



## MHIMSB completes new LNG bunkering vessel KEYS Azalea



Mitsubishi Shipbuilding Co., Ltd. (MHIMSB), a group company of Mitsubishi Heavy Industries Co, Ltd. (MHI), completed construction of the KEYS AZALEA (Hull No. 1234), a new LNG-bunkering vessel with a cargo tank capacity of 3,533m<sup>3</sup>, and delivered the vessel to KEYS Bunkering West Japan Co, Ltd. on March 27, 2024.

The vessel is intended for domestic coastal LNG transportation service and is equipped with an independent cylindrical IMO type-C cargo tank and is capable of ship-to-ship bunkering to LNG-fueled vessels. This is the first LNG bunkering vessel to operate in western Japan.

The vessel is equipped with dual-fuel generator engines capable of using both LNG and marine diesel oil as fuels.

Operation in gas mode will provide excellent environmental performance with considerably reduced emissions of carbon dioxide (CO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>), sulfur oxide (SO<sub>x</sub>), and particulate matter (PM).

The LNG cargo tank is installed in the cargo hold, and equipped with two cargo pumps, a spray pump and a fuel gas pump. The cargo machinery room is located aft of the cargo hold and equipped with two gas compressors, a LNG vaporizer, a gas heater and other equipment.

A total of four sets of cargo manifold connections for ship-to-ship bunkering are arranged on both sides in the fore and midship areas, and midship manifolds will be

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## Japanese maritime-related consortium obtains world's 1st AiP for oil tanker design using LH<sub>2</sub> fuel from ClassNK

Mitsui E&S Shipbuilding Co., Ltd. (Mitsui E&S Shipbuilding), Uyeno Transtech Ltd. (Uyeno Transtech), and Yanmar Power Technology Co., Ltd. (Yanmar Power Technology) obtained Approval in Principle (AiP) on June 19, 2024, from Nippon Kaiji Kyokai (ClassNK) for a jointly developed design of an oil tanker with liquefied hydrogen (LH<sub>2</sub>) fueled engine. This is the first AiP in the world for the design of an oil tanker powered by LH<sub>2</sub> fuel.

Reflecting worldwide movement toward decarbonization, the shipping industry needs to take rapid action. This design has been verified as feasible for construction after hydrogen infrastructure is in place such as the supply chain and bunkering of ship fuel.

Mitsui E&S Shipbuilding will continue to contribute to decarbonization in the maritime industry worldwide with advanced and technical expertise.

Main evaluation points of the ClassNK AiP include:

1. This design uses liquefied hydrogen as fuel, which allows storage of larger quantities of hydrogen than when stored as a gas.

2. This is the first design to apply the ClassNK "Part D of Guidelines for Ships Using Alternative Fuels; Guidelines for Ships Using Hydrogen as Fuel (Edition 3.0.0)."
3. This design adopts a concept of arranging the hydrogen-fueled engine as a power generator in the engine room for electric propulsion.
4. ClassNK has approved the tanker ship design with the specification of hydrogen fuel.



### AiP Award Ceremony

From left to right are:

Mr. Tetsuya Kikyo, Program Director, Ocean and Maritime Division, The Nippon Foundation

Mr. Masaki Matsunaga, Executive Vice President, ClassNK

Mr. Gen Uyeno, President & COO, Uyeno Transtech

Mr. Akihiro Tomita, General Manager, Executive Officer, Yanmar Power Technology

Mr. Yasunori Kohatake, President, Representative Director, Mitsui E&S Shipbuilding



Image of this ship with the concept of arranging the hydrogen fueled engine as a power generator in the engine room for electric propulsion

## New LNG bunkering vessel KEYS Azalea

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used for loading/unloading at LNG terminals. This configuration enables selection of the most suitable ship-to-ship arrangement conforming with various LNG fuel vessels. Each manifold is equipped with two hose handling cranes.

The LNG transfer system installed on the vessel contributes flexible and safe bunkering to various LNG fuel vessels. This system contains LNG flexible hoses, emergency release couplings capable of quick-detaching hoses without LNG leakage in an emergency, and quick connecting/dis-

connecting couplers.

The vessel is equipped with both bow and stern thrusters and has excellent maneuverability for bunkering operations.

### Principal particulars

Owner: KEYS Bunkering West Japan Co., Ltd.

Builder: Mitsubishi Shipbuilding Co., Ltd.

Hull No.: 1234

Ship Type: LNG transport and bunkering vessel

Length (o.a.): 82.4m

Length (b.p.): 80.3m

Breadth: 18.2m

Depth: 7.8m

Design draft: 4.8m

Gross tonnage: 4744 (Domestic)

Cargo tank capacity: 3,533m<sup>3</sup> (100% full)

Main Generator, Propulsion motor:

1) Main generators: Daihatsu, 6DE23DF x 3 units

2) Propulsion motors: Nishishiba Electric NTIKE-RCK5 x 2 units

Output:

1) 1,170kW x 900min<sup>-1</sup> x 3 units

2) 890kW x 1,180min<sup>-1</sup> x 2 units

Speed, service: 12.0kt

Classification: Japanese Government

Completion: March 27, 2024

## JMU delivered the newly-developed 12,800TEU Containership MAERSK EL BANCO

Japan Marine United Corporation (JMU) delivered the MAERSK EL BANCO, which is a 12,800TEU containership, at the Kure Shipyard on June 18, 2024. This is the second vessel in the series of five large 12,800TEU-type containerships, which utilizes JMU's technology to achieve a high level of both environmental and loading performance and is designed to operate in wide range of sea areas. The vessel can load up to 2,500 TEU reefer containers to meet the increase in demand for reefer-container transport in recent years.

JMU has adopted methanol-ready specifications and obtained the DNV Fuel ready (LFL[AEc;D:MEc]) Notation in anticipation of the move toward next-generation fuels. JMU has obtained the DNV SMART (EEN) Notation for this vessel, which is granted to ships applying advanced digital technology.

The MAERSK EL BANCO uses a newly-developed optimal hull form to pursue high efficiency in the different speeds and drafts most frequently encountered in operations, and JMU's original energy saving devices has been employed, including the SURF-BULB bow<sup>®</sup>, ALV-Fin<sup>®</sup>, and Rupas<sup>®</sup> rudder. These achieve extremely high fuel efficiency despite such a large hull



size.

The EEDI of this vessel is more than 50% reduced compared with the reference line, significantly exceeding the required EDDI reduction rate of 20%. Brittle crack arrest technology has been applied to the extremely thick, high-strength steel plates, which improves safety of the hull structure without sacrificing loading efficiency.

This vessel has various environmental friendly features such as EGCS SO<sub>x</sub> scrubbers, complying with NO<sub>x</sub> Tier III regulations and is

equipped with AMSP (Alternative Maritime Shore Power), which allow the diesel generator to be stopped during cargo handling.

### Principal particulars

L (o.a.) x B (mld.) x D (mld.) x d (mld.):	335.0m x 51.00m x 27.10m x 16.00m
DWT/GT:	152,237t/127,832
Main engine:	7G95ME-C10.5 diesel x 1 unit
Speed, service:	22.0kt
Complement:	30
Classification:	DNV

## Shin Kurushima Sanoyas completes Panamax bulker, BASIC STAR

Shin Kurushima Sanoyas Shipbuilding Co., Ltd. delivered the Panamax bulk carrier, BASIC STAR, at its Shin Kurushima Sanoyas Mizushima Shipyard on June 28, 2024. This is the 20th delivery of the 82,000DWT-type Panamax bulk carrier series, which was newly developed by Sanoyas.

The BASIC STAR satisfies the latest maritime rules such as CSR B&T, NO<sub>x</sub> Tier III regulations and SO<sub>x</sub> emission regulations, with the equivalent deadweight but shallower draft than the builder's previous design. The vessel can achieve over 30% re-

duction of CO<sub>2</sub> emissions as required by Phase 3 of IMO's EEDI regulations, which will be applied to ships for which the building contract is placed on or after 2025.

Propulsion efficiency has been improved by installing a low-speed, long-stroke, and electronically-controlled main engine combined with a high-efficiency propeller and rudder appendages. Moreover, the company's patented energy-saving devices are applied, which include the Sanoyas-Tandem-Fin (STF) and Sanoyas Advanced flow Controlling and Energy saving DUCT (ACE DUCT). These

devices have been improved over the previous designs to achieve over 8% reduction in energy consumption so that EEDI Phase 3 is definitely satisfied.

Various eco-friendly features include the main engine with SCR compliance and the NO<sub>x</sub> emission Tier III limit for preventing air pollution as well as the dedicated low-sulphur gas oil tank for navigation in Emission Control Areas. In addition, countermeasures such as the Ballast Water Treatment System and independent

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## Panamax bulker BASIC STAR

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holding tanks for rainwater on the upper deck for protection of the marine environment are also incorporated.

Furthermore, access trunks between the upper deck and double bottom have improved maintenance of the vessel even under laden conditions. Accommodation complies with the latest IMO noise reduction regulation for improved comfortable working and living environments for officers and crews.

### Principal particulars

Hull No.:	1400	DWT/GT:	81,947t/43,455	C.S.O. with 15% sea margin)
L (o.a.) x B (mld.) x D (mld.) x d (ext.):	229.000m x 32.240m x 20.150m x 14.594m (summer)	Cargo hold capacity:	97,034m <sup>3</sup> (grain)	Classification: ClassNK
		Complement:	24	Delivery: June 28, 2024
		Speed, service:	Approx. 14,1kt (at	



## Sasaki Shipbuilding readies methanol-powered ships for LPG transport —Plus LH<sub>2</sub>-powered ship design—

Sasaki Shipbuilding Co., Ltd. has recently developed three types of methanol-powered ships and completed the design of a liquid hydrogen-powered ship. These ships will be used for small-scale LPG-transport service under an 11,000m<sup>3</sup>-capacity class. The methanol-powered ships includes 5,000m<sup>3</sup>, 7,500m<sup>3</sup>, and 10,000m<sup>3</sup> transport-capacity types, and the hydrogen-powered ship will have 5,000m<sup>3</sup> capacity. The company has started marketing of these alternative

fuel-powered ships.

Sasaki Shipbuilding has previously completed design of LPG-powered ships before these ships, and completed construction of three 7,500m<sup>3</sup> LPG-powered LPG carriers one after another since October 2022. This three-ship series was Japan's first for small-scale LPG carriers with the dual-fueled main engine using LPG fuel.

LPG marine transport with larger-scale LPG carriers usually employs

LPG-fueled main engines as a standard design. On the other hand, small LPG carriers powered by LPG have been affected by both the rapidly rising costs of shipbuilding materials and equipment, but also less space where the LPG-fuel tank and fuel supply system can be installed.

Considering such conditions, Sasaki Shipbuilding has marketed the methanol- and hydrogen-powered ships to cope flexibly with market needs for small-scale LPG transport. The company has experience with methanol-powered chemical transport ships of four types of 6,800GT, 7,000GT, 10,000GT, and 13,000GT in preceding methanol-powered small LPG carriers.

In addition, Sasaki Shipbuilding has obtained the Approval in Principle (AiP) of Bureau Veritas (BV) for both its methanol dual-fuel (DF) system to be applied in a 9,000DWT general cargo ship and an ammonia (NH<sub>3</sub>) bunkering vessel. The company has also concluded a contract with a Nigerian shipowner for building a 7,500m<sup>3</sup> LPG carrier powered by low-sulfur oil fuel.



Photo shows Japan's first LPG-powered small-scale LPG carrier built by Sasaki Shipbuilding, which will pioneer the next generation of alternative-fueled small ships

**TURQUOISE ACE**

Builder: Imabari Shipbuilding Co.,Ltd./Tadotsu Shipyard Co., Ltd.  
 Ship type: LNG dual-fueled vehicle carrier  
 L (o.a.) x B x D: 199.93m x 38.00m x 22.85m  
 DWT/GT: 18,439t/77,695  
 Main engine: 6S60ME-C10.5-GI diesel x 1 unit  
 Speed, service: 18.0kt  
 Classification: ClassNK  
 Completion: July 12, 2024

**WAN HAI 373**

Owner: Wan Hai Lines (Singapore) Pte. Ltd.  
 Builder: Japan Marine United Corporation  
 Hull No.: 5515  
 Ship type: 3,055TEU containership  
 L (o.a.) x B x D x d: 203.5m x 34.8m x 16.6m x 11.5m  
 DWT/GT: 37,160t/30,676  
 Main engine: MAN B&W 7S70ME-C10.5 diesel x 1 unit  
 Speed, service: 21.6kt  
 Complement: 25  
 Classification: DNV  
 Registry: Singapore  
 Completion: June 26, 2024

**TAI STEADINESS**

Owner: Tai Shing Maritime Co., S.A.  
 Builder: Oshima Shipbuilding Co., Ltd.  
 Hull No.: 11082  
 Ship type: Bulk carrier  
 L (o.a.) x B x D x d: 199.95m x 32.26m x 19.28m x 13.542m (ext.)  
 DWT/GT: 64,589t/36,090  
 Main engine: MITSUI-MAN B&W 6S50ME-C9.7-EGRBP diesel x 1 unit  
 Speed, service: 14.50kt  
 Classification: LR/CR  
 Registry: Liberia  
 Completion: May 16, 2024

**MADRE ANTONIA**

Owner: Blue Line Trading Limited  
 Builder: Niigata Shipbuilding & Repair, Inc.  
 Hull No.: N-0126  
 Ship type: Refrigerated cargo ship  
 L (b.p.) x B x D: 75.20m x 12.40m x 8.10m  
 DWT/GT: 1,438t/2,157  
 Main engine: Akasaka Diesel AX34AFD diesel x 1 unit  
 Speed, service: 12.5kt  
 Classification: ClassNK  
 Registry: Panama  
 Completion: July 2, 2024

**STELLA**

Owner: Shintoku Panama, S.A.  
 Builder: Tsuneishi Shipbuilding Co., Ltd.  
 Hull No.: 1622  
 Ship type: 5,000m<sup>3</sup>-type LPG carrier  
 L (b.p.) x B x D: 99.90m x 17.60m x 8.00m  
 DWT/GT: 4,600t/4,800  
 Main engine: MAN B&W 6S30ME-B9.5-HPSCR diesel x 1 unit  
 Speed, service: 13.5kt  
 Classification: ClassNK  
 Registry: Marshall Islands  
 Completion: July 31, 2024

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