



## NSY obtains AiP for ammonia-fueled VLCC from DNV



Nihon Shipyard Co., Ltd, a new joint venture between Imabari Shipbuilding Co., Ltd and Japan Marine United Corporation, has developed an ammonia-fueled VLCC design that uses ammonia as the marine main engine fuel in cooperation with DNV (formerly DNVGL), and obtained the Approval in Principle (AiP) from DNV on 25 March 2021.

Ammonia is a carbon-free fuel that does not emit carbon dioxide (CO<sub>2</sub>) when burned and is a potential next-generation marine fuel will help in the prevention of global warming. Therefore, ammonia fuel is expected to make a significant contribution to the International Maritime Organization's (IMO) GHG (greenhouse gas) reduction strategy target of 50% reduction in total GHG emissions by 2050 (compared to 2008 levels).

The features of this ammonia-fueled VLCC design are as follows:

1. Safe and practical measures against potential ammonia leakage risks which are incorporated into the design concept, since safety measures against toxicity are very important when using ammonia as a fuel.
2. Ammonia fuel has lower energy density than conventional fuel, so providing adequate fuel tank

capacity is a design issue. Location of IMO Type-C tanks on the open deck achieved tank capacity equivalent to the same amount of energy as conventional tanks. In addition, related facilities such as ammonia fuel preparation equipment were also arranged on the open deck, which makes this concept suitable for an ammonia fuel "ready" design.

3. This concept can achieve zero emissions during normal sea going by using carbon-neutral fuel as the pilot fuel for the ammonia-fueled engine and by using a shaft generator to cover the electric demands.

Based on this AiP, Nihon Shipyard will develop a total system that further enhances the safety and stability of ammonia fuel use, intending to release ammonia fueled VLCCs to the market as soon as possible. Nihon Shipyard will also promote the use of ammonia fuel by expanding the technology to other types of vessel such as bulk carriers.

Nihon Shipyard Co., Ltd. is going to contribute to the sustainable development of society through the provision and operation of environmentally friendly vessels by utilizing its new technologies.



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## KHI delivers 84,000m<sup>3</sup> type LPG carrier, DURHAM, to Fair Wind Navigation

Kawasaki Heavy Industries, Ltd. delivered the DURHAM, an 84,000m<sup>3</sup> LPG carrier (HN: 1745), to Fair Wind Navigation, S.A. on January 29, 2021. This gas carrier is the second of the newly developed 84,000m<sup>3</sup> type series compliant with the revised IGC code, with a larger cargo loading capacity based on the design of the previous Kawasaki 82,000m<sup>3</sup> series. Kawasaki has now delivered a total of 63 LPG carriers. Despite larger cargo capacity of the new series, the principal particulars are almost the same, which permits entry to the same ports as the previous series.

The new gas carrier adopts the propulsion system compliant with the IMO NO<sub>x</sub> Tier III regulations as well as satisfying the revised IGC code. The main engine uses an Exhaust Gas Recirculation (EGR) type and the electric generator engine adopts Selective Catalytic Reduction (SCR) as countermeasures for reduction of NO<sub>x</sub> emissions. Consequently, the carrier can

navigate Emission Control Areas (ECAs).

The main engine is an energy efficient, electronically-controlled, ultra-long-stroke, two-stroke low-speed diesel engine. The Kawasaki Rudder Bulb System with Fins (RBSF) and the Semi-Duct System with contra Fins (SDS-F) also contribute to reducing fuel consumption. Kawasaki's unique bow shape called SEA-Arrow minimizes bow wave resistance and significantly improves propulsion performance.

The main engine and electric generator engine are equipped with a SO<sub>x</sub> scrubber at the gas exhaust port to satisfy the SO<sub>x</sub> emission restrictions started in January 2020. Accordingly, low SO<sub>x</sub> fuel oil can be used under the



control of restrictions, and fuel oil costs can be reduced due to continuous use of conventional fuel.

### Principal particular

L (o.a.) x B x D x d:	229.90m x 37.20m x 21.90m x 11.54m
DWT/GT:	55,408t/49,231
Cargo tank capacity:	84,278m <sup>3</sup>
Main engine:	Kawasaki MAN 7S60ME-C10.5 diesel x 1 unit
Complement:	35
Classification:	ClassNK
Registry:	Liberia
Delivery:	January 29, 2021

## Namura delivers 100,000DWT class bulker, CAPE ACE, to "K" Line

Namura Shipbuilding Co., Ltd. delivered CAPE ACE, a 101,314DWT bulk carrier, to Kawasaki Kisen Kaisha, Ltd. ("K" Line). at its Imari Shipyard & Works on December 7, 2020. The vessel is the first of the newly-developed 100,000DWT-type bulk carrier with the following features.

The vessel was designed with a wide beam and shallow draught and is suitable to carry bulk cargoes such as coal and iron ore. Further improvement of propulsion performance and fuel saving were achieved with adoption of an energy saving device, wind force reduction type superstructure, an electronically controlled main en-

gine, the latest model of high efficiency propeller, and low friction type anti-fouling paint.

For environmental protection, the vessel is equipped with a main engine and generator engines compliant with Annex VI of MARPOL 73/78 regulations to reduce NO<sub>x</sub> emissions, a SO<sub>x</sub> scrubber is installed for reducing SO<sub>x</sub> emissions under the policy of the IMO 2020 global sulphur cap, and an air seal type stern tube sealing device is adopted to reduce the risk of oil leakage. In addition, the vessel complies with the SOLAS Chapter II-1 Regulation 3-12, Code on noise levels on board ships to improve the environment of on-board living quarters.

The centralized fresh water cooling system adopted for the machinery space equipment con-

tributes to easy maintenance. The ballast water treatment system to control the quality of ballast water is equipped for protection of the marine environment to comply with the International Convention for the Control and Management of Ships' Ballast Water and Sediments. The vessel has several storage tanks for appropriate management and discharge of drainage, sewage, rain water, and water used for cleaning cargo holds. This will satisfy port restrictions on such discharges.

### Principal particulars

L (o.a.) x B (mld) x d (mld):	249.94m x 43.00m x 12.90m
DWT/GT:	101,314t/60,133
Main engine:	MAN B&W 6S60ME-C8.5 diesel x 1 unit
Complement:	28
Classification:	ClassNK
Registry:	Panama
Completion:	December 7, 2020





## Oshima completed 4,300,000cf-type woodchip carrier SOUTHERN ACE

Oshima Shipbuilding Co., Ltd. delivered 4,300,000 cubic feet-type woodchip carrier to FJ Corporation on February 25, 2021. This vessel is designed for the carriage of woodchip and has a self-unloading system with three electric deck cranes, four hoppers and conveyor systems to achieve high unloading efficiency. To prevent chip scattering, the anti-scattering net and water spraying system is equipped at the hoppers. Furthermore, the regenerative power generated by lowering the crane is utilized as electric power onboard the ship for energy saving.

This vessel has various eco-friendly features. A grey water tank for storing domestic wastewater and a collecting tank for storing water used for cargo hold and deck cleaning are installed to prevent marine pollution. Moreover, the inventory of hazardous materials describing the types and places of harmful substances is provided to prevent environmental pollution caused by harmful substances. SO<sub>x</sub> emissions which cause air pollution are reduced with the installed SO<sub>x</sub> scrubber, and this vessel complies

with IMO SO<sub>x</sub> regulations.

In addition, this vessel is designed to have higher propulsion efficiency with large cargo hold capacity for woodchip loading. For higher propulsion efficiency, an electronically controlled main engine and a high efficiency propeller are equipped. Furthermore, Oshima originally developed energy saving devices, Advanced Flipper Fins, Rudder Fin and Seaworthy Bow are installed for further improvement of propulsion efficiency. Consequently, this vessel has already achieved over 30% less fuel consumption from the IMO reference line of EEDI (Energy Efficiency Design Index), which fewer CO<sub>2</sub> emissions per deadweight and nautical mile.



### Principal particular

L (o.a.) x B x D x d (summer):

209.96m x 37.00m x 22.80m x 11.523m

DWT/GT: 60,222t/49,877

Hold Capacity: 4,326,650 cubic feet

Main engine: IHI DU-WinGD 6RT-flex50-D diesel x 1 unit

MCR: 7,480kW at 95.0rpm

Speed, service: abt. 14.0kt

Classification: ClassNK

Completion: February 25, 2021

## Sasaki obtained BV's AiP to build 7,500m<sup>3</sup> LPG-fueled ship

Sasaki Shipbuilding Co., Ltd. has received an order for construction of a 7,500m<sup>3</sup>-gas carrier mounted with a LPG-fueled main engine, of which final design work can now be completed based on Approval in Principle certification issued by the Bureau Veritas (BV) to the company.

The order is one of the first ever to be confirmed for small scale LPG fuelled ships and will be the first to be built in Japan. The ship will be powered by MAN B&W ME-LGIP engines designed for LPG as fuel.

The ships will be constructed under BV's guidelines NI647 for LPG fuelled ships. The AiP included a hazard and operability study (HAZOP) to help ensure that operational risks would be addressed in the final design process.



*Two people holding certification document are Kazuo Yamashita (left), Chief Executive, Bureau Veritas Marine & Offshore, Japan, and Daihei Sasaki, President of Sasaki Shipbuilding Co., Ltd.*

BV has made comments about smaller LPG-fueled ships and conventional diesel fuels as follows: These ships are innovative in that the use of LPG as fuel remains a fairly novel application. But our experience from LNG fuelled shipping, the application of the IGC Code, and our own class rules and guidance, provide the necessary level of confidence for these new smaller LPG carriers. Sensibly, LPG as a marine fuel is now finding a niche for use in LPG carriers. There are considerable operational benefits in terms of reduced GHG emissions and very much cleaner local air emissions. LPG is widely available and sulfur free and will reduce CO<sub>2</sub> emissions by up to 13% compared with marine diesel oil (MDO) and up to 18% compared with heavy fuel oil (HFO).

## New JSEA President appointed

The 122nd Annual General Meeting of the Japan Ship Exporters' Association (JSEA) in Tokyo selected 28 directors and 2 auditors on May 26, 2021. The subsequent 636th Directors' Meeting selected Mr. Tamotsu Saito, Senior Counselor, IHI Corporation as the new JSEA President. Mr. Saito's tenure will last the usual two years. Mr. Saito will complete a two-year as Chairman of the Shipbuilders' Association of Japan (SAJ) on June 17, 2021, having held the position since 2019.

The same meeting appointed four Executive Vice Presidents of the



*New JSEA President SAITO*

JSEA: Mr. Yukito Higaki, President, Imabari Shipbuilding Co., Ltd. (reap-

pointment); Mr. Kosuke Takechi, Executive Officer, Marubeni Corporation (reappointment); Mr. Aiichiro Matsunaga, Executive Vice President, Mitsubishi Corporation (reappointment); and Mr. Yoshinobu Nakamura, Senior Corporate Adviser, Sumitomo Heavy Industries, Ltd. (reappointment).

Standing officers of JSEA include Mr. Satoshi Ito, Senior Managing Director (reappointment) and Mr. Hidetsugu Ueki, Managing Director, concurrently Secretary General (reappointment).

## Shin Kurushima Sanoyas completes Panamax bulk carrier YM PIONEER

SHIN KURUSHIMA SANOYAS SHIPBUILDING CO.,LTD. delivered the 82,000DWT class Panamax bulk carrier, YM PIONEER, at the Mizushima Shipyard on March 10, 2021. This is the 4th vessel of a series of the SANOYAS newly developed 82,000DWT-type Panamax bulk carriers.

The vessel not only applies the latest rules such as CSR B&T, NO<sub>x</sub> Tier III regulations and SO<sub>x</sub> emission regulations, but also has the equivalent level of deadweight with shallower draft than the builder's previous design. The vessel exceeds 20% reduction of CO<sub>2</sub> emissions by IMO's EEDI (Energy Efficiency Design Index: grams CO<sub>2</sub> per ton nautical mile) regulation in advance and approaches the 30% reduction that will apply to ships for which the building contract is placed on or after 2025.

For improvement of propulsion efficiency, the vessel is equipped with a low-speed & long-stroke electronically controlled main engine combined with a high-efficiency propeller and rudder appendages. Furthermore, patented energy saving devices such as the STF (Sanoyas-Tandem-Fin) and ACE DUCT (Sanoyas Advanced flow Controlling and Energy saving DUCT) are

applied. These energy saving devices have achieved about 8% reduction in energy consumption and CO<sub>2</sub>.

Various eco-friendly countermeasures such as the main engine with SCR complying with NO<sub>x</sub> emission Tier III limit for the prevention of air pollution, and dedicated low sulphur gas oil tank to navigate in ECAs (Emission Control Areas), and the classification code IHM (Inventory of Hazardous Materials) concerning the inventory of hazardous materials are applied. In addition, countermeasures such as a ballast water treatment system and independent holding tanks for rainwater on the upper deck are provided for protection of the marine environment.

Furthermore, for improvement of maintenance, access trunks are arranged to gain access from the upper deck to the double bottom even under the laden condition. Accommodation complies with the latest IMO noise reduction regula-

tion to improve the comfortable working and living environment for officers and crew on the vessel.

### Principal particulars

Ship type:	Bulk carrier
Hull No.:	1372
L (o.a.) x B x D x d (summer):	229.00m x 32.24m x 20.15m x 14.594m
DWT/GT:	81,898t/43,424
Cargo hold capacity:	97,034m <sup>3</sup> (grain)
Complement:	25
Speed, service:	14.2kt
Classification:	ClassNK
Delivery:	March 10, 2021





## Accumulated marine engine production reaches 110 million hp —MITSUI-MAN B&W diesel engine—

Mitsui E&S Machinery Co., Ltd. has achieved accumulated diesel engine production of 110 million horsepower with a single engine model. This record was achieved with the Mitsui-MAN B&W diesel engine 7G80ME-C9.5-EGRTC, which was manufactured as the 7,023rd diesel engine at the Tamano Machinery Factory of Mitsui E&S Machinery. This is the main engine for a VLCC to be built at Imabari Shipbuilding Co., Ltd. for Shoen Kisen Kaisha, Ltd. Mitsui diesel engine production has reached 110 million horsepower in two years and nine months since cumulative production of 100 million horsepower occurred in June 2018 (90 years from the production of Unit 1).

Since entering into the license agreement with Burmeister & Wain in Denmark in 1926, now MAN En-

ergy Solutions SE, Mitsui E&S Machinery has been building experience as the world's leading diesel engine manufacturer. Mitsui E&S Machinery will continue sales activities of diesel engines for bulkers, tankers, car carriers and LPG carriers, etc. with its delivery record of diesel engines that comply with the NO<sub>x</sub> regulation Tier-III and dual fuel diesel engines.

### Principal particulars of this engine

Model: Mitsui-MAN B&W diesel en-



gine 7G80ME-C9.5-EGRTC

Length, o.a.:	About 12.1m
Height:	About 15.0m
Width:	About 5.3m
Bore:	800mm
Stroke:	3,720mm
Shop test:	March 1-2, 2021

## MHI-MME develops and delivers low pressure, cylindrical marine auxiliary boiler

Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd. (MHI-MME) has developed a low pressure cylindrical MAC-DS marine auxiliary boiler, primarily for installation on product carriers and other tankers, so expanding the company's core auxiliary boiler product lineup, which will meet the demands of customers to reduce initial costs.

The order for the first MAC-25DS

(rated evaporation 25 ton/hr) for 50,000DWT product carriers was received through CSSC Jiujiang Boiler Co., Ltd., an MHI-MME licensee in China. Delivery was completed in February 2021 to COSCO (Dalian) Shipyard Co., Ltd. A MAC-D Series high pressure cylindrical auxiliary boiler for driving a tanker unloading pump turbine is also currently being developed and is scheduled to be re-

leased soon.

MHI-MME's core boiler product has been the two-drum water tube MAC-B Series for tankers with a large number of deliveries so far. The two-drum water tube MAC-B Series features technology that has frequently been adopted for use in larger capacity, higher temperature, higher voltage power generation as well as for marine main engines. The type is highly recognized in the market as a marine boiler that is superior in terms of reliability and durability.

To ensure the same reliability as the MAC-B Series, the new MAC-D/MAC-DS Series were developed in cooperation with the MHI Group's Shared Technology research division. For commercialization of the model, structural strength and heat exchange performances were evaluated based on numerical analysis to achieve an optimal design that can withstand long term use.

MHI-MME will continue to leverage the expertise and technical capabilities gained through its copious track record and deliver products that meet the needs of customers.



**MAERSK NESNA**

Builder: Imabari Shipbuilding Co., Ltd.  
 Ship type: 2,020TEU container carrier  
 L (o.a.) x B x D: 171.93m x 32.2m x 16.8m  
 DWT/GT: 28,697t/25,805  
 Main engine: 6S60ME-C10.5 diesel x 1 unit  
 Speed, service: 18.0kt  
 Classification: ClassNK  
 Completion: March 31, 2021

**WAN HAI 326**

Owner: Wan Hai Lines (Singapore) Pte. Ltd.  
 Builder: Japan Marine United Corporation  
 Ship type: Container carrier  
 L (o.a.) x B (mld) x D (mld) x d (mld): 203.50m x 34.80m x 16.60m x 11.50m  
 DWT/GT: 37,160t/30,531  
 Main engine: MAN-B&W 7S70MEC 10.5 diesel x 1 unit  
 Speed: 21.6kt  
 Complement: 25  
 Classification: ClassNK

**KANSU**

Owner: The China Navigation Company Pte. Ltd.  
 Builder: Oshima Shipbuilding Co., Ltd.  
 Hull No.: 10898  
 Ship type: Bulk carrier  
 L (o.a.) x B x D x d (ext.): 179.99m x 30.00m x 14.63m x 10.340m  
 DWT/GT: 37,440t/22,360  
 Main engine: Mitsui-MAN B&W 5S50ME-C8.5 diesel x 1 unit  
 Speed, service: 14.00kt  
 Classification: DNV GL  
 Registry: Singapore  
 Completion: February 19, 2021

**SASANQUA**

Owner: Shintoku Panama, S.A.  
 Builder: Sasaki Shipbuilding Co., Ltd.  
 Hull No.: 711  
 Ship type: LPG carrier  
 L (o.a.) x B x D x d (ext.): 95.99m x 15.00m x 6.80m x 5.01m  
 DWT/GT: 3,208t/3,216  
 Main engine: Hitachi-MAN B&W 5L35MC6.1 diesel x 1 unit  
 Output: 2,200kW x 178min<sup>-1</sup>  
 Speed, service: 12.5kt  
 Classification: BV  
 Registry: Marshall Islands  
 Completion: March 19, 2021

**ARIES KARIN**

Owner: Panamanian owner  
 Builder: Shin Kurushima Dockyard Co., Ltd.  
 Hull No.: S-6082  
 Ship type: Bulk carrier  
 L (o.a.) x B x D: 196.50m x 32.26m x 19.40m  
 DWT/GT: 64,229t/36,762  
 Main engine: Mitsui-MAN B&W 6S50ME-C9.6-EGRBP diesel x 1 unit  
 Speed, service: 14.0kt  
 Classification: ClassNK  
 Registry: Panama  
 Completion: February 16, 2021

**SANKO HAWKING**

Owner: Hawking Ownership Limited  
 Builder: Tsuneishi Shipbuilding Co., Ltd.  
 Hull No.: 1601  
 Ship type: Bulk carrier  
 L (o.a.) x B x D: 229.00m x 32.26m x 20.15m  
 DWT/GT: abt.82,167t/abt.44,000  
 Main engine: MAN B&W 6S60ME-C10.5 diesel x 1 unit  
 SOx Scrubber: Alfalaval  
 Speed, service: 14.30kt  
 Classification: ClassNK  
 Registry: Liberia  
 Completion: January 8, 2021

