

# Marine

## News

DECEMBER 2016

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# LNG: *Lagging, Not Gone*



**Low energy prices, depressed day rates and slow growth of bunkering infrastructure has dampened progress for the marine industry's 'white knight' of environmentally friendly fuels. LNG, nevertheless, is here to stay.**

*By Barry Parker*

## **Slow Start**

Liquefied Natural Gas (LNG) is a clean fuel in abundant supply. The green advantages of LNG are well known: Class Society DNV-GL, a pioneer in the commercialization of LNG fueling for maritime applications, offers that use of LNG fuel provides *"the complete removal of SOX and particle PM emissions and a reduction of NOX emission of up to 85% ... in addition, LNG also reduces CO2 emissions by at least 20%."*

A few years ago, any conversation about LNG fueled vessels would invariably include some mention of the 'chicken and egg' quandary where boats first need a fuel source, and fuel infrastructure first requires customers. Today's operators fret about low day rates, still lower energy prices (and a tighter spread between distillates and LNG) and bunkering options which are being developed, but not necessarily fast enough to make it convenient for everyone. The use of LNG as a fuel nevertheless is growing, and the innovation needed to foster its continued use, is certainly

keeping pace. At the same time, the need for environmental improvement in an era of increasing Tier (IMO & EPA) requirements, regulatory pressure and expanding ECA's is not going away.

Early leadership on LNG came from Europe. Later to the game in the North American market, where an armada of support vessels service the oil business, Harvey Gulf Marine International LLC made the bold steps of ordering six LNG fueled OSVs, built an LNG bunkering facility at Port Fourchon, and then even bought the shipyard constructing the vessels. That momentum is continuing today, and Harvey Gulf is no longer alone. More importantly, the viability of this fuel for use in workboats has been shown to have everyday applications.

## **Ramping Up**

Chad Verret, Harvey Gulf EVP, explained to *MarineNews* that so far, three vessels (*Harvey Energy*- which began work in March 2015, *Harvey Power* and *Harvey Liberty*)

have already been delivered and have been on charter to Shell. They provide logistical support for Shell production platforms (such as Olympus, tapping the huge Mars field) in the Gulf of Mexico, based in Port Fourchon, where they also take on LNG as fuel. The 5,150 DWT boats were built at Gulf Coast Shipyard in Gulfport, Miss., based on a design from Vard Marine (part of Fincantieri Group). The design, dubbed Vard 1 311, has gained the ABS ENVIRO+ certification. The trio are the first U.S. flag vessels to have this notation.

In discussing the performance of the boats, Mr. Verret told *MarineNews*, “We are extremely proud of their performance so far. The three boats have been operating for 1,261 total days and we’ve had no forced downtime.” The vessels are powered by 3 Wärtsilä 6L34DF dual fuel main engines, providing 7.5MW (just over 10,000 hp) of power. He added, “We run almost exclusively on LNG; we are always burning 1 percent diesel fuel [for piloting the ignition in the cylinders]. With the flip of a switch, we could go to 100 percent diesel if we needed. If there’s ever a problem with the gas, the engines would automatically switch over to the diesel backup.”

Harvey Gulf has three additional boats delivering, *Harvey Freedom* in March 2017, and *Harvey America* in October 2017. Both of these vessels will be placed in service to Shell. The final boat in the series, *Harvey Patriot*, due in 2018, is currently uncommitted.

### A Little ahead, Across the Pond

In other offshore markets, Eidesvik, a Norwegian operator of PSV’s, is running a trio of dual fueled boats supporting oil producers in the North Sea and Barents Sea. The company’s pioneering efforts go back to 2004, when its *Viking Energy* delivered from the Kleven Verft in Norway’s west coast. The latest vessel, *Viking Prince*, delivered in 2014; these boats are also deploying dual fuel engines from Wärtsilä. Eidesvik also operates a pair of dual fueled supply vessels built at the Westcon yard, one of which, the fuel cell equipped *Viking Lady* (with cells fueled by LNG), built 2009, had subsequently demonstrated the feasibility of battery power in 2014.

Kleven built another dual fueled PSV, also with propulsion and storage/containment from Wärtsilä, *Rem Eir*, for Romoy Shipping, also on charter in the North Sea. In waters northwest of Australia, where major new gas production projects have been steadily coming online, gas producer Woodside Petroleum has contracted with another Norwegian operator, Siem Offshore, for a five year charter

of a PSV being built in Poland at the Remontowa yard.

Spurred by the pioneering efforts of the Norwegians, and now, closer to home – with Harvey Gulf – LNG fueling has gained a wider acceptance, and other boat builders are jumping into the fray. Also in the States, Conrad Shipyard, based in Morgan City, La, in the news with its construction of a barge to handle fuel for Tote’s new containerships, has recently launched a business unit to specifically handle LNG projects. Brett Wolbrink, who will lead the new effort, told *MarineNews* that Conrad LNG would “take advantage of our experience and knowledge gained during the construction of North America’s first LNG bunker barge. We believe that LNG as a marine fuel will prove to be instrumental in reducing emissions and providing operators with long term economic advantages.”

### Caveats & Collaboration

On supply boats, the placement of LNG tanks is not constrained by vessel dimensions. But practicalities may militate against LNG fueling of small tugs. Robert Allan, Executive Chairman of the Board at Vancouver-based naval architects Robert Allan Ltd, said, “LNG is a fuel option that makes a lot of sense in bigger vessels, where you have the storage capacity,” but he cautioned that LNG fueling required a multiple of six times the space of an equivalent diesel powered tug, for the storage of the fuel and the equipment needed to regulate and burn the gas. Thus, a pure LNG burning tug would have a very limited range.

Mr. Allan, whose firm is considered a leader in the design of high performance escort and ship-handling tugs, added: “At the moment, you pay about 50% more for the same size and power tug ... compared to conventional diesel.” For these reasons, Mr. Allan is a strong advocate of dual fuel systems, “...because you take the range limitation out of the equation.” He highlighted a building program of three boats (with the RAstar design) being built at Astilleros Gondan, in Spain, for the Norwegian owner Østensjø Rederi. All three will be working for Statoil.

In June, 2016, the Gondan yard, at Figueros (in northern Spain), launched the first of the three boats, followed by a second vessel in September- both to be delivered in early 2017. The vessels, 40.2 meters length and 16 meters beam, will provide tug and escort services at a Statoil terminal in the northern reaches of Norway, at Melkøya, near Hammerfest. He explained, “The tugs are a true “dual-fuel” vessel. For purely spatial reasons the volume of gas which can be carried is somewhat limited so the tugs will

## WORKBOAT EMISSIONS & COMPLIANCE

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**– Brett Wolbrink, Conrad Industries**



work on gas when in harbor doing ship handling, but virtually any other time where somewhat longer range/endurance is required will be on MDO.”

Importantly, Melkøya is the terminus of an underwater pipeline that transports natural gas over 100 miles from the Snøhvit gas fields in the Barents Sea, to an onshore liquefaction plant. Asked about the choice of a yard, Mr. Allan replied, “The owners have a long-standing excellent working relationship with Gondan Shipyard, who have built many of their vessels over the past 20+ years.”

Another service provider in the North Sea, Buksér og Berging AS, has taken on the challenges of LNG fueling for escort tugs, building two boats, *Borgoy* and *Bokn* (both delivered 2014), at the Sanmar yard in Turkey. These vessels, working for also Statoil, in the North Sea, are classed by DNV-GL, both pair Rolls Royce engines with a Rolls Royce Z-drive configuration. The gas storage/containment system is from Aga Cryro.

In another innovative design from Robert Allan Ltd., the RANGLer tug (which uses a body design similar to the RAsstar design being deployed for Østensjø Rederi),

problems with LNG storage inherent in conventional tug design have been addressed. The spacious crew accommodations are located within a stern ‘castle’ replacing the below deck accommodations of conventional tug designs. The space forward of the engine room is used for maximum LNG storage capacity, and is configured to allow easy installation and removal of the entire LNG tank system as an ‘LNG Fuel Module.’

### **LNG: Here to Stay**

Designs of LNG-powered PSV’s and tugs are no longer in the “experimental” category. In June 2015, the International Code of Safety for Ships Using Gasses or other Low Flash-Point Fuels (the “IGF” code) was adopted by the IMO. Reflecting a group of amendments to SOLAS, it will come into force on January 1, 2017. Requirements for newbuilds include independent engine room spaces with frequent air changes, piping (ventilated double sheathed), gas detection, automatic shutdown of gas supply and disconnecting of electrical equipment, and other safety measures to automatically shut down the gas supply.

### **LNG transfer operations in progress**



## WORKBOAT EMISSIONS & COMPLIANCE



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LNG propulsion has turned the corner beyond logistical ‘chickens and eggs.’ Investment in liquefaction facilities during oil’s boom years means that more LNG is available onshore at marine hubs such as Port Fourchon in the Gulf of Mexico and Melkøya in the Barents Sea. Brett Wolbrink, from Conrad Industries, notes, “There are significant efforts being put forth in the areas of reliable and stable fuel supply infrastructure and small scale equipment technologies to allow LNG as a marine fuel to be widely adopted in more downstream markets. However, there is still a considerable amount of work to be done and Conrad LNG is actively driving towards viable solutions with industry participants.”

Eventually, says Wolbrink, LNG’s scope will go well beyond PSVs and escort tugs. He adds, “Conrad LNG will continue to develop and market various vessel concepts and bunkering and supply chain solutions that include bunker vessels, FLNG’s, FRU’s, LNG fueled towboats and storage and cargo handling systems.”

Skeptics point out that lower energy prices generally have reduced the price spreads of diesel fuel over LNG,

lengthening the payback on investments in LNG powered newbuilds (or retrofits). However, continued social pressures for ‘sustainable transportation’ (particularly where ‘name brand’ charterers are footing the bill) will drive the trend towards more LNG propulsion of support vessels, tugs, and other vessels serving the energy and other critical sectors of the maritime business. It is no secret that oil majors in pursuit of environmental excellence – Statoil and Shell, for example – have actively pursued and gladly paid a premium for the benefits of LNG as fuel. That’s just good business. And, if industry is on the ball, it is also business that won’t go away any time soon.



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