LNG Shipping News

AN LNG JOURNAL TITLE ON LNG CARRIERS 22 June 2017

Where next for Russia?

Russia is about to boost its efforts to become a more significant LNG player with the startup of the Yamal LNG project.

Yamal will add 16.3 mill tonnes per year LNG production to the 10 mill tonnes per year already seen from Sakhalin 2, according to a report from Poten & Partners.

LNG is expected to continue to play a key role in Russia's export strategy and future development is being encouraged. Including pipeline gas, Alexey Gromov, principal director on energy studies at the Institute for Energy and Finance, a Russian think tank, suggested that a base case scenario could see Russia export 69.5 mill tonnes per year of LNG by 2035, with a high case scenario of almost 104 mill tonnes per year.

Despite, challenging market conditions, Novatek, which is sponsoring the Yamal LNG project, has been focused on expansion for some time. KBR has been working for about three years on pre-FEED for the company's next project-Arctic LNG 2. FID is planned for late 2018 or early 2019.

Arctic LNG 2, which is expected to be of a size similar to Yamal, will have three trains based at the Utrenneye Field, also known as the Salmanovskoye reserves.

Other possible future projects include Arctic LNG 1, which will be located on the Geofizcheskoye and Trekhburgorniy license areas, and Arctic LNG 3, which could be built on the North Obskiy field.

Yamal is still on track to open later later this year

Cost reduction

Novatek is seeking to reduce costs, as LNG and crude prices are expected to remain around the current low levels for the next few years. While Yamal LNG's construction is expensive, due to its Arctic location, in terms of production costs it benefits from low upstream costs when compared to many other schemes. Like the Qatari LNG projects, it is also monetising rich gas, bringing in additional revenue from condensate sales, Poten & Partners said.

Timing remains uncertain for next Russian liquefaction projects. ExxonMobil, Rosneft, Sodeco and ONGC are still trying to decide how best to monetise their Sakhalin 1 reserves in Russia's Far East. Sakhalin 1 has been producing crude since 2005 and associated gas is used locally for power generation and regional heating.

If a liquefaction option is chosen, LNG would be integrated with existing facilities at the De Kastri terminal and supply would come from the Chayvo Field located onshore on the northeastern part of Sakhalin Island.

Gas could also come from Gazprom's Yuzhno-Kirinskoye Field, which is planned to come on stream in 2021. Commissioning of Sakhalin 2's train 3 is not expected until 2023-2024 and the Baltic LNG plant - also proposed by Shell and Gazprom -is not forecast until 2022-2023.

Baltic LNG would be fed by gas from Gazprom's gas pipeline and would be built near Ust-Luga close to the border with Estonia. It would initially produce 10 mill tonnes per year with possible expansion to 15 mill tonnes per year. In June 2017, Gazprom and Shell signed a Heads of Agreement to set up a joint venture to secure financing and carry out the design, construction and operation of the plant. Both parties also inked the Joint Study Framework Agreement to conduct feasibility studies for the project.

Gazprom's proposed 15 mill tonnes per year Vladivostock LNG project to monetise gas from the Sakhalin-3 has been shelved, while Rosneft's 2.6 mill tonnes per year Pechora LNG project, planned in northern Russia on the Barents Sea, has also been put on hold. ■

SHIPPING NEWS AGENDA

Golar/Delfin to jointly develop FLNG project

Delfin Midstream and Golar LNG have signed a joint agreement to develop the Delfin LNG project off the coast of Cameron Parish, Louisiana.

The project will utilise Golar's FLNG's technology. The joint development agreement will include the financing, marketing, construction, development and operation of Delfin LNG.

Delfin LNG is the first and only permitted floating LNG export project in the US. It is a brownfield deepwater port requiring minimal additional infrastructure investment to support up to four FLNGs producing up to 13 mill tonnes of LNG per annum.

Delfin purchased the UTOS pipeline, the largest natural gas pipeline in the Gulf of Mexico, in 2014 and submitted its deepwater port license application in 2015. The project received a positive record of decision from MARAD on 13th March, 2017. On 1st June 2017 Delfin received approval from the US Department of Energy for long-term exports of LNG to countries that do not have a Free Trade Agreement with the US.

Golar has designed, financed, contracted and built its first FLNG, the FLNG 'Hilli Episeyo', which is scheduled to sail away from Keppel shipyard in the third quarter of this year.

The Delfin FLNG project has come a step closer with the involvement of Golar

A second vessel of the same design, the FLNG 'Gandria', is soon to be converted subject to a final investment decision (FID) by the Fortuna project partners. Golar is currently developing the Mark II next-generation floating liquefaction solution that is based on its Hilli and Gandria designs. The Mark II solution, as used at the Delfin LNG project, will have >3 mill tonnes per annum of liquefaction capacity and will be the lowest cost liquefaction solution in North America, the company said.

FID due 2018

It is expected that FID on the Delfin project will take place in 2018 with first LNG to be delivered in 2021/22.

Oscar Spieler, Golar CEO, commented: "Golar's proven execution model will allow Delfin to deliver the lowest cost liquefaction solution in the North American market with a construction time of less than three years. Golar's low cost modular floating technology will allow Delfin to make Final Investment Decisions in 3 mmtpa increments at a lower unit cost than large land-based projects."

Frederick Jones, Delfin CEO and Chairman, commented: "We look forward to working with Golar to deliver the first floating liquefaction project in North America and lead the second wave of US LNG projects. Golar's flexible, floating liquefaction model has proven to be the world's lowest cost liquefaction solution allowing Delfin to offer innovative commercial solutions with reduced credit requirements, mid-term offtake contracts (about 10 years) and FOB and DES LNG pricing based on fixed price, S curves or tied to a variety of energy indexes." ■

Teekay's first Chinese built LNGC built completes sea trials

Teekay confirmed this week that the 174,000 cu m 'Pan Asia' has successfully completed sea trials off the east coast of Shanghai in the East China sea.

She is the first of four 174,000 TFDE LNG newbuildings to be constructed by Hudong-Zhonghua Shipbuilding. The newbuildings are owned by a joint venture involving China National Offshore Oil Corp, China LNG Group, BW Group and Teekay.

The vessels, which are scheduled to be delivered between September, 2017 and January, 2019, will each operate under 20-year timecharter contracts, plus extension options, with Methane Services, a wholly-owned subsidiary of Shell.

The other three newbuildings, 'Pan Americas', 'Pan Europe' and 'Pan Africa', are under construction at the yard, Teekay said.

The completion of the sea trials of 'Pan Asia' marks a significant milestone in this project, with gas trials due at the end of July. The trials were attended by more than 210 personnel including all disciplines from the shipyard, class, service engineers from most equipment manufacturers, Teekay's site team, operations team and partners and charterers.

The first of four Chinese built 174,000 cu m TFDE LNGCs has undergone trials in China

The vessel performance exceeded expectations in terms of manoeuvrability, speed and vibration, Teekay said. ■

LNG Shipping News
1st Floor, 30 Warner Street
London EC1R 5EX
United Kingdom
www.lngjournal.com
Tel: +44 (0)20 7253 2700

Publisher
Stuart Fryer

Editor
Ian Cochran
+44 (0) 7748144265
cochran@tankeroperator.com

Ad sales enquiries
Narges Jodeyri
+44 (0)20 7017 3406
narges@lngjournal.com

Subscriptions
Elena Fuertes
Tel: +44 (0) 20 7253 2700
elena@lngjournal.com
Subscription included with LNG Journal

Production
Vivian Chee
Tel: +44 (0) 20 8995 5540
chee@btconnect.com

Qatargas in five-year supply deal with Shell

Qatargas has signed a new Sale and Purchase Agreement (SPA) with Shell.

Under the terms of the agreement, Qatargas will deliver up to 1.1 mill tonnes of LNG per annum to Shell over a five year period.

Saad Sherida Al-Kaabi, President and CEO of Qatar Petroleum, and Chairman of the Qatargas Board of Directors, said: "We are pleased with the conclusion of this agreement, which further strengthens our relationship with Shell - one of the largest energy traders in the world."

"Qatargas continues to win new business in an evolving market and this SPA demonstrates Qatargas' ability and flexibility to capture new opportunities," he added.

Commenting on the SPA, Khalid Bin Khalifa Al-Thani, Qatargas CEO, said: "Qatargas is delighted to conclude this new SPA with a valued partner and we look forward to working even closer with Shell in the years ahead. This deal provides Qatargas with access to Shell's gas sales portfolio in the UK and continental Europe, as well as the flexibility to manage LNG deliveries to our global client portfolio."

Maarten Wetselaar, Shell's Director of Integrated Gas, said: "We are pleased to have signed this agreement, strengthening our relationship with Qatargas. Agreements like this support our ability to provide reliable, flexible LNG supply to our customers. We strongly believe natural gas has a vital role to play in providing secure and cleaner energy for decades to come."

Commencing in January, 2019, the LNG will be supplied from Qatar Liquefied Gas Co (4) (Qatargas 4), a joint venture between Qatar Petroleum (70%) and Shell (30%).

It is expected that the LNG will be delivered to either the UK's Dragon LNG Terminal or the Gate LNG Terminal in the Netherlands. ■

Qatargas is to supply LNG to Shell for five years

Taiwan receives its first Sabine Pass cargo

Following the first US gas deliveries to Poland the Netherlands in the past few weeks, Taiwan has become the latest importer of Cheniere's Sabine Pass natural gas.

'Cadiz Knutsen' arrived at the country's Taichung LNG terminal last week, according to Reuters quoting Genscape shipping data.

In May, a record 18 vessels loaded cargoes at Sabine Pass for worldwide destinations.

Commenting on the delivery of the first US export LNG cargoes to Poland and the Netherlands, US Secretary of Energy Rick Perry said; "We will become a dominant energy force, using our research, development, and delivery capabilities."

US Energy Secretary Rick Perry believes that the US will become the third largest gas exporter by 2020

These cargoes followed gas shipments to southern Europe, including to Italy, Malta, Spain, Portugal and Turkey, which have received Sabine Pass cargoes since February, 2016, when the facility started exporting. Spain and Portugal have received multiple cargoes.

Poland has said that US LNG is critical to its efforts to diversify its sources of natural gas, Perry stated, claiming that Europe has been looking to the US as a key potential source for energy diversification to decrease Russia's leverage as the region's dominant gas supplier.

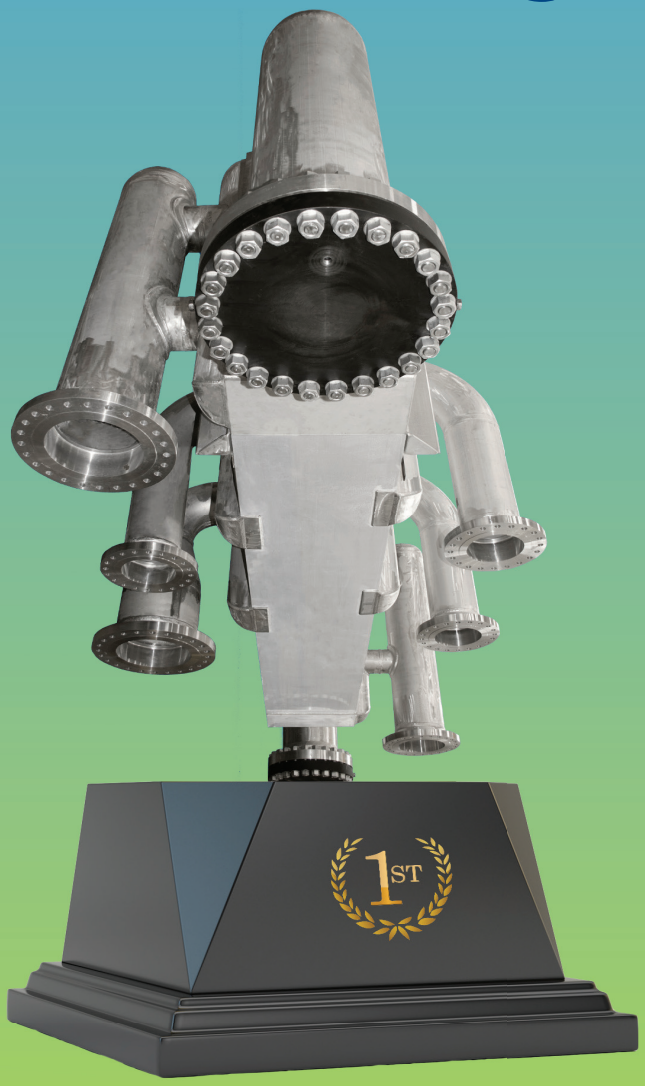
He thought that a growing number of US LNG shipments are expected to be sold to Europe, as more liquefaction projects located along the US Gulf Coast come online and begin production and shipment.

Perry confirmed that the US is expected to become the world's third-largest LNG supplier by 2020.

Thus far, 5 bill cu ft per day of US LNG has been contracted to European-based companies - ENGIE (France), BG (UK), BP (UK), Endesa (Spain), Iberdrola (Spain), Gas Natural Fenosa (Spain), EDF (France), EDP (Portugal), TOTAL (France) and Centrica (UK).

"These actions, and our plans for the future, should underscore the message I delivered in March on behalf of the Trump Administration regarding the US' unique role in the world energy market," he said. "The US will act. We will reassure the energy security of our allies and partners around the world, acting as a force for good in an environment of uncertainty." ■

Chart Brazed Aluminum Heat Exchangers



First to Produce LNG On-board a Floating Facility

Custom designed, highly efficient, compact heat exchangers with superior heat transfer performance and operational flexibility. Providing substantially lower weight, scalability, modular construction and proven performance, Chart Brazed Aluminum Heat Exchangers are uniquely suited to the rigors of floating vessels, where space is at a premium and reliability is paramount.

www.chart-ec.com

CHART®

Innovation. Experience. Performance.®

Dynagas income hit by lower charter rates

Dynagas LNG Partners' suffered a 24.6% decrease in its net income for the three months ended 31st March, 2017.

Net income for the period was $12.9 mill, compared to $17.1 mill in the corresponding period of 2016. Adjusted net income for 1Q17 was $14.7 mill, compared to $18.9 mill in 1Q16, which represented a 22.4% decrease.

The decrease in both net and adjusted net income was mainly attributable to charter hire reductions on the 'Yenisei River' and the 'Lena River', with effect from November, 2016 and to an unscheduled offhire for the 'Yenisei River' and, to a lesser extent, attributable to scheduled technical costs for the vessels undergoing their special survey and drydockings this year.

Adjusted EBITDA for 1Q17 decreased by 11.1% to $31.3 mill, compared to 1Q16 adjusted EBITDA of $35.2 mill, which was also due to the factors outlined above.

The Partnership's distributable cash flow for the three-month period was $18.6 mill, compared to $22.7 mill in 1Q16 - a decrease of $4.1 mill, or 18%.

For 1Q17, the Partnership reported earnings per common unit and adjusted earnings per common unit basic and diluted of $0.32 and $0.37, respectively, after taking into account the Series A preferred units interest on the Partnership's net profit.

Subsequently, on 12th April, 2017, the Partnership's Board announced a quarterly cash distribution of $0.4225 per common unit in respect of 1Q17. On 21st April, 2017, the Board also announced a cash distribution of $0.5625 per unit of its Series A Preferred Units for the period from 12th February, 2017 to 11th May, 2017.

Refinancing

On 18th May, 2017, the Partnership refinanced its existing secured commercial bank facilities with a new $480 mill institutional senior secured term loan B due in 2023. The Term Loan B provides for 0.25% quarterly amortisation on principal and a bullet payment at maturity. This term loan is secured by the six LNGCs in the fleet, among other things.

Tony Lauritzen, the Partnership's CEO, commented: "The earnings for the financial quarter ended 31st March, 2017 were within our expectations. Part of our strategic plan has been to enter into longer term charters for the employment of the vessels in our fleet. In general, long-term charters are priced at day rates below shorter term charters.

"Our average remaining contract duration is now 10.5 years and our contracted backlog estimate is $1.52 bill, thereby providing us with significant cash flow visibility. Our revenues are derived from the employment of our vessels on fixed multi-year charter contracts. The revenues we earn under those charter contracts are earned on a fixed day rate basis and not linked in any way to commodity price fluctuations.

"In April 2017, 'Clean Energy' became available for employment, at which time we entered into two consecutive short-term charters to employ the vessel through the end of August, 2017. Following the expiration of these charters, we expect to enter into additional charters for the 'Clean Energy' prior to its delivery to Gazprom in July, 2018.

"With our fleet 86% contracted through 2017 and 75% contracted through each of 2018 and 2019, and with an estimated fleet-wide average remaining contract duration of 10.5 years, believe we have significant cash flow visibility. Our intent is to seek additional contract coverage, particularly in 2017 and 2018, to manage our operating expenses and continue the safe operation of our fleet," he said. ■

'Clean Energy' is undertaking two short term charters before starting a period charter to Gazprom

EXMAR calls bondholders meeting

Based on the feedback received during the recent fixed income road show, EXMAR is to call a bondholders' meeting.

At the meeting, the company hopes to extend the maturity of its outstanding NOK1,000 mill senior unsecured bond - EXMAR01.

Last month, EXMAR asked DNB Markets, Pareto Securities, Nordea Bank Norge and Skandinaviska Enskilda Banken to organise a series of fixed income investor meetings in connection with the refinancing of its outstanding bond, which was due to mature in July, 2017.

At the time, the company said that a senior unsecured bond offering with up to a three year tenor may follow, subject to inter alia market conditions. ■

NEWS NUDGE

Teekay LNG Partners declares distribution

Teekay GP LLC, the general partner of Teekay LNG Partners, has declared a cash distribution of $0.5625 per unit on the Partnership's Series A preferred units for the period from 1st April, 2017 to 30th June, 2017.

The cash distribution is payable on 17th July , 2017 to all unitholders of record as at 30th June, 2017.

LNGC enters service

Another Hyundai LNGC was recently delivered by DSME.

The 174,000 cu m 'Hyundai Peacepia' has joined her sistership 'Hyundai Princepia' - see LNG SN 8th June.

FERC - Jordan Cove LNG terminal

The US Federal Energy Regulatory Commission (FERC) has issued a notice stating that it intends to prepare an environmental impact statement (EIS) on the planned Jordan Cove LNG terminal in Coos Bay, Oregon.

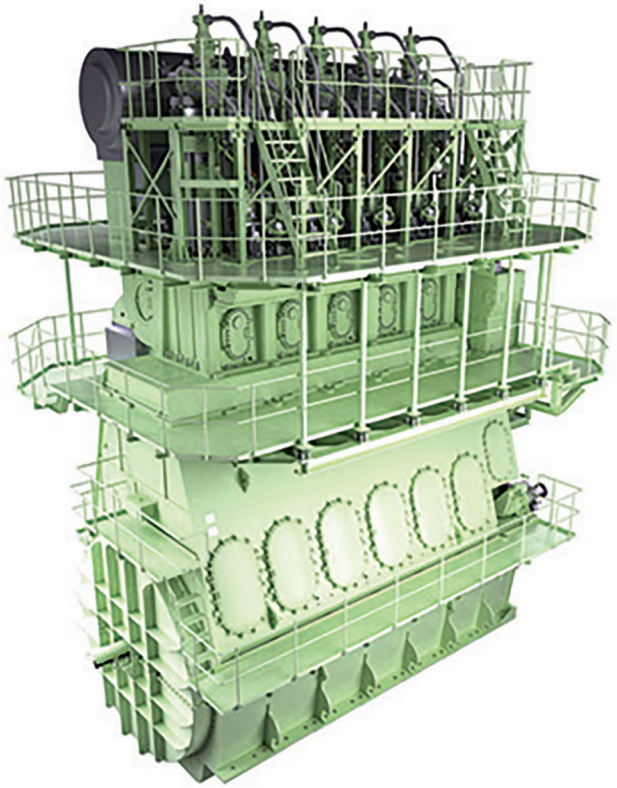
Comments must be received by 10th July, FERC said.

Knutsen opts for ME-GI engines

Haugesund-based Knutsen OAS Shipping has ordered four MAN B&W 5G70ME-GI engines fitted with exhaust gas recirculation systems (EGR) for two newbuilding 180,000 cu.m LNGCs.

Upon their delivery in 2020, the vessels will transport cargoes worldwide for two Spanish utility companies.

The two utilities have entered into 20-year agreements to purchase a total of over one mill tonnes a year of LNG on the start up of operations by the LNG export facility currently being developed near Corpus Christi, Texas, by Corpus Christi Liquefaction, - a subsidiary of Cheniere Energy.



ME-GI engines have been chosen for two Knutsen LNGC newbuildings

The order for the Knutsen ME-GI engines follows the path initiated by the Spanish group Gas Natural Fenosa, which was the pioneer in adopting ME-GI technology in an order for four LNGCs in 2013.

Bjarne Foldager, Vice President Sales & Promotion, 2-Stroke Business at MAN Diesel & Turbo (MDT), said: "These orders are notable in that they are the sixth and seventh such carriers bound for service for Spanish utilities that have been ordered within the past four years alone.

"As such, our G70ME-GI engine has become a popular choice for LNG carriers globally. This can be attributed in great part to the ME-GI's embracing of the Diesel principle, which is simply the most effective method of converting gas fuel to propulsion power," he claimed.

The ME-GI dual-fuel low-speed diesel engine is the culmination of many years of development work. 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.

MDT said that it saw significant opportunities for gas-fuelled tonnage as fuel prices rise and exhaust-emission limits tighten. Research indicates that the ME-GI engine delivers significant reductions in CO2, NOx and SOx emissions. Furthermore, the ME-GI engine's negligible methane slip makes it the most environmentally-friendly technology available.

In May, 2017, an ME-GIE variant passed operational tests running on ethane, while an ME-LGI counterpart to the ME-GI that runs on LPG, methanol and other liquid gases has also successfully been introduced to the market. ■

AiP for floating LNG power plant concept issued

ABS has granted Approval in Principle (AIP) for a floating LNG power plant and FSRU design concept developed by Japan's Chiyoda Corp.

"As the energy mix shifts and global demand for gas increases, concepts like this will reshape how energy is supplied," said ABS Vice President for Global Gas Solutions, Patrick Janssens. "By working closely with Chiyoda, we were able to help them prove the feasibility of this novel and innovative concept."

This concept offers a different approach to delivering new sources of power to remote areas of the world. The conceptual design is based on existing LNGCs, which are converted into floating power plants with small (~72 MW) to medium (~400 MW) scale power generation capabilities.

In reviewing Chiyoda's floating LNG power plant concept, ABS applied its relevant Rules and Guides to confirm that the conceptual design meets the intent of applicable class requirements.

"By applying ABS' robust guidance, we were able to develop a concept that meets operational demands and advances safety," said Chiyoda Corp's Project Manager, Toyomitsu Kanai. "By basing this concept on existing LNG carriers, we are able to reduce constructions costs and shorten delivery times. We look forward to developing this concept further and expanding the LNG value chain to new markets." ■

OLT Offshore LNG Toscana in third auction

The allocation of capacity for the regasification and storage bundled service concerning the months of August and September for OLT Offshore LNG Toscana was successfully completed.

This is the third auction following the one concluded on 11th May, 2017, by which the regasification capacity concerning the months of August and September waived on 23rd May, 2017 were made available.

The tender, launched by OLT Offshore LNG Toscana, received a positive response, as nine different companies made offers. Three slots were allocated, two in August and one in September, for a total of about 415,000 cu m of LNG which will be sent to the Stogit storage system.

Under this service, a quantity of gas equivalent to the LNG delivered, less consumption and losses, is made available by Stogit to the user by the end of the month following the discharge. ■

UK MAIB condemns rope operations on board LNGC

A deck officer suffered severe head injuries when he was struck by a parted HMPE mooring rope during a berthing operation of the LNGC 'Zarga' at South Hook LNG terminal, Milford Haven on 2nd May, 2015.

In the subsequent investigation, the UK's Marine Accident Investigation Board (MAIB) said that the area where the officer was standing was clearly within the snap back zone of the rope but had previously been designated as a safe area. The perception on board was that HMPE ropes did not recoil on failure and the elasticity introduced by the rope's tail had not been properly assessed.

The vessel's mooring lines were not fit for purpose MAIB said, as they did not have the minimum breaking strength specified at build. They were not compatible with the vessels mooring deck fittings and the required working load limit was too high.

The predominant failure mode, axial compression fatigue, had not previously been associated with HMPE rope failures. The rope's tightly bound jacketed construction increased the likelihood of axial compression fatigue and prevented the crew from inspecting its load bearing core and identifying key discard criteria.

Guidance provided by the rope manufacturers and shipping industry bodies for the selection and use of high modulus synthetic fibre mooring lines was limited and often contradictory, the investigation found.

Safety issues

- Thorough snap back zone assessments had not been carried out for 'Zarga's' mooring lines.
- Weaknesses were identified in the command and control prior to and during the mooring operation.
- Had tugs been recalled to assist in the re-positioning of the vessel the accident might have been avoided.
- The officer in charge of the forward mooring party got directly involved in a specific task and lost his overall view of the mooring operation.
- The residual strength of the parted mooring line was below its accepted working load limit.
- The manufacturer's recommended safety factors for the rope were not taken in to account by the shipbuilder or vessel operator.
- The diameter of the vessel's deck fittings were too small for the HMPE ropes.
- Mooring line condition monitoring routines on board were ineffective.
- The rope's jacketed design made it difficult to identify key discard criteria.
- Axial compression fatigue had not previously been considered as a likely failure mode or significant cause of strength loss in HMPE rope.
- Strength testing methodologies, designed for the offshore sector, were inappropriately applied to ships' mooring ropes.
- The test methodology used by Bridon to achieve the required specified MBL for 'Zarga's' mooring lines was flawed. The realisation factor applied was unrealistic and the results were higher than previously or subsequently achieved.
- Insufficient information was exchanged between the vessel builders and the rope suppliers to ensure the ropes were fit for the purpose.

As a result of the findings, recommendations were made to the vessel's manager Shell International Trading and Shipping (STASCo), The Oil Companies International Marine Forum (OCIMF), Bridon International and Eurocord aimed at improving the levels of knowledge among shipowners, managers, builders and crew regarding the complex properties of high modulus synthetic fibre ropes and the advantages and limitations they present when used on board ships for mooring line applications. ■

Mooring rope incident results in recommendations being made

GTT wins another FLNG order

GTT has received an order from Samsung Heavy Industries to fit a containment system on a new FLNG.

This new FLNG, the world's second largest with a capacity of 238,700 cu m, will be fitted with eight LNG tanks equipped with the Mark III membrane containment system.

The unit will be built at SHI Shipyard for ENI (Eni East Africa SpA) to operate off the Mozambique coast. Her delivery is scheduled in 2021.

"We are very pleased to be part of this new FLNG project. After the recent delivery of the very first FLNG and the up-coming delivery of the largest FLNG ever built, this award demonstrates GTT technologies are the solution of choice for these offshore LNG units," said Philippe Berterottiere, GTT Chairman and CEO.

In addition, the GTT membrane technology was chosen to equip the three FLNGs already ordered. These units are being fitted with the NO96 system, as well as the Mark III system. ■

WORLD LNG CARRIER ORDERBOOK

Name	Segment	Status	Yard	Design	Prop	Capacity	Delivery Date	Ordered	Imo	Hull No	Primary Owner
Asia Venture	LNGC	Order	Samsung	TZ Mk. III	TFDE	160000	01/04/2017	2012	9680190	2070	Chevron
Kawasaki Sakaide 1718	LNGC	Order	Kawasaki	Moss	TFDE	180000	01/04/2017	2013	9698123	1718	K-Line
Daewoo 2450	LNGC	Order	DSME	GT NO 96	TFDE	174000	01/05/2017	2014	9761839	2450	Korea Line
Jmu Tsu 5070	LNGC	Order	Japan Marine United Corp (Jmu)	SPB	TFDE	165000	01/05/2017	2014	9736092	5070	MOL
Hudong-Zhonghua H1717a	LNGC	Order	Hudong-Zhonghua	Membrane	TFDE	174000	01/06/2017	2012	9672844	H1717A	China LNG Shipping Holdings
Hudong-Zhonghua H1719a	LNGC	Order	Hudong-Zhonghua	Membrane	TFDE	174000	01/06/2017	2013	9694751	H1719A	China LNG Shipping Holdings
Oceanic Breeze	LNGC	Order	Mitsubishi H.I.	Moss	STRH	155300	01/07/2017	2013	9698111	2310	K-Line
Seri Cempaka	LNGC	Order	Hyundai Heavy	Moss	STRH	150000	01/07/2017	2013	9714290	2731	Petronas
Murex	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/07/2017	2013	9705641	2416	Teekay LNG
Daewoo 2462	LNGC	Order	DSME	GT NO 96	TFDE	180000	01/07/2017	2015	9771913	2462	MOL
Bishu Maru	LNGC	Order	Kawasaki	Moss	TFDE	164700	01/08/2017	2013	9691137	1713	K-Line
Seri Camar	LNGC	Order	Hyundai Heavy	Moss	STRH	150000	01/08/2017	2013	9714305	2732	Petronas
Jmu Tsu 5071	LNGC	Order	Japan Marine United Corp (Jmu)	SPB	TFDE	165000	01/08/2017	2014	9752565	5071	NYK
Daewoo 2417	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/08/2017	2013	9705653	2417	Teekay LNG
Daewoo 2421	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/08/2017	2014	9768368	2421	Dynagas
Hudong-Zhonghua H1718a Holdings	LNGC	Order	Hudong-Zhonghua	Membrane	TFDE	174000	01/09/2017	2013	9694749	H1718A	China LNG Shipping
Samsung 2153	LNGC	Order	Samsung	KC-1	TFDE	174000	01/09/2017	2014	9761803	2153	SK Shipping
Samsung 2154	LNGC	Order	Samsung	KC-1	TFDE	174000	01/09/2017	2014	9761815	2154	SK Shipping
Daewoo 2426	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	30/09/2017	2014	9750658	2426	MOL
Castillo De Caldelas	LNGC	Order	Imabari	TZ Mk. III	MEGI	178000	01/10/2017	2014	9742819	8188	Elcano
Mitsubishi Nagasaki 2316	LNGC	Order	Mitsubishi H.I.	Moss	STRH	153000	01/10/2017	2014	9743875	2316	NYK
SK Resolute	LNGC	Order	Samsung	TZ Mk. III	XDF	182000	01/10/2017	2013	9693173	2081	SK Shipping
Hudong-Zhonghua H1720a	LNGC	Order	Hudong-Zhonghua	Membrane	TFDE	174000	01/10/2017	2012	9672818	H1720A	China LNG S Holdings
Jmu Tsu 5072	LNGC	Order	Japan Marine United Corp (Jmu)	SPB	TFDE	165000	01/10/2017	2014	9758832	5072	MOL
Eduard Toll	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	31/10/2017	2014	9750696	2423	Teekay LNG
Castillo De Merida	LNGC	Order	Imabari	TZ Mk. III	MEGI	178000	01/11/2017	2014	9742807	8177	Elcano
Seri Cemara	LNGC	Order	Hyundai Heavy	Moss	STRH	150000	01/12/2017	2014	9756389	2735	Petronas
Kawasaki Sakaide 1731	LNGC	Order	Kawasaki	Moss	TFDE	177000	01/12/2017	2015	9774135	1731	MOL
Daewoo 2453	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/12/2017	2014	9770921	2453	Teekay LNG
Rudolf Samoylovich	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/12/2017	2014	9750713	2425	Teekay LNG
Daewoo 2422	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/12/2017	2014	9768370	2422	Dynagas
Daewoo 2424	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	31/12/2017	2014	9750701	2424	MOL
Flex Endeavour	LNGC	Order	DSME	GT NO 96	MEGI	172400	01/01/2018	2014	9762261	2447	John Fredriksen
Flex Enterprise	LNGC	Order	DSME	GT NO 96	MEGI	172400	01/01/2018	2014	9762273	2448	John Fredriksen
SK Audace	LNGC	Order	Samsung	TZ Mk. III	XDF	182000	01/01/2018	2013	9693161	2080	SK Shipping
Hudong-Zhonghua H1664a	LNGC	Order	Hudong-Zhonghua	GT NO 96	TFDE	174000	01/01/2018	2014	9750232	H1664A	Teekay LNG
Pan Asia	LNGC	Order	Hudong-Zhonghua	GT NO 96	TFDE	174000	01/01/2018	2014	9750220	H1663A	Teekay LNG
BW Tulip	LNGC	Order	DSME	GT NO 96	MEGI	173000	01/01/2018	2014	9758064	2435	BWGas
Daewoo 2460	LNGC	Order	DSME	GT NO 96	MEGI	174000	01/01/2018	2014	9766889	2460	Chandris
Teekay NB-6	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/02/2018	2014	9770933	2454	Teekay LNG
Hyundai Ulsan 2800	LNGC	Order	Hyundai Heavy	TZ Mk. III	XDF	174000	01/02/2018	2014	9748899	2800	GasLog
Daewoo 2443	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/02/2018	2014	9766554	2443	BP
Jmu Tsu 5073	LNGC	Order	Japan Marine United Corp (Jmu)	SPB	TFDE	165000	01/02/2018	2014	9758844	5073	MOL
Samsung 2130	LNGC	Order	Samsung	TZ Mk. III	XDF	174000	01/03/2018	2014	9744013	2130	GasLog
Daewoo 2442	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/03/2018	2014	9766542	2442	BP
Hyundai Ulsan 2801	LNGC	Order	Hyundai Heavy	TZ Mk. III	XDF	174000	01/03/2018	2014	9748904	2801	GasLog
MOL E.On.	LNGC	Order	DSME	GT NO 96	TFDE	179900	01/04/2018			TBN	MOL
Kawasaki Sakaide 1720	LNGC	Order	Kawasaki	Moss	TFDE	164000	01/04/2018	2014	9749609	1720	K-Line

DFDE = dual fuel diesel engines, STRH = steam turbine reheat / ultra steam turbine, MEGI = marine electric gas injection, DRL = slow speed diesel, FSRU = vessel with regas capacity, FLNG = floating LNG production unit
Data last updated = 26 April 2017

Name	Segment	Status	Yard	Design	Prop	Capacity	Delivery Date	Ordered	Imo	Hull No	Primary Owner
Mitusi NB 2 Cameron	LNGC	Order	Kawasaki	Moss	STRH	155000	01/04/2018	2014	9759252	1729	MOL
Daewoo 2441	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/04/2018	2014	9766530	2441	BP
Mitsui Cameron Shi NB 1	LNGC	Order	Samsung	Mark III Flex	TFDE	177000	01/05/2018	2014	9760768	2148	MOL
Samsung 2149	LNGC	Order	Samsung	Mark III Flex	TFDE	177000	01/05/2018	2014	9760770	2149	MOL
Mitsui KHI NB 1	LNGC	Order	Kawasaki	Moss	STRH	155000	01/05/2018	2014	9759240	1728	MOL
Daewoo 2432	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/05/2018	2014	9750660	2432	MOL
Daewoo 2430	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/05/2018	2014	9750725	2430	Teekay LNG
Daewoo 2455	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/05/2018	2014	9770945	2455	Teekay LNG
Daewoo 2464	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/05/2018	2015	9785158	2464	Chandris
Mitsubishi Nagasaki 2324	LNGC	Order	Mitsubishi H.I.	Moss	STaGE	165000	01/06/2018	2015	9779226	2324	NYK
Daewoo 2458	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/06/2018	2015	9767950	2458	Maran Gas Maritime
Daewoo 2444	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/06/2018	2014	9766566	2444	BP
Daewoo 2427	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/06/2018	2014	9768382	2427	Dynagas
Hudong-Zhonghua H1665a	LNGC	Order	Hudong-Zhonghua	GT NO 96	TFDE	174000	01/06/2018	2014	9750244	H1665A	Teekay LNG
Samsung 2107	LNGC	Order	Samsung	TZ Mk. III	MEGI	174000	01/07/2018	2013	9709025	2107	Flex LNG
BW Lilac	LNGC	Order	DSME	GT NO 96	MEGI	173000	01/07/2018	2014	9758076	2436	BWGas
Daewoo 2445	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/07/2018	2014	9766578	2445	BP
Samsung 2150	LNGC	Order	Samsung	Mark III Flex	TFDE	177000	10/07/2018	2014	9760782	2150	MOL
Daewoo 2446	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/08/2018	2014	9766580	2446	BP
Mitsubishi Nagasaki 2323	LNGC	Order	Mitsubishi H.I.	Moss	STaGE	180000	01/08/2018	2015	9774628	2323	MOL
Daewoo 2431	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/09/2018	2014	9750737	2431	Teekay LNG
MOL NB 2 Freeport	LNGC	Order	Kawasaki	Moss	STaGE	177000	01/10/2018	2015	9791200	1734	MOL
Mitsubishi Nagasaki 2325	LNGC	Order	Mitsubishi H.I.	Moss	STaGE	165000	01/10/2018	2015	9779238	2325	NYK
Mitsubishi Nagasaki 2326	LNGC	Order	Mitsubishi H.I.	Moss	STaGE	180000	01/10/2018	2015	9796781	2326	NYK
Samsung 2108	LNGC	Order	Samsung	TZ Mk. III	MEGI	174000	31/10/2018	2013	9709037	2108	Flex LNG
Daewoo 2428	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/11/2018	2014	9768394	2428	Dynagas
NYK NB 2 Freeport	LNGC	Order	Kawasaki	Moss	STaGE	177000	01/12/2018	2015	9791212	1735	MOL
Mitsubishi Nagasaki 2327	LNGC	Order	Mitsubishi H.I.	Moss	STRH	180000	01/12/2018	2015	9796793	2327	NYK
Daewoo 2429	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/12/2018	2014	9768526	2429	Dynagas
Daewoo 2456	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/01/2019	2015	9753014	2456	Maran Gas Maritime
Pan Africa	LNGC	Order	Hudong-Zhonghua	GT NO 96	TFDE	174000	01/01/2019	2014	9750256	H1666A	Teekay LNG
Daewoo 2433	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/01/2019	2014	9750749	2433	Teekay LNG
Daewoo 2459	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/01/2019	2015	9767962	2459	Maran Gas Maritime
SK Shipping SK E&S NB1	LNGC	Order	Hyundai Heavy	TZ Mk. III Flex	XDF	180000	01/02/2019	2016	9810549	2937	SK Shipping
Hyundai Samho S856	LNGC	Order	Hyundai Samho	TZ Mk. III	MEGI	174000	01/02/2019	2015	9781918	S856	Teekay LNG
Mitsubishi Nagasaki 2332	LNGC	Order	Mitsubishi H.I.		STaGE	165000	01/02/2019	2015	9810020	2332	Mitsubishi
Samsung 2131	LNGC	Order	Samsung	TZ Mk. III	XDF	174000	01/03/2019	2014	9744025	2131	GasLog
Hyundai Samho S857	LNGC	Order	Hyundai Samho	TZ Mk. III	MEGI	174000	01/03/2019	2015	9781920	S857	Teekay LNG
Mitsubishi Nagasaki 2321	LNGC	Order	Mitsubishi H.I.	Moss	STaGE	177000	01/04/2019	2015	9770438	2321	NYK
Daewoo 2457	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/04/2019	2014	9753026	2457	Maran Gas Maritime
SK Shipping SK E&S NB2	LNGC	Order	Hyundai Heavy	TZ Mk. III Flex	XDF	180000	01/05/2019	2016	9810551	2938	SK Shipping
Mitsubishi Nagasaki 2322	LNGC	Order	Mitsubishi H.I.	Moss	STaGE	177000	01/06/2019	2015	9770440	2322	MOL
Flex Constellation	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/06/2019	2017	9825427	2470	John Fredriksen
Nb Gaslog - Centrica Samsung 2212	LNGC	Order	Samsung	GTT Mark V	XDF	180000	01/07/2019	2016	9816763	2212	GasLog
Flex Courageous	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/08/2019	2017	9825439	2471	John Fredriksen
Hyundai Ulsan 2964	LNGC	Order	Hyundai Heavy	TZ Mk. III Flex	MEGI	180000	01/08/2019	2017	9825568	2964	Knutsen
Samsung 2213	LNGC	Order	Samsung	GTT Mark V	XDF	180000	01/09/2019	2016	9819650	2213	GasLog
Daewoo 2489	LNGC	Order	DSME	GT NO 96	MEGI	173400	01/11/2019	2015	9792606	2489	BWGas
Daewoo 2434	LNGC	Order	DSME	GT NO 96	TFDE - Azipod	172410	01/11/2019	2014	9750672	2434	Teekay LNG
Maran Gas NB1	LNGC	Order	DSME	GT NO 96	MEGI	173400	19/11/2019	2016	9810379	2467	Maran Gas Maritime
Maran Gas NB2	LNGC	Order	DSME	GT NO 96	MEGI	173400	19/11/2019	2016	9810367	2466	Maran Gas Maritime
Trinity J/V (Mitsui & Co.)	LNGC	Order	Imabari	GTT Mark III Flex	MEGI	178000	01/01/2020			TBN	K-Line
Imabari Saijo 8200	LNGC	Order	Imabari		MEGI	178000	01/10/2021	2015	9778923	8200	Trinity LNG Transport SA

DFDE = dual fuel diesel engines, STRH = steam turbine reheat / ultra steam turbine, MEGI = marine electric gas injection, DRL = slow speed diesel, FSRU = vessel with regas capacity, FLNG = floating LNG production unit
Data last updated = 26 April 2017

WORLD SMALL SCALE LNG FLEET*

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
1974	Seagas	187	LNG	Sweden	Yes	AGA
1988	Kayoh Maru	1,517	LNG	Japan	Yes	Daiichi
1993	Aman Bintulu / Lucia Ambition	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1996	Surya Aki	19,475	LNG	Indonesia - Japan	Yes	MCGC
1997	Aman Sendai	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1998	Aman Hakata	18,800	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
2000	Triputra (ex Surya Satsuma)	23,096	LNG	Indonesia - Japan	Yes	MCGC
2003	Pioneer Knutsen	1,100	LNG	Norway	Yes	Knutsen
2003	Shinju Maru No.1	2,540	LNG	Japan	Yes	Shinwa
2005	North Pioneer	2,500	LNG	Japan	Yes	Japan Liquid Gas
2007	Sun Arrows	19,531	LNG	Malaysia - Russia - Japan	Yes	Mitsui
2008	Kakurei Maru	2,536	LNG	Japan	Yes	Hogaki Zosen
2008	Shinju Maru No.2	2,540	LNG	Japan	Yes	Shinwa
2009	Coral Methane	7,551	LNG/LPG/Ethylene	Northwest Europe/Baltics	Yes, sometimes	Anthony Veder
2010	Norgas Creation	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2010	Norgas Innovation	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Akebono Maru	3,556	LNG	Japan	Yes	Chuo Kaiun
2011	Norgas Bahrain Vision	12,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Norgas Conception	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Norgas Invention	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Norgas Unikum	12,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2012	Coral Energy	15,600	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2013	Coral Anthelia	6,500	LNG/Ethylene			Anthony Veder
2013	JX Energy TBN	2,500	LNG	Japan	Yes	JX Energy
2013	Kakuyu Maru	2,500	LNG	Japan	Yes	Tsurumi Sunmarine
2014	LNG-Oil combi**	2,000	LNG	Germany	Yes	Veka
2014	Short Sea LNG Tanker **	4,000	LNG	Germany	Yes	Veka
2015	10 small carriers TBN**	5,000	LNG			Bimantara Group
2015	Jahre TBN**	6,200	LNG	Norway	Yes	Donsotank/Jahre Marine
2015	JS Ineos Ingenuity	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Insight	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Intrepid	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	LNG bunker barge 1†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG bunker barge 2†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG bunker barge 3†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG Inland bunker**	800	LNG	Germany	Yes	Veka
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	PetroChina TBN	30,000	LNG	China		PetroChina
2015	TBN	14,000	LNG	China	Yes	Zhejiang Huaxiang
2015	TBN 1	27,500	LNG	China?		Danyang?
2015	TBN 2	27,500	LNG	China?		Danyang?
2015	TBN 3	27,500	LNG	China?		Danyang?
2016	Clean Jacksonville	2,200	LNG	US Coast	Yes	CME
2016	Dalian TBN	28,000	LNG	China	Yes	Dalian Inteh Group
2016	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
2016	JS Ineos Indepence	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Innvovation	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Inspiration	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	LNG Prime	2,250	LNG	Northwest Europe	Yes	Veka Deen LNG
2016	Navigator Aurora	35,000	Ethane/Ethylene	Markus Hood - Stenungsund	Ethane, for Borealis	Navigator
2016	Gaschem Beluga	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2016	Gaschem Orca	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services

For more information please visit http://small-lng.com
*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less
TBN = To Be Nominated indicates ships are still at construction/planning stage
** = project shelved † =Data to be verified Data last updated = 24th May 2017

Small-LNG.com

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
2016	Ocean Yield TBN**	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2016	Shell Bunker Barge TBN 1	6,500	LNG	Northwest Europe	Yes	Shell
2016	Shell Bunker Barge TBN 2	6,500	LNG	Northwest Europe	Yes	Shell
2016	Shell Bunker Barge TBN 3	6,500	LNG	Northwest Europe	Yes	Shell
2016	Shell Bunker Barge TBN 4	3,000	LNG	Northwest Europe	Yes	Shell
2017	Yuan He 1	30,000	LNG	China	Yes	CSR
2017	ENGIE Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	Coral EnergICE	18,000	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2017	Coralius	5,800	LNG	Northwest Europe/Baltics	Yes, for Skangas	Anthony Veder
2017	JS Ineos Invention	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	JS Ineos Intuition	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	Navigator Eclipse	35,000	Ethane/Ethylene	US	Ethane	Navigator
2017	Navigator Nova	35,000	Ethane/Ethylene	US	Ethane	Navigator
2017	Navigator Prominence	35,000	Ethane/Ethylene	US	Ethane	Navigator
2018	Bernhard Schulte TBN	7,500	LNG	Baltic	Yes	Bernhard Schulte
2018	CME TBN†	2,200	LNG	US Coast	Yes	CME
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2021	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas

For more information please visit http://small-lng.com
*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less
TBN = To Be Nominated indicates ships are still at construction/planning stage
** = project shelved † =Data to be verified Data last updated = 24th May 2017

Small-LNG.com