

JANUARY 2013

# MARITIME REPORTER AND ENGINEERING NEWS

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# Ship Repair



**Jones Act Offshore**  
Navigating in 2013

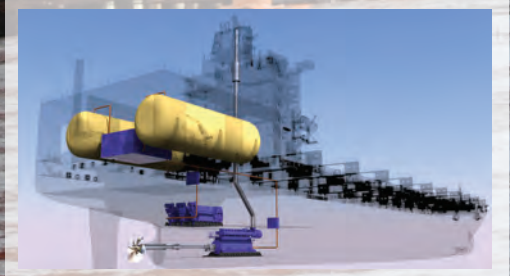
**Fuel & Emissions**  
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**U.S. Navy**  
USS Makin Island  
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**TOTE Goes for Gas**  
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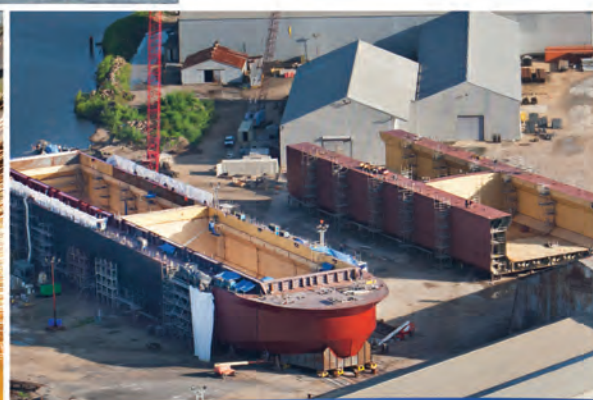
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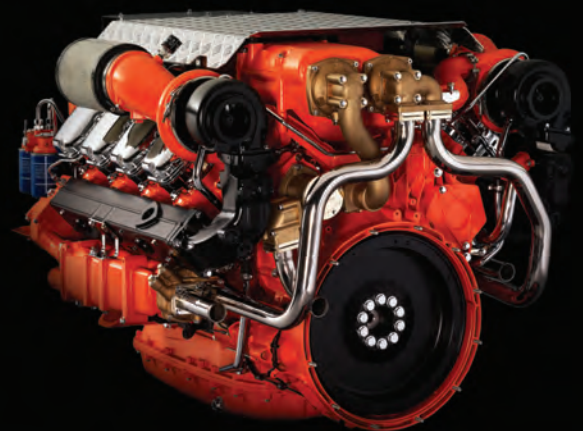


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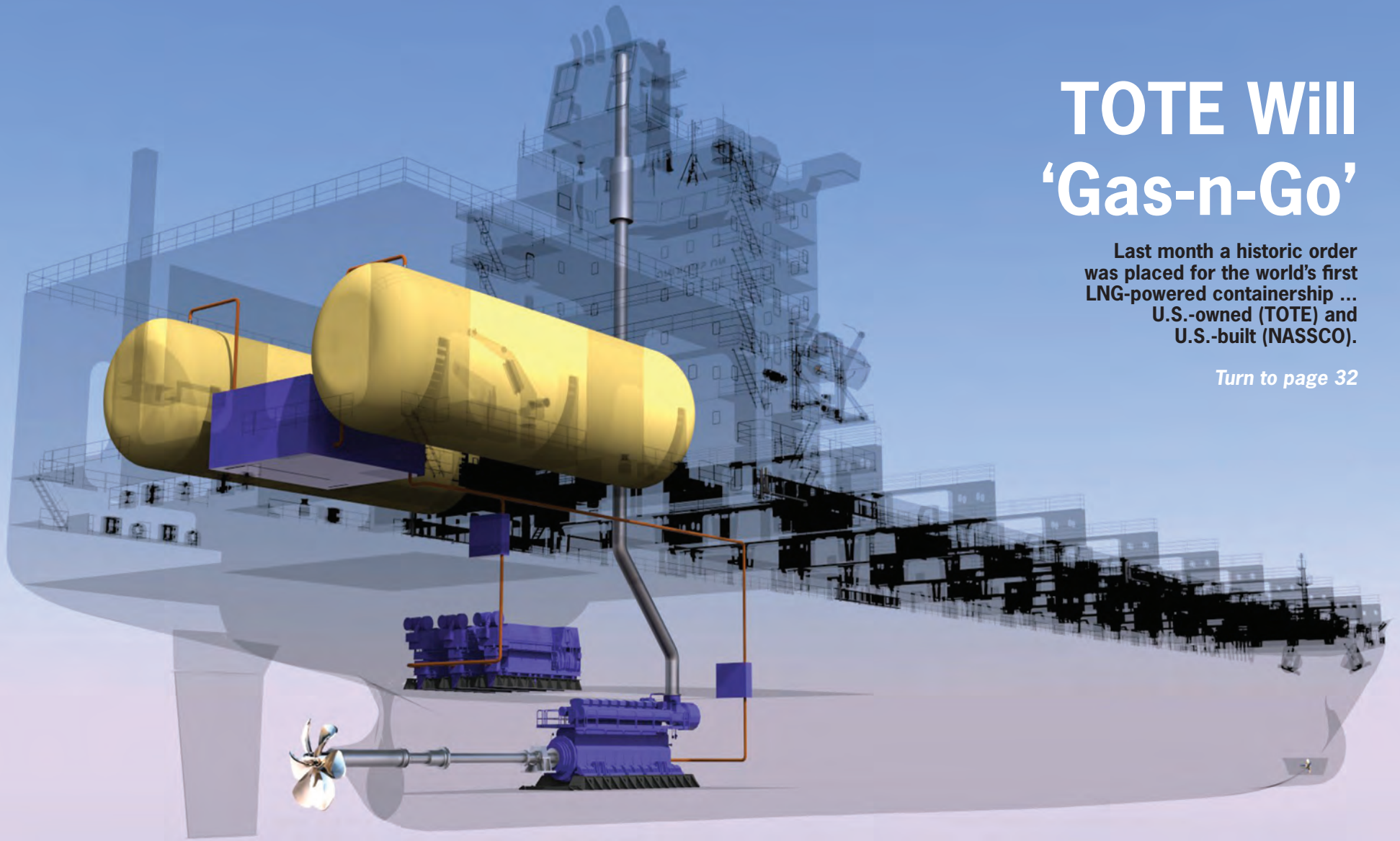


**SCANIA**  
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## TOTE Will 'Gas-n-Go'

Last month a historic order was placed for the world's first LNG-powered containership ... U.S.-owned (TOTE) and U.S.-built (NASSCO).

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By Greg Trauthwein, Editor

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By Henrik Segercrantz

### ON THE COVER

Vigor Industrial companies added 6.75 ft. sponsors to both sides of the 220-ft. F/T Ocean Peace, along with a new bow, which increased the vessel's capacity by nearly 40%.

(Image courtesy Vigor Industrial)



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By Peter Pospiech, Germany

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In winning the order to build the world's first LNG-fueled container ship, San Diego-based NASSCO was simply enacting its well laid plan of partnership and investment. Fred Harris, President of General Dynamics NASSCO, explains.

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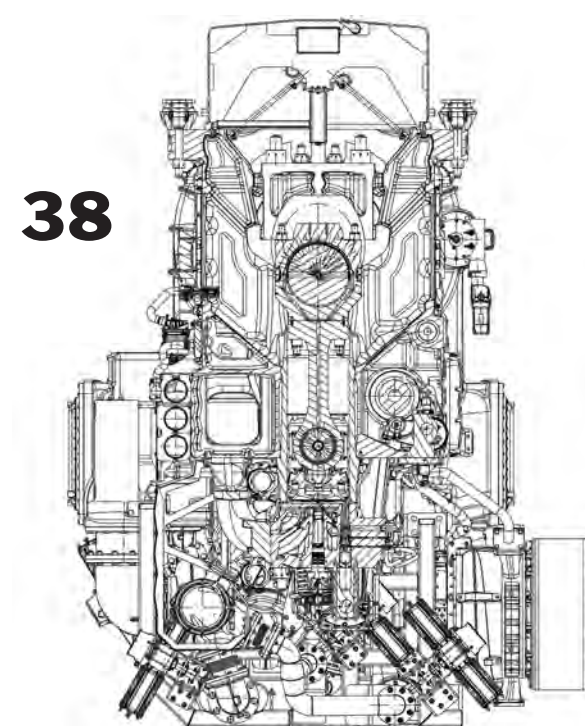
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# TOTE ‘Walks the Walk’

**H**aving sat in this chair for more than two decades, I must admit that I have become somewhat jaded in the sense that there are few developments which actually give me cause to pause. Of course there are the spectacular casualties that will never cease to amaze, but on the business side there are very few real showstoppers.

*Then there was last month.*

Just as I was literally packing up to head down to New Orleans for the International Workboat Show, news broke that U.S. ship owner TOTE Inc. had sealed the deal to build the world’s first LNG-powered containership (it is a dual fuel MAN main driver, but the full intent is to operate on LNG the majority of the time). As the ships (two firm, three options) are intended for the U.S. to Puerto Rico Jones Act trade, there was no surprise that they must be built in the U.S., in this case at San Diego-based NASSCO. On the surface, to think that a U.S. ship owner and a U.S. shipyard have collaborated to build a ground-breaking, technologically advanced, world-class ship that will not be painted grey is truly amazing. On the surface, that is.

“I’m a little surprised that it came as fast as it came, but I’m not surprised that an American ship owner has decided to invest in this technology,” succinctly summarized **Ole Grøne**, long-time Senior Vice President Low-Speed Sales and Promotions at MAN Diesel & Turbo.

Ship owners large and small are facing ever stringent rules governing the emissions their vessels put into the sea and into the air. TOTE, which runs six ships in its Puerto Rico and Alaska services, was forced to introduce new containerships, as the ships serving its Puerto Rico trade must be pulled from service in 2019 due to North American ECA regulations.

When I spoke to **Anthony Chiarello**, President and CEO of TOTE Inc., last month regarding the deal, he essentially said the decision to build these ground-breaking ships with an LNG powered main drive was a no-brainer.

“I don’t know what LNG is going to cost three years from now when the ships come out; but I absolutely know what the impact will be in terms of emissions: that’s not going to change. If there’s an advantage from a fuel cost perspective, that will be wonderful, but that’s not what this decision was based upon: it was purely an environmental consideration,” Chiarello said.

And for followers of the U.S. shipbuilding market, it should equally be of little surprise that NASSCO landed the order. The shipyard has an established relationship with the owner, but more so it has – under the steady guidance of long-time

leader and president **Fred Harris** – been an investor in itself, via relationships with design and procurement partner Daewoo Ship Engineering Company, and directly through investments in its facilities, people and modern management initiatives.

“I think this contract symbolizes two significant points,” said Harris. “First, the United States can still take a leading position in the global maritime industry by smartly teaming and learning from world-class shipbuilders ... and second, this contract represents that the Jones Act is alive and well.”

Coverage of the deal and the new ships, with insights from leading executives at each of the main players, starts on page 32.

In the big picture, the TOTE deal is really just a microcosm of the trend that will define shipping to and through 2020. The focus on marine fuels, lubes and emissions is growing daily, and while vessel owners lament (to put it very nicely) additional layers of regulation, it is the reality of the world in which they operate.

Literally, it is almost impossible to turn a page in this publication this month which doesn’t in one way or another address energy and its effects on the shipping industry. The USS Makin Island, which was widely hailed as a technological marvel when it was delivered, is now back from its first deployment, and according to the Navy the fuel-saving numbers courtesy of the ship’s hybrid electric propulsion systems are staggering: 4 million gallons of fuel and more than \$15 million saved. Henrik Segercrantz reports starting on page 28.

While the global maritime market has been in a collective economic funk since the global financial crisis and ensuing economic malaise of 2008, many signs indicate the abyss has been reached, and in true cyclical maritime fashion, a collective ramp-up in business across the board can be expected starting today, but really picking up steam and moving fast from mid-2014 forward. While the notion of investing in your fleet to meet environmental regulations seven years down the road may sicken the stomach looking at current financials, you can be sure that the quality, long-term players are starting to invest today in preparation for tomorrow.

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NEWS

# Sayaendo

## Construction Commences on Innovative LNG Carrier

Mitsubishi Heavy Industries, Ltd. (MHI) recently commenced construction of the first ship in its “Sayaendo” Series, which it has developed as a new-generation liquefied natural gas (LNG) carrier, at the company’s Nagasaki Shipyard & Machinery Works. The LNG carrier is one of two ships ordered jointly by Osaka Gas Co., Ltd., and Mitsui O.S.K. Lines, Ltd. (MOL) in October 2011. The Sayaendo Series has a hull shape that evolved from LNG carriers with Moss-type\* hemispherical tanks, and it is designed to offer improvements in fuel consumption and maintainability. The unit now being built is slated for delivery in the fiscal year 2014 (ending March 31, 2015).

At a ceremony held at the shipyard to mark the occasion (pictured right), a prayer was offered up for safety throughout the vessel’s construction. The ceremony was attended by representatives of the ship’s owners and from MHI.

The LNG carrier will measure 288 x 48.9 with a 11.55 m draft. The 138,000 gt (75,000 dwt) ship is capable of carrying up to 153,000 cu. m. of LNG (cargo tank total volume: 155,000 cu. m.). It will be jointly owned by Osaka Gas International Transport Inc. (OGIT), a wholly owned subsidiary of Osaka Gas handling the operation of LNG carriers, and MOL, which will function as the ship management company.

To protect its four Moss spherical tanks, the Sayaendo features a peapod-shaped continuous cover integrated with the ship’s hull in lieu of a conventional hemispherical cover. This innovative configuration enables reductions in size and weight while maintaining the ship’s overall structural rigidity. The continuous cover over the tanks also improves aerodynamics by substantially reducing wind pressure, which serves as drag on ship propulsion. For its main power plant the Sayaendo adopts MHI’s “Ultra Steam Turbine Plant” (UST), a new turbine that provides higher thermal efficiency through effective use of thermal energy by reheating steam. Through downsizing, weight reduction and hull line improvement, the new ship achieves a substantial 25% reduction in fuel consumption per unit cargo compared to conventional ships.



With a conventional cover configuration, pipes, wires and catwalks atop the tanks are supported by complex structures. By covering the tanks with an integrated cover and making those supporting structures unnecessary, the new design also improves maintainability. In addition, CO2 emissions are reduced as a result of decreased fuel consumption, and response to environmental issues is further enhanced with installation of a ballast water treatment system, which addresses impact on the marine ecosystem.

To date MHI has received orders for five Sayaendo Series carriers in total, including another ship ordered by MOL in June.

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Monthly Change  
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 by Year & Size

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

		VV Mini Matrix - Monthly Change												
01 January 2013		Tankers					Bulkers				Containers			
Built		Vlcc	Suez	Afra	LR1	MR	Cape	Pmax	Supra / Hmax	Handy	Post Pmax	Pmax	Handy	Fmax
2013		↓ -3.1%	↑ +0.6%	↑ +7.0%	↑ +3.9%	↓ -2.3%	↓ -3.5%	↓ -2.5%	↓ -2.0%	↓ -0.5%	↑ +0.7%	↑ +0.3%	↑ +0.0%	↑ +0.0%
		310k	160k	110k	75k	50k	180k	80k	60k	30k	7,000	4,250	1,400	750
2008		↓ -2.6%	↓ -0.2%	↑ +7.9%	↑ +4.2%	↑ +0.0%	↓ -1.6%	↓ -1.5%	↓ -1.5%	↓ -1.3%	↓ -0.9%	↓ -1.3%	↓ -1.2%	↓ -0.8%
		310k	160k	110k	75k	50k	180k	80k	55k	30k	7,000	4,250	1,400	750
2003		↓ -2.5%	↓ -1.4%	↑ +6.8%	↑ +4.3%	↓ -0.6%	↓ -0.5%	↓ -1.4%	↓ -2.1%	↓ -0.9%	↓ -3.9%	↓ -4.2%	↓ -1.0%	↓ -1.1%
		305k	155k	105k	70k	45k	175k	75k	50k	30k	6,500	4,000	1,400	750
1998		↓ -2.4%	↓ -1.3%	↑ +6.5%	↑ +4.1%	↑ +0.0%	↓ -0.7%	↓ -1.0%	↓ -1.9%	↓ -2.3%	↓ -5.4%	↓ -6.3%	↓ -1.8%	↓ -2.2%
		300k	150k	105k	65k	45k	170k	75k	48k	30k	6,500	4,000	1,400	750
1993		↑ +0.6%	↑ +1.0%	↑ +1.3%	↑ +0.0%	↓ -1.9%	↑ +1.1%	↓ -1.6%	↓ -2.8%	↓ -1.6%	↓ -1.2%	↓ -1.4%	↓ -3.2%	↑ +0.0%
		290k	145k	100k	65k	40k	150k	70k	45k	30k	4,500	3,750	1,400	750
1988		↑ +0.6%	↑ +1.0%	↑ +1.3%	↑ +1.8%	↑ +0.0%	↑ +1.1%	↑ +0.0%	↓ -4.2%	↑ +0.0%	N/A	↑ +0.0%	↑ +0.0%	↑ +0.0%
		260k	140k	100k	65k	40k	140k	65k	42k	30k	-	3,750	1,400	750

### Signet Continues Fleet Expansion

Signet Maritime continues to expand its diverse fleet by awarding a contract for the construction of two Robert Allan Ltd. designed tugs to Patti Marine Enterprises, Inc. in Pensacola, Fla., making it the ninth Signet/Robert Allan Ltd. design in five years. Construction commenced in November 2012 with an expected delivery of December 2013 for the first vessel and March 2014 for the second vessel. Continuing the longstanding Signet tradition of naming vessels in honor of America's Cup winners, the new RAmports 3200 ASD tugs will be named M/V Signet Intrepid and M/V Signet Vigilant. These vessels are the fifth and sixth ASD tugboats delivered for Signet in less than three years and will operate from the International Operations Center in Ingleside, Texas, where they will primarily be used to perform offshore and inshore rig escort, barge, and subsea support work. They will adhere to the Environmental Protection Agency's Tier III emissions regulations, and will also feature C175-16 CAT engines, Markey Model DEPCF-52S winch, and Rolls Royce US 255 controllable pitch Z-drives.



# Silverburn Ice-Class AHT for Caspian Ops

With a fleet of 25 tugs and 17 barges, London-based Silverburn Shipping is a major player in the Caspian Sea and surrounding waters. In 2009 they built a pair of 42x12.5-m Ice Class 1B tugs. These were each powered by three 1700-hp Cummins KTA50-M2 engines to deliver 50 tons of bollard pull.

Following on the success of these vessels, the company had designed a larger 49.6 x 15.8 Ice Class 1A anchor handling tug. Interestingly this larger tug has a draft of 3.5 m for sea-going operations that can be adjusted to only 2.5-m to allow operation in very shallow waters of the Northern Caspian Sea. Powered by two 2200-hp Cummins QSK60-M Tier 2 engines (1,641 kW @ 1800 rpm) the 4400-hp tug also delivers a 50-ton bollard pull; equal to the two earlier 5100-hp vessels. The engines will turn through Reintjes gears to four-blade CP propellers in nozzles.

Named the Arctic, it was, like the 2009-built Tarpan and Tur, also built at a Turkish yard, this time the Sefine Shipyard. Design work for such an advanced and complex tug included tank model testing at Aker Arctic to affirm, prior to construction, that the hull form was capable of performing to Finnish and Swedish Ice Class 1A Super standards. The tug can operate in ice up to 80 cm thick.

In addition to the 60-l Cummins main engines, the new tug has two Cummins KTA19-Cps (335 kW) generator sets providing electrical power to, in addition to ship needs, the electro-hydraulic cranes and winches. The harbor genset is a Cummins 6CT-UCM (113 kW) and emergency power is from a Cummins 6C-CS (w26 kW) genset. All generator sets are fitted with Newage alternators, produced by



(Image courtesy of Cummins Marine)

Cummins Generator Technologies.

Two 650 kW firefighting pumps for the vessel's Fi-Fi-1 System are each powered by a clutch-connected PTO to the front of the main engines.

"We currently have 12 Cummins engines on board our vessels," said Alexey Gribachev, Technical Superintendent of Silverburn. "For our service engineers it is easier to operate, maintain and order spare parts for a vessel that is powered by one engine brand. This way, we can transfer our Cummins-experienced engineers to these new vessels, where their experience is used most effectively."

The Cummins global network is also an asset for a vessel that could be chartered worldwide. Applications engineer Ba-

ran Kucukkara, from Cummins Turkey, provided support to the Sefine Shipyard ([www.sefine.com.tr/haber8.html](http://www.sefine.com.tr/haber8.html)) during construction. "We have shared out knowledge and experiences as well as Cummins requirements about the total sub-systems including mounting, electrical, fuel, lube oil, cooling and related design criteria," he explained, "This included sharing of data sheets, installation drawings, wiring diagrams and various instructions." While operating in the Caspian Sea, service and parts support will be provided by the Cummins service locations in Kazakhstan and Russia.

The Arctic's full Class is: BV HULL MACH TUG FiFi I AUT-UMS Iceclass 1A Unrestricted Navigation.

# Mobimar 18 Wind

Most of the offshore windfarms are located in places, where even the average wind speeds are high enough to meet the power production requirements. At the same time construction expenses are tried to be kept at a minimum by building in rather shallow waters. But as both strong winds and shallow waters generate higher and sharper waves, you need reliable and stable crew transfer vessels, ensuring safe embarkations for service personnel. The majority of the vessels used today have not been purpose-built for the task, causing a number of potential safety risks to boat and crew.

Instead of having to choose between really large vessels with a DP-system and an expensive crew of 10; or smaller, faster boats without a disembarkation system, or with separately bought costly structures limiting the proper use of the bow deck, Mobimar 18 Wind is being touted as a solution. The trimaran CTV Mobimar 18 Wind purports to offer many advantages, such as:

Mobimar 18 Wind is designed to offer safer transfers. The vessel is classified to

seastate Hs 4.0 by BV, DNV or equivalent and as the disembarkation is possible in up to Hs 2.5 meters, operators can get more operational days. Operational costs are kept in check, according to the designer, due to reduced crewing options and the installation of a fuel efficient power package.

Steering propulsion in the form of two waterjets is designed to ensure safe maneuvering and that the service operation continues in case of a main engine failure –up to 8 knots.

## LANDING

The 180 degree approaching angle gives the operator options, depending on wind, wave and current. The bow is steady, providing safe disembarkation and secure lifting/hoisting operations in severe conditions, and service engineers can transfer to the turbine in up to Hs 2.5 m. The trimaran hull characteristics are designed to minimize the impact on the platform.

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# Richard Bludworth

## Bludworth Marine LLC

*Running a ship repair business in the U.S. is anything but simple, with the unexpected being the norm and a cavalcade of new regulations. But Richard Bludworth has a penchant for turning the difficult simple. A staple in the Gulf of Mexico, Bludworth Marine LLC was founded by Richard Bludworth in 1998, strictly as a topside repair facility. Today the Bludworth Marine reach stretches to four waterfront facilities on the 103 mile run between Orange to Galveston, TX, with its HQ in Houston. Company founder Richard Bludworth recently spent some time with Maritime Reporter & Engineering News to discuss the company's past and promising future.*

*By Greg Trauthwein, Editor*

**Please give our readers an overview of Bludworth Marine.**

When I started in 1998 we were strictly topside repairs, but since then we have branched out to start yards, and today we have two spots in Galveston, a spot in Channelview and Orange (all in Texas), which is the largest location. Actually we have two spots in Orange, but they are very close, only about a ½-mile apart. Our primary business is repair, but in the last two years 50% of our business has been new construction. We offer in-house engineering, and in total we have about 170 people.

**In general, how has business been?**

Well we're done now with our new construction projects, but overall business has been good. Personally I believe it is tied to general economic activity. When we started

coming out of the recession, business activity started building again.

I think all of that activity feeds our business.

**Houston has emerged as an offshore and maritime hub. Do you agree?**

It's never slowed down here, really. There have been times when it has not grown as fast. When the rest of the country is having a recession, it simply means we are not growing as fast. Except of course from 1983 to 1985; that was a different story ... we all jumped off the cliff then.

**What projects have kept your crews busy in the past year?**

We picked up a contract for 24 MarAd SeaBee barges, which entailed complete maintenance, repair and overhaul. It's about a 12 month project and we are about half-way

through it. Today we do about 3 to 4 barges at a time in Houston and in Galveston, refurbishing the SeaBee barges – which includes steelwork, blast, paint and clean – so that they can last another 20 years.

We also have two 297-ft. petroleum barges that we're converting into conveyor barges for a new NUCOR Steel mill going in on the Mississippi River. They are going to have iron ore conveyors on them, basically dock barges carrying iron ore from the vessel to the land. We cleaned the decks off, completed all of the understructure for the conveyor system, and completed the engineering and the construction.

We also do a steady stream of mobilizations and demobilizations on offshore construction vessels – pipeline, dive, etc., and also on ocean deck barges.

**Can you tell us about the recently completed new vessel construction**

**projects?**

We built a pair of stainless steel acid barges in 2012; we built three Olin caustic potash barges; and we also built a couple of chemical barges. All of the barges were in the 195 ft. range, except for the acid barge which was 260 ft.

**The offshore business is obviously a driver in your region. How has it fared of late?**

In a historical perspective, today's business would just be OK. Hurricane Ike took out 100 percent of our waterfront capacity in 2008; in 2009 we had the recession; in 2010 we had the BP oil spill. On this side of the Gulf (the oil spill) really killed the business. So for the offshore industry, 2011 and 2012 have been a recovery from the steep drop off in 2008-2010. Comparatively, between 2003 and

2008, we doubled our business every year.

It sounds pretty drastic.

■ But that's the shipyard business ... it has always been cyclical, and it always will be.

What do you consider to be the greatest challenges to running a profitable business?

■ The biggest factor is regulatory; everything having to do with government regulations is probably the biggest challenge, and unfortunately even health care is a part of that today. The toughest thing that we face year-in, year-out is how to deal with the regulatory issues: environmental, safety, health care, accounting ... everything.

So you started the business in 1998. How exactly did you come to be in the marine industry?

■ I grew up operating boats, as both my dad and my uncle owned tugs and barge, operating inland to offshore. They were at the forefront of ATB development in the mid-70s. (The first Bludworth ATB Flexible Pushing System entered service in 1970. For decades Bludworth lead the field in US ATB tug & barge applications). I've spent most of my life operating tugs and barges, mostly offshore. I chose to not get into that business myself because it's too tough from a regulatory perspective and heavily capital intensive for a start up.

Why did you start your own business?

■ It's what I always wanted to do, so I jumped off and started it part time. I kept my regular job for a couple of years, and when it came time to split, we split, and they (Martin Marine) are still one of my better customers. They were on board with what I was doing.

So how does the upcoming year look?

■ Our sales will be down simply because we don't have any new construction projects in the pipeline, but the repair business is much more reliable in terms of making or losing money. New construction is tight margin business. But it's still good in terms of balancing your workforce.

Can you tell us about one of the toughest or most challenging ship repair jobs you've ever encountered?

■ I got a call one day saying that a steel ingot had fallen through a ship (courtesy of a broken chain), right here in Houston. It was stuck

like a knife blade through the double bottom. That ingot was 40 ft. long, 8 inches thick, 8 feet wide. They were lifting the ingots out, the chain broke and the ingot went right through the ship like a knife. It was sticking 8 to 10 feet below the ship, and the rest of it was in the cargo hold. No one was

hurt, but the forklift didn't make it. That said, having all of your facilities under water in the wake of Hurricane Ike was quite a challenge too. We had zero sales for 3 months, as that was recovery time. That was a tough one. We survived because we had enough cash in the bank. It's that simple.



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# Responder Immunity

By Dennis Bryant & Jim Shirley

Not long after specialized tank ships were developed, enabling the carriage of large quantities of oil and petroleum products, groundings, collisions, and other casualties started causing significant oil spills. In those early days, there was no financial incentive to clean up such spills. To the extent that there was a response, it was often by Good Samaritans, a term derived from a parable found in the Bible at Luke 10:25-37 about a stranger from Samaria who, with no thought of reward, came to the aid of an injured robbery victim in Judah. Over time, and particularly since enactment of the Federal Water Pollution Control Act Amendments in 1972 (FWPCA), specialized commercial entities, generally referred to since implementation of the Oil Pollution Act of 1990 (OPA 90), as Oil Spill Response Organizations – OSROs, have come into existence in the United States to respond to spills of oil and other substances into the water.

The United States, in addition to being environmentally conscious, is very litigious. Responders, whether Good Samaritans, OSROs, salvors, or others, have been concerned about being sued by third parties allegedly damaged by the response effort. Even though there is no reported case of a responder other than the spilling vessel owner/Responsible Party being held liable for damages following an oil spill resulting from response efforts, the mere threat of litigation can result in significant concern and legal expense.

OPA 90 includes a provision exempting from liability a person, other than the Responsible Party (generally the owner of the spilling vessel or facility), for damages which result from actions taken or omitted to be taken in the course of rendering care, assistance, or advice consistent with the National Contingency Plan (NCP) or as directed by the Federal On-Scene Coordinator (FOSC) relating to a discharge or a substantial threat of a discharge of oil or a hazardous substance. In 1998, the definition of “discharge” under OPA 90 was amended to include discharges incidental to mechanical removal authorized by the FOSC. The Coast Guard has defined “mechanical removal” to mean the use of pumps, skimmers, booms, earth-moving equipment, and

other mechanical devices to contain the discharge of oil and to recover the discharge from the water or adjoining shorelines. These provisions go a long way towards immunizing responders from third party liability. Unfortunately, those provisions, by themselves, do not provide full immunity for responders, particularly where the third party alleges death or personal injury. Just such an allegation arose subsequent to the tragic events surrounding the explosion and fire on the mobile offshore drilling unit (MODU) Deepwater Horizon and the massive oil spill from the associated Macondo well in the Gulf of Mexico in 2010. Various plaintiffs, including masters and crewmembers of vessels participating in oil spill cleanup activities, workers who decontaminated those vessels, workers who participated in shoreline cleanup, coastal residents, and coastal vacationers, brought suit against Nalco and related parties, asserting claims under state law and under general maritime law for injuries allegedly caused by exposure to oil, chemical dispersants, or a mixture of both. Nalco is a manufacturer of Corexit, a chemical agent used to emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column. The Environmental Protection Agency (EPA) has placed Corexit on the NCP Product Schedule, meaning that the FOSC can authorize its use in responding to an oil spill if the EPA concurs and, where practicable, after consulting with certain natural resource trustees. A scheduled product may also be pre-authorized in a regional or area contingency plan, meaning that it can be used in specific instances at the direction of the FOSC without further consultation. Corexit was pre-authorized for use by the relevant regional contingency plan for use in a response to an oil spill of the type experienced in this instance. The FOSC authorized use of Corexit in the response to the Macondo oil spill. By the time the response effort was over, approximately 1.8 million gallons of Corexit were applied either to the water’s surface or beneath the water’s surface, near the source of the discharge.

After the complaints were filed, defendants moved to dismiss the com-

plaints, contending that they were entitled to derivative governmental immunity and/or that the claims were preempted by the FWPCA, as amended by OPA 90, and as implemented by the NCP. Eventually, the court converted the motion to dismiss into a motion for summary judgment.

Following submittal of briefs and arguments by both sides and by interested parties, the US District Court for the Eastern District of Louisiana granted Nalco’s motion for summary judgment, ruling that the FWPCA and the NCP preempted state law and general maritime law on the claims for damages for personal injuries allegedly resulting from use of Corexit on the Macondo spill. The court found that the FWPCA authorized the President, acting through the FOSC, to remove or arrange for the removal of discharged oil unless it is properly being done by the responsible party. This authority was enhanced by OPA 90, which requires the President, again acting through the FOSC, to ensure the effective and immediate removal of discharged oil and to direct all federal, state, and private actions to remove a substantial spill (such as that involved in the instant situation). In accordance with the FWPCA, the NCP provides that, in the event of a substantial spill, the FOSC must direct all response efforts and should declare as expeditiously as practicable to spill response participants that the federal government will control the response.

The legislative history of OPA 90 provides, in pertinent part, that the immunity provision was intended to encourage immediate and effective responses. It further expresses concern that, without such an immunity provision, the substantial financial risks and liability exposures associated with spill response would deter vessel operators, cleanup contractors, and cleanup cooperatives from prompt, aggressive response. In the instant case, plaintiffs contended that Corexit was defective and that defendant manufacturers should be held responsible in tort for any and all damages attributable to its use on the Macondo spill. Defendants disputed the allegation that Corexit was defective, but also contended that the claims were preempted because they conflict with the FOSC’s decisions, made in accordance with the FWPCA



and the NCP, to use Corexit and/or present an obstacle to accomplishment of the objectives of the FWPCA.

The court determined that a fundamental objective of the FWPCA, as amended by OPA 90, was to eliminate confusion that had impeded past oil spill responses by establishing a clear chain of command and responsibility. States and private parties may not deviate from this direction. When directing a response, the FOSC is more than managing the response. He or she has specific legal authority to guide the activities of all parties responding to the discharge and all actions have to be authorized or approved by the FOSC. Use of dispersants is one of the activities specifically contemplated by the FWPCA and the NCP. Its use represents a trade-off between known effectiveness and known toxicity. The FOSC is specifically authorized to consider the relevant issues and make the operational decision regarding use of the chemical dispersant.

The court then states: "It would be extraordinary for Congress, after devising an elaborate permit system that sets clear standards, to tolerate common-law suits that have the potential to undermine this [statutory and] regulatory structure." If the court were to permit these claims to go forward, then, during the next major spill response, the threat of liability might cause the manufacturer or supplier of a dispersant or other material or equipment to refuse to provide its product, despite the determination by the FOSC that such material or equipment should be utilized. Such a refusal, or perhaps even a hesitation, by a manufacturer or supplier would conflict with the statutory and regulatory design of placing the FOSC in charge of all levels of the oil spill response and empowering him or her to determine if, when, where, and how the material or equipment should be used.

This refusal would deprive the response of a tool expressly contemplated by federal law and, consequently, impede the FOSC's ability to ensure effective and immediate removal and the efficient, coordinated, and effective response intended by law and regulation. Given the responsibility and authority of the FOSC to act in these circumstances, the court ruled that it would be improper for it to second guess the FOSC's decisions and actions. Because resolution of the preemption issue was dispositive of the motion for summary judgment, the

court declined to address the issue of derivative immunity.

This decision is important for reasons well beyond its impact on the manufacturer of a chemical dispersant and the various plaintiffs here. The reasoning so carefully laid out by the court extends to all those involved in oil spill response efforts under the

direction of a FOSC, providing them with vitally needed assurance that third-party lawsuits will be brought directly against the Responsible Party and not against responders, be they Good Samaritans or OSROs, or, although not specifically mentioned by name, salvors or marine fire fighters. The decision also supports the large

measure of authority of the FOSC as spelled out in OPA 90, eliminating much of the uncertainty about his or her decision-making power. These impacts clearly further the important national interests identified in the decision of ensuring that spill responses are efficient, coordinated, and effective.

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# Navigating in 2013 Jones Act Offshore

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Following the hubbub created in 2009-2010 by U.S. Customs and Border Protection's (CBP) proposed modification and revocation of certain Jones Act ruling letters pertaining to offshore operations, all was relatively quiet in 2011-2012 with respect to Jones Act offshore issues. Indeed, in the aftermath of the tragic Deepwater Horizon incident in 2010, which included the implementation of more prescriptive regulatory and environmental requirements and a deepwater drilling moratorium, energy development offshore took a dive as vessels departed the Gulf of Mexico and headed for more friendly seas internationally. As time passed, however, memories faded, and the regulatory offshore energy regime became more stable. And now, the work is coming back to the Gulf—by all reports, the outlook is bright as we start 2013. However, one thing that appears to be lurking offshore is the tightening of the screws on Jones Act enforcement. This article will review recent developments that could adversely affect offshore operations in 2013 and the foreseeable future.

By way of background, in July 2009, CBP proposed modifying or revoking 20 Jones Act rulings issued over a span of more than 30 years involving vessels transporting specialized equipment used by the offshore oil and gas industry. The rulings largely involved instances where CBP had made determinations as to whether certain items carried on those vessels would be considered "vessel equipment" or "merchandise." "Vessel equipment" and "merchandise" are two key terms of art for Jones Act interpretations—if an item is "merchandise," only a coastwise-qualified vessel may transport the item between coastwise points; if an item is "vessel equipment," a non-coastwise-qualified vessel may be used to transport the item between coastwise points or transport the item from a coastwise point and install the item at a different coastwise point. CBP's modi-

fication and revocation proposal came shortly after CBP's revocation of the now infamous "Christmas Tree" ruling earlier in 2009, in which CBP (originally) determined that a multi-function well head assembly called a "Christmas Tree" was vessel equipment and therefore could be transported from one coastwise point to another and then installed by a foreign-flag vessel. In its modification and revocation proposal, CBP stated that withdrawal of the "Christmas Tree" ruling was necessary pending further clarification of the definition of vessel equipment and a review of past rulings in which CBP determined certain items carried aboard a vessel were vessel equipment and not merchandise.

Amid much controversy regarding the appropriate means by which to overturn 30 years of precedent, CBP withdrew its modification and revocation proposal and then initiated a formal rulemaking in March 2010 using the Notice and Comment procedures of the Administrative Procedure Act. However, amid more controversy, this rulemaking was withdrawn by CBP and the Department of Homeland Security in November 2010.

Following the decision to withdraw the rulemaking proposal, it is interesting, especially in view of the controversy surrounding whether a particular item is vessel equipment or merchandise since the revocation of the 2009 "Christmas Tree" ruling, that there have been no ruling requests related to subsea installation involving the "equipment of the vessel" exception and thus no rulings have been issued by CBP involving the transportation of vessel equipment or merchandise to points on the OCS. Nor has CBP issued any further guidance on its own initiative to further clarify the definition of "vessel equipment" as it said it intended to do following the "Christmas Tree" ruling.

As a result, industry has continued to conduct subsea installation and repair operations offshore based on the fact that CBP's OCS-related rulings issued

over the last 30 years remain valid as precedent. This presumption is justified because CBP withdrew all official notices that it was pursuing changes to its interpretation of Jones Act rulings. In addition, it has become clear in the last couple of years that some segments of industry have been hesitant to submit new ruling requests for fear that CBP would not follow existing precedent.

Fast forward to the present—the way to operate offshore could change in 2013 due to pressure on CBP "to enforce the Jones Act" from Congress and the domestic industry. Defining what enforcement of the Jones Act means in the context of offshore operations is difficult. Does it mean adhering to precedent will continue to be acceptable? Or does it mean that CBP will change its interpretation of the Jones Act on a case-by-case basis through enforcement actions rather than through a formal rulemaking? Alternatively, CBP could issue new guidelines to assist industry in determining what types of activities would be in conformance with current Jones Act rulings.

One new development is that some CBP Port Directors have started issuing penalty notices for alleged violations, with penalties ranging in the millions of dollars, relating to offshore subsea operations that occurred years ago—even before the revocation of the "Christmas Tree" ruling.

Another development is that at least one CBP Port Director had informed industry that every offshore subsea installation or repair project requires its own ruling covering the contemplated operations to demonstrate compliance with the Jones Act. Otherwise, if a company decides to carry out subsea installation and repair activities, even when such activities are squarely within the parameters and in conformance with numerous "equipment of the vessel" rulings issued over the years, CBP will issue a penalty for the value of the merchandise or the cost of the transportation, whichever is greater, which often will be in the millions of dollars.

**And now, the work is coming back to the Gulf—by all reports, the outlook is bright as we start 2013.**

However, one thing that appears to be lurking offshore is the tightening of the screws on Jones Act enforcement.

This puts owners and operators in an untenable situation. If they request a ruling in advance (which is not required), they risk obtaining an adverse ruling, irrespective of prior precedent, as a result of the political pressure now surrounding interpretation of the Jones Act as it applies offshore. If they decide to move forward without a ruling, then the company subjects itself to a severe penalty action which they will have to defend through the CBP mitigation process.

This is no way for the U.S. government to establish policy and it is contrary to CBP's own policy of "Informed Compliance," which is supposed to make sure industry knows what to expect.

In short, fundamental fairness demands and it is incumbent upon CBP under its Informed Compliance policy to achieve consistency in interpre-

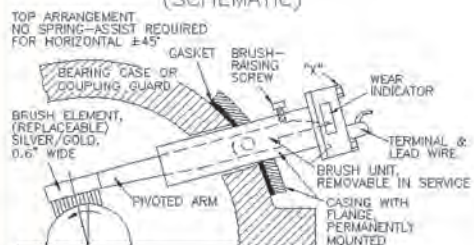
tation of the Jones Act as it applies offshore—and not through ad hoc enforcement actions, especially when there is precedent supporting the activity in question. In addition, it is particularly troubling that CBP would initiate such a policy when the United States is only now starting to see a recovery in the oil and gas development regime in the Gulf of Mexico in the aftermath of the Deepwater Horizon and when the United States is still trying to get its sputtering economy back on track.

In conclusion, given these developments, it is incumbent for all those involved in the offshore oil and gas industry to work together to find a way forward to ensure that we do not unnecessarily put a substantial damper on offshore development when the United States is only now beginning to achieve energy independence.

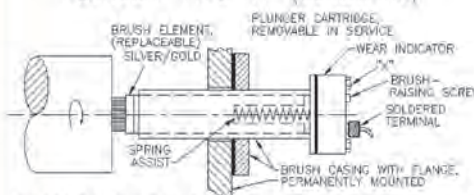
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# Scania Unveils the Future

## 1,000 hp V8 Engine Launched in New Orleans

**B**uilding on Scania's new global engine platform is the 16-liter marine V8, delivering up to 1,000 hp and 2,460 lb./ft. for patrol craft applications, a compact power source that leverages technology and architecture with Scania's truck and bus engines.

"The new 16 liter engine has gone up in horsepower for each duty cycle we offer, which means that we can approach larger vessels," said Mikael Lindner, President, Scania U.S.A. Inc. "It also means is that this engine is now able to compete with a 18-24 liter engines, which is a huge benefit because you can get a smaller engine, that is lighter with great power, and better fuel consumption."

Central to the Scania line and this

powerplant in particular is adherence to high power-to-weight ratio, a critical factor in the marine market for easy installation, refit and performance. "One of the criteria's when developing the new 16 was that it should be easily interchangeable with the current 16," said Lindner. "When you re-power the predecessor, it's plug and play."

The official North American launch was in New Orleans early last month, where the company showcased its new 16 and 13-liter engines, as well as the enhanced instrumentation.

Besides the new 16-liter V8, Scania's marine engine range includes a 13-liter inline six-cylinder unit launched in 2011, an engine intended for propulsion and auxiliary use.

Each engine in the new range is designed for higher strength and durability, and many components are shared across the range, significantly reducing the number of unique parts per engine and assisting in the repair and maintenance of the unit.

"We use a modular design on the 13 liter and 16 liter engines, which have the same cylinder head, the same combustion chamber and the same liners. Scania develops a single cylinder engine with one combustion chamber, and then adds cylinders as needed"

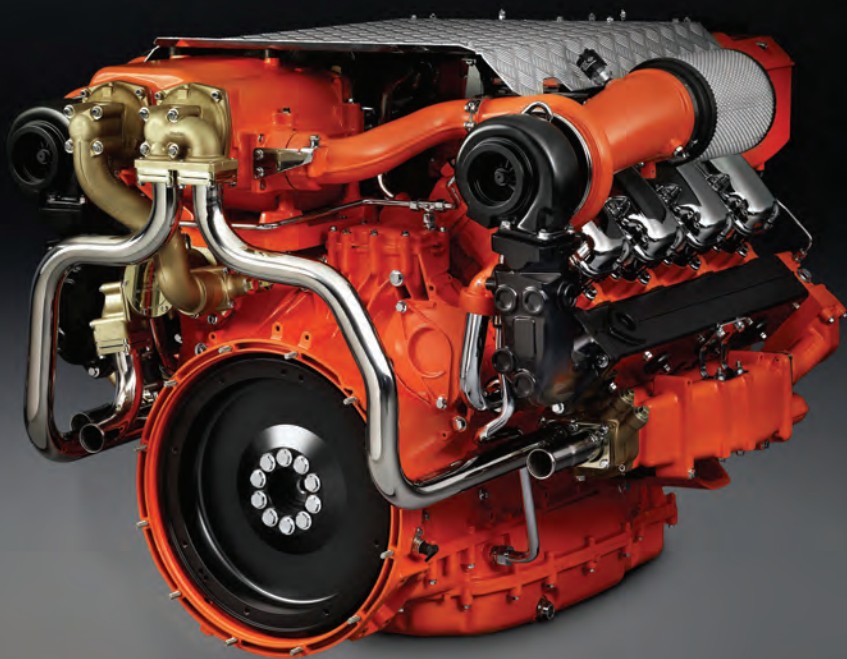
Scania has a history of conducting basic engine development and manufacturing, as well as the development of engine management, fuel injection and emission control systems in-house, a strategy it sees as central

to its goals in fuel economy, environmental performance and robustness.

### 16-LITER V8S FROM 550 TO 1,000 HP

The output of the new 16-liter marine engines spans from 550 hp for continuous use to 1,000 hp for patrol craft use. The ratings have been uprated for planing and displacement vessels, and the company's engines are competitive with engines above the 16-liter threshold. Of particular note is the torque rating of up to 2,463.5 lb./ft., a high number for this output class. Engine rooms, particularly on smaller vessels, are generally 'space challenged,' and Scania sees to it that its engines produce high power from compact packages, enabling quick refit and easy servicing while main-

THE NEW 16-LITER V8S ... FROM 550 TO 1,000 HP



### Engine Dimensions

Engine type	Swept volume	Length	Width	Height
13-liter inline 6	12.7 liters	59.0 in	37.6 in	42.2 in
16-liter V8	16.4 liters	61.0 in	49.2 in	47.8 in

Dry weights	13-liter inline 6	16-liter V8
With heat exchanger	2,623.5 lbs	3,681.7 lbs
With keel cooling	2,513.3 lbs	3,527.4 lbs

Engine performance	13-liter inline 6	16-liter V8
Power	400-750 hp	550-1,000 hp
	294-551 kW	405-736 kW
Torque	1,365-2,165 lb/ft	1,760-2,465 lb/ft



"One of the criteria's when developing the new 16 was that it should be easily interchangeable with the current 16," said Mikael Lindner, President, Scania U.S.A. Inc. "When you re-power the predecessor, it's plug and play."

taining a robust structure needed in the maritime market. Each cylinder has its own head, and together with wet cylinder liners, it makes for easy overhauls in confined spaces. Additionally, the camshaft is located high in the block and the timing gears are rear-mounted. For these reasons, most repairs and servicing can be carried out by a single service technician. The Scania Saver ring, placed at the top of each cylinder liner, reduces carbon deposits on the edge of the piston crown and reduces cylinder liner wear.

“We try to keep the engine clean and simple. We try to minimize piping and filters, to promote serviceability and the one man service concept” said Lindner.

### 13-LITER

The 13-liter marine engines range from 400 hp for continuous use up to 750 hp for patrol craft use, and the Scania 13-liter marine engine is the first in a new line of engines for propulsion and auxiliary use. Torque ratings have been increased on the new range, making it easier to maintain favorable operating speeds in high sea or with a heavy load. Single-circuit keel cooling is used to simplify installation and reduce cost.

For marine auxiliary use, the Scania 13-liter engine is designed to handle large step-load variations with short recovery time. The top version achieves its top output of 426 kW at 1,800 rpm. The engine also features Scania EMS, an in-house developed engine management system that is designed to be flexible when it comes to tailoring engine performance to individual customer applications.

The new 13-liter marine engines complies with emission standards IMO II, EU Stage IIIA and US Tier 2.

“What you’re seeing here is the engine platform that will be used for Tier III,” said Lindner. “The 13 liter engine was introduced earlier this year and it replacing the 12 liter engine. The new 16-liter engine is being introduced at this show.

Scania also launched a new type-approved instrumentation according to the standards of classification societies such as RINA, DNV, Germanischer Lloyd, American Bureau of Shipping and Lloyd’s Register. The new instrumentation is designed to be easy to install and via a user-friendly and flexible web interface, the marine operator can adapt the information on the panels and choose any required data. The panels have prepared layouts for water temperature, engine

speed, oil pressure and fuel consumption. The operator can also connect and configure a gauge indicator for transmission monitoring and for fuel or fresh-water levels.

The master panel is equipped with a flexible input/output (I/O) with ten

digital inputs, two 4-20 mA inputs, two PT100 inputs and seven digital outputs. The system is expandable with an unlimited number of slave panels via standard Ethernet. The flexible I/O makes it easy to install surveillance and alerts of seawater

flow or fuel consumption. Increased idling makes the maneuvering of a hydraulic pump for powering winches, or cranes, uncomplicated. Connection for throttle availability via all standardized interfaces (0-5 V, 4-20 mA and CAN).

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## Cat Covers it All

# From Sharks to Tier III

Exhibitions are traditional launching points for major equipment makers, and Caterpillar Marine Power Systems is no exception. Last month at the International Workboat Show in New Orleans the ubiquitous marine power company made announcements regarding its progression toward US EPA Tier 3 Regulations. In addition, it brought to the show an interesting repower presentation from its recent work on OCEARCH's 'Shark Wranglers' vessel.

Caterpillar in New Orleans highlighted its array of U.S. EPA Tier 3/IMO II compliant marine power solutions, among them the Cat 3516C marine engine, C175 marine engine as well as the C18 and C32 engines, both of which have recently become available to order in a Tier 3 configuration.

The headliner was the 3500C Tier 3/IMO II compliant engine family as well as the C175 marine engine. The 3500C engine family includes both the 3512C HD and 3516C HD marine engines, both available in a wide range of ratings that meet EPA Tier 3 and IMO II without after treatment. These new propulsion, auxiliary, and DEP engines, designed and built

from the current 3500C platform, have minimal dimensional and weight changes in comparison. New features for the 3500C series include stainless steel exhaust heat shields and a closed crankcase ventilation system.

The C175 engine for marine applications is a EPA Tier 3/IMO II certified engine series consisting of 16 cylinder, V engines. The four-stroke, non-reversible engines are rated at speeds from 1600 to 1800 rpm and intended primarily for use as main propulsion for vessels. The engines are turbocharged and aftercooled with a common rail injection fuel system with electronically controlled injectors. The C175 platform is designed for optimal emissions flexibility and capability, high power density, improved reliability and durability targeting the BSFC and reliability of a medium speed engine with the power density and unmatched performance of a high-speed engine.

### POWER TO STUDY SHARKS

Aside from the traditional display of new engines and technologies in the exhibition hall, Caterpillar brought to the show one of its more interesting repower clients. In 2007, Chris

Fischer created OCEARCH to help raise awareness of global marine conservation and further research efforts into great white sharks. To date, OCEARCH has raised more than \$10m for shark research while leading scientific expeditions around the world's oceans. The OCEARCH team was featured on the television series 'Shark Wranglers' on the History Channel, receiving acclaim for its efforts researching the unsolved mysteries of great white sharks.

Central to its research efforts is MV OCEARCH, a Cat-powered 126-ft. vessel equipped with a custom 75,000 hydraulic lift and research platform with the capability of handling 5,000 pound sharks. Repowered in 2011 with support from Milton Cat and Elite Diesel, the MV OCEARCH features 2x Cat 3412 engines, 1x C4.4 generator set and 1x C6.6 generator set while serving as an at-sea laboratory.

"In 2012 the engines of the MV OCEARCH were overhauled, lowering our emission levels and reducing fuel consumption by 20 %," said Fischer. "The new Cat generators literally paid for themselves in less than half a year because of their efficiency."

### CAT TO REPOWER ACL VESSELS

A workboat client in the more traditional sense, Caterpillar announced that American Commercial Lines (ACL) chose Cat C280 marine engines to repower six of its towboats, according to Bill Foster, ACL vice president of Boat Maintenance. All six vessels are scheduled to be repowered in 2012. The first vessels being repowered are the MV J. Russel Flowers and the MV Thurston B. Morton. Cat dealer Wayne Power Systems is assisting with the repower project.

ACL has been operating three of its higher horsepower towboats since 1998 powered with Cat 3612 engines. The Cat 3612 engine, the predecessor to the C280, has proven to be reliable and durable. After 21 years of operating with the Cat 3612 marine engines, ACL's MV Carol P. received the first major overhaul recently in Paducah with the support of Wayne Power Systems. Following the overhaul and refurbishment, the MV Carol P was dedicated as the MV Dan Jaworski. The renamed vessel represents ACL's new standards for performance, high operational efficiency and reliability.

[www.marine.cat.com](http://www.marine.cat.com)



(Photo by Jeff L. Yates)

# 90% Less NOx

## For a New Inland Waterway Tanker

This summer the MTS Duandra was launched in Benelux as the world's first semi-hybrid inland waterway tanker built by Shipyard Trico B.V. The ship uses Volvo Penta diesel engines for both propulsion and generator set that helps to reduce emissions significantly. The two standard Volvo Penta D16 MG Gensets on MTS Duandra generate power for on-board electricity, thruster, cargo pumps and two electric engines which are part of the propulsion system. This setup reduces the total installed diesel power on-board the Duandra with approximately 30% compared to a conventionally built ship. The savings made were used to invest in the extra electric equipment and as well to invest in catalytic converter and particulate filter on all the D16 engines on-board. By using this technique the NOx emissions are reduced by approximately 70 to 90% and particulates



are reduced by about 40%.

The propulsion system consists of a 750 hp Volvo Penta propulsion engine connected to a MMW1700 gearbox. On the gearbox a 475 hp electric motor is also connected and together they can

drive the 1,225 hp designed propeller to full speed on request. The propeller can be diesel-electric, diesel direct or combined driven, so the skipper can always find the most efficient way of propulsion and has a lot of redundancy which

guarantees an almost 100% uptime of this ship. Through this semi-hybrid, the propulsion and Gensets engines run on controllable higher load compared to a standard propulsion installation, which is in favor of the specific fuel consumption of the propulsion engines compared to a standard single propulsion engine unit of 1225hp. This semi hybrid concept proves that it is possible to build a ship with future emission levels, for a conventional built ship's price on existing emission levels and that's the first time ever done. The whole scope of supply, the propulsion engines, and Gensets and after treatment equipment is delivered through the Volvo Penta Marine Commercial Center Terlouw in Rotterdam.

They will also take care of the full service of all equipment which is a big advantage for the owner of the ship.

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# Moving Mountains

## Relocation and Reconditioning of 80-Ton Wärtsilä Engine Block

*Goltens mobilizes In-Situ Machining and Diesel Engines teams to complete challenging project on a barge-mounted power plant.*

**G**oltens is not new to taking on some of the most demanding repairs in the marine industry, with a history built on performing under some of the most stressful conditions. Expanding the company's horizons, Goltens Singapore won a turnkey contract to complete a challenging project on a barge-mounted power plant, as part of Goltens' global initiative to increase its activities in the power generation market. The 120-MW barge-mounted power plant in Haripur, Bangladesh, owned and operated by power generation providers NEPC and Covanta Energy, has been in operation since 1999. One of its eight Wärtsilä 18V 46GD engines required significant repair work, including the supply of a fully reconditioned engine block.

The full scope of work was carried out in three locations, culminating in the re-building of the engine and commissioning on-site in Haripur, near Dhaka, Bangladesh in February 2012. This was a challenging project that required complicated logistical arrangements and operations between the Philippines, Singapore and Bangladesh.

Goltens' started the work by dismantling and extracting the 80-ton engine block from an existing power plant in a rural location in the Philippines. At this stage, visual inspection and non-destructive testing were performed to confirm suitability of the

block for the project. Once ready for land transportation, the engine block was transported 50 km to the port by multi-wheeler trailer. The engine block was then loaded onto a heavy lift vessel for onward transportation to Singapore.

Upon arrival at the Port of Singapore, the engine block was unloaded and moved overnight to the Goltens workshop, accompanied by a police escort for increased safety. Goltens Singapore carried out the modification and conversion of the used diesel engine block into a gas-diesel engine block using specialized In Situ Machining equipment. Following reconditioning in Singapore, the engine block was shipped to the Port of Mongla in Bangladesh by a heavy lift vessel, then loaded onto a barge for onward river towage to the final location.

Goltens' dismantled the existing engine, jacked up the damaged engine block from its original position and shifted the crankshaft aside. A full inspection of the existing crankshaft was carried out on-site, resulting in honing of the crankpins and main journals, as well as milling counterweight contact landings. A delicate skidding operation was then performed whereby the existing engine block was removed and replaced by the reconditioned block. Goltens' diesel team then rebuilt the engine culminating in successful commissioning

and handover in February 2012.

"We are very satisfied with the outcome of the project and our working relationship with the customer," said Tom Boyle, VP Vice President of Goltens South East Asia. "The engine is running smoothly to the satisfaction of both ourselves and the customer. The In-Situ Machining work on the block and crankshaft, as well as the rebuilding and commissioning of the engine, were routine tasks for our experienced Diesel and In-Situ Machining teams, but the logistics were complicated due to various geographic challenges."

### Project Fast Facts

#### Project scope:

Supply of a fully reconditioned engine block for a barge-mounted power plant in Haripur, Bangladesh

#### Owned and operated by:

NEPC, Covanta Energy

#### Total electric output:

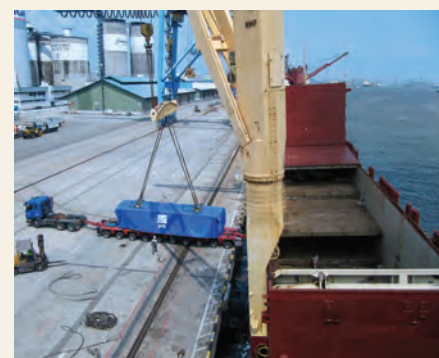
120 MW

#### Engine Type:

Wärtsilä 18V 46GD

#### Locations:

Philippines, Singapore, Bangladesh





## New Marine Engines

# John Deere Debuts Tier 3

John Deere Power Systems (JDPS) announced new Marine Tier 3 PowerTech™ 4.5L and 6.8L propulsion and generator-drive engines. John Deere will meet U.S. EPA Marine Tier 3 emissions regulations that began to take effect in 2009 based on cylinder displacement and power per displacement with a complete lineup of PowerTech 4.5L and 6.8L propulsion and generator-drive engines. They also will achieve compliance with IMO Tier II emissions regulations and EU 97/68/EC.

New EPA Marine Tier 3 regulations will impact John Deere 4.5L and 6.8L engines beginning January 1, 2013. Tier 3 regulations affecting John Deere 9.0L and 13.5L marine engines start in 2014.

### 4.5L ENGINES

John Deere is adding two new 4.5L models to its lineup of Tier 3 marine engines: the PowerTech 4045TFM85 generator-drive engine and the PowerTech 4045AFM85 propulsion and generator-drive engine. The PowerTech 4045TFM85 generator-drive engine is designed for quiet and smooth operation for genset applications. Features will include a high-pressure common-rail fuel system, two valves per cylinder, and the choice of keel cooled or integrated heat exchanger options.

The PowerTech 4045AFM85 will serve as a choice in the power range that was previously covered for Tier 2 by the PowerTech 6.8L 6068TFM75 propulsion and PowerTech 6.8L 6068TFM76 generator-drive engines. The PowerTech 4045AFM85 engine will feature a common-rail fuel system, four valves per cylinder, turbocharging and air-to-coolant aftercooling. It will be available with keel cooled or integrated heat exchanger options.

Propulsion power ratings for this engine include:

- PowerTech 4045AFM85 propulsion engine: 119 kW to 168 kW (160 hp to 225 hp)

Generator-drive 4.5L engine prime power ratings include:

- PowerTech 4045TFM85: 74 kW (99 hp) at 60 Hz (1800 rpm) and 61 kW (82 hp) at 50 Hz (1500 rpm).
- PowerTech 4045AFM85 generator-drive engine: 110 kW (148 hp) at 60 Hz (1800 rpm) and 89 kW (119 hp) at 50 Hz (1500 rpm).

### 6.8L ENGINES

John Deere 6.8L Tier 3 propulsion and generator-drive engines include the PowerTech 6068AFM85 and the PowerTech 6068SFM85 models, and will cover the power range previously covered by the PowerTech 6081AFM75 propulsion and generator-drive engine. The PowerTech 6068AFM85 and PowerTech 6068SFM85 engines will feature high-pressure common-rail fuel systems, four valves per cylinder and low-temperature aftercoolers. The 6068AFM85 model will be available with keel cooled or integrated heat exchanger options. The 6068SFM85 engine will be offered with an integrated heat exchanger configuration.

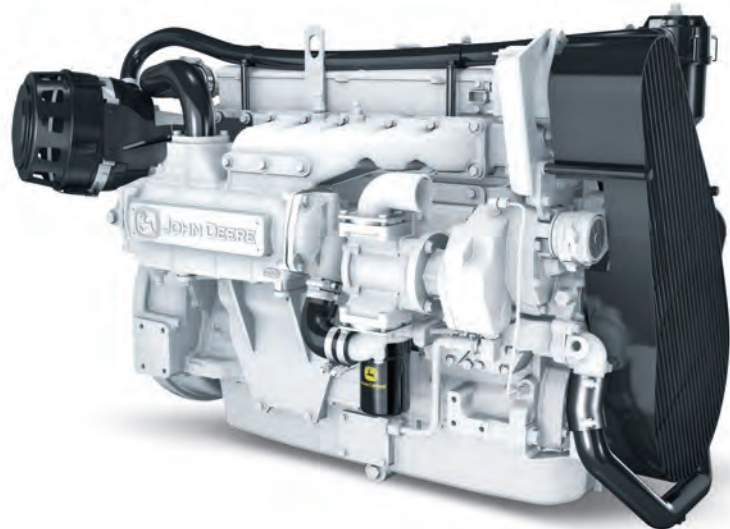
Propulsion power ratings for these engines include:

- PowerTech 6068AFM85: 172 kW to 246 kW (230 hp to 330 hp)
- PowerTech 6068SFM85: 186 kW to 298 kW (249 hp to 400 hp)

Generator-drive 6.8L engine prime power ratings include:

- PowerTech 6068AFM85: 166 kW (223 hp) at 60 Hz (1800 rpm) and 139 kW (186 hp) at 50 Hz (1500 rpm)
- PowerTech 6068SFM85: 195 kW (262 hp) at 60 Hz (1800 rpm) and 168 kW (226 hp) at 50 Hz (1500 rpm)

[www.JohnDeere.com/jdpower](http://www.JohnDeere.com/jdpower)



**John Deere 6.8L Tier 3** propulsion and generator-drive engines include the PowerTech 6068AFM85 and the PowerTech 6068SFM85 models, and will cover the power range previously covered by the PowerTech 6081AFM75 propulsion and generator-drive engine.

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# Oil & Water do Mix

## Emulsified Fuel Tech Earns a Better Rep

*Matters of fuel use, economy and emissions are “A-List” items on any vessel owner’s agenda, as skyrocketing prices for diesel and a spiraling maze of regulation regarding fuel content and emissions are pressing owners to adopt technical solutions. Maritime Reporter & Engineering News recently spent some time with Dr. Jerry Ng Kok Loon, the founder and CEO of Blue Ocean Solutions, and one of the industry’s leading experts within emulsified fuel technology.*

**By Greg Trauthwein**

**Your company was created in late 2010, but actual research into your emulsified fuel technology stretches back to the 1980s. Can you please explain?**

■ When we did the research work in the 1980s, the price of oil was so cheap that it would have not been feasible for the ship owners to invest on the system. Blue Ocean Solutions was established as a response to the need for fuel savings solutions due to escalating fuel prices. Today, 3% improvement in fuel efficiency is significant. With our system, a ship owner spending 30-40 metric tons a day, for example, would save \$150,000 to \$200,000 per year at today’s HFO price.

**We understand the premise behind emulsified fuel technology, but we also understand that it is not always highly regarded in the marketplace?**

■ Water in fuel emulsion has been around a long time. Over the past decades, the research has mainly been focused on NOx reduction. Our focus on the other hand has always been on fuel savings, to understand what kind of emulsion produces more complete combustion. It is true that water in fuel emulsions have had bad reputation mainly because not enough research work has been done. The

idea is simple, adding water into the fuel but the reality is far from simple. Extensive research works have been carried out in established research laboratories and Universities all over the world for decades. The results at test beds have proven that emulsified fuel have consistently improved fuel efficiency and reduce NOx. These results have been well published and reviewed. However, when they were applied to ship board applications at sea, the good test bed results have eluded almost every tested emulsified fuel systems.

The key reason is in the reliability and ability of the emulsifier to produce water-in-fuel emulsions with consistent water-in-fuel particles sizes of 2-6 microns. Under real sea and engine room conditions, all current emulsifiers either produce water-in-fuel water particles sizes of well below 2 microns or well above 6 microns. Theoretical and experimental research have established the optimum water-in-fuel particle sizes for 10% water v/v emulsions must be between 2-6 microns for secondary atomization to occur.

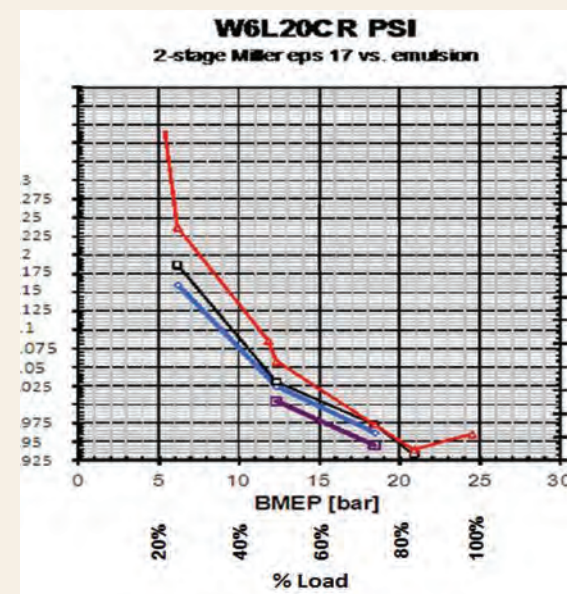
The key in emulsified fuel is to create the secondary atomization effect where water particles in the fuel explodes creating a finer fuel mist and therefore more complete combustion. To understand this is one thing and to know the characteristics of the optimum emulsion. The challeng-

ing part is to produce the emulsion consistently. We have done extensive research in emulsified fuel to understand the theory and the practice. We also started our work using homogenizer, but found out that after a short time the performance always drops. Homogenizer has mechanical moving parts and especially, in engine room environment, there will be wear and tear quickly which causes the performance to deteriorate.

The key innovation in Emulsified fuel technology is the development of our Emulsified that has no moving parts. Our Emulsifier produces that correct emulsion for best fuel savings (guaranteed and proven minimum 3% savings). There is no storage of emulsion, neither do we use any chemicals, even with MGO. So it works reliably.

**How much does your systems cost to install?**

■ The installation is rather fast and simple. When the ships is at port we would prefabricate our emulsifier module and install 3 change over valves. The rest we can do while the ship sails. It would take about 3-4 weeks if the installation is done while the ship is sailing and less than one week on a drydock. The cost of installation depends on the ship’s fuel oil supply system and the price of the used man power, naturally. Also,



the cost will be different if the installation is done during the drydock or while the ship sails. Roughly, the installation would be couple of tens of thousands.

#### **What are the maintenance factors?**

With our EFS, the maintenance requirements are a minimum. The only moving part of the system is the HP water pump that requires scheduled maintenance every six months. The key part of our system and also the key innovation in Emulsified Fuel technology is our Emulsifier that has no moving parts. The advantage compared to more conventional type homogenizer is that there is no wear and tear of the mechanical moving parts. The performance will not deteriorate. We have taken our emulsifier apart after over a year of operation and found that wear and tear were negligible when critical parts were sent to metrological laboratory for inspections. Our EFS is a total system. We have not only considered the performance of the system and ease of installation but also the ease of operation is important. The system is fully automated and fail safe with safety interlock built in. If there is an alarm, the EFS will shut down automatically and revert to the normal fuel oil service system.

**With increasing fuel costs and tightening environmental regulations, the guarantee of 3% fuel savings and NOx reduction would seemingly make installation of the system a “no-brainer”. That said, what are the most common objections you hear, and how are they overcome.**

The urgent need for fuel saving solutions has also increased the number of companies and people

coming to market with claims of fuel savings. Some are credible but too many are not. Ship owners are careful. Emulsified fuel technology has also had a bad reputation. Not enough research work has been done to fully understand what kind of emulsion achieves fuel savings, not to mention how to produce that kind of emulsion reliably and consistently.

Ship owners are also concerned if there's any damage to the engine condition, even though engine manufacturers already accept water in fuel emulsion as an alternative fuel. Furthermore, MAN, for example, has stated that their FWE “has proven not to affect the reliability of the engine,” after running some years. We have also surveyed the engine condition on our each reference after 6k hours and found no adverse effect on the engine condition. In fact we have found that the engine parts are cleaner. With our latest reference, a Cruise Liner, the engine manufacture has surveyed the condition of the engine and found no “show-stoppers.” The ship owner continues to run our Emulsified Fuel System after over a year now and continue to save fuel.

Also, the verifications of actual fuel savings at sea is a very delicate tasks that require deep experience and careful planning. Based on our experience, there is a lack of expertise in this area. The common experience to date is measuring of specific fuel consumption to ISO standards of +/- 3% deviation but not in measuring of % fuel efficiency improvement of the order of a few %. It is obvious that it is not possible to measure % fuel savings of a few % reliably and accurately by relying on a methodology that have permissible deviation of specific fuel consumption of +/- 3%. Ship owners demand a methodology that they can trust. Ship owners confidence have

been lost over the years specifically because % savings declared were not trusted. At BOS, we have the experience and methodology that can prove to ship owners the % savings achieved reliably and accurately.

#### **What are the advantages of being a subsidiary of Keppel Offshore & Marine?**

Keppel's strategy is Near Market, Near Customer. With global network of 20 yards and offices, customers is assured of excellent technical and service support backed by a strong and reliable reputation.

#### **Are there size limitations as to where the system can be installed?**

There are no size limitations. Our Emulsified Fuel System can be installed to a new engine, old engine, small or large, medium and slow speed.

#### **What do you consider to be the biggest challenge(s) to having your solution more widely adopted throughout the maritime industry?**

The biggest challenge is to deliver fuel savings to ship owners (according to ISO standards) that are reliable, dependable and trusted and which are verifiable by independent third party, and without any adverse effects to the diesel engine. There are no short cuts and these require careful planning and time. We started in late 2010 with installation in late 2011. We are now at the point of delivering such trusted results. Cost-benefits is not a challenge because the ROI is well below the commonly expected 3 years. In fact, at current equipment cost versus fuel savings, the ROI is well below 1-1.5 years.



### **Dr. Jerry Ng Kok Loon**

The founder and CEO of Blue Ocean Solutions, Dr. Jerry Ng Kok Loon is one of the industry's leading experts within emulsified fuel technology. He graduated with a Marine Engineering degree from the University of Newcastle upon Tyne and then worked with Prof RV Thompson on the applications of emulsified fuel to marine diesel engines as a research assistant in the 1980's while working on his doctorate degree. He continued his research work in emulsified fuel system at the Nanyang Technological University in Singapore with the support of the National Science Council and Neptune Orient Lines. Currently, Dr. Jerry has two patents with several pending on emulsified fuel technology.

### **Blue Ocean References**

- **Wärtsilä, Hercules Project**  
Medium speed engine,  
2-stage miller cycle using  
MGO
- **Cruise Liner, HQ in USA**  
Medium speed engine using  
HFO, MDO
- **B&I, Connaught**  
RoRo Ferry, medium speed  
engine using HFO
- **Townsend Thoresen, Spirit of Free Enterprise**  
RoRo Ferry, medium speed  
engine using HFO
- **London Overseas Freighters, MV London Viscount**  
Bulk Carrier, slow speed  
engine using HFO
- **NOL, Neptune Crystal**  
Container, slow speed engine  
using HFO



The baseline (0% water) is the red curve. The black, blue and purple curves are SFOC of the engine when using 10% water emulsified fuel. **The chart clearly shows significant fuel savings** since all the SFOC curves when using emulsified fuel are below the red baseline curve.

# AUSTAL USA

**Gulf Coast shipbuilder rolls into 2013 with a bulging backorder book, modern and efficient infrastructure** By Joseph Keefe

**A**ustal USA today finds itself plowing into 2013 with the proverbial bone in its teeth, powered by an enviably hefty U.S. government backorder book, possibly the most modern and efficient manufacturing infrastructure in U.S. shipbuilding and the leadership of a new President who, over the past five years, helped to make it all happen. Nevertheless, domestic shipbuilders all know that DoD and DHS belt tightening is a new reality.

Determining the depth of government cuts and positioning accordingly is the tricky part, yet hardly new to companies operating in defense circles. In fact Austal may be as well positioned to ride out the storm as anyone, as it has already made the successful transition from a small, conventional commercial shipyard to an efficient, modular manufacturer of the Littoral Combat Ship and Joint High Speed Vessel. And, it is the “modular manufacturing” part that may eventually lead Austal right back to their original roots.

## BEST OF A DIVERSE CONGLOMERATE

Best known as America’s largest aluminum shipbuilder, Austal USA also benefits from its position as a provider of design, construction and support of customized, high-performance aluminum

vessels for the commercial high-speed ferry market. Overseas, Austal’s facilities include a shipyard in Western Australia and a dedicated commercial shipyard in the Philippines, as well as vessel support services from Asia, Europe, the Caribbean, and the Middle East.

Closer to home, Austal USA is the quintessential definition of a full-service shipyard. During a November visit to its Mobile, Ala., facilities, *Maritime Reporter* enjoyed a full tour of the meticulously clean facilities, its impressive assembly line infrastructure and a walk-through of vessels rapidly approaching completion at its berths. Under contract to build ten 103-m JHSV’s under a \$1.6B contract and five 127-m Independence-variant LCS class ships, part of a 10-ship, \$3.5B contract, that backorder book would seem to preclude any need to plunge into the commercial waters any time soon. Nevertheless, Austal USA continually looks to expand its repair capabilities, and boasts engineering, test and trials capabilities at a new waterfront facility on the Mobile Bay waterfront. Eventually, the two contracts could eventually require a workforce of as many as 4,000 employees.

## BUSY & EFFICIENT, TOO ...

2012 was an exceptionally busy year for Austal. The shipyard continued

to generate new work, finish existing contracts and commence work on still others. In late December, Austal was awarded a \$166M modification to previous award for Joint High Speed Vessel (JHSV) 10. Originally, the JHSV series was planned to be a 21-vessel program, but just ten have been ordered to date. Two weeks prior to that, the Military Sealift Command accepted delivery of the first JHSV (pictured below). Three more of these vessels are already under construction.

As the 12th ship delivered by Austal USA in 11 years, JHSV 1 is part of an enviable benchmark that could easily lend itself to a commercial, series-build capability in the future.

In October, the keel laying ceremony of the third Littoral Combat Ship (LCS) was held. Jackson (LCS 6), one of five Austal-designed 127-m Navy vessels, was the first constructed utilizing Phase 2 of Austal’s Module Manufacturing Facility and the first ship assembled in their new Assembly Bay 5. Austal’s modular approach to ship manufacturing already has 35 of the 37 modules used to form the 127-m aluminum trimaran being assembled.

And just prior to that, in September, the USNS Choctaw became the second Joint High Speed Vessel christened at Austal in less than a year.

## PERCIAVALLE TAKES THE HELM

The recently announced promotion of Craig Perciavalle to President, Austal USA in December was a logical one. At Austal since 2007, he moves up after serving as Senior Vice President of Operations. Significantly, he oversaw Austal’s transition from a conventional commercial shipyard to an efficient, modular manufacturer that has improved its metrics and economy of scale with each new hull. Hinting towards what might come next, Andrew Bellamy, Austal’s Chief Executive Officer said, “Perciavalle is uniquely prepared to transition this shipyard into serial production and manufacture ships at a pace unmatched in the United States today.” Eventually, that could mean commercial, series build contracts – something Austal USA has already proven it can do.

For the New Year, there are few certainties on the domestic waterfront. Only time will tell which markets Austal USA will in the future focus its considerable capabilities. In a worst case scenario, government induced cuts would force the issue sooner rather than later. That said; a trip to Mobile and a few hours spent watching what happens there tells us that, when it comes to shipbuilding – any kind – Austal will be successful with any project of their choosing. That’s a lock.



Pictured left is the first Austal-built Joint High Speed Vessel (JHSV), **USNS Spearhead (JHSV 1)**. Below is Austal USA’s sprawling manufacturing complex in Mobile, Alabama.



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# USS Makin Island

## Proven Fuel Efficient

*USS Makin Island (LHD 8) is the last in a series of 8 amphibious assault ships of the WASP-class built by Northrop Grumman Shipbuilding at its Pascagoula, Miss. shipyard. Though last, it is the first in the series fitted with hybrid electric gas turbine propulsion, and recently returned to its San Diego homeport after its first deployment. “During the seven-month deployment, the ship’s hybrid-electric propulsion system saved more than four million gallons of fuel resulting in an estimated cost savings in excess of \$15 million,” the Navy claims. Maritime Reporter looks at the technology that makes this possible.*

***By Henrik Segercrantz***

Commissioned in 2009, Makin Island uses diesel-electric propulsion at speeds under 12 knots and is the first amphibious assault ship to be powered by gas turbines, used at higher speeds. The diesel-electric/gas turbine combination results in lower fuel consumption, reduced carbon emissions, and lower annual refueling costs. The earlier vessels in the series are fitted with steam plants, which were also used for generating the electricity for onboard consumption. Eliminating the steam plant also reduces engineering department manning requirements and workplace hazards associated with boiler systems. The purpose/mission of USS Makin Island is to embark, deploy, and land elements of a Marine landing force in an Amphibious Assault by helicopters, landing craft, and amphibious vehicles. The secondary/convertible mission for Makin Island is that of sea control and power projection. The ship has an overall length of 258m (847 ft.), overall breadth 36m (118 ft.) and design draft of 8.2m (27 ft.). The waterline length is 237m (778 ft.), waterline breadth 32m (106 ft.) and maximum draft is 8.5m (28 ft.). The gross tonnage of the vessel is 12,821 and displacement 41,649 tons. The ship can carry up to three LCACs or 39 Expeditionary Fighting Vehicles (EFVs). The typical aircraft load-out is 12 CH-46 Sea Knight helicopters or 10-12 MV-22 Osprey tilt-rotor aircraft, 4 CH-53E Sea Stallion helicopters, 7AH/UH-1 attack/utility helicopters, six AV-8B Harrier attack planes (6 F-35B Joint Strike Fighters in the future), and 2 MH-60S Search and Rescue helicopters. The ship typically embarks with approximately 100 officers and 1,100 crew, and can carry about 1,700 Marines.

### UNIQUE MACHINERY

USS Makin Island is powered by two LM2500+ gas turbines supplied by GE, each with a power of 35,000 hp, and six 4,000kW Fairbanks Morse diesel generators which feed the vessel’s electrical distribution network and two auxiliary electric propulsion motors. The total diesel generating power is 24,000kW (32,630hp). The LM2500+ gas turbines, which together provide a power of 70,000shp, are used for high speed service propelling the vessel up to some 25 knots through a mechanical geared two-shaft arrangement with 5m diameter controllable pitch propellers. The Auxiliary Propulsion System, or APS, consists of GE’s (earlier Converteam’s) MV3000 variable frequency electric drives and two electric propulsion motors, supplied by GE, Power Conversion, coupled to each gearbox also supplied by GE.

Since the gas turbine propulsion plant is designed to meet all the mission requirements, the electric propulsion system could be designed primarily to maximize thru life cost savings. The largest COTS ‘commercial off the shelf’ electric propulsion motor that could be utilized was a 5000hp induction motor. Two propulsion motors provide a ship speed of up to 13 knots with diesel-electric propulsion only. At the sea trials a speed of 13.7 knots was reached.

The conversion from steam to gas turbines utilizes a single gas turbine per shaft. This was made possible with the commercial launch of LM2500+. Its 25% power increase allowed for a direct replacement of the installed power on the previous vessels in the ship class with a single gas turbine. Replacing steam heating to electrical heating required additional electricity generating



**USS Makin Island (LHD 8)** is the last in a series of eight amphibious assault ships of the WASP-class built by Northrop Grumman Shipbuilding at its Pascagoula, Miss., shipyard.

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capacity. This required a higher voltage of the ship's network, which was consequently increased to 4160V from 450V. The philosophy of the electric load profile is that a maximum of 9MW of the power generated is required for resistive heating loads. This amount of power is only required during cold weather, which leaves this power available for other users in milder conditions. A decision to reallocate this capacity when not needed allowed the design of an electric propulsion system to move forward. As these ships spend over 90% of their life at 20°F (-6.6°C) or above, excess power is thus always available.

GE's LM2500 is the world's most widely used marine gas turbine. It powers more than 400 ships in 30 world navies. 1200 engines have more than 11 million hours in naval service.

The LM2500+ maximum output is 35,000shp (26,100kW) Navy Standard Day (NSD). The LM2500+ has one additional stage of compressor blades, and is available with a power of up to 40,500shp (30,200kW) and the newest fourth generation LM2500+G4 has a power of 39,240shp (29,280kW) NSD.

ing base. The enclosure attenuates noise in the engine room and provides sensors for inlet icing and fire detection. It also houses fire extinguishing equipment.

The power generation system consists of six 4,000kW synchronous generators connected directly to six 4160 VAC generator switchboards. The distribution system consists of eight 4160 VAC distribution switchboards supplying 450V load centers via step-down transformers. Each propulsion motor is supplied from a 3 phase GE's MV3000 variable speed electric drive that is fed by a 4160V (3-phase):724V (12-phase) isolation transformer. Each drive has an input power of 4,000kW, and is fitted with a 24 pulse width modulated rectifier (PWM) and microprocessor controller, with locally placed control panel. It is arranged with closed circuit water cooling. The 12-phase secondary of the isolation transformer, in combination with the 24-pulse rectifier section of the electric drive, limits harmonics from the APS to within MIL-STD 1399 Power harmonic limits. This is a critical interface requirement at the distribution bus which has power supplied by the diesel generators.

100-1800 rpm induction motors. Two independent switchboards feed each APS. The APS can be fed either by the diesel-generator (SSGD) placed in the same machinery room or using the overall 60Hz distribution system (IPS mode). The APS can either be operated in Speed Control mode or in Torque Control mode, the later preferred to limit load cycling on the electric plant due to seaway, manouvering etc. The variable speed drive (VSD) control system of the APS were tuned and the Machinery Control System (MCS) power management interface revised to provide a marked improvement with regards to the system power and frequency oscillations observed during the sea trials. The vessel has also an advanced machinery control system and a water mist fire protection systems.

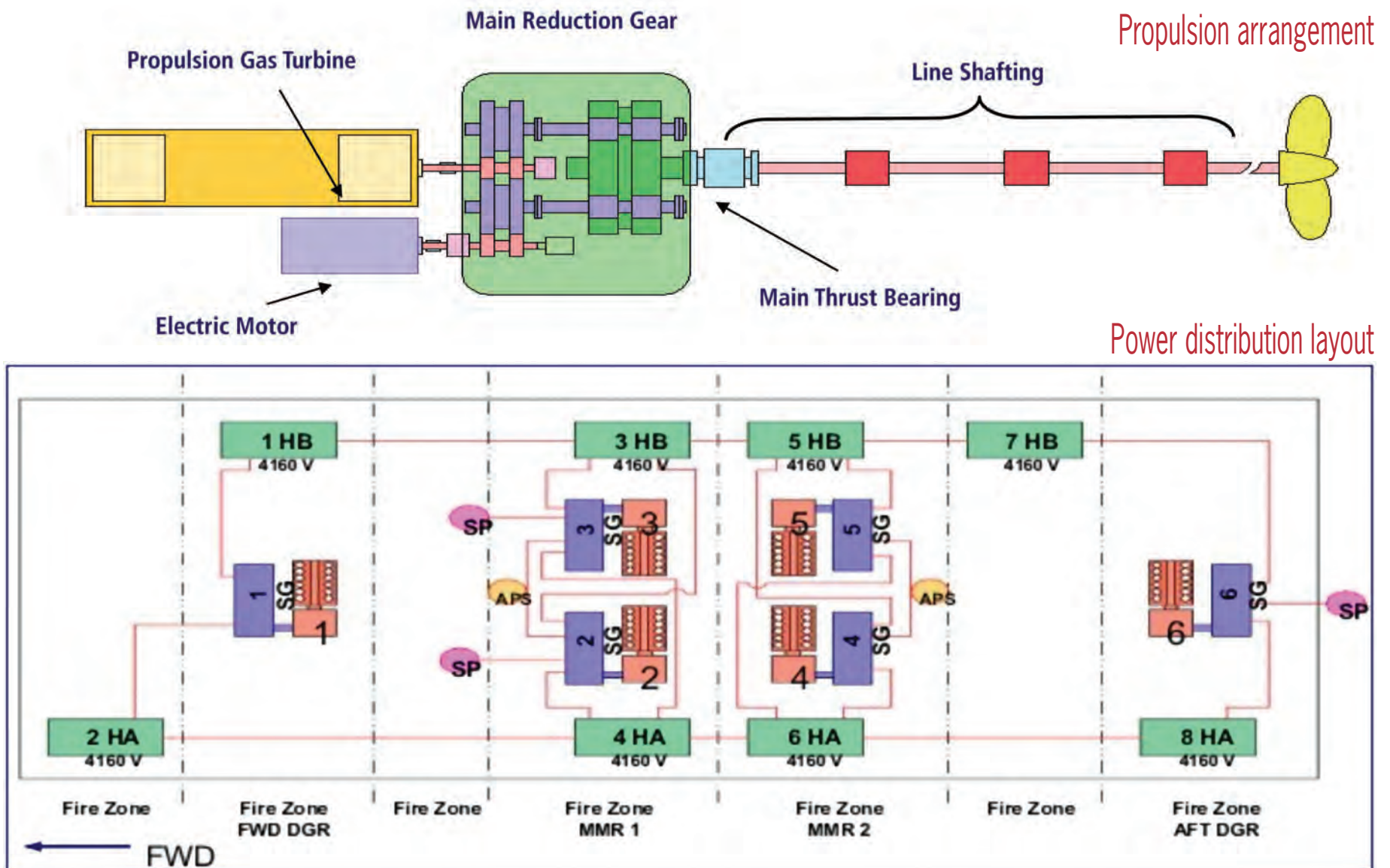
"The Navy was always very clear that it would not sacrifice operational performance in the search for economic advantage," said Paul Thompson, GE Power Conversion's Naval Director. "They wanted reliability and performance plus economy which is why Commercial Off The Shelf (COTS) equipment

preferred since it is considered to be simpler, cheaper, smaller and lighter than a standard synchronous motor that needs separate field excitation and associated control support.

It's generally considered to be more robust too and is likely to require less routine maintenance than other motors designs.

A similar thought process lay behind the selection on the MV3000 Variable Speed Drive (VSD) unit," continued Thompson. "Our 4000 kW pulse width modulated (PWM) MV3000 VSD has twelve input phases which are phase-shifted from one another by 30° electrically, resulting in an apparent 24-pulse rectifier to the ship's main power bus. This design feature eliminates the need for further bulky equipment such as harmonic filters."

Both the gas turbine and the electric propulsion motor power the same reduction gear train through synchronizing self shifting clutches. The rated shaft speed is 90rpm. Propulsion system transitions are completely automated. When switching from gas turbine (GTM) to electric propulsion, the APS is brought





plete propulsion load.

The machinery system with components was full scale tested to meet the requirements of the U.S. Navy. Tests included thermal stability, vibration, full torque, full speed, 110% torque at 0 rpm, efficiency, air bone noise, local and remote control, and for electromagnetic interference and shock testing.

The combined electric/gas turbine systems onboard were selected due to the U.S. Navy's desire for a proven commercial off the shelf system that could be developed to meet critical Navy requirements and reduce cost. The selected machinery combination also greatly reduces the amount of time required to bring the ship's engines online, improving the ability to quickly get underway and respond to emerging threats or humanitarian crises.

The ability to select the best combination of power plants to match the immediate power requirements provides flexibility in operation and reduction in operating costs. Amphibious assault ships spend approximately 75% of their underway time travelling at 12 knots or less.

Therefore, Makin Island can use its electric auxiliary drive the majority of the time, saving fuel and reducing wear and tear, and related maintenance costs, on the ship's primary engines. Intermediate speeds of 15-16 knots were reached with best fuel economy by going with one gas turbine a little too fast, and then switching to only electric drives going 10-13 knots. According to NavSea, the crew size could be reduced by 80 to 90 engineering personnel.

Beyond the environmental and energy-saving advantages of USS Makin Island's propulsion system and all-electric auxiliaries design, the ship uses a stern flap to improve fuel economy, anti-fouling coatings to minimize hull drag, and solid state lighting to reduce energy use.

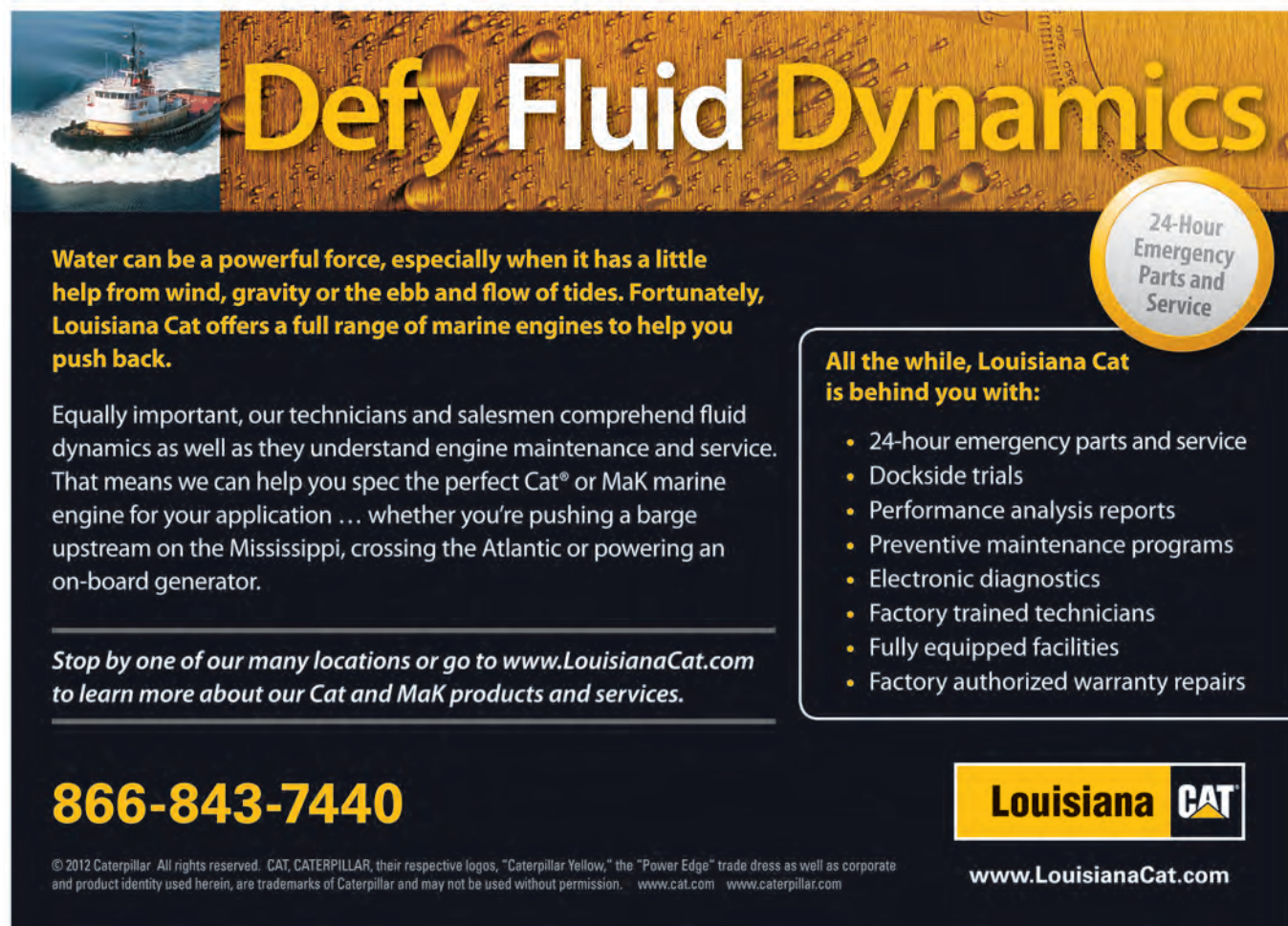
The economic benefit was quickly realized by operating the vessel on the APS instead of the greater fuel-consuming steam turbines. At a ship speed of 12 knots, the initial fuel savings on the trip from the shipyard in Pascagoula, to the vessel's home port in San Diego, CA around the southern tip of South America, fuel savings of over \$18,000/day were reached as compared to steam turbines powering the vessel and its electricity producing generators. The gas turbines are calculated to offer 12% fuel savings compared to a steam plant. The electric drive offers 30% fuel savings compared to gas turbines and 43% compared to a steam plant.

The US Navy expects over the course of the ship's lifecycle to see fuel savings of more than \$250 million.

"As the Navy's first operational test platform for this hybrid-electric propul-

sion system, our fuel efficiency directly enhanced the ability to operate forward for longer. Additionally, our significant fuel cost savings, coupled with our lessons learned, will serve as a solid founda-

tion for optimizing this ship, as well as current and future ship designs," said Capt. Cedric Pringle, Makin Island's commanding officer when the ship returned home from its first deployment.



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# TOTE Goes Gas

## Historic Shipbuilding Contract for World's First LNG-Powered Containership to be MAN-Powered, NASSCO-Built

*Last month U.S. ship owner Tote Inc. shocked the maritime community in ordering the world's first LNG-powered containerships; in one fell swoop energizing the U.S. shipbuilding sector. On the occasion of this historic contract, top executives from TOTE, NASSCO and MAN spoke to Maritime Reporter & Engineering News to weigh in on the deal's significance.*

*By Greg Trauthwein, Editor*

In recent decades, particularly in the large commercial ship niche, it is fair to say that the U.S. has not been a world force. As the majority of commercial shipbuilding continues its migration to Far East, specifically South Korea and China, developed countries with much higher labor costs and prohibitively expensive environmental regulations have seen new shipbuilding business dwindle. So when last month it was announced that an order had been placed (two firm, three options) for the world's first LNG-powered containerships, the Vegas odds of the order emanating from a U.S. ship owner would have been high; the odds of the order emanating from a U.S. ship owner for construction in a U.S. shipyard would have been mind-boggling. **Welcome to mind boggling.**

### THE OWNER

Tote Inc. ([www.toteinc.com](http://www.toteinc.com)) created a palpable buzz last month when it ordered the world's first LNG-powered containerships from San Diego-based NASSCO ([www.nassco.com](http://www.nassco.com)), a General Dynamics company which is much better known in military shipbuilding circles, but which has amassed arguably the country's most diverse and deep repertoire in the commercial sector, particularly among the large shipyards.

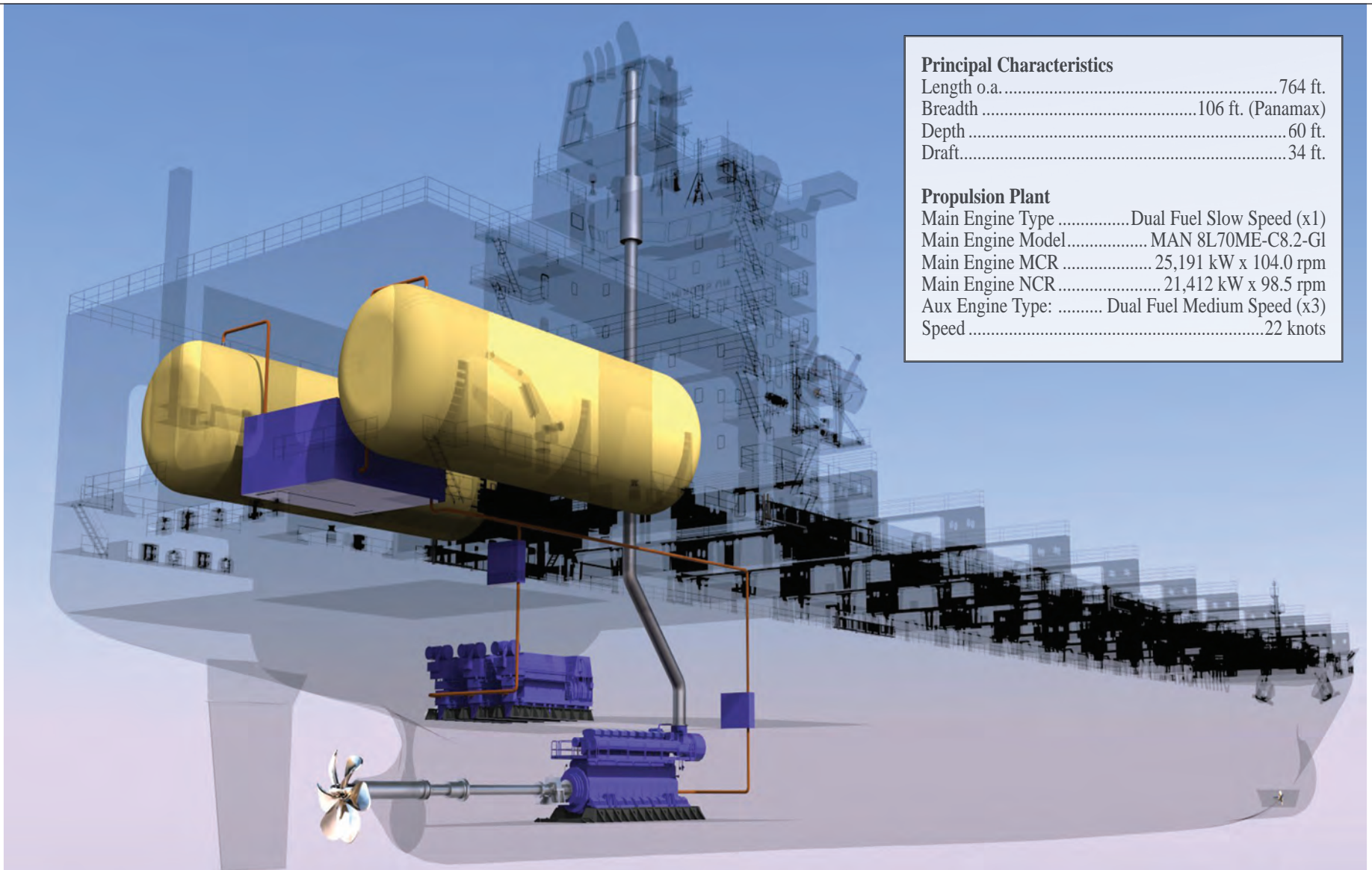
TOTE, Inc. announced its commitment to build two state-of-the-art, 3100-TEU containerships for the Puerto Rico trade, with options for three more vessels for domestic service. The debate over the advance of LNG as fuel for ships – particularly on ships that are not LNG carriers with their own built-in source or fuel – has raged for years. There is a fair balance of pros and cons on the issue, including:

#### Pros

- An abundance of cheap natural gas being developed in the U.S.
- The overwhelming environmental emission advantages without after treatment versus diesel.

#### Cons

- The higher cost of the ship (generally 10 to 20% higher than a comparable diesel)
- The uncertainty of future natural gas prices
- The massive tankage (in comparison to diesel) needed onboard vessels to accommodate the LNG fuel tanks
- The dearth of LNG bunkering stations



Principal Characteristics	
Length o.a.....	764 ft.
Breadth.....	106 ft. (Panamax)
Depth.....	60 ft.
Draft.....	34 ft.
Propulsion Plant	
Main Engine Type.....	Dual Fuel Slow Speed (x1)
Main Engine Model.....	MAN 8L70ME-C8.2-G1
Main Engine MCR.....	25,191 kW x 104.0 rpm
Main Engine NCR.....	21,412 kW x 98.5 rpm
Aux Engine Type:.....	Dual Fuel Medium Speed (x3)
Speed.....	22 knots

Artist rendering of TOTE's new dual fuel containership, the world's first containership to be powered primarily by LNG. As with other LNG powered designs, fuel tank size and placement will be a major feature.





The new containerships will replace containerships that will have to be pulled from the U.S. to Puerto Rico trade route in 2019 due to North American ECA regulations.

“In our industry, containerization was the game changer, but since then it has just chugged along. **I really think that going to an LNG fuel source is the next wave.** I know it’s a solution that is more aligned with shorter routes than long 12,000 nautical mile international runs due to the tankage required, but I firmly believe that at some point in the not too distant future that that challenge will be addressed as well and eventually LNG will be the primary fuel source for global shipping.”

**Anthony Chiarello,  
President and CEO, TOTE Inc.**

Though many questions remain, an increasing number of bold leaders are stepping to the plate and taking the LNG-plunge.

According to Anthony Chiarello, President and CEO of TOTE Inc., the decision to build the ships with the LNG option was a no brainer given the environmental advantages and the startling emissions numbers, particularly in light of ever tightening emission regulations in the ECA zones.

“Last August we announced the conversion of our Alaska Ships ... our ORCA class vessels ... to LNG,” said Chiarello. “So we had already spent a lot of time looking at LNG as an alternate fuel source; and we already had a good amount of due diligence completed relative to LNG. So when we started talking to the yards about the newbuilds, there was no doubt that the ships were going to be dual fuel and that LNG was going to be the primary fuel source. That was never a question.”

While the cost comparison between diesel and gas is currently overwhelmingly in favor of gas, Chiarello maintains that environment, not economics, was the project’s driver. “For us, this decision was purely made on the back of the environmental impact and how the ECA guidelines are driving the shipping business. Within the Saltchuk group of companies (TOTE Inc.’s owner) there are two things first and foremost: Safety and Environmental Stewardship.

In the last week I have been asked a lot if this was it a financial decision and not an environmental one ... and the answer is ‘absolutely not.’ I don’t know what LNG is going to cost three years from now when the ships come out; but I absolutely know what the impact will be in terms of emissions: that’s not going to change. If there’s an advantage from a fuel cost perspective, that

will be wonderful, but that’s not what this decision was based upon: it was purely an environmental consideration.”

And in a word, the environmental impact is staggering.

The vessels are already being touted as the most environmentally friendly containerships in the world with CO2 emissions-per-container that are 71% less than the vessels now in the Puerto Rican trade. In addition, Particulate Matter will be reduced by 99%; Sulfur oxides will be reduced by 98%; and Nitrogen oxides will be reduced by 91%. The 3100 TEU vessels are expected to be the largest ships of any kind in the world powered primarily by liquefied natural gas (LNG). Both ships will be powered by dual-fuel LNG engines that surpass the requirements of the U.S. Environmental Protection Agency’s clean air regulations.

The new ships will operate in TOTE’s Puerto Rican trade, a route that currently has three TOTE ships in the region, two active, one in lay-up. Because of the North American ECA regulations, the ships currently serving the trade cannot be run past 2019.

Universally, the lack of LNG bunking facilities has been acknowledged as one of the chief detriments to the immediate uptake of LNG as a primary fuel in the marine market.

According to Ole Grøne, Vice President Low-Speed Sales and Promotions, MAN Diesel & Turbo, LNG fuel for ships appears to be a harbinger for things to come and expects the take-up by shipowners to increase accordingly, but he said the limiting factor at the moment is the availability and lack of infrastructure on the LNG bunkering side of the equation.

But Chiarello believes this will soon be changing.

“The only remaining piece of the puzzle? Locking in our fuel source in both the Pacific NW as well as in the PR service,” he said. “But in the last week, immediately following our announcement, I’ve had no less than a dozen contacts to us from parties who are already providing LNG in other locations that would like to provide it to us, or a bunkering service or direct line. We have little concern that there will be adequate choice of fuel source.”

#### THE BUILDER

General Dynamics NASSCO in San Diego, California will build the vessels, with the first two scheduled to be delivered and enter service between Jacksonville, FL and San Juan, PR in 2015 and 2016.

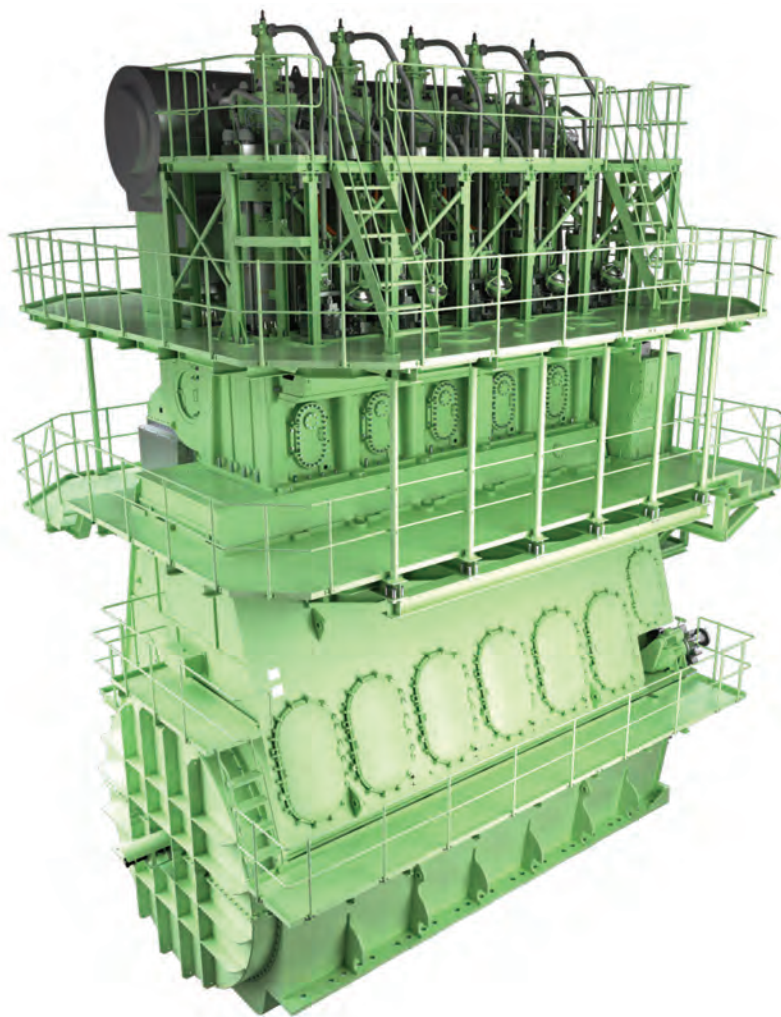
Fred Harris is the ubiquitous and long tenured president of General Dynamics NASSCO, and he summarizes the job succinctly: “This project breaks new ground in green ship technology. It adds to our design and production capabilities and validates our reputation as one of the nation’s leading shipyards for commercial and government new-construction shipbuilding.”

As U.S. shipbuilding has undergone considerable consolidation in the past decade, NASSCO has emerged as the one that seems most able to balance commercial and navy shipbuilding loads, leveraging its partnership with a leading South Korean shipbuilding yard as well as its own investment in facilities, equipment and people.

“NASSCO has three primary segments of business: Government New Construction, Commercial New Construction, and Government Repair. These three segments provide us the ability to level load our workforce during times when one segment is down, but another segment is up, which historically is often the case. As a result, NASSCO has one of the most experienced workforces in the country – our journeyman-to-trainee ratio is better than 60:1,” said Harris. “Another key ingredient for success is that we put significant effort into leveraging world-class commercial design and construction standards from our design and procurement partner, Daewoo Ship Engineering Company (DSEC). DSEC is a subsidiary of Daewoo Shipbuilding & Marine Engineering (DSME), the second largest shipyard in the world, that focuses on international collaboration projects. DSME and DSEC stay on the cutting edge of design and shipbuilding technologies.

When completed, the 764-ft.-long, 3,100 TEU LNG-powered containerships are expected to be the largest ships of any type in the world primarily powered by liquefied natural gas (LNG). The ships will be designed by DSEC, and the design will be based on proven containership-design standards and will include DSME’s patented LNG fuel-gas system and a MAN ME-GI dual fuel slow speed engine.

“I think this contract symbolizes two significant points,” said Harris. “First, the United States can still take a leading position in the global maritime industry by smartly teaming and learning from world-class shipbuilders. In our case, DSME/DSEC represents the vehicle to help us achieve this ability. The United States will never be able to compete commercially against world shipbuilding powers primarily located in Korea, Japan, and China. However, we have demonstrated that a mutually beneficial partnership can be achieved. Sec-

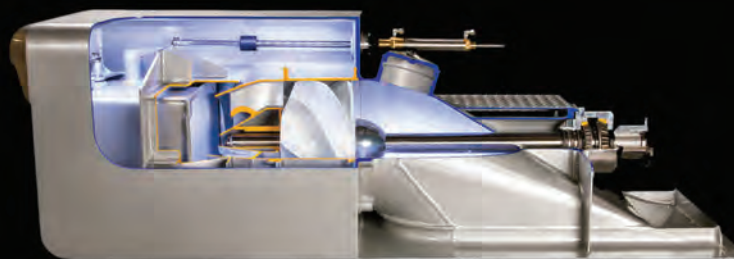


#### Illustration of the 5G70ME-GI engine.

Fresh on the heels of the TOTE order, MAN Diesel & Turbo announced another order for the MAN B&W ME-GI dual-fuel, two-stroke, gas-injection engine with Teekay LNG Partners L.P., for two LNG carriers powered by 2 × 2 5G70ME-GI engines, including an option for three further ships.

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"I think this contract symbolizes two significant points. **First, the United States can still take a leading position in the global maritime industry** by smartly teaming and learning from world-class shipbuilders ... Second, this contract represents that the Jones Act is alive and well."

**Fred Harris President,  
General Dynamics NASSCO**



"I'm a little surprised that it came as fast as it came, but **I'm not surprised that an American shipowner has decided to invest in this technology.**"

**Ole Grøne, Senior Vice President  
Low-Speed Sales and Promotions,  
MAN Diesel & Turbo**

ond, this contract represents that the Jones Act is alive and well. While the Jones Act provides a means of economic, national, and homeland security, this contract demonstrates that there is also a market for U.S. Jones Act owners, operators, and shipbuilders."

The vessels will operate on either fuel oil or gas derived from LNG, which will significantly decrease emissions while increasing fuel efficiency as compared to conventionally-powered ships. The LNG-powered containerships will also include a ballast water treatment system, making them the greenest ships of their size in the world.

"At the end of the day, these are containerships powered by a large, slow speed MAN diesel engine," said Harris. "The unique challenges presented to us are directly associated with the LNG-propulsion system. First, NASSCO, DSEC, and TOTE will have to work closely with the classification society and the USCG to ensure that the design is approved in an efficient manner. Second, NASSCO will need to determine precisely how to supply and bunker the LNG before ship delivery. Last, NASSCO must safely and successfully test and operate the fuel gas system. While these are unique challenges, all of these challenges can and will be overcome over the course of the project."

#### THE ENGINE MAKER

MAN Diesel & Turbo will supply the low-speed, dual-fuel ME-GI engine for the TOTE containership project, a high-profile win for the global power company. The vessels will each be powered by 8L70ME-GI dual-fuel gas-powered engines. Unveiled at a major event at MAN Diesel & Turbo's Copenhagen Diesel Research Center in May 2011, the ME-GI engine represents the culmination of many years' work that began in the 1990s with the company's prototype MC-GI dual-fuel engine that entered service at a power plant in Chiba, near Tokyo, Japan in 1994. While the "LNG as ship's fuel" concept has just started to pick up speed in the last few years with the emergence of ever-tightening emission regulations, Ole Grøne, MAN Diesel

& Turbo's long-tenured Senior Vice President Low-Speed Sales and Promotions, puts recent developments in perspective. "It is important to realize that we have been advocating the GI concept for decades; but frankly, the market was not ready for it," Grøne said. "In fact, the first presentation for a GI engine was at the CIMAC conference in 1983."

In step with environmental regulation changes has been the discovery and recovery of abundant amounts of cheap natural gas, particularly in North America. "Now the gas price has changed significantly," said Grøne. "In the U.S., you have found a lot of gas, and the price is low, plus you have looming sulfur level regulations."

Depending on relative price and availability, as well as environmental considerations, the ME-GI engine gives shipowners and operators the option of using either HFO or gas – predominantly natural gas but also, eventually, LPG.

MAN Diesel & Turbo sees significant opportunities arising for gas-fuelled tonnage as fuel prices rise and modern exhaust-emission limits tighten. Indeed, previous research indicates that the ME-GI engine delivers significant reductions in CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>x</sub> emissions. Furthermore, the ME-GI engine has no methane slip, and it is therefore the most environmental friendly technology available.

"Our experience with two-stroke, dual-fuel engines stretches back to the 1990s," said Grøne. "With the current developments in fuel prices and multiple customer requests for a solution, the momentum towards the development of a commercial, low-speed dual-fuel engine became unstoppable. We see this order as a natural culmination, and see the ME-GI as the beginning of a significant new era."

MAN Diesel & Turbo predicts a broad, potential market for its ME-GI engine, extending from LNG and LPG carriers to other oceangoing vessel segments such as containerships as well as ships plying a fixed trade. As such, the ME-GI engine represents a highly efficient, flexible, propulsion-plant solution.

## TOTE TODAY

On January 1, 2012, American Shipping Group underwent a dramatic transformation. The company, formerly known as ASG, became TOTE, Inc., and experienced a complete structural and cosmetic makeover. TOTE, Inc. organized its five independently managed businesses into three groups:

- Maritime,
- Logistics, and
- Ship Management

Choosing to adopt the TOTE name was an easy decision for the organization. "We felt the "America..." name was somewhat limiting with our goal of expanding our logistics services beyond the USA. Totem Ocean Trailer Express (TOTE) has a very strong brand in the trade it services. It is highly respected so it was an easy decision to utilize that strong brand for the overall parent company branding," said TOTE, Inc. President & CEO Anthony Chiarello.

Totem Ocean Trailer Express was founded in 1975 and offers twice-weekly cargo ship operations between the Port of Tacoma, Washington and the Port of Anchorage, Alaska. The company represents the foundation a much larger Seattle-based operation, Saltchuk Resources. Saltchuk was founded in 1982 with the acquisition of Totem Ocean Trailer Express from Sun Ships. Since then, Saltchuk has grown its portfolio to over 20 independent companies, organized into six operating groups, TOTE, Inc. being one of them.

# Shipbuilding by Numbers ... Easy as "1, 2, 3"

While it may come as a surprise to some that the world's first LNG-powered containership will be built in a U.S. shipyard, it should come as a surprise to none that the U.S. shipyard selected is General Dynamics NASSCO in San Diego, Calif.

In the massive consolidation of big shipbuilding prowess which has swept the U.S. industry over the past decade, NASSCO has emerged as a clear leader in ship construction and repair for both the U.S. Navy as well as commercial customers. While part of the credit lies with the shipyard's strategic alignment with leading commercial shipbuilders in South Korea, the lion's share resides within the yard itself, which has followed a steady course facility and personnel investment and improvement to help reduce costs while increasing quality.

"As you are aware, General Dynamics NASSCO is the only full-service shipbuilding and repair yard on the West Coast of the U.S.," said Fred Harris, President, NASSCO. "We aggressively pursue continuous process improvements to reduce product cost and cycle times on each of our shipbuilding and repair programs. NASSCO has taken a systematic approach to reduce the cost of producing new ships while still delivering a quality product. This approach addresses our production facilities, our design processes, and ultimately, those activities taking place at the deck plate level in the shipyard. Looking to the future, we are examining how to further improve total cost of ownership for our customer.

According to Harris, there are essentially three means the yard is working at to this end.

## 1. MODIFYING FACILITIES

The systematic approach NASSCO has taken to continuous improvement began with a complete assessment of the shipyard facility in 2005-2006. The focus of this capital investment was to provide ample lay down space for the outfitting of large ship blocks and grand blocks, prior to their erection into a graving dock or building ways. The company invested approximately \$150m in facility improvements between 2006 and 2009. The expenditures made on these capital investments came as a direct result of NASSCO's relationship with world-class Korean shipbuilders and as-

sociated benchmarking of capabilities accomplished through GAP analysis. Major renovations to NASSCO's facility during this time included the establishment of a fully-enclosed, onsite blast and paint facility, and the addition of a new intermediary stage of construction known as Stage of Construction 4 (SOC 4).

The integration of General Dynamics Marine Systems Group principles brought the thought process of moving the final State of Construction 6 (SOC 6) work to earlier stages of construction at NASSCO. In early stages of shipbuilding production, it is cheaper and easier to redesign the product so that it is more producible. Prior to bringing these producibility measures to production, all cost reduction measures resided in the engineering and planning phases at NASSCO. By bringing cost reduction measures to production, the number of man-hours required to build each ship was reduced by improving efficiencies in touch labor.

## 2. LESSONS LEARNED, LEAN SIX SIGMA, AND PROCESS IMPROVEMENT INITIATIVES

The introduction of Lean Six Sigma

(LSS) to the modernized shipbuilding processes now in place at NASSCO allowed for the modification of these processes for better efficiency. This effort looked at processes from supplier to end user, exposing hidden productivity gains in material handling and processes aimed at reducing rework. Similarly, the Process Improvement Initiative (PII) Program unleashed the capability of NASSCO's workforce by having employees focus on and speak up about what they can do to improve their jobs on a daily basis. Individuals at the deck plate level who best know the intricacies of what their tasks entail can provide the best input. Today, we now have 3,000 employees now working to reduce cost at NASSCO. Of the 10,000 employee ideas submitted to the PII Program in 2010, 75% were implemented. This year, we expect to have more than 20,000 ideas submitted, with 90% of them incorporated into our processes. With the implementation of the PII program, NASSCO has multiplied the number of people thinking about cost saving in the shipyard by tenfold. The entire enterprise is now involved in cost reductions, whereas before it was focused in Engineering and Planning.

## 3. CONSIDERING TOTAL OWNERSHIP COSTS

The three tenets of NASSCO shipbuilding are: (1) get the design process down; (2) know how you are going to build the ship (i.e. facility considerations); and (3) get the design and planning done prior to the start of construction, with all construction material available prior to start of construction.

NASSCO realized that the costs associated with producing naval and commercial vessels can be greatly improved by the efficiencies of the shipbuilder. It is estimated that 85% of the total ownership cost for a ship over its lifetime is formed at the earliest design phases. Currently, NASSCO and the U.S. Navy have established a partnership in which to openly discuss reducing costs at the acquisition phase. In our commercial shipbuilding activities, NASSCO works closely with our customers throughout each step of the design and construction phase to ensure that further cost saving considerations will be realized over the total life of the ship. NASSCO envisions that these discussions will be expanded on the TOTE contract, given that this shipbuilding program is a first-of-its-kind in the field of LNG propulsion.

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# ABC

## Belgian power maker celebrates 100-year anniversary and jumps into a higher power class with a new diesel engine

*On the occasion of its centenary, a new engine type, the DL36, has been launched to meet the future emission directives of 2016. The new range combines a small environmental footprint with the ability to deliver more than 10,000 kW. ABC's power range will thus more than double, opening up new markets and segments. At the same time ABC has experience with hybrid drives and alternative fuels, from vegetable oils through animal fats to natural and bio gas. Maritime Reporter & Engineering News takes a closer at ABC's 100-history and future.*

*By Peter Pospiech, Germany*

**In the Background:**  
Cross section of the new DL36 engine.  
(Photo: ABC)



**N**ine Belgium industrialists met on October 26, 1912 in the office of Notary Public Fobe in Ghent for reason of founding an engine manufacturing plant. The investors embodied past and future. One of them represented the company ONGH-ENA, which manufactured gas engines of an older design. He decided to stop production of these engines in favor of the new revolutionary diesel engines of Rudolf Diesel. The new company started its work under the direction of the engine manufacturer Georg Carels, who was a good friend of Rudolf Diesel, as well the two investors Marcel and Richard Drory. The name of the new company: AN-GLO BELGIAN COMPANYY.

ABC started to produce diesel engines in the power range from six to 40 hp, as well as a two-cylinder marine engine delivering 45 hp. ABC was already demonstrating three different engine types (1E, 2EM and 2D) at the World's Fair in Ghent on September 28, 1913.

Already before World War I, ABC started to export engines to Australia and Russia, and business began fairly well for the company. New developments, including the DX engine series, and bigger power output were introduced and quickly found customers in both the marine business as well as in the stationary power segment. The 1970s were tumultuous times for the company, but ultimately it survived. It was then that one of the most important markets, the former Belgian Congo, was lost because of their war of independence and the new nation Zaire did not have the finances for new engine purchases. But at the same time ABC developed a complete new engine: the DZC-series, with the goal of selling 100 engines per year.

By the end of the 1970s, the collapse of the enterprise was imminent, as the company needed fresh investment. While a number of qualified investors existed, the infusion of capital came with the demand that the existing management leave. While there was substantial resistance, eventually the old management team was replaced with new management which came out of the Belgian fabricant Pauwels, the building contractor Batibo and the Belgian Shipbuilding Association.

Simultaneously, they changed the company name into Anglo Belgian Corporation, better known simply as ABC. Soon after this also a pro-government investment company, GIMV, participated and considerably increased the basic capital. The first experiences with the new DZC engine was not successful, requiring a new round of investment.

But a capital increase was rejected by investors, and they transferred their shares to the Luxembourger Family Holding OGEPAR, which to this day still own 90% of the shares, with the remaining 10% belong to ABC. Along with the new fresh capital Ogepar again exchanged the entire management, and today management is in the hands of the General Manager Tim Berckmoes.

The existing engine series have been reworked and further developed to dual-fuel engines, and today's engine portfolio consist of the DX and DZ-series with a power band of 138 to 4,000 kW. The applications are separated into three segments: main drives for inland waterway ships, seagoing ships, tugboats as well as fishery boats. Onboard gensets are available in the power range from 128 to 3,562 kW. In addition to the marine business, on-shore stationary gensets and locomotive business rounds out the company's main markets. It's worthy to note that, for the time being, the biggest and strongest Diesel-Hydraulic-Locomotive in series production, the VOITH Maxima 40CC, is equipped with an ABC engine of type



Photos: PPM News Service Pospiech Maritim

**The fathers of the new DL-series** (l to r): Lieven Vervaeke (Head of Engineering), Tim Berckmoes (General Manager ABC), Jean-Pierre Props (Area Sales Manager), Jean-Christoph Van Acker (Sales Manager), Diederik De Lentdecker (Financial Director).

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**Left**  
The newly developed DL-series comes as a 6 and 8-cylinder in-line version and a 12 and 16-cylinder v-type configuration delivering 650 kW per cylinder.

**Right**  
“This is a completely new engine designed from the bottom up,” said Tim Berckmoe, GM, ABC.



(Photos: PPM News Service Pospiech Maritim)

16 DZC-1000-176 in V-configuration, with an output of 3,600 kW at 1,000 rpm.

**KEEPING IT SIMPLE**

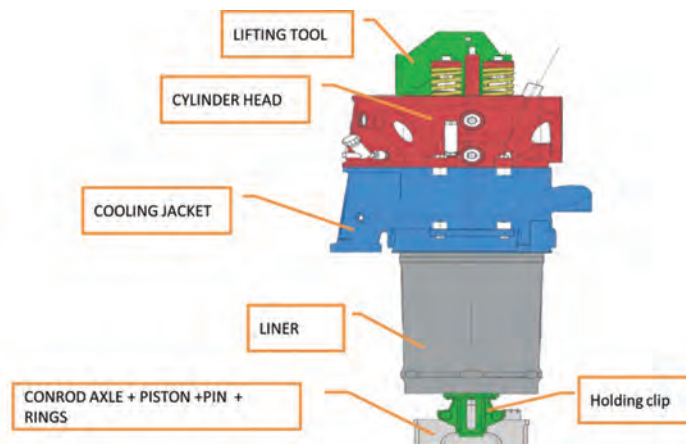
ABC engines were developed following the KIS (Keep It Simple) principle: a mechanical approach with a minimum number of components enabling quick and simple maintenance.

Thus, ABC forgoes electronic components on the DX and DZ-series, eschewing such items as electronic governors or monitoring systems. All types feature mechanical instruments, e.g. Woodward Governor and analog measuring devices. ABC’s own development department concentrates on: improved fuel consumption, oil consumption reduction, power increase, use of bio fuels and the fulfillment of the required international exhaust legislations for maritime applications. All engines hold certificates of the most important international classification societies, and genuine ABC parts and certified factory service is available in 59 countries with 76 service stations keep the engines running.

With the current DX and DZ range, ABC is offering solutions in the power range of 150-4,000 kW aimed primarily at the marine coastal, fishing, dredging, patrol-ships, tugboats and inland transportation vessels market. The engines are used in combination with alternators to generate electricity in power plants up to 30 MW and in powering locomotives with the DZ-engines In-line or V-configuration.

**MEET THE NEW DL-SERIES**

“This is a completely new engine designed from the bottom up,” said Tim



**A special feature is the modular cylinder design unit consisting out of: cylinder head with valves, cooling jacket, liner, conrod axle, piston, pin and rings.**

(Photo: ABC)

Berckmoe, GM, ABC, during a special press conference.

The new DL36 range expands ABC’s market to larger vessels such as ferries, coasters, offshore vessels, navy applications, dredgers, and large tugboats, vessels that will be particularly affected by new edicts in designated emission control areas (ECAs). The design enables shipowners to satisfy future, tougher emissions legislations without having to fit exhaust after-treatment plants. With the 6 and 8-cylinder In-Line DL36 (3,900 / 5,200 kW) and the soon to follow V-versions (up to 10,400 kW) the company will be able to supply all major shipyards with solutions for any type or size vessel. The DL36 range will also allow the company to be competitive in the 20-80 MW power plant range.

With a bore x stroke of 365 x 420 mm (displacement of 43.9 l per cylinder), the DL36 will be set to deliver 650 kW/cylinder at 750 rpm with a bmep of only 24 bar, ensuring that the traditional ABC reliability and robustness is maintained. This 650 kW/cylinder makes the new DL-engine the highest power output in

its segment.

Introducing innovative technology such as Miller combustion process (earlier closure of the inlet valves causes expansion of the cylinder charge and a lower combustion temperature, which has beneficial effect on NOx emission level), EGR, two-stage turbo-charging of company KBB and a radically optimized common rail system (rail pressure of up to 2.000 bar), the engine’s emissions are designed to meet the IMO/Tier III requirements without the need for any additional cost intensive exhaust-gas after-treatment systems, e.g. catalysts, while maintaining competitive fuel and oil consumption. The company anticipates a specific fuel consumption rate of 180 g/kWh at 100% load. The high pressure common-rail and electronic control system has been developed in cooperation with company Heinzmann.

For those applications not requiring IMO/Tier III, a full mechanical version will remain available. In addition, the engine is designed to offer a high degree of fuel flexibility: it operates reliably on all kinds of marine fuels such as HFO,

MDO, MGO, dual and bio-fuels. All these factors make the DL-series ideal for ships needing a clean yet efficient form of propulsion. The 6- and 8-cylinder in-line engines will focus mainly on the marine market while the V-engines (12 and 16 cylinders) will penetrate also the large generator set application to be found in thermal power plants as the 16DV36 will produce over 10 MW.

With the design and development of this new engine family, ABC confirms the position as a major player on the medium speed engine market.

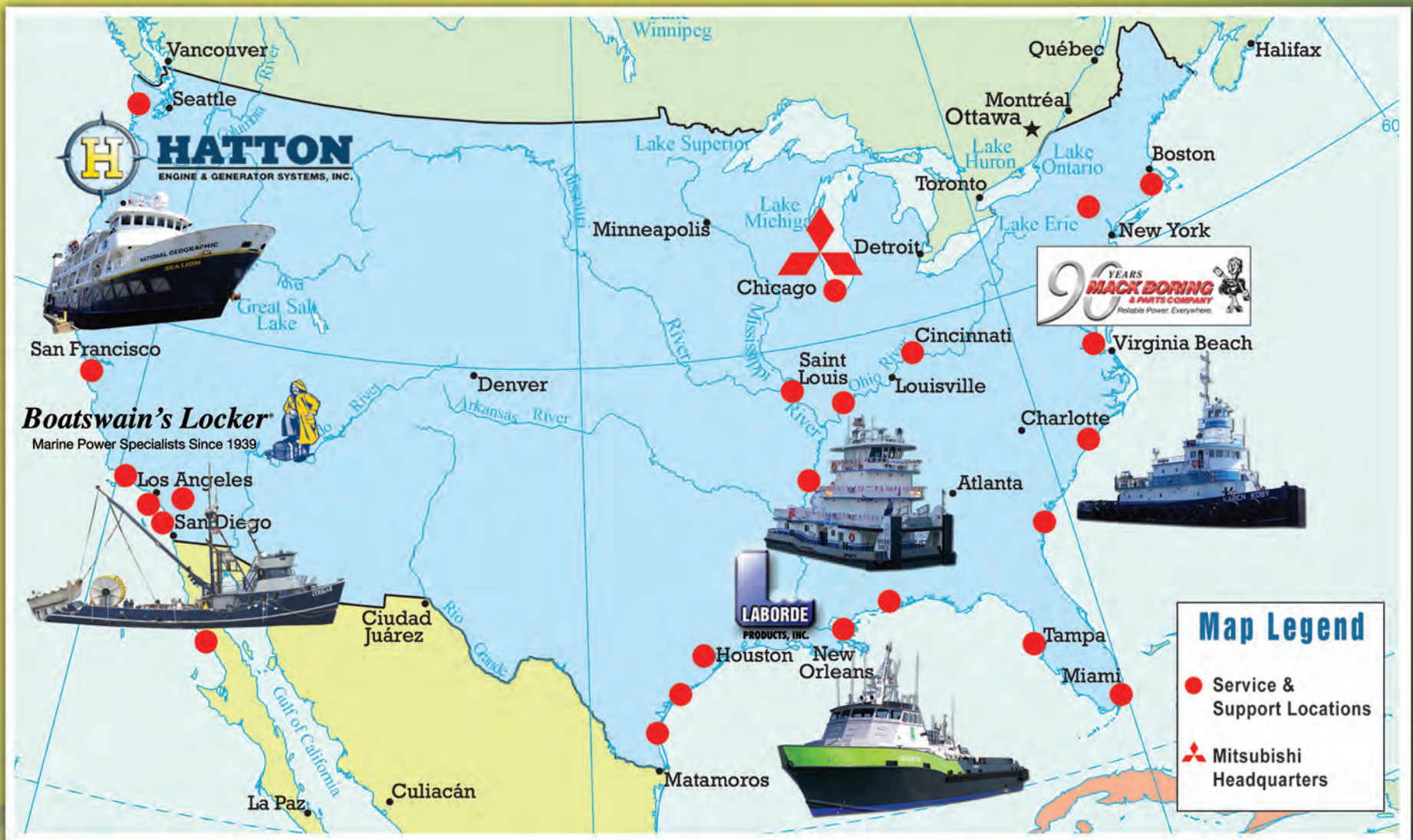
**COMPONENTS AND SYSTEMS**

The one-piece crankcase is made of nodular cast iron. Sidewalls with large crankcase doors allow easier access into the engine. The hanging bearing block are hydraulically and also transverse uptight. Thus, a very high torsional stiffness is ensured.

A special feature is the modular cylinder design unit, consisting of: cylinder head with four valves (two inlet and two outlet), cooling jacket, liner, conrod axle, piston, pin and rings. The complete unit is pre-assembled on a workbench, then mounted into the crankcase. Thus, the repair or assembly time can be substantially reduced. This is particularly advantageous in case of a necessary repair. According to ABC the 6-cylinder engine will be available for shipment in the second half of 2013 followed by the 8-cylinder in 2014. Further development steps are: development of the 12 and 16DV36 engine range and also the existing DZ range will be developed to fulfill IMO III.

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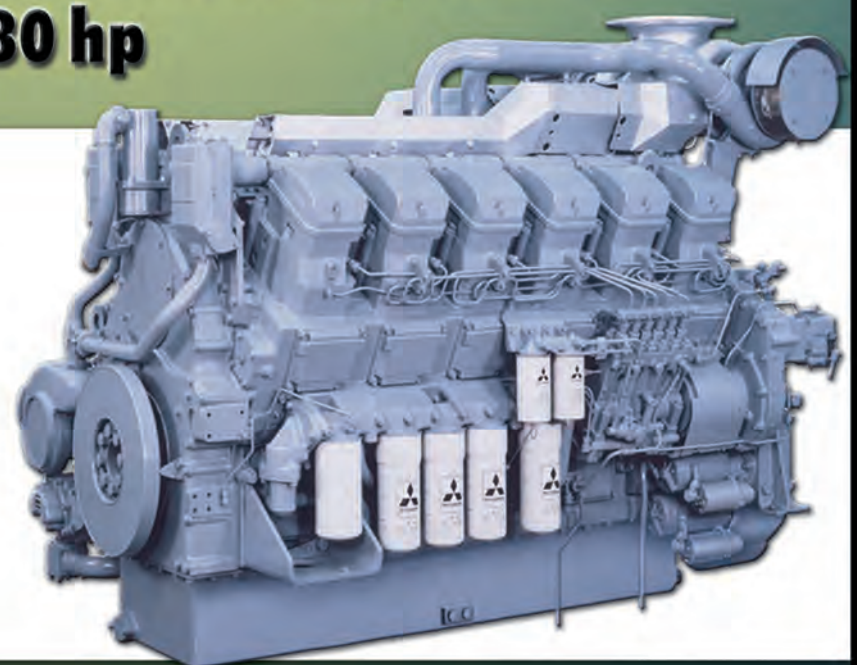
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# 6S50MC Main Engine Overhaul

By Jesper Peterson, Senior Service Engineer, Transmarine Propulsion Systems Inc.

The following is a look into the overhaul of a MAN B&W 6S50MC main engine onboard a tanker berthed in the Bahamas. The overhaul was performed by Transmarine Propulsion Systems, (TMPS) during a docking, the first major overhaul of the vessel's engine which had 22,140 running hours. The objective of the overhaul was to make sure that all the cylinder units, once inspected and overhauled, would perform another trouble free period of ~20,000 running hours. Engine maintenance was conducted on the basis of two different methods of approach, Time Between Overhaul (TBO) and Condition Based Overhaul (CBO). Many owners and operators use TMPS to conduct engine services and component overhaul because TMPS works closely with customers to prepare service overhauls according to the actual engine condition, in many cases helping owners save money. TMPS inspects the condition of the components and engine in question extremely close. Their engi-

neers talk with the Chief Engineer and the vessel's owner to understand their needs, how their engines are operated and then makes recommendations on the TBO/CBO work to be done, often at a more beneficial cost than the OEM. This is all done without jeopardizing the engine performance and reliability, and it is a solution that is cost conscious and prepares the engine for future reliable operation.

The service work on this job was concentrated around Condition Based Overhaul (CBO) inspection/work of the combustion chamber related parts, as well

as the major bearings and around Time Between Overhaul (TBO) inspection/work for the mechanical control gear, stay-bolts and the holding down bolts.

The CBO work for each cylinder unit consisted of:

**1. Inspection and overhaul of the cylinder covers** including the fuel- & starting valves located in the covers. According to the engine crew's records, the exhaust valves were in a good condition. Thus, only one valve was inspected and found to be in good order, i.e. confirming the information from the crew. The cylinder covers cooling spaces were also inspected, cleaned and fitted back with new O-rings.

**2. Pulling of the pistons** for inspection, cleaning, calibration and overhaul based on the actual findings. The wear rates of all of the piston crowns but one, turned out to be approximately halfway towards the maximum wear limits. The one piston crown which had not yet met the maximum limits, but based on the actual wear would not be able to go back in the engine and perform another ~ 20,000 running hours without going beyond limits, was replaced. All pistons

were assembled with new piston rings, O-rings and overhauled stuffing boxes.

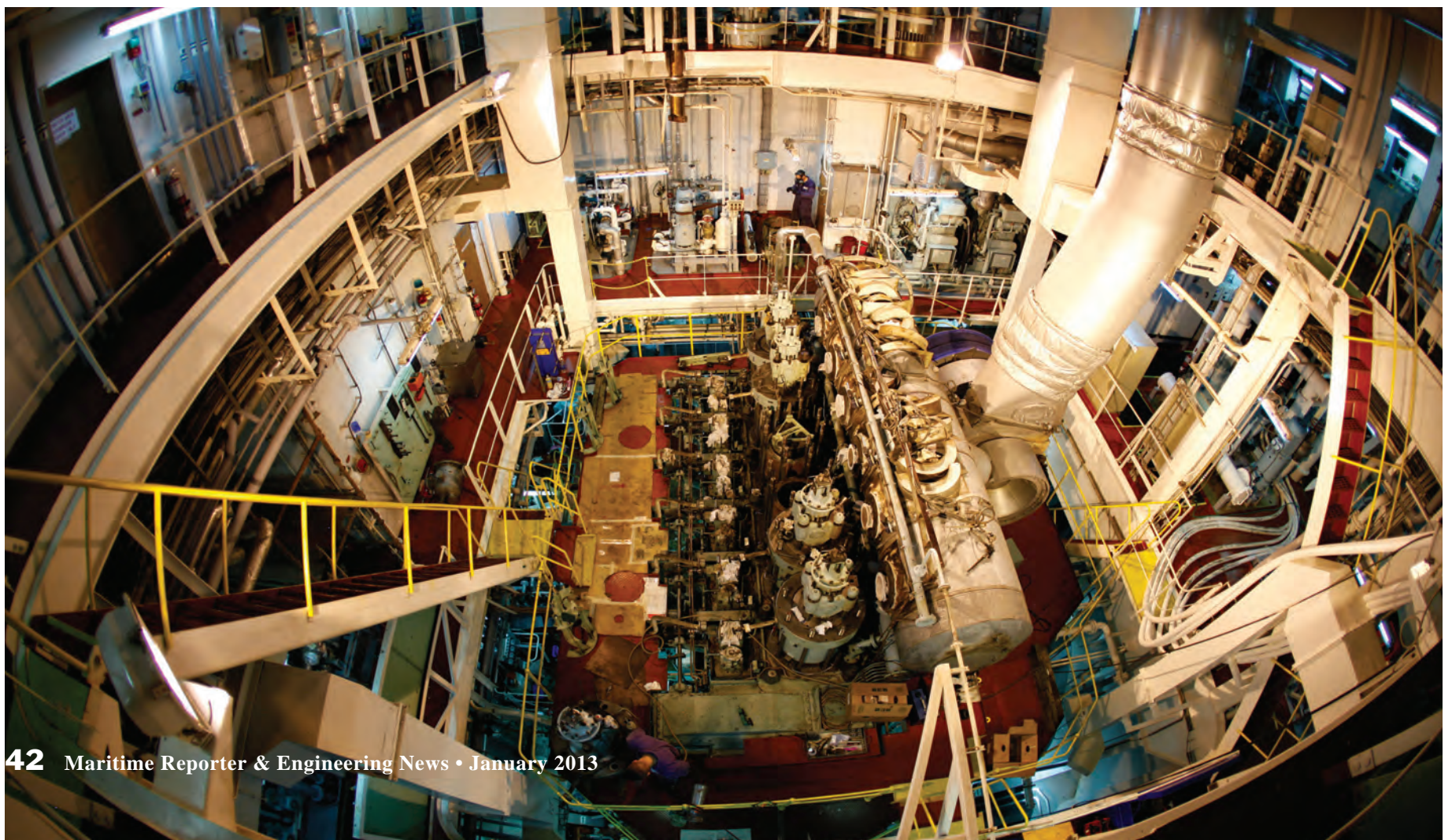
**3. The cylinder liners were cleaned,** calibrated and honed in order to restore the liners running surfaces and remove ovality. As small-bore 2-stroke engines are more sensitive to ovality than their large-bore sister engines, this ensured that the piston rings perform better and this will lead to a better overall cylinder condition, compared to if honing had not been done. The cylinder liners cooling spaces were also inspected, cleaned and fitted back with new o-rings.

**4. The fuel pumps were dismantled** and replaced with overhauled pumps having new plunger/barrel units fitted. A worn plunger/barrel may be able to start on heavy fuel oil, but not always on the thinner diesel oil. In today's world, were engines more and more have to change over to diesel oil during port calls, it is important to secure that starts can always take place.

**5. Inspection of a representative amount of engine bearings** was used as base for class approval of the remaining bearings without opening. The reason to avoid opening up bearings is, that



Right: Ly Nguyen, inspection of piston/rod assembly



statistics show most bearing damages come from human errors in connection with opening and closing for inspections. If certain parameters, such as bearing clearances and oil flow, are found to be normal then opening the bearings can be omitted.

The TBO work for the engine included.

1. Annual conditions check of the main chains and retightening.

2. Annual conditions check and tightening of stay-bolts, holding down bolts and side and end chocks.

3. Annual conditions check of the starting air distributor.

4. Annual conditions check of the crankcase relief valves.

5. Overhaul of the maneuvering system and the reversing and VIT-system for the fuel pumps. It is of importance to do such work at regular intervals of two years in order to ensure the ability to maneuver the engine safe at any time.

To ensure the quality of the service work, Transmarine Propulsion Systems Inc. used its own engineers, which all have more than 25+ years of experience in diesel engine service. Combining this experience with the customer's fleet operation data and the experience available from the engine builder, provides TMPS the ability to structure a reliable and flexible maintenance program.

Using only OEM spare parts, which are developed and tested to withstand the prolonged running hours between overhauls, makes the combination of the CBO and TBO methods the optimum way of securing cost efficient reliability in the engine performance. The result is a dependable and high quality service, which will allow the engine to perform with reliability and at the same time save on the cost of the spare parts.

When engines are overhauled it is important to pay attention to the condition of the components being overhauled, particularly to those involved in the combustion process. Proper documentation of the overhauled components, in way of pictures and service schemes should be prepared of the "as found" condition, together with the proper description of parts replaced and measurements of parts re-used. When the engine is put back into service a complete engine performance analysis should be commenced in order to ensure that all operating parameters are within acceptable limits specified by the engine manufacturer.

Bear in mind that while a proper sea-trial with all the engine performance recorded should always be done to form a basis of the condition after the overhaul is completed. Transmarine also can recommend taking a set of readings before the overhaul as to compare the before

and after results. In this particular overhaul, this service was not carried out after this docking. The reason is that most of the time the vessel will be in ballast condition, and thus it is often not possible to load the engine proper beyond 50%. Sometimes it is also a matter of time available due to commercial commitments. It can therefore alternatively be suggested that the crew makes a complete set of service readings at different engine loads (50%, 75%, 85% and as close to 100%

as possible) and forward these to TMPS for evaluation. Performance analyses are also an invaluable tool for the workboat or medium speed diesel engine operator. By peering into each individual cylinders combustion data can isolate the less than desirable performance characteristics of that cylinder or cylinders. In some cases the analyses can predict the remaining service life of the engine pre-overhaul or prolong the overhaul period and extend the running hours.

**Jesper Peterson** started his career as an engineer apprentice in Denmark in 1977, Mr. Petersen obtained a BS in Marine Engineering and completed his military service. He then went on to serve in a series of leadership roles for one of the world's largest engine manufacturers, MAN Diesel & Turbo, from 1984-2011.

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For more information: <http://www.sname.org/Go.aspx?NavigationKey=f59f7a46-106b-4757-aed-27c75183bf39>

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In a sign of further strengthening of the Asian cruise industry, Mitsubishi Heavy Industries, Ltd. (MHI) is investing in its ability to repair and convert these unique, high value ships. Along with swift expansion of the cruise market in Asia it has become increasingly important for cruise companies, both Japanese and foreign, to differentiate their services and enhance their responsiveness to customer needs. Against this backdrop, MHI has received orders from Mitsui O.S.K. Passenger Line, Ltd. (MOPAS) and Nippon Charter Cruise, Ltd. (NCC) for repair and conversion work on the Nippon Maru and Fuji Maru, respectively. The work will be performed at MHI's Yokohama Dockyard & Machinery Works in Kanagawa Prefecture between mid-December and the end of January 2013.

The repair and conversion work on the two ships will be carried out in line with the medium-to long-range maintenance plans of MOPAS and

NCC, respectively, to ramp up ship safety and passenger comfort. Earlier, the Yokohama Dockyard undertook a major conversion of the Nippon Maru (pictured) in 2010. Under the new orders, work on the Fuji Maru will take place from December 14 through 26 and on the Nippon Maru from January 15 through 27. In the latter instance, besides periodical mandated inspection, work will also be performed to boost energy savings and passenger service, including installation of LED lighting and upgrading of galley facilities.

Both ships were built at MHI's Kobe Shipyard & Machinery Works. The Fuji Maru, which went into service in 1989, was the first cruise ship manufactured in Japan in the postwar era. The 23,235 gross tonnage (GT), 167m long and 24m wide ship has 163 cabins. The Nippon Maru, the third ship so named, went into operation in 1990; it has 202 cabins and features a 166.65m long, 24m wide hull with 22,472 GT.

## Damen Acquires Arno Dunkerque

Damen Shipyards Group bought French shiprepair yard Arno Dunkerque, which is the only operator for ship repair and conversion in Dunkirk, the third largest French port. Arno Dunkerque will continue its ship repair and conversion services, and its personnel and management will remain in place. “Arno brings added value to Damen as it is a modern shipyard with about 160 highly skilled workers,” said René Berkvens, CEO Damen Shipyards. “The presence of a significant industrial environment, consisting of nearby specialist subcontractors, is another reason.” According to Damen Shipyards, this acquisition fits perfectly in its long-term strategy of expanding its repair and conversion services. It

is similar to the acquisition of Damen Shiprepair Brest (formerly Sobrena), which equally fitted in this strategy and, like Arno, not only included the yard, but also the entire staff. Arno Dunkerque is a long-term investment, integrally tied-in with Damen's other repair activities.

“We are extremely happy that a deal was achieved with Damen Shipyards Group, a company providing a worldwide network and a strong expertise in this industry, which will reinforce the position of ship repair activities in the Port of Dunkirk and will give it international coverage,” said Christine Cabau Woehrel, CEO of Dunkirk Port Authority.

[www.damen.com](http://www.damen.com)



# Vigor Completes 300-Ton Bow Replacement

In less than three months Vigor Marine replaced the bow of Olympic Spirit, an 80,000 BBL double hull petroleum barge owned by Harley Marine subsidiary, Olympic Tug & Barge, Inc. "This was a unique project that you just can't do in any shipyard," said Harley Franco, Founder & CEO of Harley Marine Services. "So we went to Vigor, who we thought would be the best facility and the best place on the West Coast to meet that challenge. The size of this bow, how to stage the job effectively and get us back out to sea as quickly as possible were major considerations."

The bow replacement of Olympic Spirit was made necessary by mistakes that were made during the original construction of the barge. Harley worked closely with naval architect, Elliott Bay Design Group, on the most effective strategy to bring Olympic Spirit up to Harley's standards, and it was mutually agreed that a total bow replacement was the best solution.

The 300-ton bow module was pre-built in a section of Vigor's 150,000 sq. ft. of fabrication bays in its Swan Island

shipyard in Portland, Oregon allowing the vessel to continue operations. As the module neared completion, the Olympic Spirit was transported to the Portland yard and lifted by one of Vigor's dry-

docks and positioned at the end of a 800 ft. long build way.

There the existing bow was removed and the new module was attached. The design work provided by Harley and El-

liott Bay allowed Vigor to retain the forward collision bulkhead, speeding and simplifying installation.

[www.VigorIndustrial.com](http://www.VigorIndustrial.com)



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### Obituary: Jack Finnegan

**Jack Finnegan** of Eagleville, Pa., a well-known industry figure, passed away suddenly on October 19, 2012. He was 65 years old. Jack was survived by his wife Diane Finnegan, with whom he shared 47 years. Born in Brooklyn, NY, Jack was the first-born son of John Finnegan and Lorraine Pivovar Finnegan. Jack was a proud graduate of Kings Point Merchant Marine Academy (class of '69) in Kings Point, NY. His love of the sea and merchant marines, built the foundation for a life-long career in association with the maritime industry.

### Austal Appoints Perciavalle President

Austal USA promoted **Craig Perciavalle** to President, Austal USA. Perciavalle recently served as Senior Vice President of Operations. He joined Austal USA in 2007, serving in a number of senior management positions while overseeing Austal's transition from a small, conventional commercial shipyard to an efficient, modular manufacturer of the Navy's Littoral Combat Ship and Joint High Speed Vessel. Austal USA Interim President and Chief Financial Officer, Brian Leathers, was promoted to Senior Vice President and CFO.

### Evensen Named CMA 2013 Commodore

**Peter Evensen**, President and CEO of Teekay Corp., was named the Connecticut Maritime Association (CMA) Commodore for the year 2013. Effective April 1, 2011, Evensen became a Teekay director and assumed the position of President and CEO. He joined Teekay in 2003 as Senior Vice President, Treasurer and CFO, and was appointed EVP and CFO in 2004, EVP and Chief Strategy Officer in 2006. He sits on the Board of Directors for Teekay Corporation, Teekay LNG Partners, Teekay Offshore Partners and Teekay Tankers Ltd.

### Volvo Penta Americas Strengthens Leadership Team

Volvo Penta announced three appointments to the newly formed Volvo Penta Region Americas organizational structure. **Julia Zelenock** has been named director of marketing, responsible for managing and implementing a strategic marketing plan that builds, promotes and communicates Volvo Penta's brand, products and services in the marine and industrial market sectors. **Marcelo Puscar** has been appointed director of marine sales for Latin America with responsibility for sales of marine gas and diesel engines. **Elpidio Luiz de Narde** has been promoted to director of aftermarket sales and customer support for Latin America, responsible for all aspects of applications, technical support, warranty, parts and accessories in the marine and industrial sectors.

### Brand to Rejoin TITAN Salvage

**Captain Dennis Brand** will rejoin TITAN Salvage, Crowley Maritime Corporation's Pompano, Fla.-based, marine salvage and wreck removal company, as director of global commercial operations, reporting to company Managing Director Rich Habib on January 2, 2013.

### Management Changes at Crowley

Crowley Maritime Corporation last month announced changes to its senior leadership team within the company's shipping and logistics business lines and the consolidation of its commercial marketing, sales, customer care and pricing activities under single leadership. **Frank Larkin** has been promoted to SVP and GM of logistics. **Steve Collar**, who is currently managing logistics, has been appointed SVP and GM of Latin America services. **John Hourihan**, who is currently managing Latin America services, has been appointed SVP and GM of Puerto Rico and Caribbean.

### XL Group's Marine Unit Expands

XL Group plc's North American Marine business expands its blue water hull risk management capabilities in New York with the addition of **Siobhan Coen** and **Jeff Loechner** as senior underwriters and **Eileen Fellin** as a senior claims consultant.

### EBDG Adds Staff

Elliott Bay Design Group (EBDG) said that **Chris Biernat** joined its New Orleans office as a Naval Architect IV. Biernat is a recent graduate of the University of New Orleans and holds a Bachelor of Science in Naval Architecture and Marine Engineering, and is currently pursuing his Master's degree at UNO in Naval Architecture and Marine Engineering. EBDG also announces that two employees achieved Professional Engineer status. Naval Architect, **Matt Wichgers** earned his PE in Mechanical Engineering (WA). **Taylor Herinckx**, who already holds a PE in Naval Architecture, earned a PE in Electrical Engineering (WA).

### COSCO Shipping Establishes JV

COSCO Shipping Company, Ltd. and NMA Maritime & Offshore Contractors B.V. have decided to further solidify their 25-year relationship by forming two Joint Ventures, separately in the Netherlands and in the U.S. COSCO Shipping Company has a fleet of both semi-submersible and conventional heavy-lift vessels, and has a pool of six newly designed, semi-submersible vessels of 20,000, 30,000, 40,000 and 50,000 DWT capacities. In addition, 8 new vessels with 700 tons lifting capacities will be delivered next year.

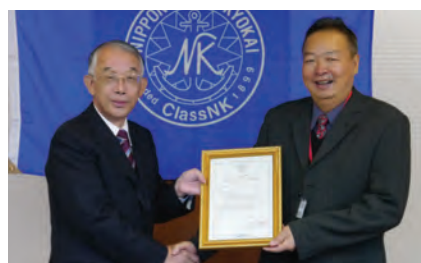




Hourihan



Biernat



Matsui, ClassNK & Liang, Zhongxin.



Waldron



### ClassNK Issues World First

ClassNK issued the world's first Statement of Compliance (SOC) for a ship recycling facility to Jiangmen Zhongxin Shipbreaking & Steel Co., Ltd. The Statement of Compliance issued by ClassNK certifies that the facility and its recycling procedures are fully in compliance with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (Hong Kong Convention). This marks the first time that a ship recycling yard has achieved this certification.

### Lürssen Group Buys the Peene Shipyard

In a meeting of the creditor committee, and acting on the suggestion of the insolvency administrator, Berthold Brinkmann, P+S WERFTEN decided in favor of the Lürssen Group (Bremen) as the buyer of the Peene shipyard in Wolgast. This decision is subject to approval by the creditors holding liens on the property. The purchase agreement has already been concluded. As of May 1, 2013, the Lürssen Group will acquire the compact shipyard with its repair and new construction area. The purchase is also subject to approval by the Federal Cartel Office. The purchase price is less than \$26m.

### Teekay LNG: Two LNG Newbuildings

Teekay LNG Partners L.P. entered into an agreement with Daewoo Shipbuilding & Marine Engineering CO., LTD., (DSME) of South Korea for the construction of two 173,400 cu. m. Liquefied Natural Gas (LNG) carrier newbuildings, with options to order up to three additional vessels. The partnership intends to secure long-term contract employment for both vessels prior to their delivery in the first half of 2016. The newbuildings will be constructed with M-type, Electronically Controlled, Gas Injection (MEGI) twin engines, which are expected to be significantly more fuel-efficient and have lower emission levels than other engines currently being utilized in LNG shipping.

### Blank Rome LLP Named "Best Law Firm"

U.S. News and World report released the results for 2013 "Best Law Firm," naming Blank Rome LLP as the top firm for Admiralty and Maritime Law. "Our success in serving the shipping industry includes a unique combination of regulatory, legislative, defense, and commercial advice and assistance," said shipping practice head Jon Waldron.

### Imtech Becomes Supplier of Infinity Solution

Imtech Marine (Rotterdam) and satcom specialist Navarino (Piraeus) announced a partnership. Imtech Marine has become global supplier of Infinity, an advanced maritime bandwidth management and

optimization solution that can be used onboard ships equipped with IP-based satellite terminals. Imtech Marine chose Infinity for its ability to support Imtech Marine's Global VSAT network and various connectivity solutions. Imtech Marine offices that will be offering Infinity include Netherlands, Germany, Belgium, China, Singapore and USA.

### Keppel Expands Foothold in Mexican Offshore Market

Keppel FELS won a contract from PEMEX Exploracion y Produccion to build two KFELS B Class jack-up rigs worth \$420m. Scheduled for delivery in 1Q 2015, the high specification rigs will be the 19th and 20th KFELS B Class rigs on order at Keppel, with 36 already delivered in the past decade. When completed, the two rigs will join a number of KFELS B Class jack-up rigs built by Keppel for Mexican customers.

### New ECDIS Course: Training the Trainer

Kongsberg Maritime launched a new ECDIS Instructor Training course designed to train Captains and senior personnel, so they can train other officers and crew members in familiarization of KONGSBERG ECDIS on board vessels. Offered in Norway and Singapore, the course is in accordance with the International Convention on STCW, and is a unique approach to type-specific ECDIS training and has been developed as a response to new IMO regulations and demand for certification in the use of ECDIS, resulting in an increasing requirement for ECDIS training.

### Survitec Group Acquires Servimar Sur

Survitec Group Limited completed its purchase of Servimar Sur SL, a marine servicing business. This follows the recent acquisition of Abteilung Seeretung, part of the larger Gummi Hasenkrug GmbH company in Bremerhaven Germany.

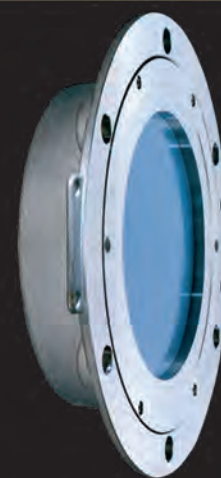
### SpecTec Launches Online Product Support Services

SpecTec launched a new online product support services for AMOS users, starting in January 2013. The new services are aimed to increase the knowledge and to optimize the software usage for those who already work with AMOS and the related solutions. AMOS users could interface with SpecTec Product Managers, Software architects and Business Analysts, and thus have the opportunity to converse with them about any issues and concerns relating to the software usage. The services will be provided by SpecTec Managers through Webinars and Web conferences; SpecTec clients may subscribe themselves from time to time, through an online subscription form available on:

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## Island Offshore Opts for Ulstein SX121

Ulstein entered into a contract with Island Offshore and its partner Edison Chouest Offshore (ECO) for delivery of a multifunctional offshore vessel based on Ulstein's SX121 design, with an option for an additional vessel. The vessel is prepared and tailored for the well intervention, IMR and SURF segments, and meets the latest requirements for both well intervention and offshore construction work. This newbuild is scheduled for delivery in May 2014.

The ship will be based on the SX121 design, a platform on which Ulstein has previously built five ships. It will be customized to meet Island Offshore's functional requirements and wishes.

The 130 x 25 m ship will be outfitted to dynamic positioning (DP3) standards, and will be equipped to perform subsea operations at depths down to 3000m. The vessel can be rigged for well intervention and is prepared for the laying of flexible pipes and cables on the seabed through a VLS tower (vertical lay sys-

tem). It also has room for a rotating carousel below deck with a capacity to load 2500 tons.

An active heave compensated (AHC) offshore crane with a 250-ton capacity at 14m outreach and a below-deck winch will be installed on board. The vessel will carry two deep-sea work ROVs (remotely operated vehicle), one to be launched from the starboard side and one through the vessel's moon pool.

The ship is designed with a large cargo deck for transport of equipment for

a multitude of operations, and it will be equipped with diesel electric propulsion and three azimuth main thrusters powered by six large generator sets. The vessel has a crew capacity of 130.

Island Offshore currently has four vessels delivered by ULSTEIN in their fleet: The well stimulation vessel Island Patriot, the subsea construction vessel Island Pioneer, and the two subsea construction and intervention vessels of SX121 design, Island Constructor and Island Intervention.

## Vripack Designs Heavy Duty Ribbon Offshore

Naval architect Vripack has designed a 43 ft. supply vessel together with Ribbon Yachts in the Netherlands. And by looking at the proportions between line and surface, one can easily see that the design of the agile and modern Ribbon 45 SC is the foundation for the sturdy Ribbon Offshore.

Vripack's challenge was to fit all their practical knowledge into this design without having to make any concessions. To accomplish this task, close collaboration with Ribbon Yachts tool place.

The Ribbon Offshore is designed to be a compact fast supply vessel. The design is suitable for multiple purposes such as transporting crew and small supplies to and from container-ships in anchor zones, offshore wind farms and offshore multi tasking. Besides that, it can also be used as a pilot-boat, survey vessel, coast guard or salvage and rescue vessel.

The strong vacuum injected composite hull

is designed to give the Ribbon Offshore a high-tech and stiff structure, suitable for heavy seas. Apart from that this 43 footer is carried out with a solid workboat construction and a sub frame in order to protect her crew. The superstructure is provided with a widened hip and a huge amount of glass, creating a spacious feeling and the dominating and powerful look she needs for the job.

The Ribbon Offshore is equipped with a flat 360 degree deck including anti slip and live rail allowing anyone to get on and off board safely at any desired position.

The Ribbon Offshore uses the same underwater body as the Ribbon 45 SC, which has very suitable sea going characteristics and makes this bruiser fast, easy manoeuvrable and extremely comfortable at sea.

Like the Ribbon 45 SC the Ribbon Offshore has a fully equipped helm and navigation cockpit which is located in the middle of the yacht,

leaving enough space for 10 passengers besides the captain and the navigator. In order to maximize comfort, the complete steering and passenger area is placed on shock absorbers in order to minimize the impact of waves.

Inside, the Ribbon Offshore is provided with a large storage area in the front. On the lower deck the Ribbon Offshore comes with a private toilet, large lockers and a serviceable seating area.

The Ribbon Offshore is water jet powered by two Cummins 600 HP engines, which are controlled by the vector stick control system providing easy docking and maneuverability with very tight turning circles and super fine control in narrow quarters.

The Ribbon Offshore is fitted for the job and is considered an ultimate work boat that ticks like a Swiss watch while being work man proof.

Email: [info@ribbonyachts.nl](mailto:info@ribbonyachts.nl)



## PSV Launched



The largest ship ever built by The Craig Group, an S class Platform Supply Vessel (PSV), launched at Balenciaga Shipyard in Northern Spain. The Craig Group has committed \$81m to the construction of the vessel, The Grampian Sovereign, and its sister ship, The Grampian Sceptre. Managed by The Craig Group division North Star Shipping, the two IMT-982 designed vessels will also create 50 new jobs for the Aberdeen-based company.

Going on long term charter in 2013 in the North Sea, the vessel represents a continued drive by the group to operate the largest and most modern British wholly owned fleet engaged in the UK offshore industry, supporting 50 installations in the North Sea. The vessels are 83m long with an 18m beam and have diesel electric propulsion systems offering a greater fuel economy and efficiency. They have been specifically designed to meet the requirements of operators in the North Sea. North Star managing director, Callum Bruce, said: "We are constantly looking at ways of modernizing

our fleet through new builds using the most up to date vessel technology and designs as we aim to meet our customers' needs in terms of safety, quality and efficiency."

This investment brings the total new-build programme by Craig Group since 2003 to over \$375m, representing 22 new vessels built.

## ESG Launches Harvey Deep-Sea

Eastern Shipbuilding Group launched Harvey Deep-Sea, the fourth of its Tiger Shark Class Offshore Support Vessels being constructed for Harvey Gulf International Marine, LLC of New Orleans, LA. Harvey Deep-Sea was launched on December 12, 2012, after completing all regulatory hull exams.

Harvey Deep-Sea is Eastern's second Construction Vessel (LCV) for Harvey Gulf, and the yard has built 10 vessels for Harvey Gulf International since 2002.

ABS class includes the ABS DPS-2 notation and FIFI 2. It is AC Diesel-Electric powered with twin Schottel Z-drives and it measures 302 x 64 x 24.5 ft.. This Multi-Purpose Construction Vessel (LCV), the Harvey Deep-Sea, will be equipped with an active heave-compensated, National Oilwell Varco 165-ton knuckle boom crane capable of lifting/setting 100 tons at depths up to 10,000 ft. The Harvey Deep-Sea is scheduled for final outfitting and delivery in the summer of 2013.



## Wärtsilä OSV Design for China's COSL

Wärtsilä signed a deal last month with China Oilfield Services Ltd (COSL) to supply the designs for a total of six new ships: two Platform Supply Vessels (PSVs) and four Anchor Handling Tug Supply (AHTS) vessels that will initially provide support operations in the South China Sea and Bohai Bay. The PSVs are based on Wärtsilä Ship Design's VS 485 PSV MKIII design; designed to offer a high energy yet environmentally efficient vessel courtesy of an optimized hull design for greater efficiency, with corresponding reduced emission to air. The AHTS vessels are to be constructed according to the Wärtsilä Ship Design VS 4612 AHTS design. The primary function of AHTS vessels is to set anchors for drilling rigs, and tow mobile drilling rigs from one location to another. Since the sea and weather conditions in which these ships work is often extremely challenging, a design that offers reliability and high levels of efficiency and performance is called for.

### VS 485 PSV MKIII

Loa..... 85.4m  
Beam ..... 20m  
Depth..... 8.6m  
Deck ..... 1000m2

### VS 4612 AHTS

Loa..... 74.1m  
Beam ..... 18m  
Depth..... 7.5m  
Deck ..... 560 sq. m.  
BP..... approx. 145t

## Wärtsilä Wins Subsea 7 DSV Design Deal

Wärtsilä signed a contract for the design of a new diving support vessel (DSV) to be built for Subsea 7. The new VS 4725 DSV design was created by Wärtsilä Ship Design specifically for this vessel, which will be built at the Hyundai Heavy Industries (HHI) shipyard in Korea. The contract was signed with HHI in December, and the vessel is scheduled for delivery in 2015.

The vessel is intended for North Sea diving operations on a year round basis. In customizing the design, close co-operation between Subsea 7, HHI, Drass Energy, the diving equipment supplier and Wärtsilä was employed. The result: a technologically advanced vessel design that should offer high safety and good working conditions to all personnel onboard, as well as safe and efficient operations in often challenging sea and weather conditions.

The DSV will be equipped with the latest integrated diving equipment, with a three-split engine and propulsion configuration for redundancy. Under this configuration, the systems relating to the generator sets, propulsion machinery, thrusters, electrical controls and all related auxiliary equipment, are divided into three sections. This is also designed to ensure a high ERN (Environmental Regularity Number) score, while limiting the failure risk. In a worst case failure scenario, most of the generator sets and thrusters will remain in operation.

"The development of the Wärtsilä VS 4725 DSV, the development of the dive system by Drass, and the overall design and building by HHI is the result of good cooperation between all the parties involved," said Stuart Smith, Vice President for Technology and Asset Development, Subsea 7.

### Subsea 7 - VS 4725 DSV

Length: ..... 123m  
Breadth: ..... 24m  
Depth: ..... 10.5m  
Accommodation: ..... 110 POB





## RL-K 7500 Subsea Crane

During customer days at the production plant in Rostock in January 2013 Liebherr will present its new subsea crane, type RL-K 7500. With this new knuckle boom crane the company extends its range of offshore cranes for subsea operations. The RL-K 7500 is able to lift up to 260t in the air and handle loads down to a water depth of 3,400m. The maximum rope diameter is 100mm, the maximum overturning moment of the crane is 75,000kNm. Depending on customers' specifications, the boom configuration allows for working radii of up to 50 m.

One advantage of the crane's knuckle boom is that loads can be lowered to the water surface with a short rope length between crane boom head and water line. Based on sophisticated Motion Reference Units (MRUs) the Active Heave Compensation system compensates this movement. In order to meet the high power demands of the AHC, the hydraulic hybrid drive system Pactronic, originally developed for Liebherr mobile harbor cranes, was specially adapted for subsea applications. Pactronic is characterized by an additional energy storage device. A hydraulic accumulator supplements the fluid pump in delivering power to the system. It serves as a pressure storage reservoir incorporating a gas in conjunction with a hydraulic fluid. Energy is stored in this compressed gas to be released upon demand. The AHC system is fully integrated in the Litronic system. One of its most important features is its self-learning function. It automatically recognizes the vessel's motion and adjusts itself according to this information. Hence, the system does not need to be manually adjusted and is independent of weather conditions. Up to 70% of the power required to operate the AHC system is currently obtained from Pactronic. This means that the hybrid drive system provides a maximum power of almost 4 MW.

### Winch Technology

In order to ensure optimized rope guidance, the crane has a patented horizontal winch shifting system that guarantees the ideal fleet angle of the rope under all load conditions in both hoisting and lowering operations.

A further innovation is the vertical winch frame lifting system, which is also patented. Two hydraulic cylinders allow for the adjustment of the lifting height without moving the drum of the hoisting winch. Due to this design, wear of the main wire rope is minimized, intended to extend its service life and reduce life cycle costs. With the RL-K 7500 Liebherr offers an innovative crane concept for subsea applications. The RL-K 7500 can be rated both as general purpose offshore crane and as heavy lift crane, being able to hoist loads weighing up to 300 t. It can thus be installed on board drill vessels and also heavy lift vessels.

[Tobias.Fröhlich@Liebherr.com](mailto:Tobias.Fröhlich@Liebherr.com)

## Waste Heat Recovery

Shipowners are faced with record and rising fuel costs and ever stricter emission regulations which deeply impact the bottom line. Increasingly, new technologies are sought to help on both ends. The new Aalborg XS-TC7A waste heat recovery (WHR) economizer from Alfa Laval is designed for use after a ship's auxiliary engines, an innovative waste heat recovery system promises fuel and emissions savings.



Reportedly capable of completely supplying or supporting ship steam requirements during maneuvering and port stays, the Aalborg XS-TC7A waste heat recovery economizer turns waste heat from a ship's auxiliary engines into usable energy and cuts carbon emissions.

With its small footprint and low weight to output ratio, the Alfa Laval Aalborg XS-TC7A promises

to reduce fuel costs for oil-fired auxiliary boilers. After two years of testing at sea, a major Danish shipping company is among the first to capitalize on the full potential of using waste heat recovery economizers both after the main engines and auxiliary engines on its fleet. For starters, the company signed a contract in January 2012 to install the Alfa Laval Aalborg XS-TC7A on 20 newbuildings and a larger number of retrofits over the coming years.

[www.alfalaval.com/marine](http://www.alfalaval.com/marine)

## Dometic Condensing Unit

Heating, Ventilation and Air Conditioning (HVAC) specialist Dometic Marine launched its new DuraSea Condensing Unit to the U.S. market. Designed to provide a robust and reliable system for the workboat environment, Dometic's new DuraSea air conditioning condensing unit operates with the vessel's existing evaporating unit to provide effective cooling of multiple on-board spaces including the pilothouse and crew accommodation areas. The unit's BTU capacity ranges from 36,000 – 120,000 to satisfy an extensive range of vessel requirements for cooling. Built with cabinet of stainless-steel 304 to resist heavy salt spray and UV damage, the DuraSea Condensing Unit is suitable for deck or rooftop mount. It employs a unique, vertical fan design which prevents water puddling on the fan blades.



[www.dometic.com](http://www.dometic.com)



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[ijz@pcsusa.pro](mailto:ijz@pcsusa.pro)

## Bending, Measuring and Bending (again)

The Springmatic optical measuring system provides a remedy to inaccuracies and time delays in accurately bending steel or stainless steel tubes and tube systems. The new development from Schwarze-Robitec, which is integrated into the bending tool, measures the bent tubes directly while tensioned on the bending machine and immediately starts the required further bending process if desired or saves the required correction value for subsequent bends. Instead of removing the tube after the bending process, checking it on an external measuring system then retensioning it for subsequent bending, tube processing companies can bend, measure and adjust in a single stage with the aid of Springmatic. Immediately after the bending of a tube, the new optical measuring system that Schwarze-Robitec is integrating into its bending tools records the rebound value, from which the CNC control of the tube bending machine calculates the required subsequent bending angle.

[www.schwarze-robitec.com](http://www.schwarze-robitec.com)





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- Maintaining records of machinery repaired and inventory of consumed stores, liquid supplies, and spare parts; preparing machinery for annual inspection by the United States Coast Guard and American Bureau of Shipping
- Planning the cadet maintenance and repair work schedules
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- Working directly with the Cadet shipboard training program, and those assigned to administer the program.
- Other duties as assigned by the Chief Engineer
- Assisting with Shipboard training and instruction as assigned

#### Requirements:

Required:

- Bachelors Degree in Marine Engineering
- USCG Second Assistant Engineers license, steam/motor, unlimited horsepower.
- Experience in pipefitting, welding, lathe and machine shop practices is also required.
- Good communication skills and a desire to teach as they will also be directly involved in the supervision and training of Cadets.
- Excellent interpersonal and problem solving skills.
- Desire to work in a student-oriented environment

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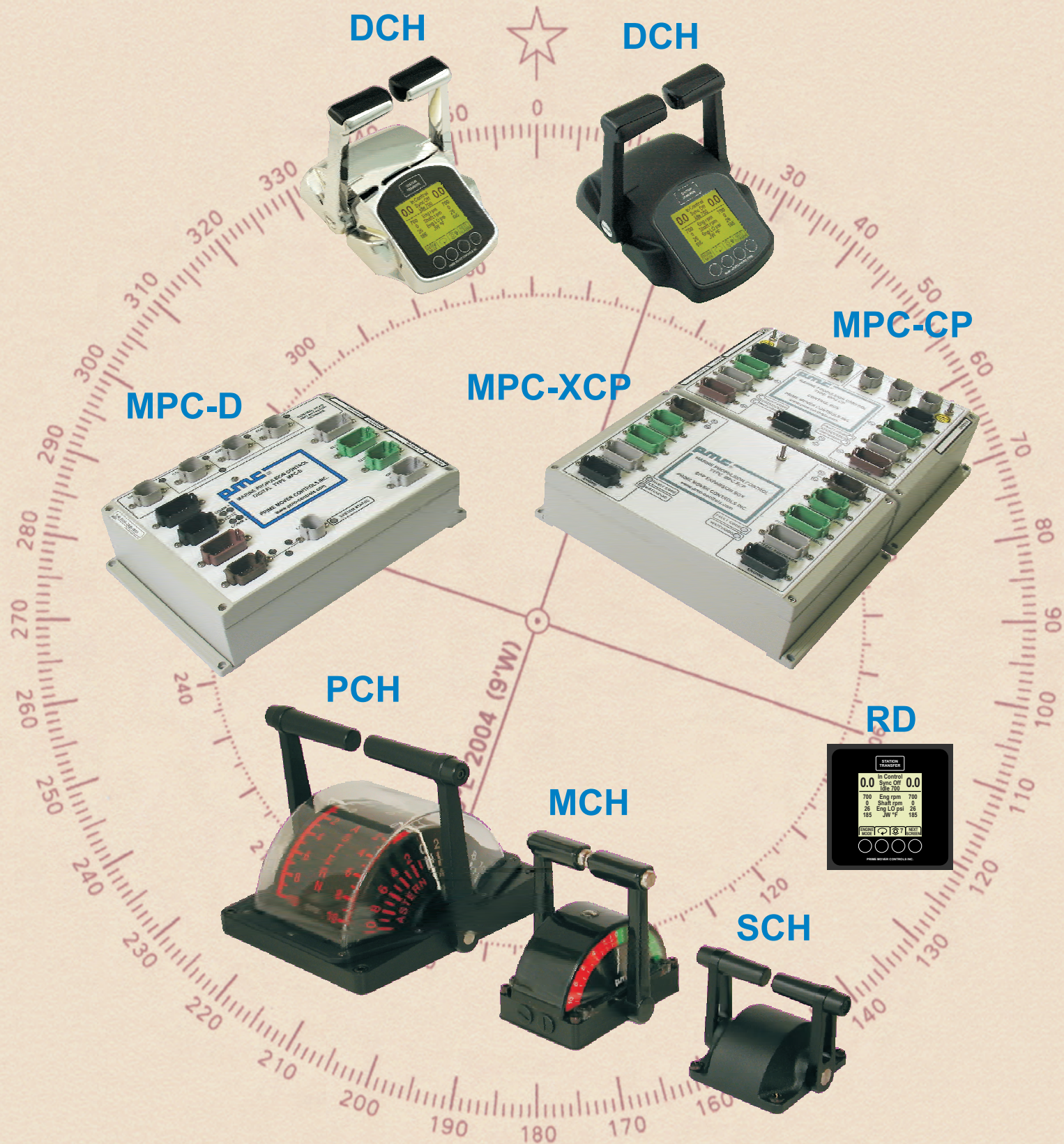
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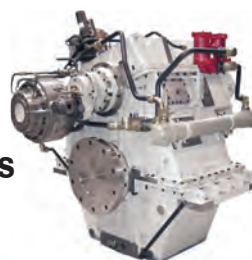
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