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Imabari develops Aero-Citadel superstructure for energy saving

95,000DWT bulk carrier, RAGA

Imabari Shipbuilding Co., Ltd. has completed the unique 95,000DWT bulk carrier, RAGA (HN: S-1590), at the Marugame Shipyard. This bulk carrier has adopted a next-generation superstructure called the 'Aero-Citadel' with both reduced air resistance effect and anti-piracy measures.

The Aero-Citadel has slimly streamlined shape and includes the accommodation quarters, engine room, and funnel casing. This slender superstructure can reduce the wind pressure during navigation by 25-30% based on wind tunnel testing. For example, a Capesize bulk carrier navigating at normal output against about 9m/sec head wind (Beaufort 5 class) will have fuel consumption decreased by 2%. Moreover, the new design incorporates marine use LED lighting in the accommodation and engine room lighting systems, which reduces the electric power required for lighting by about 50%.

The citadel concept has increased the safety and security of the ship. The slim, streamlined shape facilitates turning of the bow of the ship toward windward during anchorage and decreases the risk of anchor dragging. All stairs are placed inside the superstructure as an anti-piracy measure. The entrance on the lower level deck has thick reinforced steel doors. The accommodation windows

Exterior of Aero-Citadel superstructure

are bulletproof, and water cannons are placed on the upper deck to prevent pirate incursions into the accommodation. A citadel facility is provided as a refuge area in the superstructure that can accommodate all the crew for several days, protected by double-layer security doors. The facility is also equipped with communication devices us-

(Continued on Page 2)

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(Continued from Page 1)

able even in case of blackout, and ship maneuvering equipment such as stop main engine and steering controls, and can gather information about the ship's status including video images and sound.

The accommodation design also includes many features such as increased noise insulation and vibration countermeasures in accordance with the SOLAS MLC2006 requirements that will come into effect in the near future. Improved living conditions for the crew are provided, and the wheelhouse has a widened backward view for safer navigation.

Imabari Shipbuilding proposes that the next-generation superstructure Aero-Citadel should be applied to all possible types of vessels, to ensure special attention to energy efficiency and environment issues and reinforced anti-piracy measures, improved safety and living conditions for the crew.

Wheelhouse

Principal particulars of RAGA

Ship type: Bulk carrier
Hull No.: S-1590
L (o.a.) x L (b.p.) x B x D x d (ext.): 234.98m x 227.00m x 38.00m x 19.90m x 14.468m
DWT/GT: 95,666mt/50,615
Cargo hold capacity: 109,476.93m^3
Main engine: Hitachi-MAN B&W 6S60ME-C (Mark 8) diesel x 1 unit
MCR: 12,950kW x 101min^{-1}
NCR: 11,010kW x 95.7min^{-1} (85% MCR)
Speed, Service: 15.0kt (at NCR of M/E with 15% SM, on designed draught)
Complement: 25
Classification: NK
Registry: Panama

JMU completes new 97,000 DWT coal carrier with CRP system

SHOYOH is the first eco-designed coal carrier built by the Kure Shipyard of Japan Marine United Corporation (JMU). SHOYOH is designed mainly for carrying thermal coal to coal-fired power stations in Japan. Particulars and specifications of the vessel are optimized for Japan's port conditions.

The vessel can achieve high fuel-efficiency as well as safer and easier operation with the following technologies.

The contra-rotating propeller (CRP) system for high propulsion performance which consists of two contra-rotating propellers positioned in tandem. The aft propeller recovers waste energy from the rotating flow induced by the fore propeller and changes this energy to thrust. Since the first application to a 37,000DWT bulk carrier in 1989, JMU has installed CRP systems on over 20 vessels. For further improvement of the propeller efficiency, CRP of SHOYOH has tip raked geometries.

Additional energy saving devices include a semicircular duct and rudder bulb fitted before and behind the propellers, respectively. The semicircular duct generates thrust and increases the wake gain by guiding slower flow to the propeller disc. The rudder bulb streamlines the flow and reduces separation losses from the propeller hub.

The exhaust gas power turbine generator (PTG) for saving fuel consumption during the voyage bypasses some exhaust gas of the main engine to a gas power turbine for generating electricity and saves fuel consumption of the diesel generator.

The center water ballast tank is arranged amidships for exclusive use under heavy ballast conditions to eliminate the need for floodable hold(s). Complete separation of water ballast tanks and cargo holds helps for safer and easier ballast water loading and unloading operations, prevention of hold structure corrosion by seawater, and easier maintenance during voyage.

The vessel has been designed and built under the survey of ClassNK in accordance with IACS Common Structural Rules for Bulk Carriers (CSR-B). SHOYOH has BC-B notation, which enables the vessel to load not only coal, but also heavy cargoes, such as iron ore with homogeneous loading in all cargo holds.

Principal particulars

L (o.a.) x L (b.p.) x B x D x d: 239.90m x 234.50m x 43m x 20.50m x 13.053m
DWT/GT: 97,114t/60,876
Main engine: Wartsila 6RT-flex58T-D diesel x 1 unit
Speed: 14.2kt
Complement: 28
Classification: NK
Completion: July 25, 2013

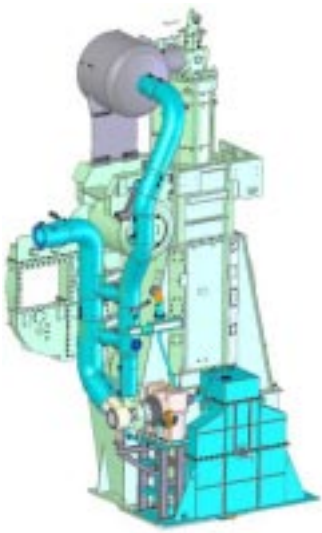
Kawasaki develops exhaust gas recovery system K-GET for reduction of CO_2 emissions

Kawasaki Heavy Industries, Ltd. has developed an exhaust gas recovery system K-GET (Kawasaki Green Eco Turbine) for marine diesel engines, which helps reduce CO_2 emissions. Vessels engaged in international marine transport will be obliged by the IMO regulations to reduce emissions of CO_2 from marine main diesel engines. As an effective measure for IMO regulations, Kawasaki has continued to develop an exhaust gas recovery system to make effective use of surplus energy of marine main diesel engines.

The exhaust gas from a main diesel engine has so far been used to power the turbochargers of the main diesel engine for supercharging fresh air to the engine. However, the supercharging system has greatly been improved based on recent technological advances, so requires less use of exhaust gas for the supercharging system.

The K-GET system obtains a portion of the exhaust gas that bypasses the turbochargers and drives a power turbine. The force of the power turbine assists the crankshaft of the main engine. The K-GET system uses Kawasaki's own power turbine to attain high power performance with simple machinery design and arrangement, which minimizes the effect on the machinery room arrangement. By using recovered energy from the engine exhaust gas as a part of the propulsion force directly, the K-GET system can decrease the quantity of CO_2 emission and fuel consumption, and is usable for vessels such as bulk carriers and tankers, which have less demand for inboard electricity during navigation.

Trial evaluations of the K-GET system carried out at the Kawasaki's Kobe



Works confirmed that the system could contribute to a 4% decrease in CO_2 emissions and fuel consumption. Kawasaki will continue to conduct sea trials on the system mounted on an actual vessel to evaluate its performance and confirm durability. The K-GET system is scheduled to be marketed in 2015.

MHI completes research and study vessel, SHINSEI MARU, for JAMSTEC

Mitsubishi Heavy Industries, Ltd. (MHI) completed construction of SHINSEI MARU (HN:1166), a vessel for research and study on the Tohoku Marine Ecosystem and delivered the vessel to the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) at the Shimonoseki Shipyard & Machinery Works on 30th Jun, 2013.

The Tohoku Ecosystem-Association Marine Science Center was established as a network for restoration and assistance in the reconstruction of fishing grounds off the Pacific Coast of Tohoku. The marine environments of the area were heavily damaged by the tsunami and earthquake caused by the Tohoku-Pacific Ocean Earthquake on March 11, 2011. To promote the effective utilization of scientific knowledge accumulated in universities and others, the Center devotes itself to carrying out research and study on marine ecosystems.

The SHINSEI MARU was built for the Tohoku Ecosystem-Association Marine Science Center as a successor to the academic research vessel TANSEI MARU decommissioned in January 2013. The new research ship has been fitted with a dynamic positioning system and diversified observation and portable research equipment so that comprehensive observation and research including marine environment observation, ocean bottom topography research. Moreover, marine weather observation can be carried out in an effective and efficient manner along the Tohoku coast or in the greater coastal area.

Principal Particulars

Owner: Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
Builder: Mitsubishi Heavy Industries, Ltd. - Shimonoseki Shipyard & Machinery Works
Ship type: Research and study vessel
L (o.a.) x L (b.p.) x B x D x d: 66.00m x 59.90m x 13.00m x 6.20m x 4.50m
GT: 1,629
Main propulsion system
Electric motor 1,300kW x 2 units
Azimuth propeller x 2 units
Speed, service: 13.2kt
Cruising range: Approx. 6,500nm
Complement: 41
Classification: NK

MES expands Eco-Bulker "neo" series

Mitsui Engineering & Shipbuilding Co., Ltd. (MES) have been promoting its eco-friendly bulk carriers "neo56," "neo66" and the newly developed "neo60", and the total number of these three designs on order has reached 30. Responding to the worldwide growing demand for eco-ships, MES will expand eco-ship newbuilding for all of its merchant vessels lineup.

The "neo56" adheres to the superior flexibility and reliability of the "Mitsui 56," MES' bestselling Handymax bulker with more than 150 deliveries, and further improved the well-known propulsion performance and fuel efficiency with a newly developed hull form and electronically controlled main engine. The "neo66" has over-Panamax beam (36m), shallow draft, and cargo gears, aiming at the best balance of cargo capacity, operational flexibility, and fuel efficiency. Since its publication in 2010, "neo66" has been highly appraised by operators, particularly in Europe, and MES has piled up its order backlog.

"neo66"

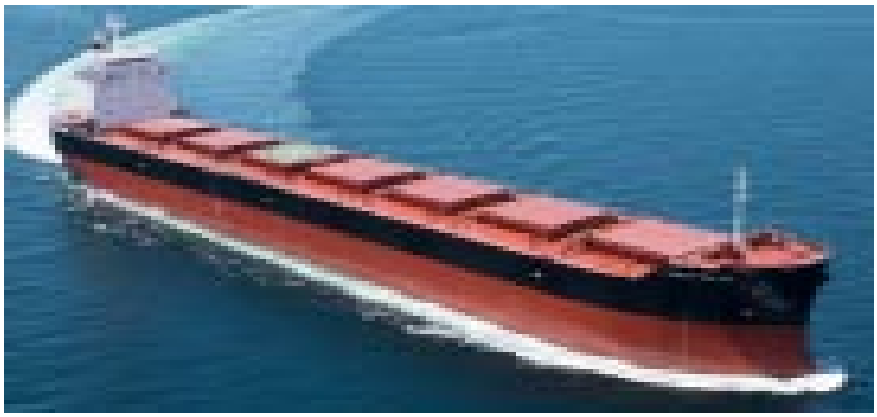
Further to "neo56" and "neo66," in order to accommodate the customer requests, MES has developed a 60,000DWT Supramax bulker with Panamax beam, the "neo60" and has several newbuilding contracts. Currently, ten or more each of the "neo56" and "neo66" are in the MES' order backlog and both first units are scheduled for delivery in late 2013 and early 2014, respectively. The first unit of "neo60" will be delivered in spring-time 2015.

MES continues responding to demands for eco-ships. Hereafter, not only these 3 types, all the MES' newbuilding merchant vessels will be eco-ship types. MES is committed to offer high quality and high performance ships meeting market requirements.

Sanoyas completes Panamax bulk carrier, FORTE DE SAO JOSE

Sanoyas Shipbuilding Corporation delivered the 78,384DWT Panamax bulk carrier, FORTE DE SAO JOSE (HN: 1308), to its owner, Empresa De Navegacao Elcano, S.A., on July 2, 2013. The carrier built at the Mizushima Shipyard is the 10th vessel of the 78,000DWT type Panamax bulk carriers developed by Sanoyas. The carrier has larger deadweight and cargo hold capacity than the conventional bulker. This is achieved by elongating the length between perpendiculars without changing the overall length and beam. This vessel applies the "Common Structural Rules" (CSR) of the International Association of Classification Societies.

For improvement of propulsion efficiency, the vessel is equipped with a low-speed and long-stroke main engine combined with a high-efficiency propeller and STF (Sanoyas-Tandem-Fin (patent): max. 6% energy saving) on stern shell, which also contribute to the reduction of CO_2 emissions. For efficient cargo handling, cargo hatches are widened as much as possible. Dedicated fresh water tanks are provided for storing hold-washing water generated by a large capacity type fresh water generator. In addition, a special fuel oil heating system is applied to the fuel oil storage tanks in order to avoid cargo damage by overheating and to save steam consumption. For protection of the environment, various countermeasures are incorporated, which include fuel oil tanks of double hull structures, holding tank for accommodation discharges and dirty hold bilge, and independent bilge segregation system for the engine room.



Principal particulars

Owner: Empresa De Navegacao Elcano, S.A.
Hull No.: 1308
Ship type: Panamax bulk carrier
L (o.a.) x L (b.p.) x B x D x d: 225.00m x 220.00m x 32.24m x 19.90m x 14.435m
DWT/GT: 78,384t/41,799
Cargo hold capacity: 91,145m^3 (grain)
Speed, service: about 14.5kt
Main engine: MAN B&W 7S50MC-C diesel x 1 unit
MCO: 9,560kW
Complement: 27
Registry: Panama
Classification: NK
Delivery: July 2, 2013

NAMURA completes ore carrier, RMC RIGEL, for MOL Cape

Namura Shipbuilding Co., Ltd. delivered RMC RIGEL, a 250,769 DWT ore carrier, to MOL Cape (Singapore) Pte. Ltd. at its Imari Shipyard & Works on June 21, 2013. This is the eleventh vessel of 250,000 DWT type ore carriers called WOZMAX and the principal dimensions of this type vessel satisfy the restrictions of Port Hedland, Port Walcott, and Dampier, which are the three major ports in Western Australia. The mooring equipment is suitably arranged for calling at Port Walcott, Western Australia.

The Namura flow Control Fin (NCF) and rudder fin, which have been developed by Namura, and high-efficiency propeller are equipped for improving propulsion performance and saving fuel oil. Corners of the superstructure are cut to reduce air resistance. The electronically controlled main engine complies with MARPOL NO_x limitation tier II. In the cooling system of the machinery, a central fresh water cooling system is used for easy maintenance. The vessel complies with the requirements of the latest amendments of the international regulations at the construction stage.

The vessel has large capacity water ballast pumps for quick operation during cargo loading. Ballast water treatment system is installed for marine environmental protection by managing the purity of ballast water of the vessel. IMO PSPC-WBT is applied for corrosion protection of the water ballast tanks to increase the safety of the vessel.

Principal particulars

L (o.a.) x B (mld) x D (mld) x d (mld): 329.95m x 57.00m x 25.10m x 18.00m
DWT/GT: 250,769t/132,913
Main engine: Mitsubishi 7UEC80LSE-Eco diesel x 1 unit
Speed, service: about 15.0kt
Complement: 25
Classification: LR
Registry: Singapore

Naikai delivers 9,450GT passenger/car ferry, SILVER EIGHT

Naikai Zosen Corporation completed the 9,450GT passenger/car ferry, SILVER EIGHT, at the Setoda Shipyard for its co-owner, Japan Railway Construction, Transport and Technology Agency, and Tsugaru Kaikyo Ferry Company, on June 25, 2013. This passenger/car ferry is the twin-engined, twin-screw, and twin-rudder type. Vehicles can roll onto car decks through ramp doors at the bow and stern of the starboard side. The inboard transit of the vehicles can be carried out through inboard ramps.

The ferry is a single hull form with a bulbous bow and ordinary stern and is designed to increase propulsion and seakeeping performance. The fin stabilizers are provided to suppress the ship's rolling during navigation, and a bow thruster and two mariner schilling rudders are employed to facilitate berthing and unberthing at a port. For the convenience of the passengers, escalators are installed, and particularly, starboard elevators are available for seniors and disabled persons as direct accesses from the car decks and the boarding entrance to the cabin decks. Two car decks can accommodate a great number of passenger cars and trucks together with large motorcycles.

Principal particulars

Co-owner: Japan Railway Construction, Transport and Technology Agency (JRTT) and Tsugaru Kaikyo Ferry Company
Builder: Naikai Zosen Corporation - Setoda Shipyard
Ship type: Passenger/car ferry
L (o.a.) x B x D x d: 142.59m x 23.40m x 14.10m x 5.60m
DWT/GT: 4,028t/9,483
Passengers: 600 (24 hrs limit)
Vehicle loading capacity
Trucks (L: 12m): 68
Passenger cars: 30
Motorcycles: 57
Crewmembers: 33
Main engines: Hitachi-MAN B&W 7L42MC6.1 diesels: 2 engines, 2 screws
MCO: 6,965kW x 176.0min^{-1} x 2 units
Speed, service: about 20.5kt
Classification: JG
Completion: June 25, 2013

ASAHI OCEAN

Owner: Sealift Maritime, S.A.
Builder: The Hakodate Dock Co., Ltd.
Hull No.: 856
Ship type: Bulk carrier
L (o.a.) x B x D x d: 175.53 m x 29.40 m x 13.70 m x 9.64 m
DWT/GT: 32,085t/19,819
Main engine: Mitsubishi 6UEC45LSE diesel x 1 unit
Speed, service: 14.4kt
Complement: 24
Classification: NK
Completion: July 19, 2013

MINAMI

Owner: Olamar Navegation S.A.
Builder: Oshima Shipbuilding Co., Ltd.
Hull No.: 10685
Ship type: Bulk carrier
L (o.a.) x B x D x d (ext.): 228.41m x 36.50m x 19.89m x 13.978m
DWT/GT: 85,555t/46,700
Main engine: Mitsui MAN B&W 5S60MC-C (Mark 7) diesel x 1 unit
Speed, service: 14.30kt
Registry: Panama
Classification: NK
Completion: July 26, 2013

ANSAC AMITY

Owner: Amity Universal Shipping Corporation
Builder: Kanda Shipbuilding Co., Ltd.
Hull No.: 536
Ship type: Open hatch cargo ship
L (o.a.) x B x D x d (ext.): 181.1m x 28.40m x 14.25m x 10.034m
DWT/GT: 32,752t/20,992
Main engine: 6UEC45LSE diesel x 1
Speed, service: 14.15kt
Registry: Panama
Classification: NK
Completion: June 17, 2013

ANSAC PRIDE

Owner: Jade Bulkship S.A.
Builder: Onomichi Dockyard Co., Ltd.
Hull No.: 592
Ship type: Box-shaped bulker
L (o.a.) x B x D x d (ext.): 177.85m x 28.60m x 15.00m x 10.87m
DWT/GT: 37,094t/22,863
Main engine: Akasaka Diesels 6UEC45LSE diesel x 1 unit
Registry: Hong Kong
Classification: NK
Completion: June 19, 2013

KM FUKUYAMA

Owner: SMG Line S.A.
Builder: Tsuneishi Shipbuilding Co., Ltd.
Hull No.: 1502
Ship type: Bulk carrier
L (o.a) x B x D x d: 228.99m x 32.26m x 20.05m x 14.429m
DWT/GT: 82,224t/43,013
Main engine: Mitsui MAN B&W 6S60MC-C (Mark 7) diesel x 1 unit
Speed, service: 14.5kt
Registry: Panama
Classification: NK
Completion: July 2, 2013

SAKIZAYA BRAVE

Owner: Sakizaya Line S.A.
Builder: Sasebo Heavy Industries Co., Ltd.
Hull No.: S811
Ship type: Bulk carrier
L (o.a.) x B x D: 225m x 32.20m x 19.80m
DWT/GT: 74,940t (at summer draft)/ 40,350
Main engine: B&W 7S50MC-C8.1 diesel x 1 unit
Speed, service: 14.5kt
Registry: Panama
Classification: NK
Completion: June 11, 2013