a good day we can do 13 knots, but we usually do 10 knots," he says. "We're looking at a system with less noise," Hansen says.

The ships are made from composite material, but they have degaussing system to compensate for any magnetic metallic objects on board.

The last of the 14 StandardFlex patrol vessels to serve in the Danish Navy is HDMS Søløven is now an unarmed diving support vessel.

The slightly smaller MSF tows a side scan sonar, which remains at a depth of 6 to 9 meters above the sea floor. There is a blind spot directly beneath the vehicle, but the sonar can provide an image of the bottom for between 45 to 90 meters on either side of the 8 meter blind swath where the sonar can't see.

According to Hansen, the system can provide a "Q route"—a path that is free from mines that ships can follow— in several passes.

"We can classify contacts from the sidescan sonar picture on the MSD or onboard the C2 container. After classifica-

(Photo by Edward Lundquist)

MCM Denmark employs MSD and MSF ships to find, classify and neutralize mines.

tion we use the tethered Saab Double Eagle 2S ROV from the MSD for identification. "The ROV are able to provide us with live video and sonar images during identification. We're happy with the Double Eagle MKIIS. It's amazing what it can do," he says. "We're also looking at autonomous solutions."

Saab is the underwater integrator. "The integration works quite well," Hansen says. "We're happy with it."

Once we identify and classify a contact and send that information to the MSD, the MSD will launch the MDV (mine disposal vehicle), which will take a picture of it with its nose mounted sonar and camera. The MDV can carry and deliver the Nordic Defense Industries DAMDIC (Danish Mine Disposal Charge), a command detonated 30kg explosive charge that destroys the mine.

"We use the ROV to carefully drop the DAMDIC close to the bottom mine. Then we get the ROV clear of the area, about 250 to 300 meters, and detonate the charge, which detonates the mine.

There are five COTS windows-based work stations aboard the MSD. "The ship has the same consoles as in the command module," Hansen says. "Controlling drones can be accomplished from any of the work stations on the ship."

The crew on the MSD can monitor engine temperature, oil pressure and fuel

levels, turn the lights on and off on the MSF, all remotely. "We practice operating them in remote. If we are controlling two drones, we need five people. If we have just one drone, we can do it with four. We even transit to our operating area with the MSFs unmanned and under remote control because it's more comfortable for the crew to be on the other ships," he says.

"You need the crew on the MSF to launch the offboard vehicle, but then you can take the crew off and put them on the MSD or Thetis and they can operate the vehicle remotely," he says. "That's modularity." "We have to maneuver the vehicle it back to the ship without hitting anything," he says. "To recover the vehicle, the ship has to remain steady. It's quite doable in seas up to a meter and a half. To help identify mines or mine-like objects, the MCM team can submit data to the Mission Support Center ashore, and its extensive database.

Diving container

The other module installed aboard Thetis for DANEX / NOCO 2012 is the diving module. "It's built to accommodate four divers with all of their gear and support equipment. But we currently have seven. They use the Interspiro IISMIX rebreather developed for MCM diving. It's non-magnetic and weighs less than 12 lbs. The tanks are all composite, made from Kevlar. All of the gear—from the diving knife to the wetsuit zipper—is also non-magnetic, made from plastic, rubber or titanium. The container itself is temperature and light controlled inside to protect the equipment from the elements and deterioration. "The ultraviolet rays would harm the rubber."

We always used mixed gas for MCM diving. We have two mixtures we use. Red is the standard Navy mixture, but we can also use Green mixture. It depends on how deep you're going to go.

Divers were involved in the design and construction of this container. "This container is made for diving. MCM and EOD divers have had input from the beginning. The MSF and MSD can transit to a mission area, and the MSF it can go into or on top of an unknown minefield, as far as our link-distance permits—six to nine nautical miles—and search an area with sidescan sonar. When we have a picture of all the objects on the ocean floor and have located a mine we launch the MDV from the MSD from a distance that is safe as possible for all personnel.

Hansen says the training environment in in and around Denmark is very challenging, but realistic. "We can train with WWII mines here. There are lots of mines here to practice on, but we also need to work with the newer threats that we can expect to see in real-world operations. The DANEX/NOCO 2012 exercise was successful, he says, and the MCM Denmark concept development is processing very well. The modules aboard Thetis performed well, as did the remote operation of the MSFs. "We are getting better every time we go to sea. We are very pleased. It was good, realistic training. As we were also conducting operations as part of the Baltic Ordnance Safety Board (BOSB) ongoing MCM operation in Baltic region, we not only located and destroyed three exercise mines, but 10 WWII mines, as well." Hansen says this is an interesting time in the Danish Navy and MCM. "There are a lot of new systems and concepts." And, he says, even though mine warfare is slow warfare, it's going quite quickly for the people doing it. "Things are happening very fast on these small ships."

NAVY

Navy Tech

In Paris Navy Technolgy Takes Center Stage

Many commercial marine products evolve from military roots. At Euronaval last month in Paris, contractors large and small from around the globe showcased new and emerging technologies.

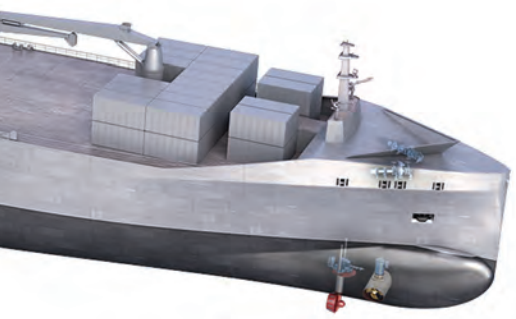
According to General Electric, there is a new era dawning for naval engineering and propulsion. “I’ve seen the future of naval propulsion, and it’s electrifying,” said GE Power Conversion’s Captain Mark Dannatt Royal Navy (retd.), speaking at Euronaval.

Capt. Dannatt’s comments came as he outlined the latest advances in advanced naval electrical technology from a GE perspective. The world’s navies are not exempt from these operational, financial and environmental imperatives—in fact, they often are more exposed to the scrutiny of politicians, taxpayers and an environmentally aware public than some of their commercial counterparts.

Against this background, Captain Dannatt believes that we have entered the age of electrically powered and propelled warships and support vessels. “It’s increasingly common for naval ship designers to be directed to give increased weighting to through life costs of naval ships including fuel consumption and routine maintenance costs based on their selected power and propulsion options,” said Dannatt. “These studies often conclude that some form of electrical propulsion is worthy of further investigation based not only on fuel and maintenance costs but also on the consequential impact on improvements in ship availability and extended operational autonomy.”

GE’s Power Conversion business provides complete power and propulsion system packages, including prime

Rolls-Royce announced a new team focused solely on Naval Ship Design. One design: a 9,000 to 25,000 dwt replenishment ship, based on the Rolls-Royce Enviroship concept.



movers, power generation, electrical distribution and fixed or variable speed drives, including motors for propulsion, thrusters and specialist applications.

The company's expertise in ship power and propulsion systems ranges from the manufacture and supply of power generation systems to integrated full electric propulsion systems and, increasingly, hybrid propulsion systems.

Synapsis Command Bridge

Raytheon Anschütz developed a solution for OPV's, smaller Naval and Coast Guard vessels. In Paris, the Synapsis Command Bridge was launched as a combination of commercial-off-the-shelf navigation with Command & Control capabilities to a new, homogeneous bridge system. The Synapsis Command Bridge aims to provide a solution that not only includes the Synapsis Integrated Navigation capabilities but also transfers enhanced Command & Control (C2) capabilities from the Raytheon Anschütz' SmartBlue surveillance system to a new sea-based application.

"The Command Bridge comes as a scalable 'off-the-shelf' solution which is standardized to save unnecessary non-recurring engineering costs while at the same time remaining flexible enough to accommodate different sensors and weapon systems appropriate for different missions," said Thomas Lehmann, System Engineer, Raytheon Anschütz. "Smaller vessels such as OPV's and Fast Attack Crafts without requirements for a dedicated combat information center can be easily equipped to handle a variety of threat scenarios and missions efficiently and effectively."

The bridge system is equipped with multifunctional workstations that unify the radar, ECDIS, conning, and C2 to single service oriented applications with a standardized user look and feel for monitoring, control, data and alert management. Whereas the tasks of radar, ECDIS (or WECDIS), and conning display are essential for navigation and IMO compliance, the C2 including electro-optic sensor (EOS) and weapon control significantly enhance the capabilities of the new system solution.

The Synapsis Command Bridge also includes flexible interfaces for rapid integration of sensors to detect, track and identify contacts as a premise for military situational awareness and surveillance requirements. This helps to realize customer-specific solutions and to add, replace or remove individual sub-systems and components - such as small target trackers, 2D radars, ESMs or sonars – with changing operational needs.

A good example for the requirement of a Command Bridge is the SeaStriker 22, which was recently launched by shipbuilder RiverHawk Fast Sea Frames of

Command Bridge installation on-board RiverHawk SeaStriker 22.

Tampa / Florida. The SeaStriker 22 is a 22 meter fast patrol and interdiction craft designed to counter asymmetric threats and to support various littoral security missions such as anti-piracy, offshore and near-shore interdiction, protection of harbors and offshore structures, anti-smuggling operations, police duties as well as search and rescue tasks. Whereas the ships needs to cope with various, potential rapidly changing missions and also to interact with other afloat and airborne platforms, as well as C2 elements ashore, there is the need for an integrated bridge solution that takes limited bridge space and small crew size into account. The vessel is equipped with a first fully operational Command Bridge.

Finely Focused on Naval Ship Design

Rolls-Royce announced that it has broadened its capability in ship design with the establishment of a new team dedicated to the development of naval ship designs. The new team will aim to develop vessels for navies, coast guards and other maritime agencies, including variants of the Environship merchant ship concept, will leverage technologies from commercial Rolls-Royce ship designs and products, adapted and integrated for the specific requirements of naval operations. One of the Rolls-Royce designs includes a replenishment ship for refueling and supplying naval fleets and is available in the 9,000 to 25,000 dwt range. The design is based on the Rolls-Royce Environship concept, featuring a wave piercing bow and hybrid electric propulsion system which increases operation efficiency while reducing fuel consumption. The design team will focus on offshore patrol vessels (OPVs), survey ships and support vessels, rather than combatant ships such as frigates and destroyers.

In a separate but equally relevant announcement, the company said **it will develop a new mini waterjet designed to propel unmanned surface craft for the US Navy. The new water jet will be the smallest Rolls-Royce design to date, with a diameter of just 100 mm**, and will be designed to quietly propel the craft through the water on remotely controlled missions that include intelligence, surveillance, and reconnaissance. Rolls-Royce will develop the water jet part of the innovative small propulsion system, part of a US Government funded Small Business Innovative Research (SBIR) project led by Candent Technologies Inc.

"Unmanned craft are a fast growing and exciting part of naval marine technology and we're delighted to be working with Candent and the US Navy in developing this groundbreaking propulsion system," said Dennis Duke, Rolls-Royce, Advanced Programs Director - Naval Marine Inc. "We are developing and adapting our world-leading water jet technologies as part of a highly efficient propulsion system which will enable these advanced craft to go about their duties criss-crossing waterways and oceans, often for months at a time."

Known as MUSCL, the US Navy's Modular Unmanned Surface Craft Littoral, is an X class unmanned surface vessel, designed to reduce risk to manned forces and perform tedious and repetitive surveillance tasks. The water jets will provide thrust to move the craft at speeds in excess of 25 knots as well as sustaining a cruise speed of 15 knots.

Production on New Finnish OPV

Late last month STX Finland Oy's Rauma Shipyard started the production of next generation offshore patrol vessel to be built for the Finnish Border Guard. The start of production at the Rauma Shipyard was carried out following traditions. Chief of the Finnish Border Guard, Lieutenant General Jaakko Kaukanen pressed the launch button. The event held in the steel construction hall was witnessed by the representatives of the Finnish Border Guard, the Finnish Environment Institute, STX Finland and the classification society Germanisher Lloyd. In addition to border safety and frontier supervision missions, the offshore patrol vessel, scheduled for delivery in November 2013, can be used for search and rescue, military national defense and various underwater assignments both independently and in collaboration with other authorities. The ship will also feature substantial oil recovery capacity with important meaning for maritime oil recovery capabilities of Finland and the Baltic Sea region. The vessel measures 96 x 17 m and incorporates the latest technologies and environmentally friendly innovations in accordance with the Government decision-in-principle on sustainable public procurement. The ship is equipped with machinery using liquefied natural gas (LNG) and diesel as fuel.

Participants at workshop make multiple radar contacts

Sea Giraffe Radar Users Meet in SD

By Edward Lundquist

Naval radar experts met in San Diego to share their expertise and experiences with the operation and support of the Saab Sea Giraffe naval surveillance radar. The workshop enabled the participants to make contacts and develop working relationships with other naval experts involved with the operation and support of the Swedish-made system, and create a clearer picture of the current state of the radar and its development.

The Sea Giraffe search radar is been installed on surface combatants, including frigates, corvettes, patrol boats, and the littoral combat ship, and is in service or selected for installation with 12 navies around the world.

Capt. Bo Wallander, RSwN (Ret.), explained the evolution of the Giraffe Land Radar and Sea Giraffe naval surveillance radar, and the models and various improvement that have brought about the current Sea Giraffe AMB. Wallander then laid out the company's vision regarding the next generation of developments. Wallander said navies have different requirements. For example, he pointed out Sweden has a unique—indeed extreme littoral—operating environment with a long coastlines, thousands of islands, fog, rocks and civilian traffic on the Baltic Sea. But, he said, there are some very similar needs they all share. "We all think about the sensor-to-shooter kill chain solution."

Saab team at the Surface Navy Association West Coast Symposium at Pier 2, Naval Station San Diego, with the Sea Giraffe radar demonstrator.

(Photo by Edward Lundquist)

Although most observers will agree upon the importance and dependednce upon radar for naval and maritime opeerations, Wallander said radars and the relationship to other systems are often misunderstood. "Radar always gets blamed, even if there is another problem," he said.

The ability to have minimum reaction time between detection and engagement is critical, he said.

While there is a desire for more capabilities, reliability and affordability are still very important customer considerations, Wallander said.

"There is a high degree of interest in Saab's Radar "road map" for future naval radar product development, such S Band," said Capt. Jon Kaufmann, USN (Ret.), responsible for naval domain programs for Saab North America.

Kaufmann said the forum was intended to accomplish three goals. "We want our customers to hear from us; and we want to hear from them. Just as important, we want the representatives of the different navies here to talk to each other so they can compare notes and share lessons learned."

"There was interest in improving troubleshooting procedures, including the software and hardware tools available to support the radar," said Kaufman. "We noted interest in having the ERES (Extended Radar Evaluation System) laptop to record radar video for trouble shooting both locally and remotely using distance support. The ERES is currently used by Saab technicians, but the users feel it would useful for them to have this capability as well."

Ted Ackerstierna, head of naval domain marketing and sales for Saab Electronic Defense Systems in Gothenburg, Sweden, said the importance of the workshop is to improve Saab's awareness of the user experience and address any shortcomings, which also helps Saab develop further improvements to the system.

Members of the Saab technical staff were present and available to answer questions and respond to problems.

The great advantage of the users' group, from Saab's point of view, is that it gave the Saab engineers a better idea of how the users viewed their radar.

"The users' practical knowledge and familiarity with systems employed aboard actual naval vessels is of tremendous value to Saab, and to all of the navies that share this system," Ackerstierna said.

Ackerstierna said it's important for Saab to learn what features are desired by customers so they can be evaluated for inclusion in future versions of the Sea Giraffe family.

Breakout sessions were held to discuss logistics, maintanence and operations.

The participants conducted a productive two-way dialog on Saab's spectrum of logistics support options, including analyzing mean time between critical failures, and full Integrated Logistics Support (ILS).

"Our Operational Availability group discussed spare part availability and par-

ticullary the time to get a spare part, said Jörgen Andersson, title. ”We all agreed that this is essential and can drive the requirments and needs for spares onboard.”

”We gave the customers a lot of useful information in a broad spectrum,” Andersson said.

Author and naval analyst Dr. Norman Friedman delivered the opening day keynote address on current trends in naval radars, sensors and combat management systems. “There seemed to be broad agreement with Dr Friedman’s thesis that near term radar advances would be made primarily using software modifications and upgrades rather than hardware, such as new antennas,” Kaufmann said.

“Often those who develop a product or system do not realize its full potential,” Friedman said. “I left the meeting feeling that the radar can do a lot more than Saab engineers realized it could, particularly in the area of radar deception.

Naval radar development is somewhat dependent on computer processing power. Friedman said computing power has progressed steadily, a phenomenon called “Moore’s Law.”

Friedman said Moore’s Law is driven by economics. ”If there isn’t a lot of money in faster chips, then it comes to a screeching halt.”

Friedman also noted that where before different radars were known to emit at certiain frequencies and pulsewidths and repetition rates, today radars employ software to operate in ”multipurpose/multimode just about all the time.”

Changing these parametres means a radar can emulate something else, making it harder to identify and counter. ” Combat management and radar management becomes the same problem.”

He also discussed how radars can be moderized without a complete replacement of hardware. ”You don’t change the antenna, you change what it produces.”

Sharing experience in employing the radar, participants from the navies suggested improvements such as modifications tothe radar control panel, specifically to allow more flexibility in start-up and shut down procedures, or a simplifying the different pull-down menues available to the operator.

“A U.S. radar engineer explained why it was important that the enormous versatility of the radar be reduced (for the operator) so that he could set it up using only one button,” Friedman said. “The operators in turn got a much better idea of the potential the radar offered. Moreover, everyone present got a better idea of the differing operating practices of the navies involved. I would hope that inspired those from the different navies to think about what they could do with this radar that they had not been able to do with earlier, less capable or less flexible ones.”

While each of the navies represented at the event have vastly different missions, operational concepts and operating environments, there seemed to be a general agreement that ”multi-mission capability, such as offered by Sea Giraffe, was the best solution.

Each navy gave a presentation on their mission and employment of the Sea Giraffe radar. Breakout sessions covered new capabilities; creating a supply chain support taskforce; and improving documentation for the logistics reporting system.

“It is productive to come together to talk navy-to-navy to discuss operational and technical issues,” said Cmdr. Bo Berg, head of naval procurement for the Swedish Navy.

Maritime Mentoring

By Murray Goldberg

There are very few forms of learning which are as effective and personal as mentoring. And nowhere is mentoring more important than it is in the maritime industry. It is with this in mind that a group of volunteers have created the online "International Maritime Mentoring Community" at **www.MaritimeMentors.com**. This is a 100% volunteer/free site that exists only for the betterment of the maritime industry. If you are a maritime worker, are considering a job in the maritime industry, or if you represent a maritime college or maritime employer, the site is here for you.

This article is an invitation of sorts. An invitation for experienced mariners and shore-side workers to give back to their community by volunteering to mentor an aspiring or progressing maritime employee. It is an invitation to young people considering a maritime career or those whose career progression choices could benefit from the sage advice of someone who has "been there before". It is an invitation to maritime colleges and maritime employers to set up a presence on the site and offer guidance. It is an invitation for the entire maritime community to come together and support one another for the betterment of the industry as a whole. The industry needs you. Oh - and did I mention that being a mentor takes no special experience (other than maritime experience), requires very little time, and is incredibly satisfying? Just ask anyone who has been a mentor.

Why Do We Need e-Mentoring?

The benefits of mentoring are deep and varied. Mentoring helps with recruitment and onboarding in a new profession. It is a strong form of knowledge sharing. It can contribute to worker retention in the industry, and it contributes greatly to skill development. Mentorship helps people navigate career path choices, understand what it takes to advance and perform, and gives them an insider's view not generally otherwise available.

Being a mentor has its benefits as well. Aside from the global goal of contributing to and improving the maritime industry, being a mentor can be personally very satisfying. It can extend your professional network, and can even provide opportunities to recruit the best and the brightest. Although mentoring relationships can take a variety of forms, the most traditional (and a very effective) form of mentoring is face-to-face mentoring. However, despite the prevalence and effectiveness of in-person mentoring, its applicability can be limited in the maritime industry.

The problem is that opportunities to interact face-to-face with a maritime mentor are rare due to the isolation of being at sea and the small size of most crews. Add to this the diversity of languages sometimes spoken on-board, and the fact that potential mentors are, more and more, burdened with paperwork and other activities while on-board, opportunities for mentoring junior crew are rare and becoming rarer. Compare a maritime career to a traditional shore-based occupation such as being a teacher or accountant. These professionals typically have access to hundreds of potential mentors in their office and through bodies such as professional associations which meet regularly. Mariners do not.

When mentoring in the maritime industry does happen, it often occurs between people serving on the same vessel, and is typically short-lived because one of the participants sooner or later ends up on a different vessel or different shift. This is a problem because mentoring relationships are most valuable when they are long lived, and when the mentor is not in a position of influence over the protege. Also, on-board mentorship opportunities do not begin until the mariner is actually on-board, yet mentorship can be very useful well before that time. It would be wonderful if new workers and trainees had access to a larger and more stable community of peers and mentors. The world needs more qualified mariners and the availability of a welcoming community where connections can be made and answers can be found will contribute to the fulfilment of that goal.

Fortunately the web has, in the last few years, provided a mechanism for those not physically co-located to interact with one another. That technology can be used to support mentoring relationships - a form of mentoring called e-mentoring.

What is e-Mentoring?

Web-based mentoring (or e-mentoring) is simply mentoring which is facilitated by a web-based application. The main idea, of course, is that traditional mentoring relationships are constrained by time and distance - the mentor and protege must meet at a time and location available to them both. This greatly limits the opportunity to find mentors and maintain a mentoring relationship.

E-mentoring overcomes these barriers. It provides tools for mentors and their proteges to interact without having to meet face-to-face, or for that matter, without even having to be available at the same time. This greatly increases the domain of available mentors for a protege since the mentor could be located anywhere in the world (even in a significantly differing time zone), as long as both parties have reasonable internet access. While it is true that not all mariners do have reliable and continuous access to the internet, the numbers are growing and most certainly have reached a point where e-mentoring is more than viable.

Another benefit of e-mentoring is that it greatly increases opportunities for group and peer mentoring. Group mentoring

can greatly improve mentoring efficiency, allowing one mentor to accommodate more proteges. Peer-mentoring enables the exchange of knowledge and experience allowing proteges to learn from one another. In the past, these forms of mentoring have been especially difficult to engage in because the constraints of time and distance are even more difficult to overcome when there are more than two people involved. E-mentoring, because it removes the constraints of time and location, makes group-based and peer mentoring no more complex than one-on-one mentoring

Aside from the difference in how they are conducted, the nature, outcomes and effectiveness of the mentoring interactions are the same for e-mentoring and traditional (face-to-face) mentoring. The only real difference is that e-mentoring interactions are far more flexible in nature, and the field of potential mentors is infinitely larger. Both are good things.

Can E-Mentoring be Personal?

Mentoring relationships - especially the good ones, are very personal, trust-based relationships. The mentor and protege come to know each other very well, come to appreciate one another's concerns and aspirations, and sometimes reveal information they would tell few other people. As such, it is reasonable to ask whether e-mentoring interactions which take place on-line could ever facilitate the same level of "intimacy" as face-to-face interactions. In other words, can e-mentoring be personal?

The answer is a resounding "yes". If the social technology revolution has taught us anything over the last 5 or 10 years, it is that people most certainly can form and sustain personal and professional relationships on-line. Not everyone has experienced this yet (including possibly many readers), but it is very true. After all, the necessary ingredient enabling the formation of a mentoring relationship is a pair of compatible people who intend to form such a relationship. Whether they see one another in person, speak using the telephone or skype, or write their comments in e-mail has little effect on their ability to convey their message. As such, why would it have an effect on their ability to effectively engage in a mentoring relationship? It doesn't. Much like comparing on-line and face-to-face learning, we find that each form of mentoring relationship has its benefits and limitations, but both can be very effective.

A Community is Launched

When the idea of a web-based mentoring community was proposed, I felt as though I would be fortunate if 10 or 15 experienced mentors supported the idea and agreed to volunteer as mentors. I was flabbergasted to ultimately receive responses from nearly 200 amazingly experienced maritime industry workers from every sector of the industry and every corner of the world eager to help. Many of the offers of help were accompanied by articulate arguments supporting the initiative. If I was not previously 100% convinced of the value of e-mentoring, I am certainly convinced now after receiving these and other responses. I'll not include their names (because I have not asked for permission to quote them), but here are some of the comments I have received in response to the e-mentoring

proposal:

"This could be of service to all the young mariners from all over the world. Attracting young and talented people to this profession is getting harder and the maritime industry is facing an acute shortage of qualified seafarers. I am sure seniors who love and have enjoyed this profession can contribute very positively in conveying the adventure and opportunities this profession offers."

"[We need to encourage women and minorities to get into the industry]. Those are the people who will not have a natural network in the industry and often encounter difficulties. A mentor might be able to intervene at a high level to reduce barriers set up by a lower level employee to prevent advancement by such individuals. ... Such intervention can only come from senior people and often it must come from outside the company. We owe it to the industry to make sure everyone has a chance to contribute."

"Leaders onboard are failing in standards and neglecting their duties as coach/teacher because of poor upbringing. [They] feel that seafaring is just another ordinary job! Well, we need to overcome these barriers when shaping better mariners for the future."

And finally, here is a comment that says it all:

"I have inherited this glorious profession as a legacy bequeathed to me by extraordinary men of the maritime profession who lived very ordinary lives. Tell me how can I repay even a fraction of this debt. I shall be honored."

Hopefully some of these reasons for offering to be a mentor resonate with you and provide an incentive to offer a bit of your time.

Visiting the International Maritime Mentoring Community

When (I am an optimist and therefore did not say "if") you visit the maritime mentoring community, you will find mentors representing over 4,000 years of maritime experience ready to be freely shared.When a mentors registers, they are asked to list their areas and depth of maritime experience, and are asked to indicate their gender, country of residence, and a few other bits of information. All this is meant to help proteges determine which mentors may be useful to them in the career choices they are facing.

Proteges then visit the site and click a button labeled "find a mentor". There they are asked to indicate the kinds of expertise they are looking for and are presented with a list of matching mentors. It is then up to the protege to connect with the mentor and, if accepted as a protege, join the mentor's "mentoring group" - an area where all of his or her proteges can congregate and share experiences.

The site also houses a library for mentors and proteges to share useful documents and links pertaining to careers in the maritime industry. Some mentors have begun to write blogs on the site, and the discussion area has topics including maritime schools, careers, and others.

What's Next?

The site is up and going. Mentors are there and proteges are there. But this initiative will only be as successful as the number of members there. So at this time we are embarking on a few initiatives to reach out primarily to maritime schools and employers.

Maritime Colleges

We are inviting all maritime colleges to have a presence on the mentoring site. Each college is welcome to create a group (or ask us to do so) dedicated to their college and have one or more faculty representatives periodically visit the group to answer questions. This would allow proteges on the site to interact with the college and gain some insight into what it would be like to study there. In addition, the college can offer their cadets a "Meet a Mariner" program of sorts. Their students are invited to visit the community, join their dedicated college group, and interact with mentors in order to help guide their careers upon graduation.

Maritime Employers

Similar to colleges, we are inviting all maritime employers to create a group dedicated to their company. Proteges who would like to find out more about what your company has to offer can join and interact with representatives from your organization. Ideally those representatives could provide a combination of generally useful career advice in addition to information on working at your company.

I will start in the same way as I began - with an invitation. This is a wonderful industry with a deep and profound mentoring tradition. Every single reader has the opportunity to improve the industry by joining the site as either a mentor or protege. We all have something to give, and something to learn. There is no downside. Please visit the International Maritime Mentoring Community. Join, share, support and learn at

www.MaritimeMentors.com

The Author: Murray Goldberg is CEO of Marine Learning Systems (**www.MarineLS.com).** An eLearning researcher and developer, his software has been used by 14 million people worldwide.

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(Photo Transpetro)

Local Content

As Brazil continues to emerge as a global offshore and shipbuilding powerhouse, are its local content laws hindering progress?

By Claudio Paschoa, Brazil

Brazil's Oil & Gas industry is in the midst of an unprecedented growth curve, with major new reservoirs being found in deepwater, the so-called pre-salt. This growth in the O&G industry has had a major influence in the growth of the nation's shipbuilding industry, which until only a few short years ago was stagnant.

The main reason for this massive increase in shipbuilding and also in the construction of new shipyards is that the O&G industry demands various kinds of ships and support vessels in order to properly operate and maintain growth. Although it is always possible to buy ships of foreign make, the Brazilian government policy is determined to strengthen local industry in order to avoid what many call the oil curse, where countries rich in oil fail to develop their local manufacturing industries and end up completely dependent in foreign equipment and manufacturing capabilities, therefore strangling their own growth potential and usually sustaining high unemployment levels, along with increasing costs of related to Oil and Gas E&P. Unfortunately, good examples of countries that have this problem abound, in Latin America, including Mexico and Venezuela, as well as most West African oil producers.

Local Content in the Oil & Gas industry

The local content policy introduced by the Brazilian government is intended to strengthen local manufacturers that supply the O&G industry in such a way as to make them competitive with foreign suppliers.

The local content policy includes a wide range of materials, equipment, systems and services, which are necessary for the different industries, in this case specifically the O&G and shipbuilding industries in Brazil. The purpose of local content requirements is to allow local goods and service providers to participate in the O&G supply chain and increase their market share in a competitive basis. The system is intended to foster the development of Brazilian industry, high-end technological development, human resources development, employment and income.

In short, local content is the percentage of materials, equipment, systems and services produced locally in relation to the total amount of purchases made by a concessionaire currently operating in Brazil.

Brazilian concession contracts for exploration and production contain a clause requiring operators to purchase a certain percentage of goods and services from locally established providers.

Local providers are required to offer conditions of price, term and quality equivalent to those offered by foreign competitors. The percentage required may vary depending on the product and the amount of goods and services available in relation to the demand, in some cases local content requirement have been lowered in order not to negatively influence an industry's growth. This usually only occurs when there are not enough qualified local workers for a given job or when specialized goods re-

quired are not locally available or do not have the necessary quality standards that the industry demands.

Brazil's National Petroleum Agency (ANP) is responsible, among other things, for formulating and overseeing the country's local content policy in relation to the O&G industry. The ANP has been using local content criterion when assessing business proposals ever since the first bidding round of blocks for exploration and production, which took place in 1999.

According to the ANP, up until the fourth bidding round in 2002, local content percentages were free. As of the fifth and sixth rounds in 2003 and 2004 respectively, however, ANP has established minimum percentages based on whether blocks were located onshore, offshore shallow water or offshore deepwater.

From the seventh round in 2005 onwards, contracts have included minimum and maximum percentages of local content for a set of specialized items used in the exploration and production development phases.

Basically the Brazilian shipbuilding industry has grown from a low of less than 2,000 jobs in the year 2000 to the current level of around 60,000 jobs.

To ensure compliance with the local content policy, ANP monitors local content requirements by quarterly auditing investments and operations of each concessionaire. The ANP will inspect local content compliance during three phases of the Exploration and Production cycle:

1) Upon completion of the exploration phase;

2) At the end of the production development phase.

3) When the exploration block is returned and the concession contract is ended.

Block operators provide ANP with contracts and invoices showing their investments on all three phases. The documentation is then audited by the ANP and if local content percentages reach or exceed the set value, the ANP will give its approval and if not the block operator may be penalized by a hefty fine. In 2007, after a protracted and heated process of public consultations and hearings, ANP finally released the Local Content Certification System (ANP Resolutions 36 through 39/2007), which establishes local content rules for all contracts signed since Round 7.

Certification activities involve collecting data on the origin of components supplied, measuring local content and issuing certificates. By attaching these certificates to all invoices, concessionaires will testify to ANP that goods and services have been produced or provided locally. According to this system, ANP accredited independent firms are responsible for checking and subsequently certifying the local content of goods and services in the oil industry based on the Local Content Primer, which was developed by the Brazil's Program for Mobilization of the Oil and Gas Industry

(Prominp).

There are currently 21 ANP accredited certification firms, and by 2011 over 7,500 certificates had been issued to more than 400 local providers, evidencing more than $2 billion worth of investments in Brazil.

This investment is a direct spin-off from the government's local content policy and it helps local industry to become more competitive and fosters all levels of workforce training including specialized geologists and engineers, a variety of technicians, and all sectors basic workforce, which is a significant gain for a country such as Brazil which deals with high levels of poverty.

The building of shipyards in very poor areas such as the EAS shipyard in Ipoyuca, Ceara, has also brought tangible social and economic gains to these locations, therefore the importance of the local content policy must be emphasized even considering the drawbacks and bottleneck the policy may cause in the industry. The main problem is the lack of a workforce pool from which to draw.

Local worker on Lula pre-salt FPSO.

(Photo: Petrobras)

Local Content in the Shipbuilding Industry

In the late 1970's the Brazilian shipbuilding industry was the second largest in the world. It directly employed 40,000 workers with an additional 100,000 indirect jobs supporting the industry. The debt crisis in the 1980s led to limitations on capital availability leading buyers to redirect orders to upstart firms in Japan, Singapore, South Korea and later China, who were able to offer lower costs and better schedule reliability. By the late 1990s the industry had all but disappeared; shipyards closed, unfinished projects were abandoned on the ways; and only about 2,000 jobs remained.

Circumstances changed in the late

Workforce by segment

Engineers	10%	1,500
Technicians	10%	1,500
Specialized Workers	70%	10,500
Administrative	5%	750
Others	5%	750

*Source: Sinaval - January 2012

Shipyard Distribution and Workforce by State

State	Jobs	%
Rio de Janeiro	25,020	42.29
Amazonas	11,987	20.26
Pernambuco	9,798	16.56
Rio Grande do Sul	5,500	9.30
Santa Catarina	2,125	3.59
Bahia	2,125	3.59
Others	2,612	4.41
Total	**59,167**	**100.00**

*Source: Sinaval - January 2012

Shipyard Workforce: Last 50 Years

Years	Workers
1960	1,400
1970	18,000
1979	39,000
2000	1,900
2006	19,000
2011	59,000

*Source: Sinaval - January 2012

Content by Vessel Type

Type	Local	Imported
Tanker	70.8%	29.2%
PSV	61%	39%
FPSO	64.2%	35.8%

*Source: Sinaval - January 2012

1990s with the discovery of significant oil reserves in the Campos basin off the coast of the state of Rio de Janeiro. The Brazilian government auctioned off exploration blocks and through the initiatives of the national operator, Petrobras, along with other firms in the global oil industry, there were multiple discoveries of deepwater oil reserves.

In the early 2000s discoveries in the "pre-salt" area off the Northeast coast led to anticipation that Brazil would become a major exporter of oil as these reserves were developed to their full commercial potential. Around 2007, major pre-salt plays were discovered in the Santos Basin, mostly located in deep waters, far from shore.

This confirmed that the country had a true potential to become a major oil exporter. It brought to earth the need for a variety of rigs, drillships, crude and LNG tankers and support vessels to serve the O&G industry and as a direct consequence a rebirth of the local shipbuilding industry was required.

The Brazilian shipbuilding industry has been embarked on an impressive growth curve, growing from a low of less than 2,000 jobs in the year 2000 to the current level of around 60,000 jobs. Shipyards that had been mothballed are now revived, and new purpose built facilities -- everything from small yards that build only modules for rigs to major shipyards which intend to compete with the big shipyards in China and Korea which currently dominate the world market. All firms involved in shipyard construction, shipbuilding, including equipment manufacturers and service providers are required to fulfill local content demands.

Shipbuilding policy in Brazil is overseen by SINAVAL, which is the Brazilian shipbuilders union.

SINAVAL and ONIP (National Organization of the Petroleum Industry) developed a local content database for the shipbuilding industry which includes equipment, products and materials needed by shipyards, these are based on real case purchases for a PSV, a Tanker and an FPSO.

The database is shared with the supply chain in order to increase local production (see Table below).Franco Papini, SINAVAL's executive vice-president, coordinates the local content initiative. Policy on local content in the workforce is decided by the Brazilian government and

(Continued on page 79)

Brazilian Shipbuilding Figures

- **6.2** million DWT order book
- **11** New yards under construction
- **18** Offshore Oil Platforms under construction
- **21** Offshore Deepwater Drilling Rigs Bid
- **47** Shipyards operational
- **59k** Workers directly employed

Petrobras Investment Program:
From 2011–2020 undertaking the world's largest E&P

- **50** Production platforms
- **50** Drill rigs
- **500** Offshore supply vessels
- **130** Oil tankers

Local content in P-34 control room.

(Photo Petrobras)

implemented by Sinaval. Local content production for tankers, drillships, rigs and support vessels involves training of human resources for workforce and supply of equipment. The compliance with local content commitments are monitored by Sinaval, along with the ANP and the Ministry of Mines and Energy (MME). The supply of equipment includes 11 groups of equipment, 111 subgroups and a total of 534 items.

SINAVAL has signed agreements for the development of partnerships with institutions that represent industries in Argentina, Spain, Korea and Japan, in order to expand the options of Brazilian shipyards in the development of their activities.The new phase of expansion of the Brazilian shipbuilding industry aims to comply with Petrobras' investment plan, as well as preparing the industry for the expansion of oceangoing shipping, coastal shipping and inland waterway transport. The increase of local content in shipbuilding is still a priority and the expected increase in workforce demand by the new shipyards and new orders from operational shipyards, places technical training and qualification of human resources as one of the main challenges of the industry along with increasing the amount and quality of local content in maritime equipment manufacture. There is still a long hurdle ahead of the industry in order to adequately maintain local content levels that comply to the demands of the industry, major training programs are underway, from federal technical training to private technical training such as the OSX sponsored ITN (Institute of Naval Technology). In both the O&G industry and the Shipbuilding industry, the main risk is that a bottleneck may be created in the industries if local content availiability does not reach the parameters demanded by each segment of the industries. This may cause serious delays in E&P efforts which force both the Brazilian government and regulatory agencies to be more flexible with local content demands; which is something that has already happened in some instances.

In the next five years we should have a good idea on how well the local content policy is working in Brazil, for now all that can be done is to increase the effort of training the workforce and preparing the equipment industry to compete with foreign brands well established in the market. The fact that many of these foreign firms are making joint ventures with local manufacturers and offering technology transfer is definitely positive, however we are still to see if all these efforts will be enough to keep up with the demand.

About ITN – the Institute of Naval Technology

Aimed at promoting research and development, projects, and sponsoring initiatives focused on technological development and innovation, OSX created the ITN – Institute of Naval Technology, which will is being developed in four phases. In the first phase of its development, ITN is training professionals in careers required to make up the teams that will work in the UCN Açu Shipyard and OSX Serviços. Under a contract with the Rio de Janeiro Industrial Federation, Firjan, facilitated by Senai-RJ, the Program for Professional Qualification in Shipbuilding was created to train 3,1 thousand professionals by 2013. The initiative is ITN´s first partnership and will invest approximately R$ 13 million to qualify professionals for the project.

** Source: OSX website*

Maritime Training: A Challenging Course

By Joseph Fonseca, Mumbai

Meeting increasing quality standards and nurturing competent seafarers has never been as much a challenge for maritime training institutes as it is today. Every cadet who chooses a sea career himself poses a challenge to trainers: In the past those entering the seafaring profession were mostly from metropolitan areas, bringing with them a more accomplished skill and knowledge set. Today, there being a paradigm shift in India, and it is rare that anyone with an urban background considers a life at sea. Manning and shipmanagement companies and training institutes often have to scour towns and villages of India to attract candidates. Not being fluent in English (since the medium of instructions in most cases being in any of the 19 officially recognized languages) these cadets have to be specifically groomed to meet the challenges of present day seafaring.

The critical focus is both onshore and on-board training, considers Capt K.N. Deboo, Director and Principal of Anglo-Eastern Maritime Training Center, whose institute provides both pre-sea and post sea training. "There is no substitute for on-board or on-shore training. It is the best. Standard Training and Certificate Watch keeping (STCW has been revised thrice. If that aspect of knowledge and experience which one gets on-board has to be reduced, then it has to be supplemented with shore-based training. In this regard there have been views about offering fast track training so that what a cadet learns on-board in one year can be taught onshore in one month. These are

all reasons being given. But we fail to take one aspect into consideration: What they learn on-board including tackling real life situations and problems, changes of situation that take place can help the cadet to improvise and innovate and continue in that direction."

STCW is revised once in 15 years but technological advances in construction of ships are much faster which reflect on board operations. Also, there are regulatory advances taking place. Hence, the need for regular refresher courses has become the norm. Another idea is to have smaller modules of required inputs made available to seafarers so that they can take them as and when the opportunity arises. Training therefore is becoming a continuous process which is not limited to the basic requirements of STCW.

Dr. Brijendra K Saxena, Principal, Tolani Maritime Institute concurs, that STCW does not necessarily address all requirements regarding training of seafarers concerning both for pre-sea and post-sea. "STCW provides a very generic requirement especially for pre-sea level. It is therefore necessary that a detailed syllabus is created covering all the competencies. There remains an area where the level of standards could be different between different institutes and also between different countries. As far as post-sea is concerned the scope of requirements is clearer and more specific. However, here also the depth of understanding by the training institutes could be different at different places."

HANDS ON

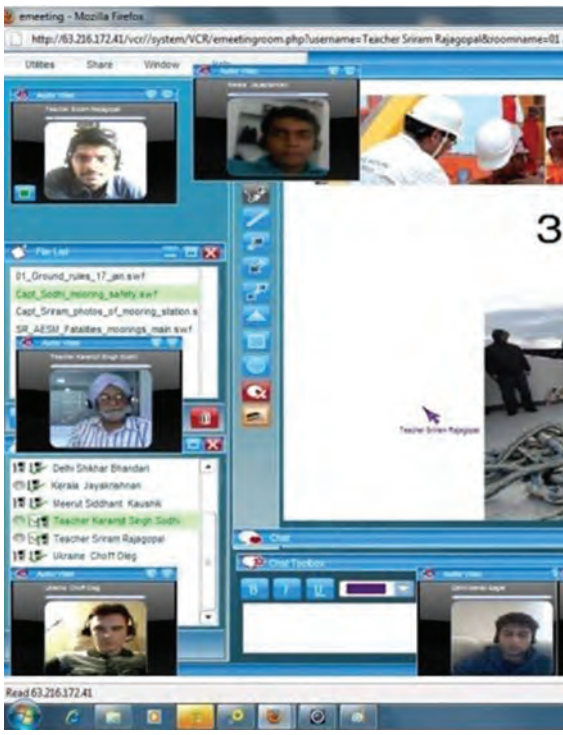
Marflex Electrically Driven Deep Well Pumps and the operating panel used for the Marflex course. Marflex is a designer of electric-driven deepwell pumps for tankers and offshore platform. The course familiarizes participants giving a hands-on-experience of the construction operation and maintenance of Marflex deepwell pumps and Variable Frequency Drives.

Training methods

Training-at-sea time being short, there are calls for changes in teaching methodologies. The use of computer and web-based learning can be very effective along with some contact classes.

eLearning can be supplemented with a short duration work shop which could provide practical training and/or simulator training. This would help supplement the time period and scope of training which is reduced on board. **Anglo Eastern Training Center was the first to introduce the "Virtual classroom" among maritime training institutes in India.** This permits people sitting at their computers with a webcam facility at home or anywhere in the world and logging in to the trainer for their on-line learning session. This learning process is being introduced increasingly in other institutes as it facilitates teacher and student interaction and saves on travel, the time for commuting, hotel accommodation, etc.

Typical training needs include a mix of technical and soft skills, including motivation, attitude building, team-work ap-



REMOTE CONTROL
Training at sea-time being short, there are calls for changes in teaching methodologies. The use of computer & web-based learning can be very effective along with some contact classes. eLearning can be supplemented with a short duration work shop which could provide practical training and/or simulator training.

proach, communication, delegation, managerial and leadership, all of which are important for a seafarer to develop, because today multi-tasking is mandatory as crew's grow smaller. A ship's turnaround is very fast and the time available to the seafarers is very limited to effectively manage and complete the tasks. The contact time being limited, the choice of training methodology is important. Once a year it is important to provide training on-shore with workshops, practical training, etc. But at other times there is eLearning, where the seafarer's leave does not get disturbed as it can be taken anywhere and at any time.

Every ship is different, and the various types of specialization being restricted to the type of cargo it carries make type specification training a priority need . And this becomes all the more challenging for training since it is not broad-based.

"The ship-owners need to be partners in training / updating their seafarers," says Dr Brijendra K Saxena. "They have to provide small training modules for their seafarers. These

should be used prior to going on board. Attending ship superintendents should verify compliance. The technique of mentoring needs to be brought back and the senior ship board staff has to be taken on board for this initiative. They must realize that it is their duty to mentor and train their juniors."

Qualification for Trainers

Tolani Maritime Institute has its yardstick in the selection process of trainers. "The minimum acceptable qualification for marine faculty is Chief Engineer/Master Certificate of Competency and Post-Graduation in concerned field for non-marine faculty members," said Dr. Saxena. "Besides the qualification, industry experience and of course teaching experience are important. In my opinion though, a very long sailing career is not necessarily a very good qualification. The trainers must have good communication skills and an interest in upgrading their knowledge by undertaking courses / presenting papers. Besides these issues we also require an applicant to teach the related subject in a mock class for at least half an hour."

Capt Deboo said, "It is also important for us to know the companies he has sailed with. Because it is important for a person to have known the best management practices and if he has sailed with good companies he will bring in his experience of good practices into the class. The third part is to find out his interest toward teaching: his motivation to become a teacher vis-à-vis to becoming an auditor, a superintendent etc. These being basic, one has to gauge other aspects:

BELOW The introduction of the electronically controlled camshaft-less low speed diesel engines is proceeding rapidly, with many ME engines ordered, and consequently, many ME engines entering service. It is the need of the hour to train the Marine Engineer in the safe operation and maintenance of the electronically controlled low speed diesel engine. Training is carried out on a complete ME simulator, so that crews can get realistic hands-on training.

whether he is computer savvy and able to develop training material. Not forgetting the power of communication: language skills, articulation, body language to help him better communicate with the students."

Finding & Retaining Good Trainers

Retaining experienced and expert trainers is critical for training institutes struggling to achieve a brand image. An Institute is only as good as its teachers. The salaries offered are indeed incomparable with the salaries offered in other industry specific shore jobs. For effective motivation this difference needs to be evened out with better working conditions, opportunities for professional development etc.

At the recent Global Maritime Education & Training (GlobalMET) conference many participants candidly spoke about the problem faced by them in selecting good teachers. It is a fact that a good master on board need not be a good teacher. In general it was felt that a good teacher should have a predisposition to teach. Since it took many years to be a good master it will also take time to be a good teacher. "It is a challenge is to have good faculty," contends Capt Y Sharma, Head of the Training center of International Maritime Training Center. "It is important when selecting these trainers to identify people who have a passion to teach, and see the opportunity and time to grow in the teaching field. Of course we need to put them in the class and for a good teacher it would take about a year to achieve a level of quality in a particular subject."

LEFT Automation trainer: An equipment used for Advanced Instrumentation & Process Control course. This program is specially designed to train the ship staff in proper understanding of marine automation systems and instrumentation.

SMARTBLUE C2

Security in a Box: New surveillance solution for commercial maritime and offhshore markets is scalable, to single asset or entire region.

In meeting the threat posed to maritime assets, Raytheon Anschütz developed what it terms a flexible and cost-effective surveillance solutions for the commercial maritime and offshore industry. Raytheon Anschütz's in-house SMARTBLUE Command and Control (C2) integration software connects long range surveillance radars, CCTV cameras, AIS and communication systems to a single interface giving the operator a surveillance and security tool for maritime assets.

Scalable, SMARTBLUE' C2 can be installed as a locally operated stand-alone system capable of protecting an offshore platform, FPSO, oil and gas terminal or vessel in a medium to high risk zone to a fully integrated remotely operated system with multiple radar and CCTV sites giving protection to an oilfield, port or coastal region. In addition and in order to increase the flexibility of the system for potential offshore customers, Raytheon Anschütz have designed a containerized version of the system with extendable radar and CCTV masts which not only reduces installation and commissioning timelines but also makes it easier to transport offshore.

The SMARTBLUE user interface allows the operator to use a variety of sensors to detect, track and identify targets entering the vicinity of a vessel, port or other maritime asset and then to share this information with multiple SMARTBLUE C2 users on other maritime assets operating within the vicinity. This sharing of data is designed to provide a greater understanding of the maritime picture, allowing operations to be coordinated more effectively. The software also allows for additional applications to be included such as; satellite communications, an oil spill detection capability which can also predict the track of the spill based on met-ocean information, ice detection, search and rescue coordination and meteorological monitoring to be integrated into the workstation depending on the environment, regulations

and client requirements. This integration of functions thereby provides the user with a one-stop emergency control center for incident management and maritime asset coordination.

In the system's simplest form, the containerized version provides a greater level of flexibility in a variety of applications in that it can be easily and quickly deployed on maritime assets such as FPSO's and platforms operating offshore in medium to high risk. When those assets are redeployed elsewhere in the world, where the security risk maybe lower, the container can be removed and transferred to another asset being prepared to operate or already operating within the medium to high risk zones.

The surveillance container is also an attractive proposition to the maritime security industry where in its anti-piracy role the container can be loaded quickly and efficiently onto a vessel at the last safe port prior to entering a high risk. The vessel can then make its passage through the high risk zone with the surveillance container providing extra protection and assurance to the vessel, crew and cargo. Once through the high risk zone the vessel can then transfer the container at its next destination to another vessel that is about to enter the high risk zone on the return leg of its journey. This kind of operation would allow a private maritime security company to maintain a few containers in the vicinity of the high risk zone between two or three of the main ports to provide this greater level of protection to their customers operating in the area.

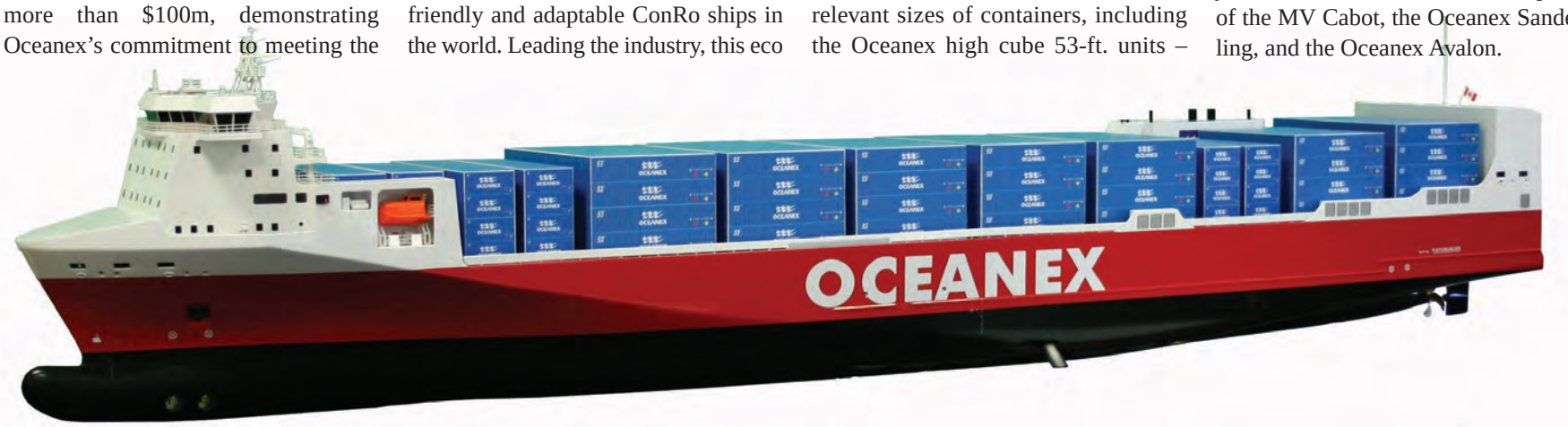
http://www.raytheon-anschuetz.com

Oceanex Connaigra

Largest Canadian Flag Con/Ro Ship

Oceanex Inc. executives traveled to Flensburg, Germany, recently for the cutting of first steel of what will become the largest Canadian flag container/roll-on roll-off (Con/Ro) ship. This 20-knot, ice-class vessel, to be named the Oceanex Connaigra, is custom designed for worldwide trade and will be 210m in length with a deadweight carrying capacity of 19,500 metric tons. According to Oceanex Executive Chairman, Captain Sid Hynes, "construction of this unique ship represents an investment of more than $100m, demonstrating Oceanex's commitment to meeting the needs of our customers throughout Eastern Canada and particularly the province of Newfoundland and Labrador. The Oceanex Connaigra has been designed to meet the company's anticipated growth for the next 30 years." Oceanex Connaigra is being built by Flensburger Schiffbau-Gesellschaft mbH & Co. KG of Germany. Peter Sierk, President and CEO for the Flensburger Shipyard said that "the vessel will be one of the most modern, innovative, environmentally friendly and adaptable ConRo ships in the world. Leading the industry, this eco friendly vessel will be equipped with a dry scrubber exhaust gas cleaning system for main engines and diesel generators and thus exceed the requirements of the proposed restrictive air emissions regulations. In fact, the vessel is classed by DNV as a 'clean ship,' which confirms a higher environmental standard, particularly with respect to air emissions." The RoRo weather deck of the Oceanex Connaigra is designed for a conventional Lo-Lo container ship operation and is able to accommodate all relevant sizes of containers, including the Oceanex high cube 53-ft. units – with a weather-deck load capacity of 11,000 metric tons of containers. Liftable ramps provide access to all five RoRo decks which allow for the transportation of up to 95 tractor trailers and 500 automobiles. Notably, the ship is uniquely designed with a 40-ft wide stern ramp to accommodate over dimensional loads that can weigh several hundred tons, which Hynes said is critically important to the construction and development projects throughout Atlantic Canada. The addition of a side ramp and starboard side door promotes more efficient and faster loading and unloading of automobiles.

Delivery of the Oceanex Connaigra to the Newfoundland service is expected in the fall of 2013 at which time it will join the current Oceanex fleet composed of the MV Cabot, the Oceanex Sanderling, and the Oceanex Avalon.



New Multipurpose LNG ATB Concept

ABS granted approval in principle (AIP) to a new liquefied natural gas (LNG) and regasification articulated tug barge concept introduced by Waller Marine Inc. The vessel has the ability to load LNG from existing LNG terminals, liquefaction facilities, or traditional LNG carriers and transport the LNG to existing tanks, traditional LNG carriers, trucks, or marine vessels using LNG as a fuel.

The barge also is equipped for regasification of LNG directly to a pipeline or to a power plant. An additional feature will be the use of natural gas as a fuel in the dual fuel engines of the tug to drive the tug-barge unit.

"ABS has been a great resource in developing the LNG ATB RV product," says Vice president- Gas Solutions Bill Hutchins, Waller Marine. "By conducting multiple meetings – including a HAZID (hazard identification) – ABS has helped us to ensure safety and regulatory aspects have been appropriately addressed."

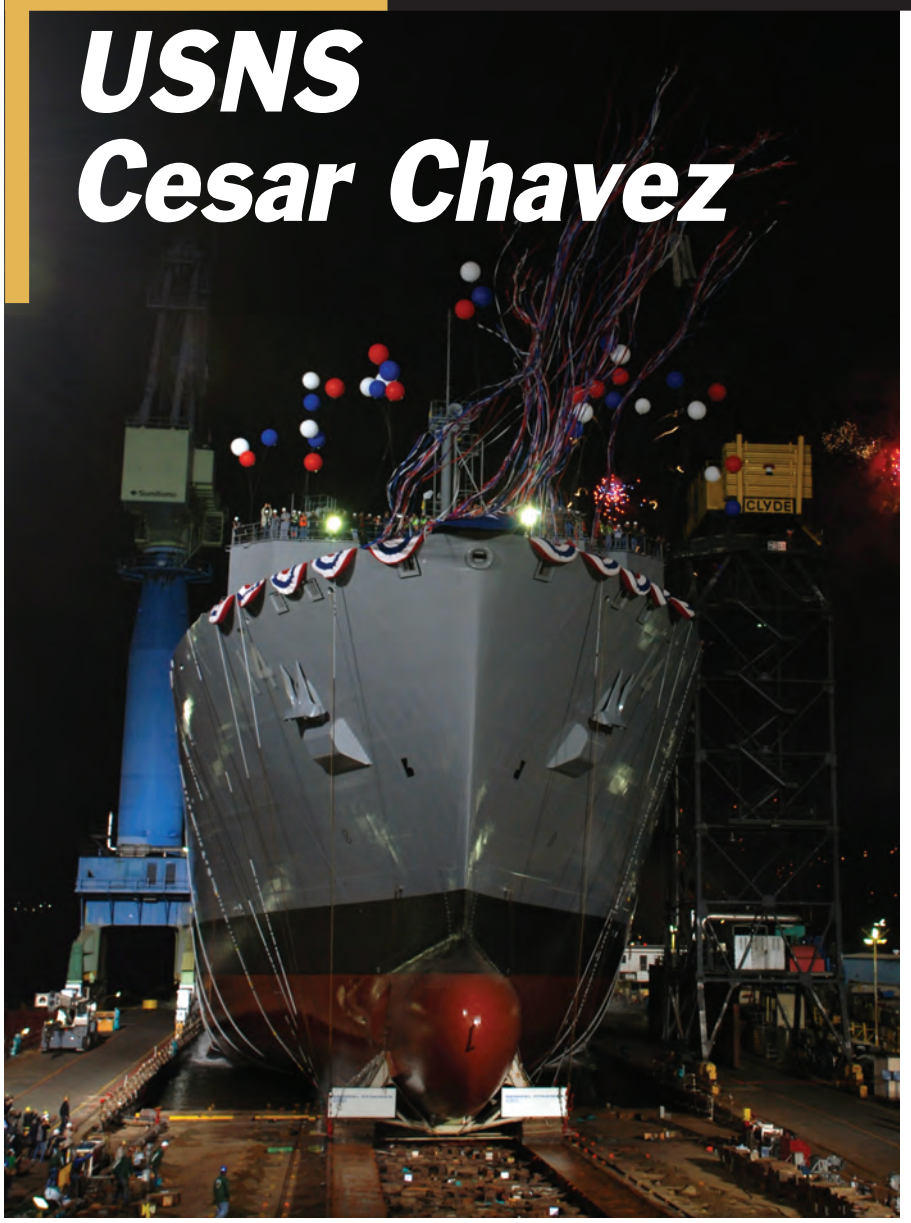
The benefit of the LNG Articulated Tug and Barge Regas Vessel (ATB RV) is that it allows LNG to be moved and delivered more efficiently on a small-scale basis in locations where large LNG infrastructure would be cumbersome, costly, and time consuming.

The barge will be fitted with independent Type 'C' LNG tanks. To make most efficient use of the hull volume and maximize the cargo-carrying capacity of the barge, bi-lobe tanks of maximum width are centered along the barge centerline. The cargo containment system is split into four longitudinally located independent tanks, with each tank supported by a simple structure that isolates the tanks from hull loads. According to Waller Marine, these tanks will be constructed of either 9% nickel steel or Stainless Steel AISI 304L to contain the cargo at a minimum temperature of -163° C. Since AIP was granted, Waller Marine has moved into the detail design phase with a goal of creating multiple variations for clients around the world.

VT Halter Delivers ATB for Bouchard

VT Halter Marine, Inc. delivered the 112-ft. ATB Offshore Tug, Evening Star, for Bouchard Transportation Co., Inc., a tug similar to others built for Bouchard in previous years by Halter Marine. Measuring 112 x 35 x 17 ft., the 4,000-hp tug is classed by ABS as A1 Towing Vessel, Dual Mode, and is equipped with an Intercon Coupler System. Construction of the vessel began in June 2011 at VT Halter Marine's Moss Point Marine facility in Escatawpa, Miss. Upon delivery, the Evening Star will enter into Bouchard's fleet service in New York, N.Y.

"Bouchard Transportation Co, Inc. is pleased to have taken delivery of another well built VT Halter Marine tug boat," Morton S. Bouchard III, President/CEO, Bouchard Transportation, in a prepared statement. "Bouchard enjoys a 30-year-old relationship with Halter, who has continuously built vessels that meet and exceed Bouchard standards. The Evening Star will be pinned to the newly built B.No.250 and operate on the East Coast. Bouchard looks forward to future successful building programs with VT Halter Marine in the near future."



T-AKE 14 Delivered to MSC

Last month Military Sealift Command accepted delivery of its newest dry cargo/ammunition ship, USNS Cesar Chavez (T-AKE 14), during a short ceremony at the General Dynamics NASSCO Ship Yard San Diego. The ship, which was christened May 5 in San Diego, honors Cesar Chavez, an American farm worker, labor leader and civil rights activist who co-founded the National Farm Workers Association, which later became the United Farm Workers. He is well known for his use of non-violent tactics that made the farm workers' struggle a moral cause with nationwide support.

"This is an historic day for Military Sealift Command, as we accept into our fleet the last ship in the T-AKE program," said Capt. Sylvester Moore, commander, Military Sealift Command Pacific. "Like the 13 ships that came before it, USNS Cesar Chavez will be an important component in support of the United States Navy ships and missions around the world. Whether we are supporting an aircraft carrier or transporting humanitarian assistance and disaster relief supplies, the T-AKEs and all MSC underway replenishment ships bring to life the motto: MSC delivers," he said.

The 689-ft. long ship is the 14th and final of the dry cargo/ammunition ships and is slated for use by MSC's Combat Logistics Force, or CLF. CLF ships deliver ammunition, food, fuel and other supplies to U.S. and allied ships at sea, enabling the Navy to maintain a worldwide forward presence. The first 11 dry cargo/ ammunition ships are currently operating as part of MSC's Combat Logistics Force, delivering vital fuel, equipment and supplies to Navy warships at sea. The remaining three ships the T-AKE class are expected to be assigned to maritime prepositioning squadrons, which strategically place combat cargo at sea for rapid delivery to warfighters ashore.

"The delivery of Chavez marks a significant milestone for MSC - we are now at full capacity with our dry-cargo and ammunition ships and stand ready to support a wide-range of Department of Defense requirements," said Rear Admiral Mark Buzby, Commander, Military Sealift Command.

Shenzhen Pengxing Orders Coastal Cruisers

Coco Yachts announced a contract for the basic and detailed design for two fast ferries type Coastal Cruiser 200, vessels to be built by Afai Southern Shipyard in Guangzhou, China. Shenzhen Pengxing Shipping Co. chose the Coastal Cruiser 200 and will use both to provide ferry services between Shenzhen – Zhuhai – Macau and Hong Kong, including several (Hong Kong) islands.

Coastal Cruiser 200 is a new design, specially designed for comfortable high speed trips in moderate seas with the lowest possible fuel consumption. Hull lines optimization for both resistance and sea keeping has been done by CFD calculation and model testing, and show an average fuel efficiency improvement of 15%, according to data provided by the designer. The Coastal Cruiser 200 has the following principle particulars:

CoCo Yachts has worked almost one year to develop the Coastal Cruiser range, and delivers a range of fast ferries between 35 and 75 m that has been designed with the main focus on fuel efficiency, without compromising comfort at sea.

Email: hvh@cocoyachts.com

Main Particulars

Length, o.a.	40m
Beam	9.3m
Depth	3.4m
Passenger capacity economy class	163
Passenger capacity business class	28
Passenger capacity in two (2) VIP rooms	8
Crew accommodation	8
Marine Diesel Engines	Two (2) MTU 12V2000M72 main engines
Power	2 x 1080 kW @ 2250 rpm

Vessel Launched to Transport Nuclear Waste

In Sweden there will be a need for safe transport of spent nuclear fuel and radioactive waste for many years to come. At the beginning of 2010, SKB's Board decided to build a new vessel to replace M/S Sigyn, which has been in operation since 1982. On October 25, 2012, SKB's new vessel, M/S Sigrid, was launched at the shipyard in Galati, Romania. Sigrid should arrive to its home port in Oskarshamn by summer 2013. The new vessel is slightly larger than M/S Sigyn and able to carry 20% more cargo. Safety requirements are stringent as one may expect on a ship of this type, and Sigrid has, for example, a double hull, radiation protection, four engines and other multiple systems. “The launch marks an important milestone in the project. 20 months ago, this vessel was nothing more than a drawing. Now she is a reality. The vessel is the result of hard work and good project management,” said Bo Sundman, Director of the Department of Operations at SKB.

The vessel is designed and built by the Dutch-owned Damen Shipyards Group, which owns the shipyard in Galati, Romania.

M/S Sigrid:

Length o.a.	99.5 m
Breadth	18.6 m
Loading capacity (number of containers)	12
Draft	4.5 m
Speed	12 knots

LHA-6 Christened at Ingalls

Huntington Ingalls Industries' Ingalls Shipbuilding division christened the multi-purpose amphibious assault ship America (LHA 6). The ship, the first in a new class, is the fourth U.S. Navy vessel to be named America, extending a legacy dating back to 1861. **Lynne Pace, wife of retired U.S. Marine Corps Gen. Peter Pace, former chairman of the Joint Chiefs of Staff, served as the ship's sponsor.** Ingalls has built 13 amphibious assault ships: five in the Tarawa (LHA 1) class and eight in the Wasp (LHD 1) class. HII received a $2.38 billion contract in May to build Tripoli (LHA 7), the next ship in the America class.

"No other shipyard in the United States can boast the amount of experience that Ingalls has in the production of these critically important ships," said Ingalls Shipbuilding President Irwin F. Edenzon.

America-class ships are 844 x 106 ft. and displace 44,971 long tons. The gas turbine propulsion system will drive the ships in excess of 20 knots. They will accommodate 1,059 crew (65 officers) and 1,687 troops. The America-class will be capable of carrying a Marine Expeditionary Unit, including Marine helicopters, MV-22 Osprey tiltrotor aircraft and F-35B Joint Strike Fighter (JSF) aircraft.

The newest class has an increased aviation capacity to include an enlarged hangar deck, realignment and expansion of the aviation maintenance facilities, a significant increase in available stowage for parts and support equipment, and increased aviation fuel capacity.

Terasea Accepts First

"Raptor Class" AHT

Singapore-based Terasea said the vessel Terasea Falcon — one of its first set of 'Raptor Class' 200T BP AHT's — was launched at Universal Shipbuilding's Keihin yard on October 18, 2012. Terasea Falcon will be delivered at the end of February 2013. Three additional sister vessels (Terasea Hawk, Eagle, and Osprey) are to be delivered approximately every three months after the Falcon.

Terasea intends to use these specialized long distance towing and anchor handling tugs to be the market's leading contractor for long distance towage and positioning services. Terasea's focus will be on providing the highest level of service to our FPSO, FSO, FLNG, Rig, Salvage and general towage customers' requirements while maintaining a strict adherence to best practices for HSEQ.

The Raptor Class vessels are 16,300 bhp, ABS Class, 200T BP, FIFI 1, DP1 ready, and completely compliant with current and expected SOLAS and IMO regulations including ballast water treatment & MLC 2006. Terasea, headquartered in Singapore, will have commercial and operational support centers in Europe and North America.

Austal Lays Keel for LCS 6

Austal held a keel-laying ceremony for the third Independence-variant Littoral Combat Ship (LCS) – Jackson (LCS 6), one of five Austal-designed 127-m U.S. Navy Independence-variant LCS under contract with the U.S. Navy. **Dr. Katherine Holmes Cochran, the ship's sponsor, was present to weld her initials onto the keel plate as the Keel Authenticator.** She was assisted by J.B. Craig, III, who is an "A" Class welder that has been part of the Austal team since November of 2011.

Dr. Cochran is the daughter of U.S. Senator Thad Cochran (R-Miss.) and his wife Rose Clayton Cochran. She was born in Jackson, Miss., and received her Ph.D. in English from the University of Mississippi. She is currently an associate professor at the University of Southern Mississippi where she directs the English Licensure Program, works with the South Mississippi Writing Project, and teaches courses in southern literature. In 1991, Dr. Cochran served as the maid of honor as her mother sponsored the USS Barry (DDG 52).

Senator Cochran is a native of Pontotoc, Miss., and is currently serving his sixth term in office as a U.S. Senator. After graduating from the University of Mississippi, he was commissioned an Ensign in the U.S. Naval Reserve. He served on USS Macon, a heavy cruiser, and became the ship's legal officer after graduating as an honor student from the U.S. Navy School of Justice in Newport, Rhode Island. He also taught military law and naval orientation at the Officer Candidate School in Newport at which time he was promoted to the rank of Lieutenant in the U.S. Naval Reserve. Senator Cochran is a member of the Defense Appropriations Subcommittee where he has worked successfully to support the Navy's shipbuilding programs.

"Jackson (LCS 6) is the first of 10 Independence-variant Littoral Combat Ships awarded by the Navy to Austal as prime contractor," said Craig Perciavalle, Austal USA's Senior Vice President of Operations. "It is exciting to see our most recent facility additions come to life, with this ship being the first constructed utilizing Phase 2 of our Module Manufacturing Facility and the first ship assembled in our new Assembly Bay 5. None of this would be possible without the hard work of the great employees of Austal USA."

Austal is currently under contract with the U.S. Navy to build nine 103-meter Joint High Speed Vessels (JHSVs) under a 10-ship, $1.6 billion contract and five 127-meter Independence-variant LCS class ships, four of which are a part of a 10-ship, $3.5 billion contract.

For the LCS and JHSV programs, Austal, as prime contractor, is teamed with General Dynamics Advanced Information Systems, a business unit of General Dynamics. As the ship systems integrator, General Dynamics is responsible for the design, integration and testing of the ship's electronic systems including the combat system, networks, and seaframe control. General Dynamics' proven open architecture approach allows for affordable and efficient capability growth as technologies develop.

Proposed 2013 VGP

Links Enviro Stewardship to Long-Term Growth

The EPA's Proposed 2013 Vessel General Permit (VGP) will require vessel owners and operators to adopt environmentally-acceptable lubricants (EALs) into their operations to further reduce their environmental impact starting in December 2013. This regulation brings a two-fold benefit to the industry by boosting the bottom line of both small and large vessel operations, while engendering positive change that ensures the preservation of ecosystems in which these vessels operate. The directives put forth in the 2013 VGP will incentivize action that is not only environmentally ethical but also can bring additional profit to the bottom line. Let's examine the specific language of the 2013 VGP, as it relates to lubricants:

All vessels constructed on or after December 19, 2013 must use an environmentally acceptable lubricant in all oil-to-sea interfaces. "Environmentally acceptable lubricants" means lubricants that are "biodegradable" and "non-toxic" and are not "bioaccumulative." For all vessels built before December 19, 2013, unless technically infeasible, owners/operators must use an environmentally acceptable lubricant in all oil to sea interfaces.

Who is affected by the 2013 VGP?

The wording of the 2013 VGP is purposefully broad. "Vessels," as referenced in the 2013 VGP, covers "every description of watercraft or other artificial contrivance used as a means of transportation" on U.S. waters. The reach of the 2013 VGP spans the globe – touching any vessel owner/operator whose business depends on traveling through U.S. waters. This article will serve to detail who will be affected and how these new regulations will impact their business operations.

What will replacing conventional lubricants with EALs cost?

Every vessel that does not currently use EALs in all oil-to-water interfaces will experience incremental costs associated with phasing in environmentally-acceptable products, but in the scope of yearly vessel operations, the increase is virtually negligible. **The EPA upper-bound projections estimate a 120% cost increase and their lower-bound projections estimate an increase of 50% for an average annual increase of $555 to $1,111 per vessel (see table below)**. Of course, depending on a vessel's lubricant consumption rate and the type of EAL selected, costs will vary.To put these fractional cost increases into perspective, Nordic American Tankers, a major international tanker company, announced net voyage revenue per vessel per day of $16,200 in its Q2 2012 report. Using the "high-end estimate" from the EPA of the annual costs of phasing in EALs to tank barges and tank ships, it would take slightly over one hour of voyage time per vessel to recoup these costs.

Disregarding the substantial return-on-

Chart 1

EPA, Economic and Benefits Analysis of the Proposed 2013 Vessel General Permit

http://www.epa.gov/npdes/pubs/vgp_economic_analysis_draftpermit2011.pdf

Table 4-19. Environmentally Acceptable Lubricants Sensitivity Analysis.

Vessel Class	Vessel Count[a]	% Vessels where Practice is Applicable[b]	Annual Cost per Vessel	Total Annual Cost
Low End Estimate (Average Incremental Cost $4/gallon)				
Use EAL				
Commercial Fishing	2,315	49%	$482	$534,654
Freight Barges	39,757	48%	$96	$1,821,140
Freight Ships	765	50%	$1,350	$544,316
Passenger Vessels	1,959	48%	$514	$483,069
Tank Barges	7,138	48%	$96	$327,422
Tank Ships	312	50%	$627	$103,580
Utility Vessels	6,185	48%	$723	$2,169,474
Low End TOTAL	**58,431**			**$5,983,656**
High End Estimate (Average Incremental Cost $8/gallon)				
Use EAL				
Commercial Fishing	2,315	73%	$964	$1,642,369
Freight Barges	39,757	73%	$193	$5,606,986
Freight Ships	765	74%	$2,700	$1,630,424
Passenger Vessels	1,959	73%	$1,028	$1,483,289
Tank Barges	7,138	73%	$193	$1,007,702
Tank Ships	312	74%	$1,254	$309,930
Utility Vessels	6,185	73%	$1,446	$6,641,840
High End TOTAL	**58,431**			**$18,322,539**

a Existing and new vessels, assuming that vessels are replaced at the rate of 1/30th of the population each year.

b Fraction represents the combination of assumptions on the fraction of new and existing vessels that implement the practice in the baseline and those anticipated to use EALs under the 2013 VGP.

Source: Environmental Protection Agency (EPA), Economic and Benefits Analysis of the Proposed 2013 Vessel General Permit, 83

investment of using EALs in vessel operations, which this article will discuss later on, we believe the costs do not pose a threat to profitability.

What options are available with regard to EALs and how are they different?

Currently, there are four categories of EALs that vessel owners and operators can choose from:

Triglycerides

- Base Fluid: Vegetable
- Class: HETG
- Biodegradation Time: Days
- Toxicity: Low
- Typical Performance: Varies
- Seal and Hose Compatibility: Mixed
- Water Tolerance: Medium

Poly glycols (PAG)

- Base Fluid: Glycol
- Class: HEPG
- Biodegradation Time: Years
- Toxicity: High
- Typical Performance: Weak
- Seal and Hose Compatibility: Very Poor
- Water Tolerance: Very Weak

Synthetic Esters

- Base Fluid: Synthetic
- Class: HEES
- Biodegradation Time: Days
- Toxicity: Low
- Typical Performance: Mixed
- Seal and Hose Compatibility: Very Poor
- Water Tolerance: Very Weak

Biopolyolefins

- Base Fluid: Synthetic
- Class: HEPR
- Biodegradation Time: Days
- Toxicity: Low
- Typical Performance: Excellent
- Seal and Hose Compatibility: Excellent
- Water Tolerance: Excellent

The EPA estimates that EALs from vegetable sources are 10 to 50% more expensive than conventional lubricants and also noted that synthetic-based lubricants tend to be significantly more expensive than mineral-based lubricants (twice to four times more expensive).

In terms of application, vegetable-based EALs demonstrate lower performance metrics and usable lifespans when compared to synthetic alternatives. Vegetable-based EALs only have an upper temperature threshold of 180°F and tend to break down when mixed with water. Perhaps most importantly, the expected change-out time for vegetable-based EALs is 1,000-2,000 hours. Biopolyolefin synthetics have an upper temperature threshold of 400°F, are water-resistant and last 10,000-15,000 hours or more. Even though synthetic products can cost up to four times more than vegetable-based products, they last ten times longer, while performing at the same level as conventional, mineral-based lubricants.

PAGs, glycol-based fluids and lubricants, tend to be highly toxic and demonstrate less effective performance than other EALs. In addition, PAGs take years to biodegrade, which this article will show makes for a poor investment compared to readily biodegradable fluids.

Overall, Biopolyolefin fluids are the optimal choice for complying with the 2013 VGP regulations, maintaining peak performance of vessel systems. In addition, these lubricants are readily biodegradable, which helps to mitigate cleanup and remediation costs following leaks and spills.

How exactly do EALs affect environ mental cleanup and remediation expenditures?

Based on the low capital requirements needed to phase in EALs to oil-to-water interfaces, the use of environmentally-acceptable lubricants produce significant returns by reducing cleanup and remediation costs on fluid spills and leaks. Initial cleanup and containment efforts will always be costly to extract as much of the leaked fluid as possible. However, long-term remediation (continuing action to control lingering environmental affects like chemical toxicity and sheening) represents about 60-70 percent of spill containment costs that involve conventional lubricants and oils.

As discussed above, for a lubricant to be considered an EAL, it must be "biodegradable" and "non-toxic." Technically, all lubricants are "inherently biodegradable," meaning they will biodegrade eventually, but they can be toxic (like many mineral-based lubricants) and persist much longer (often years) in the environment than their readily biodegradable counterparts. Readily biodegradable lubricants meet the Organization for Economic Co-operation and Development's (OECD) guidelines for biodegradability, breaking down at least 60% within the first 28 days and reaching the 60% level within 10 days of reaching the 10% level (10 day window criterion).

The following table shows the distinct long-term benefits of readily biodegradable products over conventional fluids.

The remediation schedule of EALs as compared to conventional lubricants is a matter of weeks versus a number of years, resulting in greatly reduced capital requirement of cleanup efforts.

Mark Miller is the CEO of Terresolve Technologies, a Cleveland-based company that provides non-toxic, biodegradable lubricating products. Mr. Miller has a B.S. in Chemical Engineering from Tufts University and an M.B.A. from Manhattan College. He has engineered, sold and marketed lubricants and lubricant additives for over 20 years.

What happens if a vessel owner/operator does not comply?

As with any government regulation, non-compliance will bring penalties and fines of varying amounts, depending on the severity of the case. The EPA grants enforcement authority to the United States Coast Guard (USCG), who will assist the EPA in upholding the statutes in the 2013 VGP.

Conclusion

The Proposed 2013 Vessel General Permit is an effort by the EPA to ensure the ongoing protection of the environment, while creating minimal impact on the businesses it affects. The 2013 VGP's focus on proliferating environmentally-acceptable lubricants across the industry helps preserve fragile ecosystems in American waters and offers vessel owners and operators a significant return on a marginal upfront investment. By switching from conventional fluids to EALs, vessel operators that comply with the 2013 VGP will not only help significantly reduce their carbon footprint, but will also measurably increase profitability without sacrificing performance.

Klüber Lubrication
Protection for Critical Maritime, Offshore Assets

Whether their job is in the international transport of goods, the extraction of oil or gas, or in the cruise business – ships operating at sea or on inland waterways are exposed to high stresses. Many factors work simultaneously toward the degradation of vessel and systems, factors such as extreme cold or heat, high mechanical loads, corrosion, rising and falling temperatures, micro-movement, and the contact with salty air and sea water, all make maintenance and repair a perpetual task. When a piece of on-board equipment breaks down, there are costly consequences due to non-availability, repair times and high replacement investment, and worse, it can put the crew, the vessel, the cargo or the environment at risk.

Ship owner and operators, working in tandem with vessel designers, builders, major equipment and system outfitters and product and service providers seek to Increase the reliability and extend the service life of components as well as reduce operating and maintenance costs.

In this context, the selection of suitable lubricants plays a vital role since speciality lubricants tailored to the individual friction points can contribute substantially. In recent years, the call for eco-compatibility has emerged alongside functional lubrication requirements. Far-reaching laws aiming at the protection of the seas and their species are coming into force. The impact of possible oil spills aside, even well-maintained ships tend to leak a certain small quantity of oil into the sea every day, which poses an additional strain on fragile marine eco-systems. New ideas from lubricant development engineers are much in demand in this respect.

Synthetic lubricants have come to offer a genuine alternative to mineral oils. This new generation of speciality lubricants supports operators in extending maintenance intervals and reducing lubricant quantities. For critical applications such as propeller gears, non-toxic, readily biodegradable gear oils are already available. These products can make a sizable contribution to protecting the seas.

Klüber Lubrication's speciality lubricants for maritime applications at a glance:

- Readily biodegradable gear oil for thrusters and rudder propellers (Klüberbio EG 2-150)
- Readily biodegradable stern tube oil (Klüberbio RM 2-150)
- Speciality lubricants for open gear rims (GRAFLOSCON B-SG 00 Ultra, Klüberfluid C-F Ultra)
- White adhesive lubricant for winches, cranes and cruise ships (Klüberplex AG 11-462)

New additions to the portfolio:

- Synthetic and readily biodegradable hydraulic fluids (Klüberbio LR 9-series)
- Readily biodegradable open-gear lubricant (Klüberbio LG 39-700)
- Readily biodegradable special grease for rolling bearings (Klüberbio M 72-82)

Klüber Takes Spotlight at SMM

It goes without saying that the world's suppliers of marine and offshore fuels and lubes are under increasing pressure to provide solutions that are not only more environmentally benign, but at the same time economical and of course efficient in the job that they do, working compatibly with other products and systems changing onboard just as rapidly. Companies such Klüber Lubrication – long-term players with a strong history and equally bright future – have taken to the challenge to ensure that its solutions help clients meet emerging regulations, as well as keep their bottom line sound.

"Powerful, naturally" was Klüber Lubrication's motto for its SMM stand, with a spotlight on its environmentally sound, efficient speciality lubricants for ships, offshore rigs and other marine applications.

Its new, efficient hydraulic fluids of the Klüberbio LR 9 series bear the European Eco Label for environmentally sound products. With the Klüberbio LR 9 series Klüber Lubrication has developed synthetic, readily biodegradable products.

The new adhesive lubricant Klüberbio LG 39-700 is an open-gear lubricant with a highly viscous base oil made from renewable raw materials. It was especially developed for the lubrication of open gears and pinions driving large anchor winches and the tooth racks of jack-up systems.

The new, readily biodegradable special grease Klüberbio M 72-82 for rolling bearings is highly resistant to water, protects components against corrosion, and due to its good adhesion enables long re-lubrication intervals.

In addition to the new additions to its family of lubricants, Klüber presented additional speciality lubricants for marine applications at SMM, including the recently launched synthetic gear oil for thrusters and rudder propellers Klüberbio EG 2-150 as well as environmentally sound stern tube oils of the Klüberbio RM 2 series especially designed for the lubrication of bushes and shaft seals of fixed-pitch and controllable-pitch propellers.

Put to the Test

Klüber Lubrication has built up an enviable test bay in the sector. Here the extremely high stresses a lubricant is subjected to in the shipping and offshore industries can be simulated. These include strong variations in temperature, high surface pressure, micro-movement and contact with salty air and sea water. On Klüber Lubrication's test rigs, the components are loaded until failure, causes are examined, and the results used to develop optimised lubricants. Throughout this process, Klüber cooperates with leading OEMs.

New Special Grease

Salt water, crashing waves, the ship's decks permanently drenched – conditions at the high seas can be rough. The bearings of cranes, winches and sheaves, and also ropes and open drives must be relubricated with care on a regular basis to ensure reliable operation. The readily biodegradable special grease Klüberbio M 72-82 was developed by Klüber Lubrication especially for the eco-friendly lubrication of rolling bearings and other components operating under extreme maritime conditions.

"It is inevitable that some of the greases used will drop off and ultimately be washed into the sea", explains Dirk Fabry, Market Manager Maritime and Offshore Industry at Klüber Lubrication. "The use of eco-compatible lubricants can help prevent excessive impact on the environment and marine organisms."

Klüberbio M 72-82 is highly resistant to water, protects components against corrosion, and due to its good adhesion enables long relubrication intervals. The fully synthetic special grease offers good wear protection and can be pumped through lubricating systems over a wide temperature range. The product can also be used in cold climates down to minus 40 degrees Celsius without problems.

The biodegradability of the grease is over 60% percent after 28 days according to OECD 301 F. Klüberbio M 72-82 should be the preferred choice wherever contact with water or soil cannot be excluded. Besides on ships or offshore platforms, Klüberbio M 72-82 may also be used for components in port facilities, hydroelectric power stations or water sports craft.

New Synthetic Hydraulic Fluids

In hydraulic systems leakage is a particularly frequent phenomenon that has not been sufficiently solved to date. The root cause lies with the numerous flexible connections within a hydraulic system that are subject to wear or can be damaged due to external mechanical stress. They are constantly under pressure and hard to seal completely even with the best of maintenance. The specific technical requirements of complex hydraulic systems are such that until recently they could often only be met by fluids based on mineral oils. With the development of the Klüberbio LR 9 series, however, Klüber Lubrication has reportedly created a synthetic, readily biodegradable product offering a performance that is at least equal to that of mineral oil based products.

"The new, highly efficient hydraulic fluids of the Klüberbio LR 9 series bear the European Eco Label issued for particularly eco-friendly products. They contain more than 90% of renewable resources," said Fabry. "They are readily biodegradable and not toxic to marine organisms, which considerably reduces their environmental impact in the event of a leakage."

Due to their very good viscosity-temperature behaviour and low setting point, Klüberbio LR 9 oils help hydraulic systems get easily started even at low temperatures. They can therefore be used even where temperatures fluctuate considerably. As they are resistant to hydrolysis, they enable longer oil change intervals and better reliability of the hydraulic system also in wet environments. The synthetic ester based oils are specially designed for applications in mobile hydraulic systems in the marine and offshore sectors. They are also products of preference for land-based hydraulic applications in ecologically sensitive environments, for example in hydroelectric power plants or waterway locks.

Lube Oil: Less Can be More

Ever tightening environmental regulation in the maritime sector means that effective fuel and lube management onboard ships will become a defining issue for vessel owners; a bigger factor in profit versus loss. With new international and regional regulations come new technologies, and when a company the size of ExxonMobil talks, people tend to listen. We sat with Iain White, field marketing manager, ExxonMobil Marine Limited, in Germany earlier this fall to discuss the company's largest product launch ever.

By Greg Trauthwein

As regulation continues to evolve regarding fuel quality and emissions from commercial ships, so too must technology evolve on vessels to ensure that owner not only stay in compliance, but that they also stay in business. In response to the proliferation of ECAs in Europe and North America, ExxonMobil has this year introduced its new variable-sulfur cylinder oil – Mobilgard 560 VS – which is designed for use with residual fuels spanning both high and low sulfur levels. "The ECA legislation is the driver for change," White said. "Customers have to change the fuel, they do not have an option, so that leads through to having to consider changing their lube oil to meet that fuel requirement." While the product officially was available globally in October, it has been in use on the company's U.S. Jones Act client's ships since the summer of 2012, as quite simply the demand was there to meet new Emission Control Area (ECA) requirements in the U.S. "With North American coastal waters set to become the latest region to implement a 1.0 percent sulfur ECA in August 2012, Mobilgard 560 VS will provide ship owners and operators with the convenience of being able to use the same cylinder lubricant as they transition from deep-sea operation with traditional fuels to ECAs in coastal areas that demand the use of low-sulphur fuel," White said.

According to White, the concept behind Mobilgard 560 VS is quite simple: it is an advanced lubricant which offers ultra low feed rate capability for slow speed engines while simultaneously enhancing operational performance and reducing engine wear. As is the signature of any of the oil majors, ExxonMobil approached the problem scientifically confirmed by lab and field tests, and the result is the meeting the requirements of leading engine makers, including MAN Diesel & Turbo, Wärtsilä and Mitsubishi Heavy Industries. "With crew quality being a challenge for our customers now, they want a simple solution. So a single cylinder oil that meets the requirements of all of the different sulfur levels, we feel, is the way to go," White said. "We will be replacing the two cylinder oils we have today with the new one."

According to the company, across a wide range of field trials that were conducted using fuel with variable sulfur levels of between less than 1% to nearly 4%, Mobilgard 560 VS, a 60 BN oil, consistently delivered piston cleanliness, a result achieved even while operating at the same low feed rates as Mobilgard 570, a popular, high-performance 70 BN cylinder oil. Furthermore, in vessels operating under extreme conditions, such as slow steaming or ultra-low feed rates down to 0.45 g/kWh, tests showed how Mobilgard 560 VS can help minimize scuffing and wear.

Less is More

As ExxonMobil has stepped up its involvement with shipowners in the monitoring and management of

LEFT & CENTER Photos: In field trials, Mobilgard 560 VS reportedly provided excellent deposit control. After 3,532 hours with low-sulfur HFO, the Ring Land #1 of Cylinder 2 shows negligible deposits. FAR RIGHT Photo: Mobilgard 560 VS is designed to deliver excellent performance at ultra-low feed rates. After 2,729 hours at 0.45 g/kWh, 2.45% fuel sulfur (14,030 total running hours), this engine's pistons and piston rings are free of deposits.

lube oil, White said the company has found some interesting information regarding the real-world use of lube oil, findings that could help all shipowners save money.

"What we've discovered – that is kind of a game changer – is that most of our customers use too much cylinder oil," White said. "Your typical chief engineer is conservative and wants to ensure his vessel works effectively and safely. He wants to sleep at night knowing that everything is going to stay running, and he thinks that a little more cylinder oil is a little extra insurance policy." We have seen everything from them using the manufacturer's recommendation up to 100% too much, he said.

Chief engineer sleeping habits notwithstanding, the practice is wasting money, and with escalating oil prices and tighter margins it is not a luxury that most can afford. Along with new Mobilgard 560 VS and its range of Mobil-branded marine lubricants, ExxonMobil also offers valuable support services that can help ship engineers optimise feed rates, extend cylinder and ring life, and minimize oil consumption.

For example, its MobilGard Cylinder Condition Monitoring Program – which at the moment has more than 400 ships in the program, according to White – is designed to help ship engineers detect any potential changes in cylinder condition, such as elevated iron levels.

In various field trials, the use of Mobilgard 560 VS, in conjunction with the MobilGard Cylinder Condition Monitoring Program, enabled several companies to operate with cylinder oil feed rates of nearly 25 percent below original equipment manufacturer (OEM) recommended levels, with extremely low wear rates.

"I think with market conditions as they are – things are really tough out there for shipowners – I don't know that we're at the bottom of the cycle, but we're certainly low in the cycle, owners have to operate more cost effectively," White said. "The typical chief engineer that has had this mind set for years: is he going to change? Well, there's a huge cost driver to change."

www.mobilgard.com

Engineering a New Path

WR Systems, long renowned for its prowess in delivering innovative engineered solutions to the U.S. Navy, is making waves in commercial maritime circles.

By Greg Trauthwein

WR Systems is a rare bird by many accounts. While the Norfolk, VA-based engineering firm earns the lion's share of its business from the U.S. Navy, it was never fashioned specifically as a "defense contractor." While it houses an enviable stable of technical talent, with access to some the world's leading experts in marine electronic systems, it does not consider itself an R&D facility … or a manufacturer … rather a hybrid in the middle that is fully capable of both. And while many marine system and service providers are scrambling to diversify from the commercial maritime market, WR Systems is diving headlong into the commercial marine business, expanding its staff, facilities and global reach. Meet WR Systems, a company which today is now re-introducing itself to the global marine industry, with a new logo, a new swagger, but the relying on the same steadfast values and technical expertise that has helped it grow from a start-up in 1983 to its premium position as a go-to source for complex technical matters for one of the world's more demanding clients: the U.S. Navy.

The People

"We are an engineering firm, period," said David K. Edwards, President, WR Systems, Ltd., "We never set out (from the beginning) to be a defense contractor, so we've never really adopted that mentality." Instead the company was fashioned from the outset as a problem solver, and with a cumulative 350 employees in Norfolk and Jacksonville, FL, and a rapidly expanding global network of representatives, it delivers a sizeable technical punch to help solve some difficult problems. "We are a customer driven, matrix organization," Edwards continued, stressing the fact that equal share is given to cultivating, nurturing, growing and maintaining employees as it is customers.

Whether it on the established military, the growing commercial marine, or the newborn healthcare side of its business,

"We are an engineering firm, period," said David K. Edwards, President, WR Systems. Edwards is quick to credit the company's 350 employees (below is the EMSYS team) in Norfolk and Jacksonville as cornerstone to its success.

Edwards maintains that a leading challenge always is to not simply design a solution for solutions sake, rather deliver to the customer what they want.

"Our job is to understand what the customer really wants, and the key is to really listen," Edwards said. "Our engineers may have ideas of grandeur, but we must base our solutions on reality, on the customer need."

With its largest customer being the U.S. Navy, Edwards maintains that the company is well situated, actually serving more on the staffing side of the Navy, working with them to define the parameters of future systems, while at the same time helping them fix systems that may be 40 years old or older, decoding work from companies that may no longer exist and modernizing the circuitry to extend the life (and the budget) of Navy assets instead of buying new. The company's focus on attracting top talent was solidified earlier this year when it added two venerable names – Arthur Thomas Sr. and Mike Kellner – to its team. Thomas, VP Maritime business, was both President and owner of Seacoast Electronics until its sale to Radio Holland (RH) in 2009. He then joined RH USA as Vice President Business Development. Before joining WRSystems he held the position of Director, Maritime Sales – Americas at Thrane & Thrane. Kellner, Director, Maritime Business, is a board member of RTCM, has held senior positions at Thrane & Thrane, Radio Holland and Furuno.

The Systems

The core strength of WR Systems is its work on Marine Electronics Suites, and a stroll through its Norfolk workshop is a literal stroll across the U.S. fleet, surface and subsurface, new and old, large and small. "The Navy can usually find about 80 percent of the solution it needs off-the-shelf. What we do is provide the final 20%," Edward said.

To that end, he sees the foray into commercial maritime business as a natural

extension, as he said the company has effectively helped to introduce many commercial technologies via its developments with the U.S. Navy.

(When we decided to enter the commercial market) "we didn't want to just come into the marine electronics side of the business and be just 'another one,' Edward said. Per protocol, the company conducted extensive fact-finding missions, talking primarily to shipowners, and what it found universally was the feeling that marine electronics service had degraded over time, particularly when economic times turned bad. At the same time, Edwards counts many of the electronics majors as colleagues and business partners, representing approximately 30 OEMs. "Some see us as competitors, some don't," Edwards said. Some, in fact, see the company as a means to get in with the Navy, as for example WR System conducts all ECDIS certification for the U.S. Navy.

Ultimately the target is a 60/40 split between Government and Commercial business by 2015, with a 70/30 split between providing service and providing product.

The Product

To avoid entering the commercial maritime market as just another marine electronics engineering and service provider, the decision was taken that it had to come up with an actual product that could serve as the de facto 'face' of WR Systems to the industry. About the same time, the company was working on an ancillary project with containership giant Maersk, when a casual conversation regarding future technical needs turned to emissions monitoring. *And so born was Emsys.*

To help the maritime industry meet the new emission requirements, WR Systems developed the Emsys, a continuous emissions monitoring system (CEMS), a technical solution to provide a full emissions inventory for NOx, SOx, CO2 and PM for all installed engines and boilers. It also was reportedly the first system to be certified for the calculation of totalized emissions, particulate matter measurement and the calculation of the CO2 Operational Index in line with IMO guidelines. In addition, the Emsys software suite incorporates GPS position and time stamping to allow accurate report generation, important to meeting ECA limits. "We developed Emsys in a proactive fashion to be a straight-forward and cost-effective solution for compliance," said Edwards. "Cost savings will be realized in black smoke fines and ship detention avoidance, as well as a reduction in engine maintenance expense, part replacement costs, fuel expense and reporting expense."

Emsys is a second generation quantum cascade laser and optics-driver single enclosure device that can continuously monitor emissions from up to 10 smokestacks for marine applications and is certified by ABS. WRSystems developed this integrated technology not only to assist industry to meet the MARPOL Annex VI requirements, but for other localized and international marine air pollution regulations. Importantly, the system has been designed for low cost, weight and footprint onboard the ship, with no consumables to replace, rather a filter that must be removed, cleaned and returned.

Confirmation of the concept has come via contracts with Royal Caribbean and Transocean, as well as the latest deal for Emsys aboard two 125,000-ton Carnival Cruise Line's AIDA cruise ships being built at Mitsubishi Heavy Industries (MHI) of Nagasaki, Japan.

Heavy Lifters

A key market sector for maritime business has been the burgeoning oil and gas market globally, a sector which has pushed the technical bounds on many fronts due to the increasing depths of operation. While there are many technologies that work hand in hand to ensure safe, efficient operations in increasingly deep and treacherous waters, heavy lifting technology is central to getting the job done.

The first CAL 64000-1500 Litronic, a heavy lift offshore crane developed by Liebherr-Werk Nenzing GmbH, recently was readied for operation, installed onboard Innovation, which is a vessel belonging to HGO InfraSea Solutions, christened in Bremerhaven on September 3, 2012.

Liebherr has positioned this new crane to meet the increasing demand for high performing heavy lift cranes and strengthens its position in the offshore industry. Within the last two years, eight heavy lift cranes were delivered for the heavy lift jack-up vessel market throughout the world: five of them are Liebherr products. The CAL 64000-1500 Litronic achieves a maximum lifting capacity of 1,500 tons at a maximum working radius of 31.5 m. Even at a working radius of almost 46 m the crane is still capable of lifting 1,000 t. The boom length is 105 m and the deadweight of the crane is 1,500 t. Another fascinating feature is the lifting height of over 120 m above deck. A special component of the heavy lift crane is its slewing ring with an outer diameter of 13 m and an inner diameter of 11 m. The crane is so large and so heavy, that it required its own special planning for production, transport and installation. First, the company's own production facilities at Liebherr-MCCtec Rostock GmbH had to be adapted. For example, the clearance heights and widths in the workshops and on internal site roads had to be enlarged. Then the crane was transported to Poland in several parts weighing up to 600 tons each. Final assembly took place at the Crist Shipyard in Gdynia.

The crane is designed as "Crane Around the Leg," – a design that, despite the crane's enormous size it can be positioned in a space-saving way and thus requires a relatively small obstruction area of only 12 m – but a design demanding special installation planning. The heavy lift crane is able to rotate 360 degrees around one of the four jack-up legs of the vessel. The assembly of the crane is thus closely coordinated with the completion

The first heavy lift offshore crane, type CAL 64000 developed by Liebherr, is ready for operation.

of the jack-up vessel as the crane must be positioned before the vessel leg. The CAL 64000-1500 Litronic is reported to be the first heavy lift offshore crane in the world to date to be built according to this design.

The combination of slewing bearing, slewing gear, winches and the Litronic control system, all manufactured by Liebherr, enables exact positioning and safe moving of the loads while reducing fuel consumption. Together with the powerful 4,000 kW electro-hydraulic drive this provides optimum control in all operating conditions. Moreover, in the crane's design stage special attention was paid to ease of maintenance.

The CAL 64000-1500 Litronic will first be used for the installation of offshore wind power stations in the North Sea wind park Global Tech I. The crane's enormous lifting capacity of up to 1,500 t enables the installation of over 5 MW strong turbines and rotors as well as the loading and subsequent safe installation of the heaviest foundations down to a maximum water depth of 50 m. This reduces set-up times and so contributes to increased productivity.

Offshore Mooring Lines

While winches and cranes take much of the stress offshore on rigs and vessels, the line their pulling is also a major consideration in ensuring safe and efficient ops. Long considered an expensive alternative to traditional steel wire and conventional polyester-based synthetic ropes, offshore ropes and mooring systems made with Dyneema fibers have been making inroads in recent years. Companies such as ConocoPhillips, Shell and Petrobras are selecting to work with systems based on the ultra high strength at low weight fiber of DSM Dyneema. Coupled with durability and longevity, these rope systems beoming recognized for a variety of performance and user benefits. DSM Dyneema's entry into the offshore industry over 10 years ago met with more troubled waters initially. Manufacturers and users were slow to calculate the value and investment payback that Dyneema offered, with the higher upfront capital investment proving a major barrier to entry. In addition Dyneema fiber supply was occasionally lower due to capacity restrictions in the early days of market commercialization. These are no longer issues. Building on its expanding track record of proven success in the offshore industry this perception has changed, and the fiber is now recognized as a choice for the long term, reportedly paying back on the CAPEX investment in a few years. In addition, over the past 10 years DSM has invested significantly to boost capacity in its global plants in order to meet the growing year on year demand as well as anticipated market growth. Most recently the solution received a major feather in its cap courtesy of Brazilian oil giant Petrobras, which specified Dyneema fibers for a complete set of mooring ropes for a semi-submersible mobile offshore drilling unit (MODU).

A New Name in Heavy-lift Projects

A new engineering company has opened its doors in Hamburg: HeavyLift@Sea (**www.heavyliftatsea.de**) which offers design and planning services for heavy-lift shipping and offshore projects. The 10-person team around founders Lars Rolner and Hendrik Gröne is designed to take on projects from designing individual chain hoists to developing special-purpose vessels. Gröne, Managing Director, explains the idea behind the business: "The number of shipbuilding sites in Germany is decreasing. At the same time, there is a great deal of engineering know-how to be found in the field of design and technology for challenging shipbuilding projects and in the development of highly complex solutions, which, for example, the shipyards in the Far East cannot offer. This know-how needs to be bundled, maintained and supplied to customers like ship owners and builders of offshore plants. And that's exactly what HeavyLift@Sea does at the well-established shipbuilding site in Hamburg."

Gröne (37) is an experienced shipbuilding expert and previously worked, for example, at the Sietas shipyard in Hamburg as Chief Engineer.

The engineers, technicians and designers at HeavyLift@Sea prepare individual simulations and calculations for their customers to ensure the best possible proportions and movement in the ship, crane and cargo based on their intended application. They design, for example, chain hoists such as special cross beams and they supervise the building work at the shipyards. Further-

Markey for Canadian
Super Ice Class Tugs

While the offshore market has been a driver for maritime based heavy lifting capability, it certainly is not the only one, and leading company Markey Machinery recently won the order for a complete suite of deck machinery for the most powerful Harbor Class Tugs ever to be built in Canada: the TunDRA 100 tugs, which will be operated by Group Ocean of Quebec, Canada for harbor operations, ship escort services, short and long distance towing, as well as rescue operations and wreck removals. The new tugs will serve needs in ice navigation of the maritime market in Northern Quebec and Canada. The Markey suites of deck machinery will include:

Markey Model DESDF-48-200HP Electric Class III Hawser Winch

- A Split-Drum sized to store up to 300 meters of 10 in. circ. (80mm dia.) soft-line on each side
- An extra-heavy duty levelwind featuring two rope guides to service each side of mid-flange
- Render/Recover capable of operation up to full rated line-speeds and line-tension
- Instrumentation to allow for the display of line-tension, scope, and line speed during ALL modes of operation.
- Controls including a handheld wireless remote unit, as well as wheelhouse and on-deck stationary control stations
- A load shedding feature enabling the winch to automatically reduce power to a predefined limit if the generator becomes too loaded.

Markey Model TES-40UL-125HP Electric Single-Drum Towing Winch

- Drum sized for up to 800 m of 64 mm (2.5 in.) wire rope
- Enclosed chain-and-diamond-screw automatic level-wind, in oil-bath (spooling gear)• Instrumentation to allow for the display of line-tension, scope, and line speed
- Handheld wireless remote operation using the same control used for Hawser Winch operation, plus dedicated wheelhouse and on-deck stationary control stations

Two Markey Model VEP-16-40 Electric Vertical Capstan/Windlasses

- Sized for 26 mm stud link chain
- On-deck stationary control station

"When we were first approached by Group Ocean over two years ago, the development and coordination of "Ice Class" standards by the world's marine rating agencies were in their earliest stages. Group Ocean had never used Markey equipment," said Scott Kreis, Markey's Vice President of Sales and project leader for this opportunity, makes special note of the extensive collaborative effort between Group Ocean, Markey, Robert Allan Ltd and Lloyd's Register. "Following our standard sales and engineering methodology, we visited Group Ocean's headquarters, met with their senior management and rode their tugs to gain a better feel for their particular operational challenges."

"We then applied our decades of experience in supplying deck equipment for service in Alaska and oceanographic winches for use in Antarctica to satisfy the requirements of both Group Ocean and Lloyd's Register," Kreis said. The hull of the TunDRA 100 tug will be reinforced and certified "1A Super F.S." by Lloyd's Register for ice navigation, and its engines will develop a force of 8,000 BHP, resulting in a total bollard pull of nearly 100 Metric Tons.

www.markeymachinery.com

Hendrik Gröne and Lars Rolner, founders of HeavyLift@Sea

more, they develop entire special-purpose vessels based on customer specifications along with prototypes of their own design, like a jack-up service vessel (for servicing offshore plants) and a heavy lifter. The basic designs of these prototypes can be adapted to specifications of the relevant customer.

Additional staff can be brought in for different projects to expand the core team at HeavyLift@Sea and make it even more flexible.

“Everything we do, we do from the position of chief engineering, which means we are always focussed on the ship's system as a whole," explains Hendrik Gröne. “We ensure that the basic concept and the initial idea behind the vessel are observed at all times and remain in place throughout the building process."

One of the first projects that HeavyLift@Sea took on was the development of a chain hoist for the offshore installation of a natural gas field on the sea floor in the eastern Mediterranean. Alongside customer projects, the engineering company also works on a research contract with the Hamburg University of Technology on the subject of ships, cranes and seas.

New Offshore Electric Winch

Cargotec debuted its new range of electrically-driven offshore winches, electrically-driven versions of its range of offshore MacGregor anchor handling/towing winches (eAHT). "This new series of electrically-driven winches inherits the best characteristics of our proven designs," said Francis Wong, Cargotec's Sales Director for offshore winch solutions. "This ensures safe operations, easy maintenance, and also combines improved operability with a low environmental impact, reduced power consumption and low installation costs."

The eAHT series includes winches with line pulls ranging from 200 to 600 tons, with an initial speed up to 25 m/min and with a brake holding capacity up to 800 tons. Each winch is available in double- or triple-drum configuration to meet various designs and operational requirements. The drums are designed to carry a huge capacity of steel wire rope, as well as large diameter low specific weight fiber rope. The extended shaft connections at both ends of the winch are suitable for fitting chain wheels to handle chains ranging from 76mm diameter up to 160mm diameter.

The winches are driven by an AC variable frequency electric motor through an enclosed helical bevel gearbox. They also feature a freshwater-cooled hydraulic or pneumatic disc brake system allowing smooth changing between operational speed modes, from static to dynamic and during dynamic-lowering operations. They also have a regenerative multi-drive system, which is designed to help save space, reduce wiring and provide greater redundancy. The regenerative energy can be easily fed back into the ship's main power system using Active Front-End (AFE) technology which has ultra-low harmonics capability; alternatively it can be dissipated through the braking resistor.

The winches are equipped with independent electro-hydraulically or fully electrically-driven spooling devices, which can be supplied as separate units for the yard to install on the winch compartment bulkhead or on the deck. The winch and spooling device can be controlled both locally and remotely from the wheelhouse.

All control features, including the length, speed and tension-monitoring system, are incorporated in one or two touch screens and remote control panels. Alternatively, these controls can be integrated into an ergonomically-designed operator chair with two joysticks located in the armrests.

Remote Control Ship-to-Shore Cranes at Maasvlakte 2

ABB won contracts from two container terminal operators, APM Terminals and Rotterdam World Gateway (RWG), to provide automation systems for its new ship-to-shore cranes. Specifically, ABB's delivery will enable the cranes to be operated remotely, without a driver on board, to maximize efficiency. The two new terminals that will open in 2014 in Rotterdam at Maasvlakte 2 will be the first in Europe to use remote control of ship-to-shore (STS) cranes, and the terminal of APM Terminals will be the first in the world where STS cranes have no driver's cabin installed. The remote control of cranes are intended to improve productivity and working ergonomics for crane operators, and the new terminals of APM Terminals and RWG in Rotterdam are designed to serve the largest containerships, ships that require lifting heights of more than 50 m. ABB's system for remote control of STS cranes has the crane operators working in a control room located in the terminal building, where they supervise the cranes. This is designed to improve working ergonomics and help reduce the stress on operator's back and neck.

Operators supervise the crane motion via onboard cameras; often the camera views are more comprehensive than the views available from inside the crane cabin. Combined with access to control information provided by the automation system, these help to improve overall operator performance. With a crane operator on board, crane acceleration and deceleration rates are limited. With no operator on board, the crane can run faster and ramp times can be shorter. This enables significantly shorter cycle times to unload an entire ship's worth of cargo. ABB's system automates the crane's corrective movements to ensure accuracy and speed. With no operator on board, more aggressive corrections can be made, which further reduces cycle times and contributes to higher productivity.

Wärtsilä X72 Engines for Six Vessels

Wärtsilä will supply its new Wärtsilä X72 licensed engines to power six new vessels for two Singapore based shipping companies. Wärtsilä equipment will be installed on four container vessels that Pacific International Lines (PIL) has ordered from Dalian Shipbuilding Industry Company (DSIC), in China, and on two bulk carriers being built by Bohai Shipbuilding Heavy Industry Co. Ltd. (BSHIC) also in China. The Wärtsilä X72 will serve as the main engine for these ships, with delivery of the first engines scheduled for early 2014.

"The maritime sector continues to confront the need to achieve lower operational costs and better environmental performance," said Martin Wernli, Vice President, Wärtsilä Ship Power, 2-stroke. "In fact, compared to similar vessels that have recently been delivered, the bulk carriers' fuel consumption can be reduced by approximately 5 tons/day, while the container vessels can achieve savings of 4 tons/day."

The low-speed Generation X engine series was launched in May 2011 with two mid-sized engines, the Wärtsilä X62 and Wärtsilä X72, designed specifically for merchant vessels that use mid-size, low-speed engines; such as Panamax to Capesize bulk carriers, Aframax to Suezmax tankers, and Feeder to Panamax container vessels.

The series includes also the Wärtsilä X35 and X40, which cover the small bore end of the market, such as small bulk carriers, product tankers, general cargo vessels, reefers, feeder container ships, and small LPG carriers. The first of these electronically controlled, low speed engines was started in November 2011 and passed its factory test in February 2012. The recently introduced Wärtsilä X92 is a direct response to the container shipping industry's move towards larger ship sizes and more efficient propulsion systems. To date, a total of 24 Wärtsilä Generation X engines have already been ordered since their market introduction.

Wärtsilä will supply its new Wärtsilä X72 licensed engines to power 6 new vessels.

Voith Inline Thruster with Swing-Out Unit

With its Voith Inline Thrusters (VIT) (pictured right), Voith is producing transverse thrusters with permanent-magnet synchronous machine technology (RIM drives) with a power of 1,500 kW. At the SMM in September, Voith presented a RIM drive which can be extended from the vessel hull and is equipped with an azimuth gear: the Voith Inline Propulsor (VIP). The VIP Swing-Out Azimuth Thruster is a special type of Voith Inline Propulsor which can be extended hydraulically from the vessel hull and can be turned limitlessly through 360 degrees once it has reached the end position. Combined with the advantages of the RIM drive concept, this special design is particularly advantageous for the dynamic positioning of megayachts and for offshore applications. Retracting the auxiliary propulsion units once they are no longer needed and when cruising in the open sea is beneficial with regard to speed, fuel consumption and CO2 emissions.

www.voith.com

GE LM2500 Gas Turbines to Power Jackson (LCS 6)

GE Marine delivered two LM2500 marine aeroderivative gas turbines to Austal USA's Mobile, Ala., shipyard to power the U.S. Navy's Independence-variant Littoral Combat Ship Jackson (LCS 6). In total, GE will provide 20 LM2500 gas turbines for the Austal USA LCS program, part of a contract for up to 10 ships over a five-year period. Similar to the previous two Austal-built LCS Independence and Coronado, Jackson will be powered by two LM2500s arranged in a CODAG configuration with two diesel engines.

The 127-m aluminum trimaran LCS is an agile surface combatant that can be deployed independently to overseas littoral regions, can remain on station for an extended period either with a battle group or through a forward-basing arrangement, and is capable of underway replenishment.

All the LM2500 gas turbines for the Austal LCS program were or will be manufactured at GE's Evendale, Ohio, facility.

Shown is USS Independence (LCS 2) during sea trials in the Gulf of Mexico. Two LM2500 aeroderivative gas turbines arranged in a COmbined Diesel and Gas turbine (CODAG) configuration with two diesel engines power the Austal-built LCS.

Marorka Online to Validate Hull, Prop Performance

Jotun Hull Performance Solutions (HPS) commends the Marorka Online team on implementing the functionality required to measure hull and propeller performance in its 'energy-management dashboard.'

Improving hull and propeller performance is an effective and quick-win solution for shipowners seeking to boost the energy efficiency of their fleet. The reliable and accurate measurement of performance allows owners to make both fuel-cost and greenhouse-gas (GHG) emissions savings, based on informed investment decisions. The new functionality in the Marorka Online solution is compatible with Jotun's Hull Performance Measurement Method (JHPMM), which was developed to enable performance-based contracts as part of Jotun HPS. JHPMM is transparent by design and has been placed in the public domain.

The Marorka Online platform can be used to reliably determine the outcome of performance-based contracts between shipowners and suppliers of hull and propeller performance solutions. Jotun welcomes the new functionality in the Marorka Online platform and, in particular, the fact that it offers full transparency.

(Photo courtesy of Austal USA)

Using the Right Tool Can $ave

Horizon Shipbuilding in Bayou La Batre, Alabama saves time and money with a new VO mount installation tool

Situated in the far southwest corner of Bayou La Batre, Alabama, sits a top ship and boat building company, Horizon Shipbuilding. For more than 15 years, Horizon has been building an array of impressive vessels, ranging from 30-ft. boats for the U.S. Navy to 200-ft. supply vessels. The family run business covers 12 acres with every available space dedicated to building, repairing and maintaining boats. Horizon Shipbuilding is a full service company whose capabilities include design, construction, operation, maintenance and repair. One of the most common boats Horizon builds are the 140-ft. towboats, most of which end up pushing barges – sometimes as many as 30 at a time – up and down the Mississippi River.

To move so many barges at one time, modern towboats need plenty of horsepower, and one result of these powerful high torque engines is they can produce harmonics: vibrations produced by the firing and internal moving parts of the engine that adds wear and tear to the vessel. To ensure that doesn't happen, vibration oscillator mounts must be installed between the engine and engine mounts. Vibration Oscillators (VO) combat the back and forth vibrations produced by the high horsepower engines.

Installing VO mounts is a big job considering that each engine can weigh 18 tons. Roger Oliver the 10 year Production Superintendent at Horizon, who is responsible for "everything in the yard," knows this job all too well. "By the time you get them in, get everything aligned, pulled back out and drilled and set back in there, you're looking at a three day evolution. We used to have to take the engines right out of the boat, make the holes, and then set them back in."

To install VO mounts, each engine has to be lowered into the engine compartment, lined up on the guide posts, holes marked, then hoisted back up and out so 24 holes through A36 material could be drilled with a magnetic drill and mounts installed. Then the tedious task of realigning the engine back on the guides. After which it is lowered down and finally secured into place. "When realigning these engines we shoot for a tolerance of zero, but the tolerance on an engine like this is .002" said Oliver.

For Horizon, the ability to fully design and construct a boat from the ground up is one of the keys to their success. And

Above:
Drilling a Hole with HMD150 Magnetic Drill under the Engine.

Below:
Horizon Shipbuilding builds an array of vessels.

with as many as 14 newbuilds going on at a time, the 230 plus employees at Horizon must look for every avenue to save time while exceeding customer expectations. Oliver was investigating a better way to drill the holes for the VO mounts, and searching for a "small skinny drill," he eventually came across a low profile magnetic drill from Hougen Manufacturing called the HMD150.

Intrigued by its small size and large hole capacity, he felt this might be just the ticket they needed to save time. Oliver contacted Fred Buish from Tooling Concepts in Mobile, Alabama and had him out to go over the Hougen drills. Together Fred and Roger pulled the prints to installing the VO mounts and discovered they could raise the powertrain up just 10-in. while keeping it aligned on the guide posts. The HMD150 drill was only 7-13/16-in. high which would work perfect for drilling the holes under the engine. The Hougen HMD150 is a low profile magnetic drill weighing 22.7 lbs. It has the capacity to drill holes up to 1-3/8-in. diameter and 1-in. deep using the tool-less RotaLoc Plus annular cutters. To achieve the low profile, the HMD150 drill uses a right angle Hougen motor, high power gearing and a quill feed arbor system which incorporates positive slug ejection. Roger was excited that the drill would work but the holes had to be 1.5-in. deep, and standard cutters for the HMD150 are 1-in. deep. Oliever put in a request and asked if Hougen could make custom RotaLoc Plus tools in the size of 15/16-in. x 1.5-in. deep. Fortunately Hougen had a handful of 1.5-in. deep cutters already on the shelf and immediately sent them to Horizon.

When it came time to install the VO mounts, Roger and the crew at Horizon put their new method to the test. Once the holes were marked, they hoisted the engines 10-n. while they stayed aligned on the guide posts. An HMD150 was brought in to drill down to the max depth of 1-in. Then the crew put the 1.5-in. long RotaLoc Plus cutter in the drill, placed the cutter back into the existing hole that had just been drilled and finished drilling out the last half inch. They did this to all 24 holes. Mounts were secured, the powertrain was lowered back down, bolted into place and was ready to go into service. "It's much faster. We don't have to pull the engine out. Once the alignment is done it takes just four hours for the job," said Oliver. As comparison, the job used to take three days. "We like the HMD150 because of its small size but not only that, it drills quite well. For its size it packs quite a punch and will get right on through the material."

www.horizonshipbuilding.com
www.hougen.com

Lilaas: High Design in Vessel Control

At the SMM 2012 exhibition in Hamburg, Lilaas debuted a family of innovative new marine control devices; innovation leveraging the storied company's in-house software solutions and packaged in an elegant yet functional design.

The marine industry has many with small, innovative family owned companies, and it is no coincidence that more than a few hail from Norway. Lilaas is a leading supplier of control levers and joysticks for the shipping industry, a family-owned Norwegian venture that unveiled two new product series: a new range of electronic levers and an improved joystick. The new series come in a high-design package, but the change is far more than skin deep, as software control promise significant gains in operational efficiency and flexibility for the user.

"We kept it simple," said Øyvind Lilaas, Managing Director, who has been with the company more than 25 years but in reality his entire life. "We surveyed our customers regarding the look and feel of the new products."

"These two major product launches demonstrate our strength in the areas of both design and technology," said Terje Akerholt, Lilaas' sales and marketing manager. "There are many technical benefits that ship owners and operators will be able to get from these new products."

In September 2012 Lilaas officially launched its new electronically-controlled LO1 lever range, a range driven by a high software content that is integral and represents a major step forward, according to the company. In fact, the company sees the use of software control in marine levers as not simply a turning point for the company, but indeed for the wider marine industry.

"There is no doubt we are pioneers in using this technology," said Akerholt. "I believe strongly that all-electric levers like the LO1 series are the future and the arrival of this new range will mark a step-change for the industry."

Essentially the LO1 range, which incorporates advanced software solutions and a digital display screen, brings together the functions of multiple joysticks or levers into a single unit. All of the various components and capabilities a customer wants to have can be pre-installed within the lever structure, and only a very shallow cut-out beneath the lever is required. In addition, a wide range of different functions, including tension and force feedback, can be programmed to meet individual customer requirements.

While the marine industry is sometimes dubbed conservative, Mr. Lilaas contends that the new generation of mariners – those brought up in the video gaming generation – are early adapters of technology and in fact demanding new products. "It's important to remember that the real change here is the software control."

A key feature of the design, developed in-house by Lilaas together with a company specializing in control system software, is the built-in TFT LCD display. This shows the position of the lever and feeds back information from the ship's systems that are being controlled. The display screen also allows settings to be configured by the user to suit individual preferences.

A Quantum Change

"The use of software control versus hard wires is the quantum change," said Mr. Lilaas. To help deliver this flexibility, Lilaas invested in a software program called CREO/Pro Engineer, which is a 3D software tool allows the designer to 'talk' with the machinery directly. No drawing is needed, enabling the company to quickly make adjustments and construct parts using the materials requested by clients. A benefit of the new lever design and the software installed within is that it makes it easier to introduce customizations that meet an individual operator's preferences. "Every operator likes to work in a different way," said Akerholt. "With the new generation LO1 levers it will be much simpler to take this into account." Having the display as an integral part of the lever's structure will also make the LO 1 class levers easier to use, as all of the information required by the operator is available in one place. The levers were designed to ensure a high degree of redundancy, in the event of technical problems, and feature capacity touch switches, with up to four for azimuth or single controllers and up to eight covering a double controller. The switch text has been engraved on the lever as an added precaution against electrical failure. Other features of the LO1 range include an isolated analogue and emulated potentiometer output, an isolated back-up system and an analogue dimming input.

Lilaas is marketing a core design platform for the LO1 series, with different models available for azimuth, thruster or propulsion control, and a range of options to facilitate customization. These include a 4-20ma current loop, relay outputs, display graphics, a USM interface, brushless DC motors, force feedback and the possibility of having either CAN bus, Profibus or Ethernet interfaces.

Brains & Beauty

While the core competency of the controls is undoubtedly the more critical consideration, considerable attention was paid to the visual impact of the new LO1

The LO1 incorporates software solutions and a digital display screen, bringing together functions of multiple joysticks or levers into a single unit.

The LO4 joystick is compact, requiring only a small amount of space to be provided under the mounting plate.

“The use of software control versus hard wires is the quantum change.”

Øyvind Lilaas, Managing Director

range. Lilaas has worked with Oslo-based Hareide Design to produce the distinct, bold aesthetics which makes the LO1 stand out. “The product combines a rational functionality with a focus on safety,” said Magne Ekerum Hoiby, Hareide’s creative director. “We chose not to use any kind of styling, so the physical shapes are pure and functional, yet proportional and balanced. The graphic display as well, with its ultra-basic look, is a contrast to modern 3D graphics.”

Hoiby believes the most significant element of the new lever range is that it embodies Lilaas’ unique qualities as a company. “The fine mechanics, achieved through hidden screws and fasteners, as well as the subtle highlighted surfaces, can only be produced through high precision milling,” he said. “Also the distinct silhouettes of the sharp and angled outboard arms, and the simplistic form of the physical and digital elements, reflect the best values within the Lilaas company and the unique way that they work.” The result, Mr Hoiby believes, is a strong and distinct design identity that reflects the Lilaas image, and yet is still general enough to fit in with the console layouts of many different clients. “The LO1 levers have a design DNA that is far from typical,” Hareide said.

The process of securing DNV approval for the new levers is advanced and a pilot order has been secured. The LO1 levers will be installed for the first time on a series of newbuildings for an offshore operator.

LO4 Joystick

Lilaas is also marketing a new joystick, type LO4. The primary aim of this particular R&D initiative has been to allow greater control sensitivity on offshore and other vessel types. To achieve this, the new unit incorporates magnetic touch-free sensors and dispenses with the need for a potentiometer. The design approach adopted by Lilaas offers users a number of benefits. The LO4 joystick is compact and requires only a small amount of space to be provided under the mounting plate. In addition the use of magnetic sensors makes the movement of the joystick smooth, ensuring that it is user friendly and accurate to operate. Other features include adjustable brakes, a push button with a light, and spring-return and switches on both X and Y axes. Furthermore all axes can be used simultaneously.

“We decided to use a magnetic sensor that is physically smaller than a traditional potentiometer,” said Espen Hoff, Lilaas’ R&D manager, in explaining the main aim of the in-house design team: to produce a joystick that was smaller, and also offered better ergonomics when operating at 45 degrees. “The sensor’s size gave us the opportunity to produce a more compact mechanical solution with fewer parts than before.”

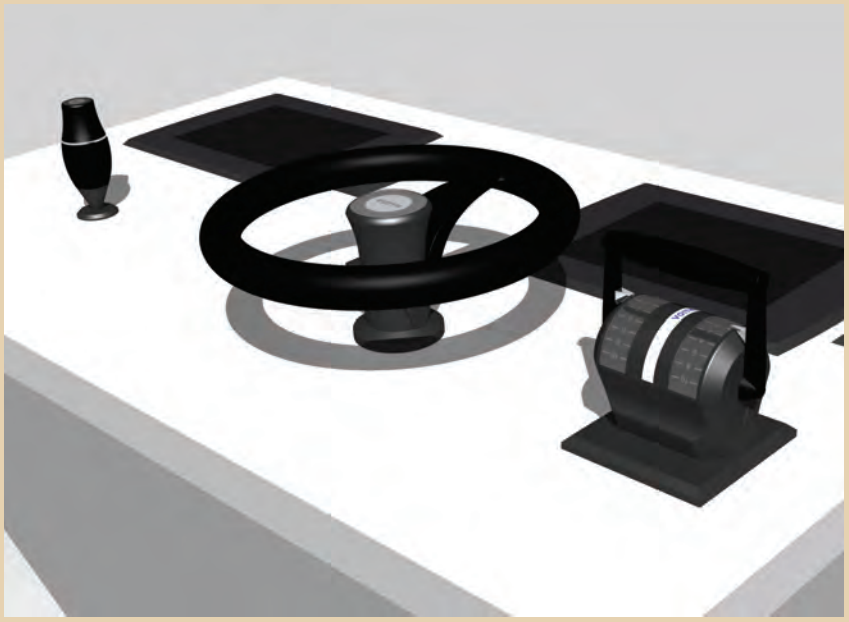
DNV type approval has recently been secured for the LO4 joystick. In fact the classification society has confirmed the certification at a higher level than originally requested by Lilaas, and so the LO4 series is now DNV approved at the IP-56 standard and also IEC 60945 and IACS E10.

www.lilaas.no

Voith Vessel Propulsion Control System

At SMM in Hamburg, Voith displayed a functional model of the new vessel propulsion control system for Voith Schneider Propellers and Voith Radial Propellers. The new system is designed to offer various new electronic control and assistance features including faster actuation and more precise control of the propulsion systems, remote diagnostics via the internet and communication through a range of interfaces. The new control system will be supplied for the first time in the last quarter of 2012 and will be available as a series product from mid-2013 onwards. Voith for the first time developed the entire control system in-house. This comprehensive solution is underlined by the uniform Voith design of the bridge components: Joystick, steering wheel and propulsion control lever were developed in cooperation with Stuttgart University taking into account ergonomic characteristics. Voith already has a successful record of cooperation with the university during previous projects such as the Voith Radial Propeller since the Stuttgart University degree course "Design" requires a degree in engineering. This ensures that the focus is not just on esthetic and haptic aspects but also on optimum handling as well as on functional issues.

To monitor the propulsion units, the new control system records all data as well as faults. Monitoring can be done from the bridge as well as from the machine or propeller room. In addition, the new electronic control and assistance features lower the fuel consumption of the propulsion units. The control features can be tested on Voith's own vessel simulator. Communication is via interfaces such as CAN bus, Modbus TCP/IP, Modbus RTU, Profibus DP or NMEA.



www.voith.com

Mitsubishi ALS Installed on Ferry

Claims more than 5% Fuel Efficiency Improvement

Mitsubishi Heavy Industries, Ltd. (MHI) installed its innovative "Mitsubishi Air Lubrication System" (MALS) for the first time on a ferry - a ship with a slender hull form* - and confirmed over 5% improvement in fuel consumption. MALS is MHI's proprietary technology that reduces frictional resistance between the ship hull and seawater by introducing a layer of air bubbles blown from the ship's bottom. The verification experiment was conducted at sea using the Ferry Naminique, a ship owned by Japan's A-LINE Ferry Co., Ltd. that went into service starting September 27. The experiment results have verified that MALS is also applicable to high-speed, slender ships as a way to reduce fuel consumption. The Ferry Naminique is an 8,072 gt ship measuring 145 x 24 m, with a design draft of 6.2m. It was built at MHI's Shimonoseki Shipyard & Machinery Works and plies the Kagoshima-Amami-Okinawa route in southern Japan.

In 2010 MHI installed MALS for the first time on two module carriers operated by NYK-Hinode Line, Ltd. — first the Yamatai, then the Yamato — and confirmed significant energy savings. To expand MALS' application range, MHI next proceeded to develop a system applicable to high-speed, slender ships, which have a comparatively smaller flat area at the ship bottom and are thereby considered technologically difficult to apply MALS effectively. Installation of the system on the Ferry Naminique was realized thanks to the full cooperation extended by A-LINE Ferry Co., Ltd.

** Note: A slender hull-form ship refers to a ship with relatively small block coefficient (Cb). Cb = volume of displacement divided by the volume of the block defined by a ship's length x breadth x draft. Ships with a comparatively large Cb value are known as "full hull-form ships."*

During the speed trial test at sea, fuel consumption improvement (reduction in propulsion power required) exceeding 5% was confirmed even with waves as high as 2.5-3m. These results verified reduction of frictional resistance by MALS even when installed on high-speed, slender ships, the company claims.

Going forward MHI will continue to monitor the operational conditions of the Ferry Naminique and verify MALS' effectiveness in both energy saving and CO2 reduction. The verification experiment using the v was supported by ClassNK (Nippon Kaiji Kyokai) as a joint research project.

Peerless Electronics
New Circuit Breaker Solutions

Peerless Electronics is stocking 3 families of vehicle circuit breakers from E-T-A, including:

- **The 1610 Series** - A resettable alternative for standard plug-in type blade fuses for fuse blocks in vehicles with 12V or 24V electrical systems, the 1610 Series circuit breaker reduces downtime caused by blown fuses in trucks, recreational vehicles, speciality vehicles, passenger cars and boats. A new benefit of the 1610 series is a color-coding scheme that corresponds to the colors of blade fuses. The 1610 Series thermal circuit breaker offers:

- It can be quickly reset, enabling the circuit to be restored with a minimum of downtime.
- It eliminates the possibility of a fuse being replaced with another fuse of the wrong rating.

1620 Series

Color coded thermal vehicle circuit breakers that mount like a standard automotive fuse into a socket. These breakers meet the requirements of SAE J553.

- **The 1620-2 Series** - The Type II circuit breaker with modified reset has the lowest operating temperature in the miniature vehicle circuit breaker market. The 1620-2 also offers a space saving profile vs. the competition!
- **The 1620-3 Series** - Is the smallest Type III automotive circuit breaker on the market! For 24 V systems, these resettable thermal automotive style circuit breakers are particularly suitable for installation in inaccessible areas. Fits into fuse blocks designed to ISO 8820-3. The convenience and reliability of a circuit breaker in a fuse sized package.

www.peerlesselectronics.com

Hazardous Duty Magna Shear Motor Brakes

MagnaShear oil shear motor brakes from Force Control Industries (Fairfield, OH) – which are ideal for hazardous marine environments - will be featured in the Force Control Industries booth #3468, during the International Work-Boat Show in New Orleans. These brakes are designed to eliminate normal maintenance and adjustment, operate smoothly, and last up to 10-times longer than standard brakes. High grade castings, marine duty coatings, stainless steel fasteners and accessories make these brakes a solution for onshore and offshore marine applications – including those with wide temperature variations (suitable for offshore operations down to -40°C). Their varied ship-board and in-port applications include use on anchor winches, mooring winches, drawworks, capstans, conveyors, hoists, loaders and un-loaders, and more. Oil Shear Technology is the reason that brakes by Force Control do not need maintenance, adjustment, disc replacement, and last up to 10 times longer than standard brakes. Oil Shear Technology is the function of a boundary layer of transmission fluid in shear between the friction disc and drive plate. As the parts come together the fluid under shear will transmit torque between the two parts as well as absorb heat. This heat is then taken away from the friction surface to the housing to be dissipated.

www.forcecontrol.com
Email: sales@forcecontrol.com

Victaulic Mechanical Pipe-Joining Products

Victaulic received updated and renewed ABS Type Approvals for a range of grooved-end couplings and fittings. The newly issued approval certificates are valid until end June 2017 and cover joining methods, and that are ideally suited to many applications in the shipbuilding and marine piping industries. Applications include fresh water, potable water, sea water cooling and ballast systems; bilge pipes; vents and overflows; compressed air, sanitary, fire main and fire suppression systems.

Among the products approved is the Victaulic Style 177 QuickVic flexible coupling — part of the Victaulic patented installation-ready product line. It installs in half the time as standard flexible grooved couplings without the need to disassemble the bolts, nuts, gasket and housings — making installation faster, easier and safer than any other solution currently available. ABS Product Type Approval for the 177 coupling includes sizes 2 to 4 in. (50mm – 100mm) with a pressure rating of 232 psi/1600 kPa.

Also approved are Victaulic ZeroFlex rigid couplings (Style 07), flexible couplings (Style 77 and 75), reducing coupling (Style 750), Roust-A-Bout coupling (Style 99) and flange adapters (Style 741 and 743). The products are manufactured from ductile iron conforming to ASTM A-536 and are available in varying sizes from 1" – 12" (25mm - 300mm) according to product type. Certified for pressure ratings up to 232 psi/1600 kPa, they deliver high performance and

http://www.victaulic.com/en/businesses-solutions/maritime

Portable Buoy System for Underwater Noise Measurements of Ships

Noise Control Engineering, Inc. (NCE) has created a portable system for measuring underwater radiated noise from vessels and offshore platforms. The system was developed using internal research and development funds as NCE sees an increasing need for underwater noise assessments given the planned construction of new Fisheries Research Vessels worldwide and a growth in awareness of underwater noise issues as they relate to the marine industry.

The system uses a floating buoy that supports measurement hydrophones and data acquisition electronics. NCE engineers connect with the buoy electronics remotely to collect and process data; providing the ability to calculate underwater noise signatures within minutes of the measurement.

The buoy can be deployed from the ship being tested by using a small crane or A-frame; this removes the need for additional support vessels, reducing the planning and operational costs of the test. The measurement system can be broken down and shipped in conventional cases, allowing for measurements to be performed in locations convenient to a particular port or shipyard.

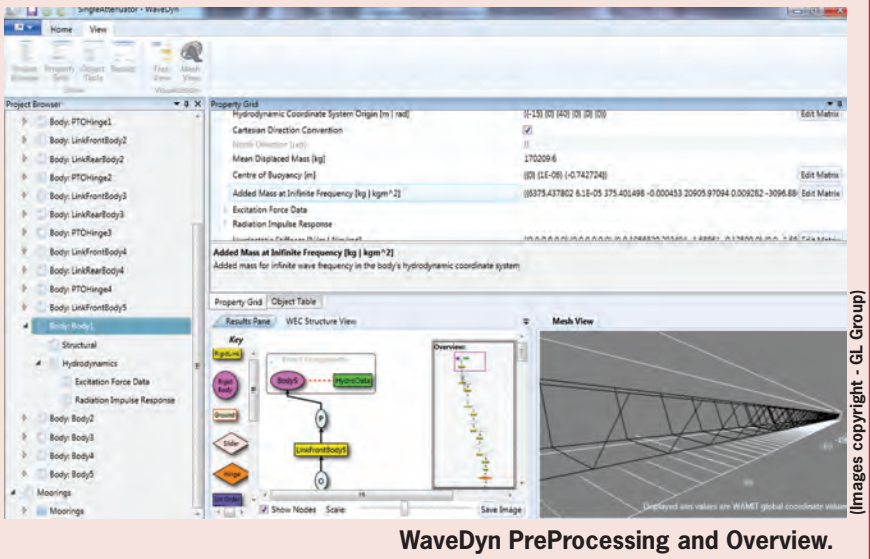
NCE has used the system in two tests, performed on nearly opposite sides of the globe, and has plans to use the system to measure noise from five different vessels in the next 12 months. This system can take measurements in accordance with the Grades B and C requirements of ANSI's underwater measurement standard – S12.64 (2009).

NCE's Senior Engineer, Jesse Spence, stated that "this measurement system will not only augment NCE's existing capabilities of underwater noise prediction, measurement, and solution identification, but will also reduce the costs of testing for shipyards and owners who need to perform underwater noise diagnostic or compliance measurements.

E-mail: nonoise@noise-cotnrol.com
URL: www.noise-control.com

GL Garrad Hassan Releases WaveDyn

At the International Conference on Ocean Energy (ICOE) in Dublin, GL Garrad Hassan released WaveDyn, the first independently developed wave energy converter design tool to be made commercially available. WaveDyn allows users to model a wide range of wave energy conversion device types. Its flexible, multi-body modeling approach, coupled with a hydrodynamic flow solver, and a range of additional modules, including Power Take-Off (PTO) and Moorings modules, allows the user to build models that match the physical properties of real machines. WaveDyn will take its place in the company's software portfolio alongside the design tool for wind turbines, Bladed, and the tidal turbine design tool, Tidal Bladed. Wave energy conversion brings with it a unique set of challenges, one of the most significant being the independent evaluation of the wide variety of different device types under development. WaveDyn has been developed to provide one self-consistent and rigorous tool that can be applied to a wide range of concepts. WaveDyn has been under development at GL Garrad Hassan for nearly five years, during which it has been applied to a wide range of wave energy converter types. It has benefitted from extensive verification exercises involving other device specific numerical models, and validation against experimental data from both R&D and commercial design projects. Most recently, WaveDyn has undergone Beta testing and validation as part of the £8m PerAWaT Project (Performance Assessment of Wave and Tidal Array Systems) commissioned and funded by the Energy Technologies Institute.



(Images copyright - GL Group)

WaveDyn PreProcessing and Overview.

Platsidakis

Stanzel

Webb

Christensen

Platsidakis to Head Intercargo

Intercargo appointed John Platsidakis as Chairman. Platsidakis is currently Managing Director of Piraeus-based Anangel Maritime Services Inc., a function that he will continue to perform alongside his role as Intercargo Chairman. Platsidakis said "the role of Chairman of Intercargo is both a great honor and privilege for me given the important work that the Association carries out. Taking the role after Mr. Pappadakis is undoubtedly a daunting task given his enthusiasm and passion for the dry bulk industry, but I'm hoping that I can equal his achievements and success during my tenure and urge our members to enhance their support of Intercargo to assist in my efforts to achieve the objectives of our Association."

Stanzel Wins WISTA Award

At the Women's International Shipping and Trading Association (WISTA) meeting of the National WISTA Association Presidents held in Paris on October 3rd, INTERTANKO's Katharina Stanzel was voted the 2012 WISTA Personality of the Year. Her nomination had been submitted for consideration by WISTA UK. "In 2012 Katharina was unanimously voted as the fifth Managing Director since the Association's foundation in 1970 - she is the first woman to take this position. INTERTANKO is a titan of the maritime industry; its influence is far-reaching, acting as advocates and lobbyists, their connection to the (controversial) fuel / energy industry is intrinsic.

Katharina's responsibility to steer these waters requires great expertise combined with diplomacy – the perfect platform for an environmentalist.

Previous winners of this Award include Mfon Ekong Usoro of Nigeria, Suzanne Williams of the United Kingdom, Pamela Conover of the United States, Rodi Kratses and Sir Stelios Haji-Ioannou of Greece.

Black Promoted to S VP of WR Systems

Greg Black, Director of the Government Business Solutions Division, was promoted to Senior Vice President of W R Systems, Ltd. (WRSystems). He has more than 30 years of experience in federal and private sector weapon system program management.

He served in the United States Air Force and after completion of his military duty, entered the Federal Civil Service as an engineer with the Naval Space Command, performing several functions including Program Manager for the Relocatable Over-the-Horizon Radar (ROTHR) program. He joined WRSystems in 1997 and holds a Bachelor of Science degree in Engineering from the University of Pittsburgh.

Wärtsilä North America Appoints Webb

Wärtsilä North America appointed Patrick Webb as General Manager, Field Services, USA. Webb is a graduate of the United States Merchant Marine Academy and holds a Master of Business Administration from Auburn University. Webb brings over 20 years of marine engineering and business management experience. Based in New Orleans, Webb will oversee the North American field services team and will be a member of the U.S. Services Management Team.

OW Bunker Launches Physical Operations in U.S.

OW Bunker launched a Physical Division in its US operation to complement the company's existing trading arm. To drive the growth, the company has appointed Adrian Tolson as Regional Manager and Keith Richardson as a Senior Trader for the North American Physical Division. Jan Christensen, Vice President, Physical Division, OW Bunker, said: "I am delighted that Adrian Tolson and Keith Richardson have joined OW Bunker. They have a wealth of industry experience and will play a pivotal role in creating the infrastructure for our new Physical Division in the US, and driving its growth. Their knowledge and understanding of the region will help us to build better and closer relationships with our customers, enabling us to meet their increasing needs and demands."

OW Bunker's US Physical Division will be based out of Connecticut. The initial focus will be to provide physical supply in the US Gulf and create a platform for further expansion in key ports throughout North America.

OW Bunker: New Global Quality Control Standard

OW Bunker launched a new global standard to ensure the quality of products supplied by its physical division. The move is part of strategy to drive annual global claims below 1%, an unprecedented figure in the bunker industry. Customers will be provided with a specification analysis on a minimum of 90% of all physical product orders, delivered prior to the usual testing procedures conducted by an external fuel oil analysis provider.

This is designed to ensure total rigor in the fuel oil testing process and guarantees that customers receive the best quality products.

"Fuel quality is critically important to our customers, particularly as regulations become more stringent," said Jan Christensen, VP, Physical Division, OW Bunker. "Our new global standard on pre-testing analysis provides customers with confidence in our products and our quality control processes."

"Claims are expensive for all parties and something that ship owners can ill-afford in the current economic environment. Pre-testing analysis reduces unnecessary claims and saves customers' money. Through this and other quality control measures, OW Bunker is striving to achieve an industry-leading goal of less than 1% claims."

Dr. Strahberger to Head Marine Business at Voith Turbo

As of October 15, 2012, Dr. Christian Strahberger (40) takes over the responsibility for the Business Division Marine of Voith Turbo. After studying physics in Regensburg, Colorado (USA) and Munich, Strahberger obtained a doctorate at the Walter Schottky Institute of TU Munich in 2001. Prior to joining Voith AG he worked for seven years at Siemens Management Consulting (Siemens AG) in Munich as a Consultant and Project Manager of international industrial projects of Siemens AG. His activities focused mainly on sales optimization and restructuring.

At Voith, Strahberger started out by assuming the strategy management at Voith Paper as Vice President Strategy in 2009. From 2010 he was in charge of rebuilds, spare and wearing parts, as well as services for stock preparation and recycling machinery as Senior Vice President Products & Services and Member of the Management Board of Voith Paper Fiber & Environmental Solutions. Strahberger succeeds the previous Head of the Division Dr. Martin Füllenbach.

Dielen Joins GPA in Brazil

Baldo Dielen joined Naval Architecture & Marine Engineering firm Guido Perla & Associates, Inc. (GPA) and has been appointed General Manager of the Brazilian branch Guido Perla do Brasil Ltda. Dielen, a naval architect himself with over 20 years of extensive experience in the international maritime business, has worked in over 40 countries with residential periods in the Netherlands, the UK, the USA, and the past nine years in Brazil.

Previous experience in Brazil includes maritime consultancy and working as Partner at EDDY Tugs. Dielen also held various management positions with SMIT.

Dr. Strahberger

Dielen

MHI Won PCTC Order

DNV Assists Belgium Toward LNG Bunkering

The Flemish government and the port authorities of Antwerp, Zeebrugge, Ghent and Fluxys have published a feasibility study on LNG bunkering. DNV provided a market forecasting study, a regulatory analysis and modeled the LNG supply logistics. The Flemish government is now acting on DNV recommendations to ensure the safe introduction of LNG bunkering at Flemish seaports. The legal and regulatory analysis resulted in a comprehensive listing of applicable local, regional, national, European and international standards and regulations as well as in 23 concrete recommendations indicating gaps in the current framework.

This part of the report is now available online: http://www.flanderslogistics.be/fpa/lng-rapport.pdf

ABS Signs Agreements in Korea with KOGAS, Universities

ABS signed Memoranda of Understanding (MOUs) with several Korean entities to advance local research and development (R&D) efforts. On October 19, 2012, ABS President and CEO Christopher J. Wiernicki signed an MOU with the Korea Gas Corporation (KOGAS) to join in international projects through equity participation in overseas LNG projects. The scope of the agreement includes technological cooperation, training, and co-hosting seminars related to R&D in offshore LNG development, including LNG cargo containment systems, LNG floating storage and regasification units, floating storage and offloading units, LNG fuelled ships, bunkering and subsea exploration and production.

"ABS has been a pioneer in advancing LNG technologies," Wiernicki said. "and partnering with KOGAS – a company with a strong history of LNG development – will provide both the expertise and resources to continue extending the boundaries of what is possible."

KOGAS Executive Vice President and CTO Dr. Young-Myung Yang also sees great potential for collaboration between KOGAS and ABS. "I am sure that we can establish a good partnership for mutual growth," he said.

In addition to the KOGAS MOU, ABS signed MOUs for academic collaboration with Pusan National University on 18 October 2012 and with Seoul National University on 19 October 2012, where Wiernicki presented a lecture titled "Future Challenges for Ship and Offshore Engineering."

Palau International Ship Registry

The newly formed Palau International Ship Registry has processed its first two vessel registrations at a historic inauguration ceremony. At the ceremony, held in Singapore on September 28, 2012, the cruise/passenger vessels Amusement World (12,764 GRT) and Leisure World (15,653 GRT) were registered and Palau International Ship Registry was officially launched.

The event was attended by Delegate Swenny Ongidobel, Congressman, House of Delegates, Palau National Congress; Delegate Lentcer Basilius, Congressman, House of Delegates, Palau National Congress; Steven Kanai, Permanent Representative of Palau to the International Maritime Organization and Representative of the Palau International Ship Registry in Palau; and Fermin Meriang, Press Secretary of the Office of the President. Dignitaries from Universal Ship Management Pte Ltd, the company which manages the two vessels, also attended.

Keith Lai, Executive Director of Universal Ship Management Pte Ltd, said: "We decided to change the flag of the two passenger ships that we manage, Amusement World and Leisure World, to the Palau International Ship Registry because we wanted a flag that would represent quality, expertise and professionalism and also provide a fast, efficient and reliable service."

The Palau International Ship Registry is an open registry headquartered in Houston, with John Waight appointed as Manager Director.

Email:technical@palaushipregistry.com

MHI, Imabari Win Order for PCTC

Mitsubishi Heavy Industries, Ltd. (MHI), jointly with Imabari Shipbuilding Co., Ltd., has received an order to build two next-generation pure car and truck carriers (PCTC) for Nippon Yusen Kabushiki Kaisha (NYK Line). Formal contract signing will take place soon. In building the two vessels, MHI will provide Imabari with design information on PCTC incorporating advanced ship technologies, including installation of various devices and systems to reduce environmental burdens, such as the Mitsubishi Air Lubrication System (MALS). Imabari will contribute significantly to the project through its strong cost competitiveness. The newly designed car carriers will feature an over-Panamax size hull, and their advanced energy-saving technologies are expected to enable a over 30% reduction in fuel consumption per loaded vehicle compared with existing ships. The two ships are slated for completion in 2015.

Panama Canal Sets Tonnage Record

The Panama Canal set a mark in its history as it reached a new tonnage record of 333.7 million Panama Canal tons (PC/UMS) during fiscal year 2012 which concluded on September 30. Preliminary figures showed that the Panama Canal closed fiscal year 2012 with 333.7 million Panama Canal tons (PC/UMS). This figure represents an increase of 11.6 million Panama Canal

Dr. Tikka Wins SNAME's *David W. Taylor Medal*

The Society of Naval Architects and Marine Engineers (SNAME) awarded its highest technical honor, the David W. Taylor Medal for notable achievement in naval architecture or marine engineering, to Dr. Kirsi Tikka, currently President of the ABS Europe Division. The award was given at the society's Annual Banquet during the SNAME Annual Meeting held in Providence, RI. Dr. Tikka has held a variety of executive positions within ABS over the last 10 years including Vice President Technology, responsible for research and development at the class society, Vice President Global Technology and Business Development, Chief Engineer and, most recently, President of ABS' European and African operations.

During her tenure with ABS she led the establishment of the ABS Harsh Environment Technology Center in collaboration with Memorial University of Newfoundland, played a key role in the development of the Common Structural Rules for Tankers and Bulk Carriers and subsequently served as the driving force behind the Common Structural Rules Harmonization Project and established and led the ABS Environmental Solutions Group.

"Kirsi is an international leader in ship structure design and energy efficiency," says ABS President and CEO Christopher J. Wiernicki. "Her insight and guidance are valued throughout the industry because throughout her career she has consistently provided practical solutions for the challenges impacting the marine and offshore industries."

Prior to joining ABS, Tikka served as a Professor of Naval Architecture at the Webb Institute in New York, where she carried out research on the structural strength of tankers. She also worked in several departments at Chevron Shipping and began her career with Wartsila Shipyards in her native Finland.

Tikka earned her PhD in Naval Architecture and Offshore Engineering from the University of California (UC)-Berkley. She also holds a Master Degree in Naval Architecture and Offshore Engineering from UC-Berkley and a Mechanical Engineering degree from the University of Technology, Helsinki. Tikka is the fourth ABS executive to receive a prestigious SNAME award within the past decade. Chairman and CEO Robert D. Somerville was awarded the organization's Land Medal in 2009 recognizing his outstanding contributions to naval architecture and marine engineering. Executive Vice President and Chief Technology Officer Donald Liu, received the David W. Taylor Medal in 2004, and Senior Vice President of Technology Peter Tang-Jensen, was recognized by SNAME for this same honor in 2010.

tons or 3.6% compared to the 322.1 million tons registered last year, and also surpasses the previous 2007 record of 312.9 million tons. (Under PC/UMS, a mathematical formula is applied to the vessel´s total volume or cargo carrying capacity). PC/UMS tonnage during the most recent fiscal years of the Panama Canal:

FY	PC/UMS (in mil.)
2002	235.1
2003	242.7
2004	266.9
2005	279.3
2006	297.8
2007	312.9
2008	309.6
2009	299.1
2010	300.8
2011	322.1
2012	333.7

During fiscal year 2012, Canal Waters Time (CWT) averaged 25.66 hours. The top market segments during this fiscal year were full container vessels with 119.8 million Panama Canal tons, followed by dry bulk carriers (83.4 million Panama Canal tons) and tankers (51.6m Panama Canal tons).

SEEMP Implementation & Management

BIMCO, Fathom Debut

Step-by-Step Guide

As shipowners around the world struggle to keep in compliance with emerging emission rules and administration, a pair of industry leaders team to provide solutions. BIMCO last month announced the release of 'The Step-by-Step SEEMP Manual' in association with Fathom.

The manual, which can be utilised as a ship's official Ship Energy Efficiency Management Plan (SEEMP), has been developed to enable ship owners to plan, manage and document the energy efficiency performance of their ships. SEEMP becomes mandatory from January 2013.

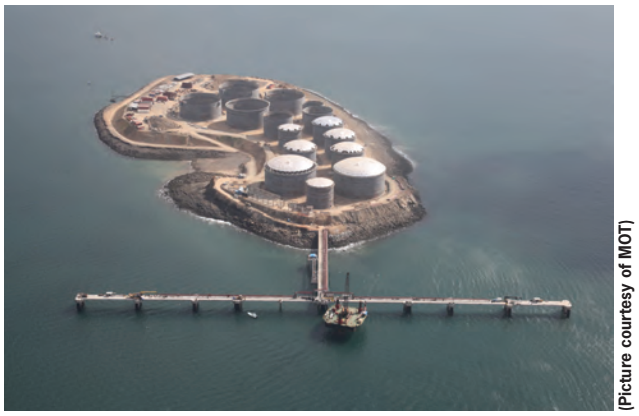
SEEMP, designed by the IMO to encourage best practices for the fuel efficient operation of ships, is a requirement for all owners and operators of ships over 400 gross tons (GT) to detail measures that are being implemented to reduce fuel consumption and thus lower Greenhouse Gases and other emissions.

"BIMCO supported the SEEMP regulation to enable ship-owners to better optimize their energy consumption," said Lars Robert Pedersen, Deputy Secretary General, BIMCO. "We do not believe, however, there is necessarily any need to pay substantial amounts to third parties to prepare SEEMPs.

"The Step-by-Step SEEMP Manual" gives ship-owners and operators a one-stop solution that allows them to easily create ship-specific plans in-house. It is our view that a simple SEEMP implemented effectively is better than a complicated document that may not be followed."

The manual includes clear templates on an accompanying CD which can be populated and then printed off to make up a ship specific SEEMP program. These are placed at the front of the elegant hard-back binder containing the manual and together these act as the official SEEMP.

The manual is designed as a simple way to ensure compliance with impending regulation whilst giving the potential for real benefits to be gained from the implementation of the plan. 'The Step-by-Step SEEMP Manual' is available online from fathom-ctech.com/guide/bimco-step-by-step-seemp-manual/7/ at a price of GBP 130,



(Picture courtesy of MOT)

Melones Offshore Terminal Panama

Omega Expands in China

or a reduced price of GPB 100 for BIMCO members:

www.bimco.org

Safety at Sea Delivers First Port Project

Safety at Sea Limited completed its first port project, for the Melones Oil Terminal, (MOT) in Panama. MOT is a 2.1 million barrel capacity tank farm facility due to open before the end of 2012 on the Islas Melones, a greenfield development around eight nautical miles from the Pacific end of the Panama Canal.

Safety at Sea provided a Marine Safety Assessment covering marine procedures and operational limits around the newly constructed terminal. The project encompassed the modelling of vessel maneuverability in the waters approaching the transfer and storage terminal and devising the initial stages of a Vessel Traffic Management System. Safety at Sea also prepared a plan to ensure MOT's International Ship and Port Facility Security Code Compliance.

MOT, which will mainly cater for local bunkering requirements, is situated on an island within the approaches to the Panama Canal. As part of its traffic management review, Safety at Sea assessed how tanker and barge operations would interact with both through-Canal traffic and around anchorage sites in the area, where up to 100 vessels can be waiting at any time.

Omega Engineering Expands to China

Omega Engineering, Inc. headquartered in Stamford, CT with sales and distribution offices in Canada, UK and Germany, has been a global leader in process measurement and control for 50 years. Omega recently announced that it will serve its China customers from a new office opening in Shanghai at the end of September 2012. Omega was recently acquired by Spectris plc, a leading supplier of productivity enhancing instrumentation and controls. With this change of leadership, the first order of business was to make Omega a strong force in China. The company appointed Zhang Dou Ms. (Sharon Zhang) as the Omega Engineering General Manager of China. The Omega China business unit will have more than a dozen employees, including well-trained technical support engineers, offering high-quality customer service to China.

Email: szhang@omega.com

Wrist Group Launches New Trading House for Marine Fuels Market

Wrist Group launched Dynamic Oil Trading, a new global trading company for marine fuels and lubricants. Headquartered in Singapore, Dynamic Oil Trading will work with all aspects of the shipping industry, building close relationships with ship owners, operators, brokers, traders and suppliers. The company is well financed and has an ambitious growth strategy with plans for further expansion in Asia, Europe and the Americas.

Dynamic Oil Trading is headed by Lars Møller, who has 16 years' bunkering experience. "This is a great opportunity to develop a world class organization that goes back to the roots of bunkering," said Lars Møller, CEO, Dynamic Oil Trading. "There is a niche for a company that is trusted by all entities of the shipping supply chain and operates within a fast-paced, high energy environment to provide customers with products quickly and efficiently, no matter what the challenge."

www.dynamicoiltrading.com
Email: sin@dynamicoiltrading.com

Corvus Batteries Featured on Viking Lady

Corvus Energy is supplying the battery pack and battery management system for the Viking Lady, a, state-of-the•art offshore supply vessel, specially designed to safely service offshore installations in the harsh waters of the North Sea. The Viking Lady was the first commercial ship in the world to use a fuel cell specially adapted for marine use. Following the success of the installation and demonstration of the fuel cell power pack on board, Viking Lady recently entered into a third project phase in which energy

storage capability in the form of Corvus' AT6500 lithium-•polymer battery pack is being integrated in the power system.

The lithium-polymer battery is comprised of 6.5 kWh modules, has a capacity of 455 kWh, and is capable of delivering up to 4MWh bursts over a short period of time. "Having our product win its place on the Viking Lady is a tremendous validation of Corvus Energy's approach to working with key marine industry partners such as Wärtsilä for the next generation of drive and storage systems," said Brent Perry, Corvus Energy's CEO. After looking at different options, the designer and system integrator of Wärtsilä's Viking Lady selected Corvus' battery pack and battery management system as the solution to monitor all aspects of the system's module, pack and array operations. "With her innovative fuel cell technology and extremely advanced systems integration, Viking Lady required a reliable, robust and extremely energy dense energy storage solution," said Wärtsilä's Bjørn Roger Haugen, Power Drive Specialist, Ship Power Technology. "Corvus Energy's battery packs and battery management system allows us to optimize the benefits of energy consumption in a true hybrid energy system." The nitrogen oxides (NOx), Carbon monoxide (CO) and methane (CH4) will be significally reduced from the offshore supply vessel by optimizing the use of the total power system.

www.vikinglady.no

GTT, Amarcon Offer Sloshing Prevention Technology

Amarcon, a member of the ABB group, signed an agreement with GTT (Gaztransport & Technigaz) on mutual development of forecasting and advice software system onboard LNG carriers. GTT (Gaztransport & Technigaz) is a French engineering company formed in 1994 by the merger of the two major players in the field of LNG (Liquefied Natural Gas) membrane containment systems Gaztransport and S.N.Technigaz resulting in a cumulative experience of more than 80 years. GTT specializes in designing and licensing the construction of cryogenic LNG storage tanks for the shipbuilding industry.

In the coming years, a significant growth in the long distance transport of LNG is expected. The International Energy Agency predicts that LNG trade will reach record heights, almost doubling between 2006 and 2015 to 393 billion cubic meters a year. Consequently, a considerable number of new build LNG carriers will come into the market. It is clear that the safe operation of these vessels will be imperative in order to provide safe conditions to the LNG tanks and to optimize the operational availability of the ships.

In the coming years, Amarcon and GTT will work together to develop and market tools and services that enable the operators of LNG vessels with GTT containment systems to safely operate their ships by preventing sloshing. The new system will collect data from operation processes in order to control and fine-tune the quality of the sloshing measurements and predictions. "For Amarcon, this agreement with GTT is a unique opportunity to work together with the leading designer of LNG tanks in order to provide their clients with a complete package to facilitate safe and efficient LNG transportations," said Leon Adegeest, General Manager of Amarcon.

www.amarcon.com

MARITIME REPORTER AND ENGINEERING NEWS

2013 Editorial Calendar

January
Ad Close: Dec 21

Ship Repair & Conversion

MARKET:
U.S. Navy Vessel Technology

TECHNICAL:
Pumps, Valves & Pipes

PRODUCT:
Marine Propulsion Equipment

SPECIAL REPORT:
Offshore Vessel Design & Operation

BONUS DISTRIBUTION:
ASNE DAY Feb 21-22 Arlington, VA

February
Ad Close: Jan 25

Cruise & Passenger Vessel

MARKET:
Satellite Communications

TECHNICAL:
Ballast Water Treatment

PRODUCT:
Marine Electronics & Navigation Buyer's Guide

SPECIAL REPORT:
Maritime Simulation

BONUS DISTRIBUTION:
Seatrade Mar 12-15 Miami, FL

March
Ad Close: Feb 22

Training & Education

MARKET:
U.S. Coast Guard Annual

TECHNICAL:
Software Solutions

PRODUCT:
Coatings & Corrosion Control

ROUNDTABLE:
From Fleet Management to Navigation & Remote Monitoring

BONUS DISTRIBUTION:
CMA Mar 18-20 Stamford, CT NACE Mar 17-21Orlando, FL
Workboats Exchange Apr 1-14 Amelia Island, FL
Sea-Air-Space Apr 8-10 MD

April
Ad Close: Mar 22

Offshore Energy Edition

MARKET:
Innovative Offshore Service Vessel Design & Outfitting

TECHNICAL:
Maritime Salvage & Recovery

PRODUCT:
Deck Machinery, Winches & Ropes

REGION:
Houston, Texas - Global Maritime & Offshore Hub

BONUS DISTRIBUTION:
OTC 2013 May 6-9 Houston, TX
Marine Money May 8 Houston, TX
CIMAC May 13-16 Shanghai, CN

May
Ad Close: Apr 26

Energy Production & Transportation

MARKET:
Specialty Workboats, Patrol, Escort Craft & RIBS

TECHNICAL:
Modern Marine Power

PRODUCT:
Fuels, Lubricants & Additives

REGIONAL FOCUS:
Scandanavia

BONUS DISTRIBUTION:
Norshipping June 4-7 Oslo, NO

June
Ad Close: May 24

Annual World Yearbook

MARKET: Training & Education- Leading Institutions

TECHNICAL:
Integrated Bridge-Navigation & Radar

PRODUCT:
Ship Repair- Tools & Techniques

ROUNDTABLE:
Coatings & Corrosion Control

THIRD ANNUAL MARITIME PHOTO CONTEST

BONUS DISTRIBUTION:
Marine Money June New York, NY
MegaRust June 25-27 Newport News, VA

July
Ad Close: Jun 21

Maritime Security Edition

MARKET:
Classification & Ship Registry

TECHNICAL:
Oil Spill Respons & Recovery

PRODUCT:
Marine HVAC, Insulation & Piping

August
Ad Close: July 26

Shipyard Edition

MARKET:
Maritime Communications- Condition-Based Monitoring & Maintenance

TECHNICAL:
Offshore Deepwater Exploration & Production

PRODUCT:
Maritime Tools - Welding & Cutting

THE ARCTIC: Challenges & Opportunities

BONUS DISTRIBUTION:
Offshore Europe Sept 3-6 Aberdeen, UK
NEVA Sept 24-27 St. Petersburg, RU

September
Ad Close: Aug 23

Marine Propulsion Annual

ROUNDTABLE:
Workboat Academy - Training & Education

TECHNICAL:
Offshore Service Vessels (OSVs)

PRODUCT:
Heavy Lifting- Deck Machinery & Cranes

SPECIAL REPORT:
Clean Water Technologies

BONUS DISTRIBUTION:
Int'l Workboat Oct 9-11 New Orleans, LA
OTC Brasil Oct 8-10 Rio de Janeiro

October
Ad Close: Sept 20

Marine Design & Construction

MARKET:
Marine Firefighting, Safety & Salvage

TECHNICAL:
The Electric Ship: Drives, Batteries, Transmission & Control

PRODUCT:
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