

# SEA-Japan

No. 392 Dec. - Jan. 2019

Season's Greetings

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## JAPAN SHIP EXPORTERS' ASSOCIATION

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## JMU completes 311,000DWT crude oil tanker, SUZUKASAN

Japan Marine United Corporation (JMU) delivered the SUZUKASAN, a 311,000DWT crude oil tanker, to EPEE TANKER INC. at its Ariake shipyard on October 12, 2018. This is the third vessel of the new eco-type Malaccamax VLCC series developed by JMU after integration of two companies, Universal Shipbuilding Corporation and IHI Marine United Inc.

The ship design was optimized for transportation between the Middle East and Japan by satisfying the restrictions of various ports. Many of the latest technologies developed through JMU varied experience in building tankers have been incorporated into the vessel.

High propulsion performance was achieved by the application of lower resistance and high efficiency hull form, and optimized energy saving devices such as the Super Stream Duct®, SURF-BULB® and ALV-Fin®. In addition, good sea performance was achieved by the application of

the low wind resistance super-structure and unique bow shape called the "L E A D G E - B O W R." Furthermore, the fuel oil consumption was further improved by the application of a new electronically controlled marine diesel engine, low friction paint and large diameter propeller. Energy Efficiency Design Index (EEDI) phase 2 was achieved, which is required for vessels contracted for construction on or after 2020.

The vessel is designed to advance the compliance with future environmental rules and regulations by installing the Ballast Water Management System and furnishing the inventory list of hazardous materials.



All these features ensure effective energy-saving and environmental friendly performance.

### Principal particulars

L (o.a.) x B x D x d: 339.5m x 60.0m x 28.5m x 21.085m

DWT/GT: 312,037t/160,123

Main engine: MAN B&W 7G80ME-C9.5 diesel x 1 unit

Speed, service: 15.5kt

Complement: 36

Classification: ClassNK

## MES-S delivers 310,000-ton type VLCC, EAGLE TRADER

– Completion of the third Eco Ship "neoVLCC" –

Mitsui E&S Shipbuilding Co., Ltd. (MES-S) delivered the 310,000DWT VLCC, EAGLE TRADER, at its Chiba Works to Atlantis Shipping Navigation S.A., on October 2, 2018. The vessel is a VLCC featuring the largest deadweight and cargo oil tank capacity with dimensions complying with major port restrictions in Japan. The vessel is also the third of the MES-S neo VLCC series as a next-generation eco-ship featuring excellent fuel efficiency and the fifth in the Eco-Ship line-up of the MES-S neo series starting from the neo66BC, a 66,000DWT type bulk carrier.

The neoVLCC series is the largest class of VLCCs with a deadweight of over 310,000 metric tons and dimensions complying with the major port restrictions in Japan,

together with improved propulsion performance and transport efficiency achieved by state-of-the-art energy saving technologies. The latest propeller and energy saving devices pro-



vide higher energy efficiency and environmental friendliness.

To ensure protection of the environment, low sulphur fuel oil tanks

adopt a proactive design for future installation of the exhaust gas cleaning system (SO<sub>x</sub> scrubber), according to the new SO<sub>x</sub> regulations. In addition, the vessel is equipped with the Vapour Emission Control System (VECS). Fuel oil consumption of the vessel is further improved by the G-type electronically controlled marine diesel engine, MITSUI-MAN B&W 7G80ME-C9.5. The waste heat recovery system (WHRS) utilizes the main engine exhaust gas energy, and the vessel has a turbo generator system and main engine tuned to the optimum conditions, which reduces the ship operating costs. Cargo oil tanks and

ballast water tanks are coated in accordance with the IMO Performance Standard for Protective

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## Kawasaki delivers LNG carrier, ENSHU MARU, to "K" Line

Kawasaki Heavy Industries, Ltd. delivered the ENSHU MARU (HN. 1720), a 164,700m<sup>3</sup> capacity liquefied natural gas (LNG) transport vessel for use by Kawasaki Kisen Kaisha, Ltd. ("K" Line) and Tokyo Century Corporation.

The third of Kawasaki's series of 164,700m<sup>3</sup> capacity LNG carriers to be commissioned, this ship is designed to pass through the newly expanded Panama Canal, which opened for full operations in 2016. The vessel features the standard LNG carrier hull dimensions to enable docking at major LNG terminals around the world while offering larger cargo tanks for increased transport capacity, thus cutting LNG transport costs and facilitating more flexible LNG trade operations by ship-owners.



In addition, Kawasaki has made hull structure improvements to decrease overall ship weight and developed a more optimal below-waterline hull design to fully optimize propulsive performance. The new

ous 147,000m<sup>3</sup> capacity LNG carriers. The cargo tank section is protected by a double-hull and double-bottom design, so damage to the carrier's hull will not affect the LNG tanks. The bridge is designed with

state-of-the-art electronic navigation equipment concentrated in one location for greater ease of operation as well as panoramic windows offering a 360-degree view to the outside.

### *\* Kawasaki Advanced Reheat Turbine Plant (Kawasaki URA Plant)*

This steam turbine plant achieves a dramatic increase in thermal efficiency by utilizing a reheat cycle in which steam used to drive the high-pressure turbine is returned to the boiler to be reheated before being sent back to the medium-pressure turbine. The first LNG carrier equipped with the Kawasaki Advanced Reheat

### *Continued from P2*

Coatings (PSPC), enhancing corrosion resistance.

Navigation support systems are greatly improved by various equipment such as the Integrated Bridge Console, Fleet Monitor (MES-developed ship operation monitoring system) and the latest energy-saving autopilot system. The vessel complies with IMO Noise Code and ILO/MLC, 2006 (Maritime Labor Convention, 2006), so improving the working environment for the ship's crew. The vessel has accommodations for 36 persons in total, including 6 trainees.

### **Principal particulars**

Length (o.a.):	339.5m
Breadth (mld.):	60.00m
Depth (mld.):	28.50m
DWT/GT:	312,424t/159,625
Main engine:	Mitsui-MAN B&W 7G80ME-C9.5 diesel x 1 unit
Complement:	36
Classification:	ClassNK

carrier is also equipped with a Kawasaki Advanced Reheat Turbine Plant (Kawasaki URA Plant)\* as its main engine unit. This reheating-type steam-turbine propulsion plant offers significant improvements to transport efficiency. Moving forward, Kawasaki will continue to pursue ship-building operations with the anticipated rise in demand for LNG and other clean-energy fuels.

The principal features of the vessel as follows. This large-scale LNG carrier is equipped with four independent Moss LNG tanks for a total cargo capacity of 165,257m<sup>3</sup>. The thermal insulation system of the LNG tanks adopts the proprietary Kawasaki Panel System, which offers outstanding heat insulation performance resulting in LNG boil-off rate of no more than approximately 0.08% per day. The Kawasaki URA Plant was used to enable an increase in transport efficiency of more than 25% compared with previ-

Turbine Plant was commissioned in September 2011, and the steam turbine plant powering Kawasaki's latest LNG carrier has been further improved using data obtained through sea trials and sea experience using the first plant.

### **Principal particulars**

Length, (o.a.):	293.00m
Length, (b.p.):	280.00m
Breadth (mld.):	48.90m
Depth (mld.):	27.00m
Draught (mld.):	12.20m
DWT/GT:	83,708t/127,088
Cargo hold capacity:	165,257m <sup>3</sup> (at -163°C, 100% capacity)
Main engine:	Kawasaki URA-400 reheating-type steam-turbine engine x 1 unit
MCO:	26,800kW at 70rpm
Speed, service:	19.5kt (approx.)
Complement:	48 people
Classification:	ClassNK
Registry:	Panama
Delivery:	August 31, 2018



## Sanoyas completes Post-Panamax bulk carrier, MEDI KYOTO

Sanoyas Shipbuilding Corporation delivered the 89,000DWT bulk carrier, MEDI KYOTO, constructed at the Sanoyas Mizushima Shipyard on September 21, 2018. This is the second vessel of the newly developed Sanoyas series of post-Panamax bulk carriers based on the concepts of energy-saving and flexibility.

The vessel has wide beam and shallow draft permitting larger deadweight and cargo hold capacity than the conventional Panamax bulk carrier and complies with the New Panama Canal Locks requirements. Cargo space is divided into seven compartments designed for efficient and more flexible loading not only just of coal but of various bulk cargoes such as grain.

The vessel is equipped with low speed and long-stroke electronically controlled main engine combined with a high-efficiency propeller for improvement of propulsion efficiency, and associated energy saving devices such as the Sanoyas Tandem-Fin (patent) with max. 6% energy saving on the stern shell and appendages around the propeller or high lift

rudder, which also contribute to achieve more than the required 20% reduction of CO<sub>2</sub> emission according to the IMO EEDI (Energy Efficient Design Index) regulations in 2020.

The main engine compliant with NO<sub>x</sub> emission Tier II limits and dedicated low sulphur gas oil tanks available in Emission Control Areas are installed for the prevention of air pollution.

Other various countermeasures such as Ballast Water Treatment System and independent holding tanks for rainwater on the upper deck are employed for protection of marine environment. Furthermore, access trunks are arranged for access from the upper deck to the double bottom even under the laden condition for improvement of maintenance of the vessel. Accommodation compliant with the latest IMO noise reduction regulation improves the working and living environment for officers and crews.

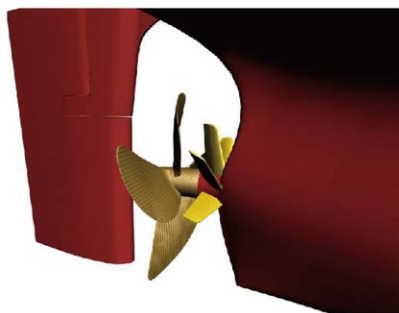


### Principal particulars

Builder:	Sanoyas Shipbuilding Corporation
Ship type:	Bulk carrier
Hull No.:	1351
L (o.a.) x B (mld.) x D (mld.) x d (ext.):	235m x 38.0m x 19.4m x 13.527m (summer)
DWT/GT:	89,499t/49,401
Cargo hold capacity:	105,486m <sup>3</sup> (grain)
Main engine:	MANB&W6S60ME-C8.2 diesel x 1 unit
Speed, service:	about 13.8kt (at C. S. 0. with 15% sea margin)
Complement:	25
Registry:	Panama
Classification:	ClassNK
Delivery:	September 21, 2018

## TSUNEISHI energy-saving device MT-FAST installed on 500 ships

TSUNEISHI SHIPBUILDING Co. Ltd. (TSUNEISHI) has completed the 500th MT-FAST mounted ship. MT-FAST is the energy-saving hull fitting (see image) jointly developed by TSUNEISHI and MTI Co., Ltd. of the NYK Line Group. MT-FAST was first made available for mounting in May 2008.



MT-FAST is a device consisting of multiple fins attached to the stern tube before the propeller. This arrangement permits recovery of the energy loss induced by the rotational flow generated by propeller rotations and reducing fuel use by approximately 4%. As flexibility for installation allows mounting on both newly built and existing ships, MT-FAST has steadily increased the number of installations, especially on ships constructed by TSUNEISHI and bulk/container carriers operated by NYK Line and its group companies. Amid a growing focus on environmental issues and expanding needs for ships with high environmental performance with increased fuel efficiency, MT-FAST has reduced fuel consumption by approximately 447,000 tons<sup>(\*)</sup> and CO<sub>2</sub> emissions by

approximately 1,341,000 tons<sup>(\*)</sup>, contributing to preservation of the global environment.

Dedicated to next-generation shipbuilding, TSUNEISHI will continue to pursue upgrades in fuel efficiency, environmental performance and other measures, and engage in new technology development that will help reduce environmental burdens and improve operation profitability.

<sup>(\*)</sup>1 Annual fuel-consumption reduction of all applicable ships was measured and used as a base to calculate the cumulative total value with consideration of the operational periods of each ship.

<sup>(\*)</sup>2 Calculated by taking the fuel-consumption reduction and multiplying by 3 as the CO<sub>2</sub> conversion factor. This coefficient is based on the Ministry of the Environment's Guidelines on Accounting for Greenhouse Gas Emissions.

## NAMURA completes 99,000DWT-type bulk carrier, OI MARU

Namura Shipbuilding Co., Ltd. delivered the OI MARU, a 100,325-DWT bulk carrier, to Erica Navigation S.A. at its Imari Shipyard & Works on June 14, 2018. This is the third vessel of the series with optimum principal dimensions for the Hekinan Thermal Power Plant of Chubu Electric Power Co., Inc.

The vessel has wide beam and shallow draft design to achieve more efficient cargo unloading at Hekinan compared with conventional types, so this type of vessel is called "Hekinan-max." Improved propulsion per-

formance and fuel saving can be achieved with adoption of the Namura flow Control Fin (NCF) and Rudder-fin (R-Fin) developed by Namura, low friction type anti-fouling paint, and an electronically controlled main engine.

To preserve the environment, the vessel is equipped with main engine and generator engine complying with the Annex VI of MARPOL 73/78 regulations to reduce NO<sub>x</sub> emissions, air seal type stern tube oil sealing device to reduce the risk of oil leakage, and a tank arrangement for low sulfur fuel

oils to reduce SO<sub>x</sub> emissions. The centralized fresh water cooling system is adopted for the machinery space equipment to ease maintenance.

The vessel has several storage tanks for appropriate management

and discharge of drainage, sewage, rainwater and water used for cleaning cargo holds to satisfy port restrictions controlling such discharges.

The ballast water treatment system to control the quality of ballast water is equipped for protection of marine environment to comply with the International Convention for the Control and Management of Ships' Ballast Water and Sediments. The IMO PSPC (Performance Standard for Protective Coatings) – WBT is applied for corrosion protection of the water ballast tanks to increase safety of the vessel.

### Principal particulars

L (o.a.) x B (mld) x D (mld) x d (mld):	249.97m x 43.00m x 18.70m x 12.70m
DWT/GT:	100,325t/59,880
Main engine: MAN B&W 6S60ME-C8.2 diesel x 1 unit	
MCO:	10,450kW x 94.5 min <sup>-1</sup>
Speed, service:	about 14.0kt
Complement:	25
Registry:	Liberia
Classification:	ClassNK



## MHI-MME markets new models of turbochargers for diesel engines

Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd. (MHI-MME), has developed new models of its MET Turbochargers for diesel engines, the MET-MBII axial-flow turbocharger series for two-stroke engines, and MET-ER radial turbocharger series for four-stroke engines.

The MET-MBII axial-flow turbocharger series mainly for two-stroke engines is smaller and lighter than the existing MET-MB series, with 16% greater air flow capacity. The MET-ER radial turbocharger for four-stroke engines is more compact, with fewer components for improved maintainability.

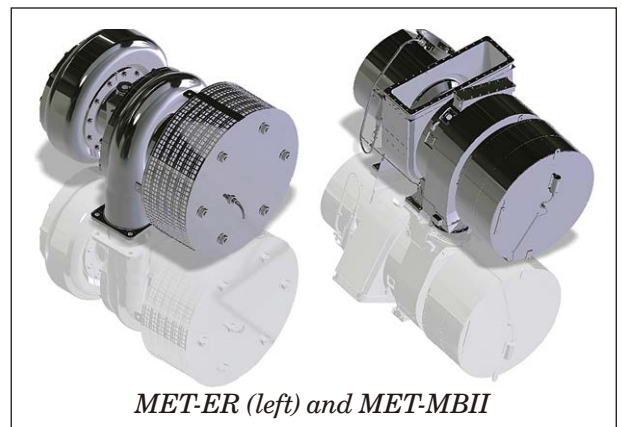
Axial-flow turbochargers are mainly used for large two-stroke marine propulsion diesel engines. The MET-MBII series has been reduced in size to lower the initial cost, weight, and maintenance costs, while still retaining the same

performance as the MET-MB series, which has reached cumulative production of more than 2,000 units, and demonstrated high reliability and maintainability.

Radial turbochargers are mainly used for four-stroke engines for marine and land use. The MET-ER series offers improved performance and more compact size compared to the MET-SR series of radial turbochargers, which reached a cumulative production total of 15,000 units in 2018. The new MET16ER is around 40% smaller than the existing MET18SRC for systems with 1,000kW output because of the greater air flow capacity. The new MET16ER also offers improved maintainability with

around 30% fewer components, which results in lower initial cost, enhancing the environmental performance, economic efficiency, and functionality.

The new models will meet modern requirements for high pressure ratio performance, smaller size, and lower cost to comply with the stricter regulations on exhaust gas from marine vessels and to enhance the efficiency of ship engines.



MET-ER (left) and MET-MBII



**ORANGE EHIME**

Owner: Shikoku Kaihatsu Ferry Co. Ltd.  
 Builder: Imabari Shipbuilding Co., Ltd.  
 Ship type: Car ferry  
 L (o.a.) x B x D: 199.9m x 27.5m x 10.2m  
 DWT/GT: 6,464t/15,000  
 Main engine: Pielstic 18PC2-6B diesel x 1 unit  
 Speed, service: 22.05kt  
 Classification: JG  
 Completion: August 21, 2018

**UNI HORIZON**

Owner: Yamasa Shipholding Victoria S.A.  
 Builder: Oshima Shipbuilding Co., Ltd.  
 Hull No.: 10878  
 Ship type: Bulk carrier  
 L (o.a.) x B x D x d (ext.): 179.99m x 30.00m x 14.63m x 10.339m  
 DWT/GT: 36,861t/22,734  
 Main engine: Kawasaki-MAN B&W 5S50ME-C8.5 diesel x 1 unit  
 Speed, service: 14.00kt  
 Registry: Hong Kong  
 Classification: ClassNK  
 Completion: June 28, 2018

**SWORD**

Owner: Lundquist Shipping Company Limited  
 Builder: Sumitomo Heavy Industries Marine & Engineering Co., Ltd.  
 Hull No.: 1393  
 Ship type: Tanker  
 L (p.p.) x B x D: 224.64m x 42.00m x 21.45m  
 DWT/GT: 106,200t/57,300  
 Main engine: Mitsui MAN B&W 6G60ME-C9.2 diesel x 1 unit  
 Speed, service: about 15.0kt  
 Classification: LR  
 Completion: August 9, 2018

**SULPHUR GLORY II**

Owner: DT Chemical S.A.  
 Builder: Sasaki Shipbuilding Co., Ltd.  
 Hull No.: 701  
 Ship type: Molten sulphur carrier  
 L (o.a.) x B x D x d (ext.): 89.50m x 14.50m x 6.90m x 5.03m  
 DWT/GT: 2,999t/2,812  
 Main engine: Daihatsu Diesel 6DEM-28L diesel x 1 unit  
 Speed, service: 12.50kt  
 Registry: Panama  
 Classification: BV  
 Completion: July 24, 2018

**DIAMOND GAS ROSE**

Owner: Diamond LNG Shipping 2 Pte. Ltd.  
 Builder: MI LNG Company, Limited (Mitsubishi Shipbuilding Co., Ltd.)  
 Hull No.: 2325  
 Ship Type: LNG carrier  
 L (o.a.) x L (b.p.) x B x D x d: 293.5m x 289m x 48.94m x 23.05m x 11.050m  
 Gross tonnage: 144,828  
 Cargo tank capacity: 165,467.106m<sup>3</sup>  
 Main propulsion units:  
 1) Mitsubishi, MR21-II, steam turbine x 1 unit  
 Output: 12,400kW x 61.0rpm  
 2) GE, N3 HXC 1000 J8, electric propulsion motor x 1 unit



Output: 12,400kW x 61.0rpm  
 Speed, service: 19.5kt  
 Classification: ABS  
 Completion: August 1, 2018

**Cover Photo**

Fireworks over the Port of Hamburg at its 827th Anniversary celebration. The cruise ship AIDAprima built by MHI is illuminated at the quayside.