

LNG Shipping News

AN LNG JOURNAL TITLE ON LNG CARRIERS

24 January 2019

Putin inaugurates Russia's first FSRU

A commissioning ceremony for the FSRU 'Marshal Vasilevskiy' was held recently in the Kaliningrad Region attended by Russian President, Vladimir Putin.

Earlier, Gazprom had developed the Kaliningradskoye underground gas storage (UGS) facility and increased the throughput capacity of the Minsk/ Vilnius/ Kaunas/ Kaliningrad gas pipeline, which was the only route for gas deliveries to Russia's westernmost entity until now.

In order to further enhance energy security in the Kaliningrad Region taking into account its strategic location, Gazprom embarked on another gas supply project focused on LNG deliveries by sea.

As a result, a gas receiving terminal based in the Baltic Sea with onshore connections was built in the Kaliningrad Region.

A key component of the terminal



Russian President Vladimir Putin recently inaugurated the country's first FSRU near Kaliningrad

is a fixed marine berth with a surrounding breakwater, located 5 km from the shore in a water depth of about 19 m, at which the FSRU is moored.

'Marshal Vasilevskiy' is currently

the only FSRU operating in Russia. She has a capacity of 174,000 cu m and will handle up to 3.7 bill cu m of gas annually.

Once processed, the gas will be fed into the existing gas transmission system via a new 13 km long connecting gas pipeline.

The FSRU has been fitted with three regasification lines, including one as a backup. The Arc4 Ice Class vessel also has the ability to independently navigate in ice with a thickness of up to 0.8 m.

“In order to further enhance energy security in the Kaliningrad Region ... Gazprom embarked on another gas supply project focused on LNG deliveries by sea.”

LNGC spot rates fall

The LNGC spot charter rate has fallen below \$80,000 per day in the Pacific region for the first time since late August.

Fearnleys assessed the Pacific spot rates at \$70,000 per day this week and \$85,000 per day for a 12-month timecharter.

This rate drop came after the market hit a record high of \$190,000 per day during the

fourth quarter of last year for spot LNGCs available in Asia.

Illustrating the rate drop, Cheniere was believed to have sublet the 'Lena River' for around \$68,000 per day for a spot reload from Kochi, India. Unipac was also recently thought to have fixed a Shell or Cool Pool vessel in the mid-\$70,000s to \$80,000 per day for an early APLNG loading.

Prior to that, ExxonMobil was said to have fixed the 'British Partner' or 'British Achiever' for a 6th -10th February Gorgon or PNG cargo, for in the region of \$90,000s per day.

Elsewhere, broking sources also reported that the 65,000 cu m 'LNG Portovenere' had been fixed to ENI for five years at \$37,500 per day.

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Small-scale LNGCs to use Wilhelmshaven FSRU

German utility company Uniper and Dutch-based Titan LNG have signed a Memorandum of Understanding (MOU) to accelerate the growth of LNG as a fuel in Germany by offering small-scale shipments at Wilhelmshaven.

Both companies said that they plan to develop a technical interface and commercial products for small-scale LNG players at the Wilhelmshaven FSRU terminal.

As a result, the FSRU will be adapted to allow the loading of small seagoing LNGCs and barges. In addition, several truck

loading bays are planned to enable the onward transport of LNG by road.

Suitable location

With its proximity to the Jade Weser Port, Bremerhaven and the German Bight, Wilhelmshaven is claimed to be a suitable location to supply

LNG for all downstream markets and in particular for marine fuels.

Keith Martin, Member of Uniper's Executive Board and CCO, said: "The agreement with an experienced and established market player in the small-scale LNG sector such as Titan LNG is another important step for the FSRU Wilhelmshaven project.

"Titan LNG has extensive knowhow in the development of attractive products for customers in this segment. With Wilhelmshaven, we offer a first-class location for supplying the shipping and road fuel markets with LNG. With this co-operation, the FSRU Wilhelmshaven project can make an important contribution to reducing CO2 and pollutant emissions," he said.

Niels den Nijs, Titan LNG CEO, added: "Titan LNG is pleased that we can contribute the knowhow

we have built up over the last six years to this project for the LNG downstream market. We believe that the short distances to the markets will help to boost LNG as a fuel. Our existing and future customers will benefit from the economic and environmental advantages of this fuel."

Uniper is currently developing the FSRU project at Wilhelmshaven, which will have a natural gas send-out capacity of 10 bill cu m per year and an LNG storage capacity of more than 263,000 cu m.

The terminal is scheduled to become operational in the second half of 2022. In December, 2018, Uniper signed a MOU with Mitsui OSK Line (MOL) to own, finance and operate the FSRU.

Uniper also said that it is currently co-ordinating the permits for the operation of the facility with the relevant authorities. ■



Uniper and Triton are to offer small-scale shipments from the Wilhelmshaven FSRU terminal

Bangladesh terminal to start up in March

Bangladesh's second LNG terminal is expected to start operations in mid-March.

However, domestic pipeline constraints mean that it will be unable to fully supply gas demand to the country's capital Dhaka, according to a Reuters report.

Summit Corp, a subsidiary of Bangladesh's Summit Holdings, and partner Mitsubishi Corp are expected to start FSRU operations by the middle of March, ahead of schedule.

Construction delays on a pipeline that will carry the regasi-

fied gas from the coastal city of Chattogram, near where the FSRU will be moored, to Dhaka will mean that the vessel will not be fully utilised.

Until the pipeline is fully connected, the FSRU will handle about 300 mill cu ft per day of gas, which will be supplied to the Chattogram area, according to Reuters sources. The FSRU will be able to regasify up to 500 mill cu ft per day, according to Summit.

Once the pipeline is completed, state-owned energy company Petrobangla will be able to send up to 1,000 mill cu ft per day from both the Summit FSRU and another FSRU operated by Excelerate that started operations last August.

Summit LNG's FSRU will be located about 6 km off the island of Moheshkali in the Cox's Bazar district of the Chattogram division.

The planned LNG import vol-

ume of the project is about 3.5 mill tonnes a year, which will double the country's LNG import capacity to 7.5 mill tonnes per year once fully operational.

Bangladesh had scrapped plans to build additional floating LNG terminals in favour of land-based solutions after the start-up of Excelerate's FSRU was delayed by several months, due to technical problems and bad weather, Reuters reported. ■

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Gastech to explore eight industry trends

At the forthcoming Gastech exhibition and conference, eight key industry trends will drive its conference programme, due to be held in Houston on 17th-19th September this year.

The eight key industry trends are:

1) The new geopolitics of energy: The vast and fast paced changes in the energy sector mean organisations across the value chain are having to navigate challenges arising at the nexus of energy and geopolitics, such as the 2020 IMO emissions cap and the North American shale revolution.

2) Security of demand: If the industry of old used to only compete for access to resources, the sector of the future will have to compete for access to customers. What are the new business models for a new energy landscape?

3) Downstream evolving: With gas playing an ever-more strategic role as a fuel for industrial processes, it's certain to become a new era of technical partnerships and joint ventures. CO2 recycling, the future energy supplier landscape and meeting the growing

demand of ethane are some of the topics to be discussed in Houston.

4) The emerging role of the trading houses: The recent rise in flexible supplies means more trading opportunities, as uncontracted cargoes need a home. In 2017, the number of LNG spot cargoes sold reached 1,100 for the first time. Contracts, trading and pricing will all be put under the spotlight at Gastech 2019.

5) Future proofing the operating model: Companies need to innovate at scale to create intelligent organisations equipped to compete for future customers. The technical programme will study advances in equipment and technology that can improve predictability, productivity and efficiency at all stages of the upstream value chain.

6) Implementing a workforce and talent model fit for the future: Workforce strategies to re-

cruit, develop and retain the right talent will be analysed to support those employees needing to work in new ways, develop new skills and work with a wider range of technologies.

7) New commercial constructs to promote investment: The development of destination free and gas indexed US LNG exports challenges the traditional features of fixed delivery, oil-indexed supply agreements. Sellers need lasting agreements, but buyers now want shorter, flexible deals. What new business models can help, and what does the future energy supplier landscape look like?

8) Greater industry wide collaboration: Whilst the industry has been conservative in its approach and pace of adoption of partnership concepts that are widely proven elsewhere, the pivot to the 'new' in the industry will provide

plenty of opportunities for greater industry wide collaboration when it comes to local content, HSSE and CSR.

"The conference at Gastech is renowned for its quality, breadth and expertise. It's a celebration of the projects, research, innovations and leadership teams that are successfully driving and progressing the upstream, midstream and downstream value chains for the global gas, LNG and energy industries. We want to hear from all those working at the cutting edge of both commercial and technical energy production. A place on the Gastech programme represents an unparalleled opportunity for speakers to share their vision, gain international recognition and position themselves at the forefront of the global energy transition," said Jenny Kelly, Gastech Conference Director. ■

NYK and JERA name new LNGCs

This month saw the holding of naming ceremonies for two NYK controlled LNGCs in Japanese shipyards.

Both were built to lift JERA cargoes.

On 17th January, a naming ceremony was held at the Sakaide shipyard of Kawasaki Heavy Industries for a new LNGC.

The 177,277 cu m DFDE 'Shinshu Maru' was built for a joint venture between NYK and JERA - Trans Pacific Shipping 7 - formed in 2015.

She will be delivered in February, 2019 and assigned to transport LNG for 20 years from the Freeport LNG Project in Texas, US, in which JERA has an equity interest. NYK will be responsible for technical management of the vessel.

This followed the naming ceremony held a week earlier by MOL and JERA for Trans Pacific Shipping 5's MOSS-type 'Nohshu Maru' at the Nagasaki Shipyard & Machinery Works of Mitsubishi

Heavy Industries.

'Nohshu Maru' is the second MOL LNGC to feature the MHI-designed Sayarango cargo tank.

She is also fitted with MHI's hybrid dual-shaft steam turbine

and gas engines (STaGE) propulsion system.

The 177,300 cu m vessel will transport gas from the US Freeport LNG project, plus from other exporters for JERA. ■



'Shinshu Maru' was one of two LNGCs recently named at Japanese shipyards for NYK

NEWS NUDGE

Philippine terminal

Tanglawan Philippine LNG has been granted a 'Notice to Proceed' by the Philippine Department of Energy to build an LNG terminal at Batangas.

The company plans to break ground this year for the regasification and receiving terminal with a capacity of 2.2 mill tonnes per annum. Commercial operations are scheduled to start by 2023.

This facility will help support the demand for gas in Luzon and contribute to the sustainable development of the Philippine economy, one of the partners, Phoenix Petroleum said.

A possible joint venture arrangement for Tanglawan Philippine LNG is currently being discussed between CNOOC Gas and Power Group and Phoenix Petroleum. ■

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GasLog unveils details of long-term charters

GasLog has provided further details on the new charter party agreements with a wholly owned subsidiary of Cheniere Energy, originally announced at the end of last year.

To fulfil the seven year charters, two 180,000 cu m LNGCs (HN 2311 and HN 2312) with low pressure two stroke (LP-2S) propulsion and GTT Mark III Flex + cargo containment systems were ordered from Samsung Heavy Industries, with expected delivery in mid-2021.

The latest charters build on GasLog's existing relationship with Cheniere, which now totals four LNGCs on order and the GasLog Partners owned 'GasLog Sydney', which is currently on a multi-year timecharter to the US-based LNG exporter.

The charter rates are broadly equivalent to mid-cycle rates and delivers returns in line with GasLog's financial strategy, GasLog said.

Vessels' dropdown

GasLog Partners has the right to acquire the vessels once on charter pursuant to the omnibus agreement between GasLog and GasLog Partners. As a result, GasLog Partners' potential dropdown pipeline will increase to 12 LNGCs with charter lengths of five years or longer and the Partner-

ship was claimed to be well positioned to announce a further dropdown acquisition within the first quarter of 2019.

Paul Wogan, GasLog CEO, stated, "I am delighted to build further on our existing relationship with Cheniere. The four newbuilds that we now have on order for them will provide further support for their leading position in US LNG exports.

"We announced seven newbuild orders in 2018, all equipped with the latest advancements in propulsion and boil-off technology.

Six of these newbuilds have long-term charters attached, cementing our status as a leading owner and operator of LNG carriers.

"Attractive LNG shipping market fundamentals, the strong liquidity position of the GasLog group and increasing debt capacity, due to scheduled amortisation underpin the funding strategy for our newbuild programme. As a result of our activities in 2018, we have made substantial progress towards meeting our target of more than doubling consolidated EBITDA over the 2017-2022 period," he said. ■

MOL introduces VSAT on LNGCs

Mitsui OSK Lines (MOL) is to increase the roll-out of Inmarsat's Fleet Xpress Service, across the remainder of its owned and managed fleet, including LNGCs.

The Japanese shipping giant was among the earliest adopters of Fleet Xpress; deploying Inmarsat's global high-speed broadband connectivity on the majority of its car carriers in 2016, shortly after the launch of the service and currently has over 100 vessels installed.

MOL will now install Fleet Xpress across its managed and owned fleet including LNGCs.

Inmarsat's Fleet Xpress has emerged as the market-leading pathway to digital transformation, which is being adopted by shipping companies in order to deliver improved vessel and fleet efficiency, boost profitability and enhance seafarer wellbeing, the satellite provider claimed.

The fleet-wide commitment aligns strongly with MOL's recently disclosed plans to scale up its digital activities. MOL said that it saw the Internet of Things (IoT), combined with advanced data analytics, as offering huge potential for improvements in safety, efficiency and environmental impact, driven by guaranteed, continuous connectivity on board its ships.

"There is no doubt MOL

believes that digital technology can have a profound impact on vessel operations and its broader business objectives. Fleet Xpress lays the foundation for the successful realisation of its smart-shipping ambitions by bringing together greater bandwidth and high resilience in a seamless, fully-managed service," said Inmarsat's Maritime President, Ronald Spithout.

Illustrating the types of project that will only be enabled through satellite communication connectivity has been MOL's partnership with Mitsui E&S Shipbuilding and Weathernews on the new Fleet Optimal Control Unified System (FOCUS) platform.

Analysis tools

In its initial stages, FOCUS will see detailed voyage and engine data gathered from 150 vessels and stored in the cloud, where it will be available to build analysis tools for improving operational efficiency and propulsion performance.

MOL commented: "As Satellite communications technology has grown dramatically over the past

decade, we have adopted VSAT from an early stage, for email communication and sharing of images between ship to shore and now we can also monitor equipment.

"The continued roll-out of Fleet Xpress will help implement our forecast maintenance solutions through our FOCUS platform and we will continue to develop our use of satellite communication in the future to help to continue to digitalise our vessels," he said.

New engine health monitoring and fault diagnostics, 'digital twins' that streamline vessel maintenance management, augmented reality and other remote visualisation techniques that enrich ship/shore interactions are among a range of ideas under consideration.

"Reliable connectivity between ship and shore is critical for these tools to work to maximum effect," Spithout added. "Fleet Xpress meets the requirement through its unique, fully integrated dual capability of high-speed, high-capacity link on Ka-band together with high reliability back-up services on L-band." ■

NEWS NUDGE

Driftwood moves closer

On 18th January, the US Federal Energy Regulatory Commission (FERC) issued the final Environmental Impact Statement (EIS) for Tellurian's Driftwood LNG project.

The proposed Driftwood project will be a 27.6 mill tonne per annum LNG export facility with an associated 96-mile pipeline, near Lake Charles, Louisiana, on the US Gulf Coast.

Tellurian President and CEO, Meg Gentle, said, "Tellurian thanks the FERC for a thorough review and for remaining on schedule. We look forward to receiving the agency's order granting authorisation to site, construct and operate our Driftwood project.

"Tellurian will then stand ready to make a final investment decision (FID) and begin construction in the first half of 2019, with the first LNG expected in 2023." ■

'Coral Methane' bunkers 'AIDAnova'

On 16th January, 2019, the converted small-scale LNGC 'Coral Methane' carried out her first LNG bunkering operation on the world's first LNG-powered cruise ship at Tenerife.

She fuelled 'AIDAnova', the latest ship from AIDA Cruises, which is the cruise industry's first ship to be powered at sea and in port by LNG.

'Coral Methane' is a 7,500 cu m vessel that was modified from an ethylene/LNGC to an LNG bunker vessel for Shell, which is supplying the LNG.

"We believe LNG is today's most sustainable marine fuel. The delivery of 'Coral Methane' as an

LNG bunker vessel, in partnership with Shell, underlines our dedication to LNG and marks the next step in our contribution to a sustainable supply chain," said Klaas Kerssemakers, Anthony Veder COO. "The success of this project is due to an excellent co-operation with all parties involved, from the engineering phase up to and including our first LNG bunkering operation."

The modification project, man-

aged by Anthony Veder, took 12 months and required the relevant bunkering licenses for the various ports. To guarantee safe bunkering operations, the crew was familiarised with all the necessary equipment and procedures together with employees of Shell and AIDA Cruises, along with Carnival Corp, AIDA's parent company.

'Coral Methane' was built in 2009 and was fitted with Azipull thrusters that give the vessel high manoeuvrability and fuel efficiency. Modifications, such as the hose transfer system fitted enables the vessel to perform safe bunkering operations while the boil-off gas management system provides a sustainable solution for efficient use of natural gas and carbon emission reductions.

The project also involved a review of all necessary operational procedures to ensure compliance with the SGMF (Society for Gas as Marine Fuel) recommendations and guidelines, Anthony Veder said.

Before arriving in Tenerife, 'Coral Methane' carried out berthing trials at Gibraltar's new LNG power plant, which is to be fuelled by sea.



The converted small-scale LNGC 'Coral Methane' recently bunker the LNG powered 'AIDAnova' at Tenerife.

ASRY partners with NOGA to serve Bahrain LNG

ASRY, the Bahrain-based maritime repair and fabrication facility, has signed a contract with Bahrain's National Oil & Gas Authority (NOGA) to provide a dedicated marine services area at the yard.

The 'NOGA Zone' will provide berthing, storage, crew facilities, and more, within ASRY's premises, for NOGA-related projects. For example, the Bahrain LNG Terminal project will soon be using the NOGA Zone for some of its maritime operations, as required, the yard said.

"We're honoured to support NOGA and their projects in bringing added value and growth to the Kingdom of Bahrain," said ASRY Business Development Manager, Arran Dall. "For a major Bahrain firm like ASRY to contribute to other nationally important projects, such as the new Bahrain LNG Terminal, not only makes commercial sense, but also national sense for the mutual development of the Kingdom."

"Working together with Bahrain corporate partners is a win-win situation," added NOGA General Manager Oil & Gas Affairs, Jassim Al Shirawi. "As we develop and advance, co-operation and support of local value-providers will support the Bahrain's economy and make the Kingdom's industrial sector more competitive internationally."

LNGCs to be used to train UK cadets

The search for the next generation of UK seafarers has been launched thanks to a project involving Glasgow-based Teekay Shipping and London's Trinity House.

Its aim is to recruit cadets from across the UK to undertake a three or four year training programme, which on successful completion could lead to a permanent role with Teekay, either on board or ashore.

This project will be administered by Chiltern Maritime, a cadet management company who specialises in marine cadetships. Chiltern Maritime will oversee all aspects of the training through Trinity House, whilst cadets will also gain valuable hands on experience with Teekay on board one of its LNGCs.

Cadets will also have access to Teekay's simulation centre in Glasgow covering ship handling; navigation; bridge teamwork; ship-to-ship

interactions; cargo operations; heavy traffic situations, and harsh weather conditions.

Chris McDade, Teekay Shipping's Director of Marine HR, said: "Our new UK cadet programme is a fantastic opportunity for those looking to pursue a rewarding career within the maritime industry.

"With over 40 vessels in our fleet, now is the perfect time for us to be recruiting the next generation of seafarers to help support the great work that our team is currently doing across the world. We are thrilled to be working in collaboration with Trinity House who have an excellent reputation of attracting the highest calibre of talent through their various

education programmes.

"We hope that the programme will not only appeal to those who are studying nearby to us in Glasgow but also that it will appeal to those across the UK who have an interest in pursuing a career in an exciting yet competitive global industry," he said.

Nigel Hope, Trinity House Director of Maritime Training, added "We are delighted to be working in collaboration with highly regarded shipping companies. This will give our cadets the opportunity is gaining the necessary on board training to qualify for the OOW certification and go on to rewarding careers at sea or in the wider maritime industries ashore."

NEWS NUDGE

Newbuilding news

Brokers have reported that MOL has ordered two 174,000 cu m LNGCs at DSME on the back of Uniper charters for 2021 deliveries.

In addition, DSME was also thought to have won orders for another three 173,400 LNGCs from Alpha Gas, bringing the Greek owner's total up to five newbuildings.

The price was said to be \$185 mill each and the vessels are also set for delivery in 2021.

In addition, the three TMS Cardiff Gas orders reported recently were said to have cost \$179 mill per ship.

Elengy to sell Fos terminal capacity

French energy company, Elengy is preparing to sell Fos Tonkin LNG terminal's access capacities during 2021-2030.

Under the plan, Elengy will offer its potential customers several types of services, including the conventional unloading of Medmax-type LNGCs with a capacity of 75,000 cu m, the reloading of small-scale LNGGCs for bunkering purposes, as well as LNG truck loading.

The sale will be launched next month.

Detailed information concerning the services offered will be provided in the information memorandum at the opening of the sale, Elengy said.

An expert in LNG for over 50 years, Elengy owns the Fos Tonkin LNG terminal and is a 72.5% shareholder in Fosmax LNG, owner of the Fos Cavaou LNG terminal.

GTT meets with more success

GTT has received orders from Samsung Heavy Industries (SHI) for the tank design for two LNGCs ordered by GasLog and two for NYK.

The GasLog newbuildings will each have a capacity of 180,000 cu m and the tanks will be fitted

N-KOM docks first FSRU

Nakilat-Keppel Offshore & Marine (N-KOM)'s first FSRU recently arrived at the Erhama Bin Jaber Al Jalahma Shipyard for drydocking, maintenance and upgrades.

During the drydocking, the FSRU will undergo modifications and the retrofitting of new systems, including the installation of a ballast water treatment system (BWTS). To date, N-KOM has completed six BWTS installations on various types of vessels, such as LNG and LPG carriers, as well as on VLCCs.

Nakilat CEO, Eng Abdullah Al Sulaiti, said: "We are proud to be entrusted with this repair project from our partner Excelsate Energy (USA), which is made even more significant since it is the first FSRU to be repaired at our shipyard. This goes to show the remarkable progress the shipyard has made since it first began operations in 2011 to where it is today - a centre of excellence for marine repairs and offshore fabrication that has safely and reliably delivered more than 880 projects to clients worldwide."



The giant N-KOM repair facility recently docked its first FSRU

Excelsate Energy's Managing Director, Steven Kobos, said: "Over the past months, we have enjoyed a fruitful working relationship with Nakilat and this is today strengthened by the award of the FSRU repair project to their world class shipyard, prior to its deployment in Bangladesh. We look forward to the growing partnership between both companies and the successful delivery of the project."

Last week, Nakilat's FSRU

'Exquisite' achieved a milestone by completing the 200th ship-to-ship LNG transfer at the Engro Elengy terminal (EETL) in Pakistan's Port Qasim. Nakilat acquired a 55% interest in the FSRU last year, after forming a joint venture with Excelsate Energy-USA. This strategic acquisition paved the way for Nakilat to widen its international footprint and take its first step into a new business segment. ■

Guidance on near shore LNG mooring systems

DNV GL has issued guidance addressing the challenges specific to long-term mooring of floating installations in shallow water and near shore applications.

In recent years, FSRUs have been increasingly used as LNG import terminals, and this trend is likely to continue as it provides a relatively quick and inexpensive solution for gas import compared to onshore installations.

Onshore installations can take years to implement, from planning and permitting through to construction. And while new land-based LNG projects are often met with scepticism from the public that can be hard to overcome, floating installations are rarely questioned, DNV GL said.

In nearly all cases they are located close to or directly on the shore, and quite frequently they

are expected to remain at the same location for a long period of time - anything from five to 20 years. Similarly, near shore floating units also provide a ready means of exporting land-based gas in the form of LNG.

Near shore floating units differ significantly from long-term offshore mooring, which is addressed by DNVGL-OS-E301, and from shorter-term mooring common in the general shipping industry, as addressed by codes developed by OCIMF and SIGTTO.

This prompted DNV GL to develop a new Offshore Technical Guidance - OTG 18 - Guidance for long-term nearshore mooring systems. Conn Fagan, Vice President

Business Development Offshore Classification at DNV GL Maritime, explained: "This new Offshore Technical Guidance clarifies our approach to the specific challenges of long-term nearshore and inshore mooring. We have issued this document as a supplement to our existing Offshore Standard for Position Mooring Systems, DNVGL-OS-E301.

"The document is intended to be used in all applications involving longer-term mooring in shallow water, at jetties or at the dockside. This would typically include floating LNG regasification units, floating LNG liquefaction units taking gas from shore, and floating storage units," Fagan added. ■

with the Mark III Flex+ containment system.

The vessels' delivery is expected for Q2 and Q3 of 2021, respectively, GTT said.

Earlier, GTT had announced that SHI had contracted the tank design of two new 174,000 cu m LNGCs ordered by NYK.

These tanks will be fitted with

the Mark III Flex membrane containment system.

The vessels' deliveries are scheduled between the third and the fourth quarters of 2021 ■

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WORLD LNG CARRIER ORDERBOOK

Name	Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
Jmu Tsu 5072	JMU	SPB	165000	TFDE	Mar-19	Feb-14	MOL
Jmu Tsu 5073	JMU	SPB	165000	TFDE	Jul-19	Feb-14	MOL
Jmu Tsu 5071	JMU	SPB	165000	TFDE	Mar-19	Feb-14	NYK
Gaslog Gladstone	Samsung	TZ Mk. III	174000	XDF	Jan-19	May-14	GasLog
Maran Gas Syros	DSME	GT NO 96	173400	MEGI	Apr-19	Jun-14	Maran Gas Maritime
Daewoo 2430	DSME	GT NO 96	172000	TFDE - Azipod	Jul-19	Jul-14	Teekay LNG
Daewoo 2431	DSME	GT NO 96	172000	TFDE - Azipod	Aug-19	Jul-14	Teekay LNG
Daewoo 2433	DSME	GT NO 96	172000	TFDE - Azipod	Oct-19	Jul-14	Teekay LNG
Daewoo 2434	DSME	GT NO 96	172000	TFDE - Azipod	Nov-19	Jul-14	Teekay LNG
Daewoo 2432	DSME	GT NO 96	172410	TFDE - Azipod	Sep-19	Jul-14	MOL
Kawasaki Sakaide 1729	Kawasaki	Moss	155000	TFDE	Dec-19	Sep-14	MOL
Samsung 2150	Samsung	GTT Mark III Flex	174000	XDF	Jan-19	Oct-14	MOL
British Mentor	DSME	GT NO 96	173400	MEGI	Feb-19	Nov-14	BP
British Sponsor	DSME	GT NO 96	173400	MEGI	Mar-19	Nov-14	BP
Daewoo 2444	DSME	GT NO 96	173400	MEGI	Jan-19	Nov-14	BP
Nikolay Zubov	DSME	GT NO 96	172410	TFDE - Azipod	Mar-19	Dec-14	Dynagas
Mitsubishi Nagasaki 2322	Mitsubishi H.I.	Moss	177000	STaGE	Sep-19	Jan-15	MOL
Marvel Crane	Mitsubishi H.I.	Moss	177000	STaGE	Dec-18	Jan-15	NYK
Mitsubishi Nagasaki 2323	Mitsubishi H.I.	Moss	177000	STaGE	Jan-19	Mar-15	MOL
Maran Gas Chios	DSME	GT NO 96	173400	MEGI	Jan-19	Jun-15	Maran Gas Maritime
Maran Gas Hydra	DSME	GT NO 96	173400	MEGI	Jan-19	Jun-15	Maran Gas Maritime
Hyundai Samho S856	Hyundai Heavy	TZ Mk. III	174000	MEGI	Jan-19	Jun-15	Teekay LNG
Yamal Spirit	Hyundai Heavy	TZ Mk. III	174000	MEGI	Jan-19	Jun-15	Teekay LNG
Daewoo 2489	DSME	GT NO 96	173400	MEGI	Nov-19	Sep-15	BWGas
Shinshu Maru	Kawasaki	Moss	177000	STRH	Feb-19	Sep-15	MOL
Sohshu Maru	Kawasaki	Moss	177000	STRH	Jul-19	Sep-15	MOL
Diamond Gas TBN	Mitsubishi H.I.	Moss	165000	STaGE	May-19	Nov-15	Mitsubishi
Bushu Maru	Mitsubishi H.I.	Moss	180000	STaGE	Jun-19	Nov-15	NYK
Nohshu Maru	Mitsubishi H.I.	Moss	180000	STaGE	Feb-19	Nov-15	NYK
Hyundai Ulsan 2937	Hyundai Heavy	GTT Mark III Flex	180000	XDF	Apr-19	May-16	SK Shipping
Hyundai Ulsan 2938	Hyundai Heavy	GTT Mark III Flex	180000	XDF	Jul-19	May-16	SK Shipping
Daewoo 2466	DSME	GT NO 96	173400	MEGI	Oct-19	Jun-16	Maran Gas Maritime
Daewoo 2467	DSME	GT NO 96	173400	MEGI	Nov-19	Jun-16	Maran Gas Maritime
Samsung 2213	Samsung	GTT Mark III Flex	180000	XDF	Jun-20	Sep-16	GasLog
Daewoo 2469	DSME	GT NO 96	173400	MEGI	Apr-20	Dec-16	Maran Gas Maritime
Hyundai Ulsan 2964	Hyundai Heavy	GTT Mark III Flex	180000	MEGI	May-19	Mar-17	Knutsen
Flex Constellation	DSME	GT NO 96	173400	MEGI	Jun-19	Mar-17	Flex LNG
Flex Courageous	DSME	GT NO 96	173400	MEGI	Aug-19	Mar-17	Flex LNG
Hyundai Ulsan 2963	Hyundai Heavy	GTT Mark III Flex	180000	MEGI	Jun-19	May-17	Knutsen
MOL HUDONG-ZHONGHUA 1/4	Hudong-Zhonghua	GT NO 96	174000	MEGI	Dec-19	Jul-17	MOL
MOL HUDONG-ZHONGHUA 2/4	Hudong-Zhonghua	GT NO 96	174000	MEGI	Mar-20	Jul-17	MOL
MOL HUDONG-ZHONGHUA 3/4	Hudong-Zhonghua	GT NO 96	174000	MEGI	Jul-20	Jul-17	MOL

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Name	Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
MOL HUDONG-ZHONGHUA 4/4	Hudong-Zhonghua	GT NO 96	174000	MEGI	Oct-20	Jul-17	MOL
Gaslog Windsor	Samsung	GTT Mark III Flex	180000	XDF	Jul-19	Dec-17	GasLog
Daewoo 2478	DSME	GT NO 96	173400	MEGI	May-20	Dec-17	Maran Gas Maritime
HHI NYK/EDF	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Apr-20	Jan-18	NYK
HHI / Total	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-20	Jan-18	Cardiff Marine
HHI / Total / Sovc	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-20	Jan-18	Sovcomflot
DSME 2490	DSME	GT NO 96	173400	MEGI	Feb-20	Feb-18	BWGas
DSME 2491	DSME	GT NO 96	173400	MEGI	May-20	Feb-18	BWGas
HHI / Cardiff #1	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-20	Feb-18	Cardiff Marine
HHI / Cardiff #2	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-20	Feb-18	Cardiff Marine
DSME 2479	DSME	GT NO 96	173400	MEGI	Aug-20	Feb-18	John Fredriksen
DSME 2480	DSME	GT NO 96	173400	MEGI	Sep-20	Feb-18	John Fredriksen
Flex America	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Aug-20	Mar-18	Flex LNG
Flex Aurora	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-20	Mar-18	Flex LNG
SHI Gaslog #1	Samsung	GTT Mark III Flex	180000	XDF	Jun-20	Mar-18	GasLog
Samsung 2271	Samsung	GTT Mark III Flex	174000	XDF	Apr-20	Mar-18	Cardiff Marine
DSME Minerva #1	DSME	GT NO 96	173400	MEGI	Mar-21	Mar-18	Minerva Marine
DSME Minerva #2	DSME	GT NO 96	173400	MEGI	Jul-21	Mar-18	Minerva Marine
Hyundai Ulsan 3086	Hyundai Heavy	GTT Mark III Flex	180000	MEGI	Jun-20	Mar-18	Knutson
DSME 2483	DSME	GT NO 96	173400	MEGI	Oct-20	Mar-18	Alpha Gas
DSME 2484	DSME	GT NO 96	173400	MEGI	Dec-20	Mar-18	Alpha Gas
SHI Gaslog #2	Samsung	GTT Mark III Flex	180000	XDF	Sep-20	May-18	GasLog
Maran Gas DSME	DSME	GT NO 96	173400	MEGI	Oct-20	Jun-18	Maran Gas Maritime
DSME 2487	DSME	GT NO 96	173400	TFDE	Apr-21	Jun-18	Maran Gas Maritime
DSME 2485	DSME	GT NO 96	173400	MEGI	Mar-21	Jun-18	Alpha Gas
HHI Thenamaris #1	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Nov-20	Jun-18	Thenamaris
HH 8012	Hyundai Heavy	GTT Mark III Flex	174000		Feb-21	Jun-18	Flex LNG
HH 8013	Hyundai Heavy	GTT Mark III Flex	174000		May-21	Jun-18	Flex LNG
HHI Capital Gas #1	Hyundai Heavy	GTT Mark III Flex	174000		Sep-20	Jul-18	Capital Gas
HHI Capital Gas #2	Hyundai Heavy	GTT Mark III Flex	174000		Dec-20	Jul-18	Capital Gas
HHI Capital Gas #3	Hyundai Heavy	GTT Mark III Flex	174000		Mar-21	Jul-18	Capital Gas
HHI Capital Gas #4	Hyundai Heavy	GTT Mark III Flex	174000		Jun-21	Jul-18	Capital Gas
DSME 2492	DSME	GT NO 96	173400	MEGI	Nov-20	Jul-18	John Fredriksen
SHI Celcius #1	Samsung	GTT Mark III Flex	180000	XDF	Oct-20	Aug-18	Celcius Shipping
SHI Celcius #2	Samsung	GTT Mark III Flex	180000	XDF	Jan-21	Aug-18	Celcius Shipping
HHI 3037	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jul-20	Aug-18	Cardiff Marine
SHI 2300	Samsung	GTT Mark III Flex	174000	XDF	Nov-20	Aug-18	GasLog
SHI 2301	Samsung	GTT Mark III Flex	174000	XDF	Dec-20	Aug-18	GasLog
HHI / Cardiff	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Sep-18	Cardiff Marine
HHI/ Thenamaris	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Sep-18	Thenamaris
Samsung/NYK	Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Sep-18	NYK
Samsung/Minerva 1	Samsung	GTT Mark III Flex	174000	XDF	Feb-21	Oct-18	Minerva Marine
Samsung/Minerva 2	Samsung	GTT Mark III Flex	174000	XDF	Aug-21	Oct-18	Minerva Marine

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Name	Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
Samsung/Cardiff 1	Samsung	GTT Mark III Flex	174000	XDF	Dec-20	Nov-18	Cardiff Marine
Samsung/Cardiff 2	Samsung	GTT Mark III Flex	174000	XDF	Jan-21	Nov-18	Cardiff Marine
HHI / Cardiff 1	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Nov-18	Cardiff Marine
HHI / Cardiff 2	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Apr-21	Nov-18	Cardiff Marine
HHI/Latsco 1	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jan-21	Nov-18	Latsco Shipping
HHI/Latsco 2	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Nov-18	Latsco Shipping
Samsung/NYK 1	Samsung	GTT Mark III Flex	174000	XDF	Aug-21	Dec-18	NYK
Samsung/NYK 2	Samsung	GTT Mark III Flex	174000	XDF	Nov-21	Dec-18	NYK
DSME BW 1	DSME	GT NO 96	174000	MEGI	Feb-21	Dec-18	BWGas
DSME BW 2	DSME	GT NO 96	174000	MEGI	Jun-21	Dec-18	BWGas
DSME Maran Gas	DSME	GT NO 96	173400	MEGI	Jun-21	Dec-18	Maran Gas Maritime
HHI NYK 1	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Nov-20	Dec-18	NYK
HHI NYK 2	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	NYK
HHI NYK 3	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-21	Dec-18	NYK
DSME MOL 1	DSME	GT NO 96	180000	MEGI	May-21	Dec-18	MOL
DSME MOL 2	DSME	GT NO 96	173400	MEGI	Jun-21	Dec-18	MOL
HHI Sov 1	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Sep-20	Dec-18	Sovcomflot
HHI Sov 2	Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Dec-18	Sovcomflot
Samsung GasLog 1	Samsung	GTT Mark III Flex	180000	XDF	Jun-21	Dec-18	GasLog
Samsung GasLog 2	Samsung	GTT Mark III Flex	180000	XDF	Aug-21	Dec-18	GasLog
Samsung Cardiff	Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	Cardiff Marine
DSME Alpha	DSME	GT NO 96	174000	MEGI	Oct-21	Dec-18	Alpha Gas
Samsung/ Navigare	Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	Navigare

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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 Conception	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Norgas Invention	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Vision Spirit	12,000	LNG/LPG/Ethylene	Worldwide	No	Teekay
2011	Unikum Spirit	12,000	LNG/LPG/Ethylene	Worldwide	No	Teekay
2012	Coral Energy	15,600	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2013	JX Energy TBN	2,500	LNG	Japan	Yes	JX Energy
2013	Kakuyu Maru	2,500	LNG	Japan	Yes	Tsurumi Sunmarine
2013	Coral Anthelia	6,500	LNG/Ethylene			Anthony Veder
2014	LNG-Oil combi**	2,000	LNG	Germany	Yes	Veka
2014	Short Sea LNG Tanker **	4,000	LNG	Germany	Yes	Veka
2015	LNG Inland bunker**	800	LNG	Germany	Yes	Veka
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 Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	10 small carriers TBN**	5,000	LNG			Bimantara Group
2015	Jahre TBN**	6,200	LNG	Norway	Yes	Donsotank/Jahre Marine
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
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	TBN 1	27,500	LNG	China?		Danyang?
2015	TBN 2	27,500	LNG	China?		Danyang?
2015	TBN 3	27,500	LNG	China?		Danyang?
2015	PetroChina TBN	30,000	LNG	China		PetroChina
2016	Clean Jacksonville	2,200	LNG	US Coast	Yes	CME
2016	LNG Prime	2,250	LNG	Northwest Europe	Yes	Veka Deen LNG
2016	JS Ineos Indepence	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Innvation	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

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*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less

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Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
2016	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
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
2016	Ocean Yield TBN**	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2017	Oizmendi	600	LNG	Bilbao	Yes	Itsas Gas
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	ENGIE Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
2017	Coralius	5,800	LNG	Northwest Europe/Baltics	Yes, for Skangas	Anthony Veder
2017	Cardissa	6,500	LNG	Northwest Europe	Yes	Shell
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	Coral EnergiCE	18,000	LNG	Northwest Europe/Baltics	Yes	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	Yuan He 1	30,000	LNG	China	Yes	CSR
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	HUA XIANG 8	13,720	LNG	China	Yes	Zhejiang Huaxiang
2018	CME TBN†	2,200	LNG	US Coast	Yes	CME
2018	Shell Bunker Barge TBN 4	3,000	LNG	Northwest Europe	Yes	Shell
2018	Shell Bunker Barge TBN 2	6,500	LNG	Northwest Europe	Yes	Shell
2018	Shell Bunker Barge TBN 3	6,500	LNG	Northwest Europe	Yes	Shell
2018	Kairos	7,500	LNG	Baltic	Yes	Bernhard Schulte
2018	Qi Yuan	28,000	LNG	China	Yes	Dalian Inteh Group
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
2018	Bunker Breeze	0	LNG	Barcelona	Yes	Suardiaz Energy Shipping
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	Shell Bunker Barge	4,000	LNG	US Coast	Yes	Q-LNG Transport / Harvey Gulf
2020	Stolt TBN (option) **	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Total TBN	18,600	LNG	NWE	Yes	MOL
2020	FuelLNG TBN	7,500	LNG	Singapore	Yes	FuelLNG
2020	CLS TBN	3,500	LNG	Japan	Yes	CLS
2020	Eesti Gaas TBN	6,000	LNG	NWE	Yes	Eesti Gaas
2020	ENN TBN	8,500	LNG	China	Yes	ENN
2021	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2021	Knutsen TBN	30,000	LNG	Mediterranean	Yes	Knutsen OAS
2021	Gazprom Neft TBN	5,800	LNG	Russia	Yes	Gazprom Neft

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