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Season's Greetings

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JMU completes new Dunkirkmax-type bulk carrier, FRONTIER SPIRIT

Japan Marine United Corporation (JMU) delivered the FRONTIER SPIRIT, 181,000DWT bulk carrier, at the Ariake Shipyard on October 6, 2023. This is the second vessel of the newly-developed Dunkirkmax-type bulk carrier, called N181BC, which has proved successful in both economical and environmental friendly features.

The Energy Efficiency Design Index (EEDI) of the N181BC type has achieved Phase 3 (30% reduction from the reference value) by application of the latest energy saving technologies. This development will contribute to the green environment through its eco-friendly performance. The vessel has larger deadweight and cargo hold capacity suitable for loading bulk coal and iron ore in its nine cargo holds, achieved by JMU's expertise and vast

experience. The SSD® (Super Stream Duct®) and SURF-BULB® equipped fore and aft of the propeller, respectively, greatly improve the propulsion performance. The ALV-Fin® (Advanced Low Viscous Resistance Fin) equipped forward of the propeller controls stern water flow to gain better propulsive efficiency. Furthermore, the unique bow shape, LEADGE-Bow®, can reduce the added resistance due to waves, and the well-refined shape of the superstructure can attain low wind resistance.



Principal particulars

L (o.a.) x B (mld.) x D (mld.) x d (mld.):	292.00m x 45.00m x 24.55m x 18.20m
DWT/GT:	182,461t/93,367
Main engine:	MAN B&W 7S60ME-C10.6-HPSCR engine x 1 unit
Speed, service:	14.4kt
Complement:	25
Classification:	ClassNK

Shin Kurushima Sanoyas completes Panamax bulker, PEDHOULAS TRADER

Shin Kurushima Sanoyas Shipbuilding Co., Ltd. completed the Panamax bulk carrier, PEDHOULAS TRADER, constructed at Shin Kurushima Sanoyas Mizushima Shipyard on September 21, 2023.

This is the 16th vessel of a series of the Sanoyas newly developed 82,000DWT type Panamax bulk carriers. The vessel not only applies latest rules such as CSR B&T, NO_x Tier III regulations and SO_x emission regulations, but also has the equivalent level of deadweight with shallower draft than the builder's previous design. The vessel exceeds 30% reduction of CO₂ emissions (Phase 3) according to IMO's EEDI (Energy Effi-

ciency Design Index: grams CO₂ per ton nautical mile) regulation in advance 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 low-speed & long-stroke electronically controlled main engine combined with a high-efficiency propeller and rudder appendages. Furthermore, patented energy saving devices such as Sanoyas developed STF (Sanoyas-Tandem-Fin) and ACE DUCT (Sanoyas Advanced flow Controlling and Energy saving DUCT) are applied. These energy saving devices which has been improved than the previous design

have achieved over 8% reduction of energy consumption so that EEDI Phase 3 is thoroughly satisfied.

Eco-friendly features include the main engine with SCR compliant with the NO_x emission Tier III limit for the prevention of

air pollution, and dedicated low sulphur gas oil tank to cruise in ECAs (Emission Control Areas). In addition, countermeasures such as the Ballast Water Treatment System and independent holding tanks for rainwater on the upper deck for protection of the marine environment are also incorporated.

Furthermore, for improvement of the vessel's maintenance, access trunks are arranged to allow access from the upper deck to the double bottom even under the laden condition. Accommodation compliant with the latest IMO noise reduction regulation improves the comfortable working and living environment for officers/crews in the vessel.

Principal particulars

Hull No.:	1392
L (o.a.) x B (mld.) x D (mld.) x d (Summer, ext.):	229.00m x 32.24m x 20.15m x 14.594m
DWT/GT:	81,950t/43,429
Cargo hold capacity:	97,034m ³ (grain)
Speed, service:	Approx. 14.2kt
Complement:	24
Classification:	ClassNK
Delivery:	September 21, 2023



Kawasaki delivers LPG-powered LPG/NH₃ carrier, ENEOS GUNJO

Kawasaki Heavy Industries, Ltd. has delivered the ENEOS GUNJO (HN: 1757), an 86,700m³ liquefied petroleum gas (LPG) and ammonia (NH₃) carrier powered by LPG.

The ENEOS GUNJO is the second of Kawasaki's newest-design 86,700m³ capacity, LPG-fueled LPG/NH₃ carrier, with cargo capacity increased from the existing 84,000m³ LPG carrier as well as ammonia loading capability. Kawasaki has completed eight LPG-powered vessels to date, and the ENEOS GUNJO is its 72nd LPG carrier in total.

This carrier is equipped with separate cargo tanks and can achieve simultaneous transportation of LPG, which is already widely used as a low carbon-emission energy source, and ammonia, which may be expected to be utilized as a new fuel in the low and zero carbon-emission societies. Furthermore, this vessel is designed to increase cargo tank capacity, by maintaining the principal dimensions like LOA and beam similar to conventional-type vessels so that the carrier

can be berthed at major LPG terminals around the world.

In consideration of the strengthening of environmental regulations around the world and action plans for the Sustainable Development Goals (SDGs), Kawasaki will continue to develop and provide customers with environmental-friendly ship technologies with a focus on LPG carriers and LPG/NH₃ carriers powered by LPG, as well as other types of merchant vessels to comply with the latest environmental regulations, including liquefied hydrogen carriers, which is expected to be adopted widely as a next-generation energy source. In this way, Kawasaki will contribute toward the realization of low and zero carbonemission societies.



Principal particulars

L (o.a.) x B (mld.) x D (mld.) x d (mld.):	229.90m x 37.20m x 21.90m x 11.65m
DWT/GT:	56,531t/49,541
Main engine:	Kawasaki-MAN B&W 6G60ME-C10.5-LGIP engine x 1 unit
Speed, service:	Approx. 17.0kt
Cargo tank capacity:	86,904m ³
Complement:	29
Classification:	ClassNK
Registry:	Panama
Delivery:	September 29, 2023

Tadotsu Shipyard completes PCC, SWEET PEA LEADER

Construction of the SWEET PEA LEADER, an LNG-fueled pure car carrier (PCC) capable of transporting 7,000 automobiles, was completed at Tadotsu Shipyard Co., Ltd., a group company of Imabari Shipbuilding Co., Ltd., on October 26, 2023.

This PCC is fitted with a high pressure-type dual-fuel main engine that can use clean and environment-friendly LNG fuel and demonstrate highly efficient performance. This is one of the most advanced ships to reduce GHGs (greenhouse gases) and

will contribute to the future sustainability of international marine transportation.

When compared with the conventional heavy fuel oil engine, the LNG-fueled main engine can decrease emissions of CO₂ by 25 to 30%, SO_x by nearly 100%, and NO_x by 80 to 90%. NO_x reduction has been achieved by adopting the exhaust gas recirculation (EGR) system. Thus, to cope with environmental conservation, emissions of GHG and air pollutants can be suppressed. The BOG (boil-off gas) constantly generated from the LNG fuel tank is used as fuel for an electric-generator boiler. This makes the ship further environment friendly.

The ship has been designed to have no

bulkhead in the cargo hold, and in-board ramp ways between car decks provide straight and wider passages so this arrangement furnishes easy and simple roll-on/off movement and ensures safer and more efficient car-handling operation. Lifiable car decks have been adopted adjustable to the vehicle height. This allows the ship to load not only automobiles but also high cargo vehicles including trucks and trailers.

Principal particulars

L (o.a.) x B x D:	199.93m x 38.0m x 38.76m
DWT/GT:	18,534t/77,644
Main engine:	6S60ME-C10.5-GI-EGRBP engine x 1 unit
Speed, service:	About 18.0kt
Classification:	ClassNK
Registry:	Liberia
Completion:	October 26, 2023



Namura completes Dunkirkmax-type bulk carrier, AGIS

Namura Shipbuilding Co., Ltd. delivered the AGIS, a 182,334DWT bulk carrier, at its Imari Shipyard & Works on September 13, 2023. The vessel is the second of a newly-developed 182,000DWT-type bulk carrier with excellent features.

The principal dimensions have been optimized to satisfy the restrictions of the Port of Dunkirk in France. Further improvement of propulsion performance and fuel saving in conformity with EEDI Phase 3 can be achieved by adoption of three energy saving devices, the Namura flow Control Fin (NCF), the Rudder-Fin and the additional fins behind NCF developed by Namura, and an electronically controlled main engine, 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 the MARPOL 73/78 regulations to reduce NO_x emissions, and

an air seal type stern tube sealing device to reduce the risk of oil leakage. In addition, the vessel also complies with the SOLAS Chapter II-1 Regulation 3-12, Code on noise levels onboard ships to improve the environment of the living quarters. The ballast water treatment system to control the quality of ballast water is equipped to protect the marine environment to comply with the International Convention for the Control and Management of Ships' Ballast Water and Sediments. The vessel has class notation IHM (Inventory of Hazardous Materials) for compliance with the ship recycling convention according to the Guidelines for the Inventory of Hazardous Materials.

The vessel has several storage



tanks for appropriate management and discharge of drainage, sewage, rain water, and water used for cleaning cargo holds to satisfy port restrictions on such discharges.

Principal particulars

L (o.a.) x B (mld.) x d (mld.): 291.92m x 45.0m x 18.2m
DWT/GT: 182,334t/93,721
Main engine: MAN B&W 7G60ME-C10.5-EGRBP engine x 1 unit
Complement: 24
Classification: ClassNK
Registry: Cyprus
Completion: September 13, 2023

Naikai completes passenger/automobile carrier, FERRY OSUMI NO.11

Naikai Zosen Corporation completed construction of the FERRY OSUMI NO. 11, a 1,500GT coastal passenger-cum-automobile transport ship, at its Setoda Shipyard on September 27, 2023. The ferry was built for delivery to the Japanese co-owners, Iwasaki Corporation and the Japan Railway Construction, Transport and Technology Agency, and is now plying between Kamoike Port, Kagoshima City, and Tarumizu Port, Osumi Peninsula, which are located in Kagoshima Bay.

The ferry runs a service distance of 15.3km between two ports in Kagoshima Bay, and can transport

500 passengers and 54 automobiles, or 14 large buses only, and has the following features. The vehicles can embark and disembark through ramp doors at the prow and the stern. As a barrier-free facility for passengers, an elevator is installed for the aged and the disabled, facilitating movement between the vehicle decks and the navigation bridge deck.

The ferry propulsion system consists of two engines and two propellers, and is provided with a bow thruster and two sets of flap rudders, of which the main rudder board and flap rudder can turn maximum angles of 45 degrees and 90 degrees, respectively. By operating the thruster and rudders at the same time, the ferry can be maneuvered easily when entering and leaving the port.

The ferry has an eco-cap attached on the end of the propeller axis, rudder bulbs, bow and stern fins, and stern wave distributor for increased propulsion performance.

Principal particulars

L (o.a.) x B x D x d: 76.90m x 13.30m x 9.50m x 3.63m
DWT/GT: 1,942t (at designed full load)/1,443
Main engines: Daihatsu Diesel 6DKM-26e diesel x 2 engine/2 propeller
MCO: 1,470kW x 750/215min⁻¹ x 2 units
Speed, service: approx. 16.4kt
Passengers: 500
Officers and crew: 11
Vehicle loading capacity
Large buses only: 14 units, or
Automobiles only: 54 units
Classification: JG Class 2 (smooth water area)
Port of registry: Kagoshima City, Japan
Completion: September 27, 2023



Oshima completes LNG-fueled coal carrier, SHOYO

Oshima Shipbuilding Co., Ltd. (Oshima) completed construction of SHOYO, a 95,233DWT LNG dual-fueled coal carrier, for delivery to Nippon Yusen Kaisha (NYK Line) and Kyushu Electric Power Co. Inc. (KYUDEN) at its Koyagi Shipyard. NYK Line is now operating the carrier to transport coal from overseas to the thermal power plants operated by KYUDEN in Kyushu.

SHOYO is the world's first Post-Panamax type LNG dual-fueled coal carrier. LNG fuel is expected to reduce harmful emissions significantly, SO_x by 100%, NO_x by 80%, and CO₂ by 30%, compared to conventional marine fuel oil.

The vessel's main engine can operate in the gas mode or the diesel mode. In the gas mode, it mainly consumes natural gas, alongside small amount of diesel fuel for ignition. In the diesel mode, the engine is operated purely with diesel fuel. Generator engines and an auxiliary boiler of the vessel are also LNG dual-fueled.

The vessel incorporates several advanced energy-saving features as well. "Seaworthy Bow", "Advanced Flipper Fins" and "Rudder fin" are all developed in-house to improve propulsive performance of the vessel. The

propeller is also designed in-house to optimize the shape and maximize its performance.

By combining the LNG fuel with these advanced energy-saving technologies, SHOYO achieved more than 40% less compared to reference value in Energy Efficiency Design Index (EEDI).

After delivery, SHOYO received LNG fuel by the shore-to-ship bunkering procedure at the LNG terminal of Kitakyushu LNG Co., Inc., a subsidiary of KYUDEN, and is now servicing coal transport.

Oshima has already concluded the contract with NYK Line for building the second and third LNG dual-fueled coal carrier of the same class as SHOYO. These carriers will be completed within 2025 and dedicated to coal transport for Electric Power Companies.

Oshima says it will continue to actively tackle development of next-



generation-fueled ships as well as advanced energy-saving technologies including improvement of fuel efficiency, and to contribute to decarbonization and environmental-load reduction in the world's marine transport.

Principal particulars

L (o.a.) x B (mld.) x D (mld.) x d (mld.):	234.98m x 38.00m x 20.16m x 14.35m
DWT/GT:	95,233t/54,633
Main engine:DU-WinGD 6X62DF2.0 engine x 1 unit	
MCR:	9,400kW at 81.0rpm
Speed, service:	14.00kt
Classification:	ClassNK
Completion:	October 2, 2023

Mitsubishi Shipbuilding delivers LNG FGSS for LNG-fueled car carriers

Mitsubishi Shipbuilding Co., Ltd., a Mitsubishi Heavy Industries (MHI) Group company based in Yokohama, delivered the Fuel Gas Supply System (FGSS), a liquefied natural gas (LNG) fuel gas supply system for high-pressure dual-fuel marine engines to Shin Kurushima Dockyard Co., Ltd. at the end of August 2023.

The FGSS ordered by Shin Ku-

rushima Dockyard features an optimized cargo space layout utilizing a modular design for exceptional space-saving and maintenance access, a shortened construction schedule at shipyards, and a proprietary control system that can be customized according to customer needs, contributing to both excellent operability and safety. Mitsubishi Shipbuilding previously received and filled orders for FGSS units for two LNG-fueled car carriers built by Shin Kurushima Dockyard between 2020 and 2022. Including those deliveries, the total number of FGSS ordered from Japanese clients is now twenty-six units and the deliveries of seven

units have been completed.

Mitsubishi Shipbuilding, as part of MHI Group's strategic initiatives for energy transition, will provide FGSS units to a broad range of customers involved in the construction of LNG-fueled vessels, enhancing the added value and competitiveness of ships. Further, by helping to reduce greenhouse gas (GHG) emissions through the widespread adoption of LNG-fueled vessels, Mitsubishi Shipbuilding, as a maritime system integrator, aims to further the decarbonization of the marine industry, support the realization of a carbon neutral world, and reduce environmental impacts on a global scale.



FGSS modules

BUNUN VICTORY

Builder: The Hakodate Dock Co., Ltd.
 Hull No.: 915
 Ship type: 40,000DWT type bulk carrier
 L (o.a.) x B (mld.) x D (mld.) x d (mld.)
 : 182.94m x 31.60m x 14.80m x 10.37m
 DWT/GT: 40,074t/24,472
 Main engine: J-ENG 6UEC42LSH-Eco-D3-EGR engine x 1 unit
 Speed, service: Approx. 13.6kt
 Classification: ClassNK
 Registry: Panama
 Completion: October 5, 2023

**JFE KOKURYU**

Owner: Asuka Kisen Co., Ltd.
 Builder: Japan Marine United Corporation
 Hull No.: 5386
 Ship type: Roll-on/roll-off ship
 L x B : 115.0m x 22.0m
 DWT/GT: 5,026t/8,611
 Main engine: Hanshin Diesel engine x 1 unit
 Speed, service: 14.7kt
 Complement: 16
 Completion: September 28, 2023

**ANDROMEDA**

Owner: Firenze Shipmanagement S.A.
 Builder: Sumitomo Heavy Industries Marine & Engineering Co., Ltd.
 Hull No.: 1413
 Ship type: Crude oil carrier
 L (b.p.) x B x D : 239.67m x 44m x 21.55m
 DWT/GT: 114,800t/approx. 60,000
 Main engine: Mitsui MAN 6G60ME-C10.5 engine x 1 unit
 Speed, service: 14.5kt
 Classification: LR
 Registry: Bahamas
 Completion: September 14, 2023

**GREEN FAIRY**

Owner: Co-owner of Marshall Islands and Japan
 Builder: Shin Kurushima Kochijyuko Co., Ltd.
 Hull No.: S-6181/S-7377
 Ship type: Bulk carrier
 L (b.p.) x B x D : 130.00m x 23.00m x 12.30m
 DWT/GT: 16,905t/11,361
 Main engine: MAKITA-MITSUI-MAN B&W6S35MC7.1 engine x 1 unit
 Speed, service: 12.85kt
 Classification: ClassNK
 Registry: Marshall Islands
 Completion: August 4, 2023

**MORNING KATE**

Owner: TRIO HAPPINESS, S.A.
 Builder: Sasaki Shipbuilding Co., Ltd.
 Hull No.: 720
 Ship type: Pressurised-type LPG carrier
 L (b.p.) x B x D : 95.30m x 17.70m x 7.80m
 DWT/GT: 5,274t/4,551
 Main engine: MAKITA-MITSUI MAN B&W 5L35MC6 x 1 unit
 Output: 2,200kW x 178 min⁻¹
 Speed, service: 13.40kt
 Classification: BV
 Registry: Panama
 Completion: September 1, 2023

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