

April 14, 2022

Kawasaki Kisen Kaisha, Ltd.

Developed a New Concept Design of FLNG Hull
that Achieves Shorter Construction Period and Cost Reduction
~Approval in Principle (AIP) from American Bureau of Shipping~

Kawasaki Kisen Kaisha, Ltd. (“K” LINE) and JGC CORPORATION (JGC) jointly developed a new concept of FLNG (floating LNG) Hull (Note 1) and have received Approval in Principle (AIP) (Note 2) from American Bureau of Shipping (ABS), in which the LNG storage tanks of existing LNG carriers are to be utilized.

FLNG is suitable for the development of offshore natural gas fields, especially small and medium-sized gas fields where onshore LNG plants are not profitable. FLNG also reduces the cost of laying subsea pipelines and enables it to be diverted to other sea areas after the natural gas field is depleted. There are many small and medium-sized offshore natural gas fields around the world. With the increase in energy demand especially in emerging countries and the shift to natural gas as low-carbon fuel, there are already several FLNG projects that are presently underway mainly in Asia and Africa.

Supported by the Ministry of Land, Infrastructure, Transport and Tourism (Note 3), “K” LINE and JGC have developed a new type of FLNG Hull. This FLNG Hull pursues the following effects by transferring and utilizing the spherical (Moss type) tanks from the existing LNG carriers of the earlier generation as an LNG storage facility which is FLNG’s core function.

- Reduce Hull construction costs by eliminating the need to build new LNG storage tanks, which are expensive and require special techniques
- Increase the candidates of shipyards that can build the Hull, thereby shortening the lead time and reducing the construction cost

“K” LINE has been engaged in the LNG transportation business for many years and has extensive experiences in the construction and operation of LNG carriers. “K” LINE is also involved in the offshore business by participating in the owning and operation of FPSO (Note 4). JGC Group has a world-leading track record in FLNG as they have been involved in the design, procurement, and construction (EPC) of two of the seven FLNGs in operation or under construction around the world, as well as providing commissioning support.

LNG is positioned as a relatively low-carbon and clean fuel among fossil fuels. The use of LNG is expected to grow continuously and steadily along with the increasing demand in emerging countries. With this development results of FLNG with JGC, “K” LINE will continue to focus on the LNG value chain business to meet the diversifying needs of our customers.

(Note 1) FLNG is mainly comprised of a hull (including LNG storage tanks) and a topside plant which produces, stores, and ships LNG by liquefying natural gas on the sea.

(Note 2) AIP means ABS considers that the conceptual engineering as proposed is feasible for the intended application, and the facilities as presented are, in principle, in compliance with the applicable requirements of the applicable Rules/Regulations

(Note 3) Research and development of advanced technology related to marine resource development: MLIT support companies engaged in research and development for the commercialization of packaged products used in ships and products that contribute to cost reduction in the field of ocean development.

(Note 4) About FPSO service: <https://www.kline.co.jp/en/service/energy/about/fpso.html>

<AIP Letter>

APPROVAL IN PRINCIPLE		
As requested by:		Date of Issuance: 4 November 2021
JGC Corporation		Certificate Number: T2177721
Kawasaki Kisen Kaisha, Ltd.		
<p>ABS has reviewed the documentation as specified in the ABS letter dated 4 November 2021 (Task No. T2177721) in accordance with the applicable requirements of the Rules/Regulations indicated in page 4 of "Guidance Specification of 187,500 m3 Floating Liquefied Natural Gas Unit (IMO Type-B Moss Tank)", and considers that the conceptual engineering as proposed is feasible for the intended application, and the facilities as presented are, in principle, in compliance with the applicable requirements of the above Rules/Regulations.</p>		
Facility: FLNG		
Description: 187,500m³ Floating Liquefied Natural Gas Unit (IMO Type-B Moss Tank)		
New Technology Maturity Level: Subsystem A – Feasibility Stage		
<p><i>To achieve final class approval of the subject design, the conditions and requirements as specified in the Approval Road Map [ABS letter dated 4 November 2021 (Task No. T2177721)] must be satisfied.</i></p>		
Junichi Nigorikawa, Electronically Signed		
Junichi Nigorikawa Director of Engineering, Japan, ABS		
<small>Note: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of American Bureau of Shipping or a statutory, industrial or manufacturer's standards and is issued solely for the use of the Bureau, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without ABS approval will result in this certificate becoming void. This certificate is governed by the terms and conditions in the ABS Rules.</small>		