



Kawasaki completes 145,000m³ LNG carrier, *Muscat LNG*



Kawasaki Shipbuilding Corporation (Kawasaki) has delivered the *Muscat LNG* (HN: 1527), an LNG carrier with a cargo capacity of 145,000m³ LNG, to Oasis LNG Carrier S. A. of Panama.

The carrier is the second of the 145,000m³ type developed by Kawasaki and designed with 10,000m³ larger capacity than the conventional 135,000m³ type carrier, although the ship dimensions are almost the same as the conventional type. Therefore, the carrier can visit many LNG terminal ports worldwide.

Four LNG cargo tanks of independent spherical MOSS type are provided. The heat insulation is the Kawasaki panel system, which has a high heat insulation effect. The boil-off gas rate is maintained at about 0.15% per day by the system. The cargo tanks are installed inside the compartment built with double side shells and double bottom to ensure safety so that the cargo tanks are not damaged directly.

The wheel-house is equipped with the advanced integrated navigation equipment, which has improved ship operation tasks. Windows around the wheel-house pro-

vide a panoramic view of 360 degrees, allowing one-man operation during ocean-going navigation.

Cargo-handling operation is carried out at the cargo-handling room located in front of the accommodation quarters, where the Kawasaki IMCS (Integrated Management Control System) is installed for monitoring and control of cargo handling operation as well as monitoring engine conditions. The IMCS is very easy to use since it was developed by incorporating experience and opinions from many operators.

Principal particulars:

L (o.a.) x L (b.p.) x B x D x d: 289.50m x 277.00m x 49.00m x 27.00m x 11.90m

DWT/GT: 77,351t/118,219t

Cargo tank capacity: 145,494m³ (at -163°C, 98.5%)

Main engine: KAWASAKI UA-400 steam turbine x 1 unit

MCR: 26,900kW at 80rpm

Speed, service: approx. 19.5kt

Complement: 45

Classification: NK

Completion: Apr. 12, 2004



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Large Cruise Ship *Sapphire Princess* Delivered to Princess Cruises

Mitsubishi Heavy Industries, Ltd. (MHI) recently completed the large cruise ship *Sapphire Princess*, built at its Nagasaki Shipyard and Machinery Works. The ceremony to celebrate her delivery took place on May 27, attended by Mr. Peter Ratcliffe, Chief Executive Officer of Princess Cruises, Mr. Kazuo Tsukuda, President, and Kazunori Ohta, Managing Director, both of MHI.

The *Sapphire Princess* was built in parallel with her sister *Diamond Princess*, which was delivered to her owner in February this year. The best of MHI's resources was put into the parallel construction of these two large cruise ships, which was unprecedented in the world shipbuilding industry, and has now been successfully completed with the delivery of the *Sapphire Princess*.

The approximately 116,000 GT *Sapphire Princess* measures 290 m in overall length and 54 m high from the sea surface, a height comparable to an 18-storey building on shore. The cruise ship is provided with gorgeous public spaces including restaurants, a theater, a disco, a casino and a tennis court together with seven swimming pools. This floating luxury hotel



has 1,339 private cabins.

A cogeneration system and an electrical propulsion system combining a gas turbine converted from an aircraft engine with low emission type diesel engines achieve high power output while suppressing noise and vibration. Thus the vessel embodies thorough pursuit of high maneuverability, quietness and comfort, which are priority requisites of passenger ships.

The *Sapphire Princess* is further equipped with a state-of-the-art emission cleaning device and a waste water treatment system embodying next-generation biotechnology. The cruise

ship thus represents thorough consideration for the global environment as exemplified by these facilities which can dispose of all the wastes generated on board and discharge none into the sea.

Principal particulars

Gross tonnage: About 116,000

Overall length: 290.0 m

Maximum breadth: 41.5 m

Height above sea level: 54.0 m

Total number of passenger cabins: 1,339

Maximum passenger capacity: 3,078 persons

Toyohashi completes Panamax car carrier, *Hual Dubai*

Toyohashi Shipbuilding Co., Ltd. has completed construction of the *Hual Dubai*, a pure car carrier with a carrying capacity of 6,402 vehicles for Dynamic Rainbow Marine S. A. of Panama.

The *Hual Dubai* is designed to carry passenger cars, trucks, buses, recreational vehicles (RV), and bulldozers. This is the first of the series of car carriers, which are be-

ing built successively by Toyohashi.

The PCC has 12 car decks including four liftable decks. Car holds above the freeboard deck have no partial bulkheads for the convenience of loading and unloading vehicles.

The main engine is a low-speed and long-stroke type diesel engine. Adoption of the high performance propeller with turbo ring saves fuel oil consumption.

Principal particulars

L (o.a.) x L (b.p.) x B x D x d: 199.99m x 192.00m x 32.26m x 35.80m x 9.60m

DWT/GT: 18,369t/59,217t

Main engine: Mitsui-MAN B&W 7S60MC (Mark 6) diesel x 1 unit

MCR: 14,280 kW (19,416 PS) x 105 min⁻¹ (rpm)

NOR: 12,138 kW (16,504 PS) x 99.5 min⁻¹ (rpm)

Speed, max. trial: 21.83kt

Speed, service: 19.8kt

Classification: NV/KR (Double Class.)

Complement: 25



Sanoyas completes Panamax bulker, *Ikan Bilis*

Sanoyas Hishino Meisho has completed completion of the Panamax bulk carrier, *Ikan Bilis* (HN: 1217), for the Mi-Das Line S. A. at the Mizushima Works and Shipyard. The vessel is the 46th of the Panamax series, or the 20th as the 75,000DWT type, developed by Sanoyas.

Seven cargo holds are arranged along the ship centerline, and the accommodation quarters and engine room are located aft. Cargo holds are constructed with topside tanks and hopper bottoms for efficient cargo loading and unloading.

Hatch covers are the side rolling type driven by hydraulic motors and chains for opening and closing. The main engine is a low-speed, long stroke, and 2-cycle diesel engine. The engine coupled with a large diameter propeller attains less fuel consump-



tion.

Principal particulars:

L (o.a.) x L (b.p.) x B x D x d: 225.00m x 217.00m x 32.26m x 19.30m x 13.994m

DWT/GT: 75,729mt/38,871t

Cargo hold capacity: 89,250m³

(grain)

Main engine: MAN B&W 7S50MC-C diesel x 1 unit

Output: 12,200ps

Classification: NK

Completion: May 18, 2004

Onomichi completes 71,000DWT crude oil carrier *Sanko Confidence*

Onomichi Dockyard Co., Ltd. has completed the *Sanko Confidence* (HN.: 499) for Deepsea Agency Ltd. of Liberia. The vessel is a 71,000DWT crude oil carrier, which was developed by Onomichi as a standardized oil carrier with a double hull construction, complying with the latest marine pollution regulations.

The cargo space is segregated to permit loading of three types of crude oils simultaneously. Three self-stripping type pumps efficiently achieve simultaneous unloading and loading of the three types of cargoes.

A leakage preventive device retains harmful gas in the cargo tanks, and an anti-explosion system will minimize explosion at an accidental

leakage of harmful gas into the double hull space. Thus safety measures are fully taken into account for safe ship operation.

The engine room is equipped with unattended machinery, and the main engine uses a low-speed, long-stroke, and low-fuel consumption diesel that turns a large-diameter propeller

Principal particulars:

L (o.a.) x B x D x d: 228.55m x 32.20m x 19.60m x 13.70m

DWT/GT: 71,000t/38,700t

Main engine: MAN B&W 6S60MC

(Mark-VI) x 1 unit

Output: 16,641ps x 105rpm

Speed, max. trial: 16.1kt

Classification: ABS



To our readers

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MHI installs anti-rolling gyros on luxury yachts of Ferretti group of Italy

Mitsubishi Heavy Industries, Ltd. (MHI) and the Ferretti Group have signed an important exclusive European agreement for installing a new stabilization system on vessels produced by the companies of the Ferretti Group. This innovative system, called ARG or Anti Rolling Gyros, is produced by MHI, and applies the operating principle of a control moment gyro (CMG) to suppress a boat's rolling motion or rolling angular velocity on the water surface, the main cause of seasickness, thus enabling passengers to sail in comfort.

MHI will supply three models of its ARG systems, MSM-2000, 4000 and 12000, but mainly MSM-4000, to Ferretti Group until 2006, marking the first export of ARG units. The ARG, developed by MHI based on its CMG technology for attitude control of satellites, automatically reduces boat rolling by more than 50%, for a more comfortable ride. In essence, an ARG consists of a flywheel, damper, gimbal (on which the flywheel is suspended) and a motor (to drive the flywheel). Based on the same principle as that of a spinning gyroscope, the high-speed rotation of the flywheel

produces force to counter a boat's rolling motion.

Although other devices that reduce rolling during cruising exist, for example fin stabilizers, the ARG is the first system in the world capable of reducing rolling of a small boat even at anchor or when trolling. Finally, thanks to the ARG's extreme quietness, the stabilizers can be activated at night without disturbing the sleep of passengers.

MHI's first ARG, the MSM-500, was developed and marketed in 1995 for small boats with displacements below 5 tons. The MSM-500 features angular momentum of 500 Nms (Newton meter second), weighs 130kg, and measures 710mm in width, 516mm in height, and 470mm in length. Subsequently, MHI developed higher-power models, the MSM-2000/4000/12000, in response to customer



needs.

By installing ARG systems in multiple units, it is possible to accommodate vessels with displacements above 5 tons all the way up to 500 tons. In Japan, MHI has already sold 220 ARG systems for public-sector, commercial and private use, including cruise ships, sightseeing boats, fishing boats, pleasure craft and patrol boats.

Major Specifications of MSM-4000 ARG

Angular momentum: 5000 Nina (Newton meter second)

Dimensions (width x height x length): 1000 x 700 x 700 mm

Power consumption (max/reg): 4300/3000 W (AC200V, 3-phase)

Weight: 700 kg



Anti Rolling Gyro MSM-4000 (above) and Custom Line Navetta 30 (left: By courtesy of the Ferretti Group)

18,000DWT product tanker, *Kirana Tritya*, completed at Naikai Zosen

Naikai Zosen Corporation has completed the *Kirana Tritya* (HN: 682), an 18,000DWT product tanker for Kirana Tanker Pte. Ltd., at the Setoda Works. The tanker has been put in service to transport refined petroleum products such as jet engine and automobile fuels on S. E. Asian routes centered on Singapore and Indonesia.

The *Kirana Tritya* is designed with a wide beam and a shallow draught of 7.0m for operation on the routes. Cargo tanks including slop tanks are segregated into 12 tanks. The cargo space construction is ensured by double side shells and double bottom to prevent marine pollution caused by accidental cargo leakage.

Cargo tanks have a total capacity

of 24,568.4m³, and three units of 600m³/hr electric screw pumps perform cargo unloading. As the tanker is the shallow draught and wide beam type, the new hull form has been developed with consideration of propulsion performance and maneuverability. The rudder is a larger design. Thus the total design allows exact course keeping and changing in shallow waters.

The bunker oil tanks are installed at the bow and stern, and the bunker oil can be shifted to either of the two tanks to provide even keel of the ship during navigation.

Principal particulars:
L (o.a.) x L (b.p) x B x D x d: 160.00m x 152.00m x 27.90m x 11.20m x

7.00m

DWT/GT: 18,774t/13,203t

Cargo tank capacity: 24,568.4m³

Complement: 25

Main engine: Hitachi Zosen B&W 7S35MC (MK6) diesel x 1 unit

MCR: 4,900kw x 170-1

NCR: 4,420kw x 164-1 (90%)

Speed, service: 13.7kt

Classification: NK



Niigata Shipbuilding acquires ISO9001 certificate

Niigata Shipbuilding & Repair, Inc., a wholly owned subsidiary of Mitsui Engineering & Shipbuilding Co., Ltd. (MES), has obtained the ISO9001 certificate authorized by The Japan Accreditation Board for Conformity Assessment (JAB), which is a private nonprofit foundation and the only organization in Japan responsible for almost all accreditation under the conformity assessment scheme, and the examination and registry was performed by Nippon Kaiji Kyokai (NK), the Japanese ship classification society.

The certificate will cover design and development, shipbuilding and repairing, and the related services for commercial ships (LNG carriers excluded), government ships, defense ships, fishery ships, high-speed ships, passenger vessels, ferries, workvessels, and steel structures. The Niigata head office, the Misaki

Works (Kanagawa Prefecture), and the Tokyo Office (Minato-ku) are also covered by the certificate.

Niigata Shipbuilding started preparation work to obtain the certificate in August 2003. Through eight-month preparation work, the quality policy and the quality management system were established, i.e., to adhere closely to the related rules and customers' requirements, and the quality management system required by the ISO9001 must be maintained. Further satisfaction of users will be continuously improved through the quality system.



From left are president K. Yashiki, ex-president Y. Akutsu, and Y. Tsudo, vice president of NK

Niigata Shipbuilding is the ex-shipbuilding department of Niigata Engineering Co. that was dissolved in 2003 and restarted as a subsidiary of MES in April 2003. The company is headed by President Kazuki Yashiki and has 180 employees with headquarters in Niigata City, Niigata Pref.

19th International Shipping Exhibition, Posidonia 2004

The Japan Ship Exporters' Association (JSEA) participated in the 19th International Shipping Exhibition Posidonia 2004 held at the Exhibition Center of Piraeus, Greece, for five days from June 7 to 11. Posidonia 2004 attracted 1,662 companies and organizations from 74 countries, and was visited by 16,338 people including the public.

At the opening ceremony held on June 7, Mr. Costas Karamanlis, the Prime Minister of Greece, gave the opening address. After the ceremony, the Prime Minister, Mr. Manolis Kefaloyiannis, the Minister of Mercantile Marine of Greece, and Mr. Nicos Efthymiou, the Chairman of the Shipowners Association of Greece, visited exhibition stands. Mr. Toshio Mochizuki, Japanese Ambassador to Greece and Mr. Toshimichi Okano, JSEA president met the Minister at the Japanese stand.

The participation of JSEA consisting of 11 Japanese shipbuilders was carried out with the financial support

of The Nippon Foundation and in cooperation with The Shipbuilders' Association of Japan. JSEA, The Cooperative Association of Japan Shipbuilders, and the Nippon Kaiji Kyokai used a 261m² co-exhibition area where Japanese shipbuilding technology was presented.

On June 9, Ambassador and Mrs. Mochizuki, and JSEA president Mr. and Mrs. Okano co-sponsored a cocktail party at the Athenaeum Inter-Continental Hotel with 900 guests including government officials and others concerned with the shipping and shipbuilding industries.



From left are Japanese Ambassador, Mr. C. Karamanlis, Mr. M. Kefaloyiannis, and Mr. Okano at the Japanese Stand

Clipper Horizon

Owner: Colas Horizon Ltd.
Builder: The Hakodate Dock Co., Ltd.
Hull No: 796
Ship type: Bulk carrier
L (pp) x B x D x d: 168.56m x 29.40m x 13.50m x 9.56m
DWT/GT: 32,040t/19,730t
Main engine: Mitsubishi 6UEC52LA diesel x 1 unit
Speed, service: 14.0kt
Classification: ABS
Completion: March 12, 2004

*Ferry Oki*

Owner: Oki Kisen Kabusiki Kaisha
Builder: Mitsubishi Heavy Industries, Ltd.
Hull No.: 1100
Ship Type: Passenger/car ferry
L (b.p.) x B x D: 90.00m x 16.00m x 30m (at upper deck)
DWT/GT: 895t/2,366 (at 4.5m draught)
Main engine: Daihatsu 6DKM-36(L) (4,500ps x 2 units)
Speed, service: abt. 18.9kt
Classification: JG
Completion: Mar. 18, 2004

*Star Osakana*

Owner: Masterbulk Pte Ltd.
Builder: Oshima Shipbuilding Co., Ltd.
Hull No.: 10333
Ship Type: Bulk carrier
L (o.a.) x B x D x d: 199.00m x 32.26m x 19.00m x 12.00m
DWT/GT: 48,712t/36,324t
Main Engine: Kawasaki MAN B&W 6S60MC x 1 unit
Speed, max. trial: 17.0kt
Classification: DNV
Completion: Apr. 23, 2004

*Scarlet Ibis*

Owner: Green Garden Navigation S. A.
Builder: Imabari Shipbuilding Co., Ltd./Iwagi Zosen Co., Ltd.
Hull No.: S-Z223
Ship type: Chemical & product tanker
L (o.a.) x B x D x d: 179.0m x 32.20m x 19.05m x 11.85m
DWT/GT: 46,719t/30,411t
Main engine: 7S50MC-C diesel x 1 Unit
Speed, service: 15.4kt
Classification: NK
Completion: Jan. 23, 2004

*Olympic Flag*

Owner: Onassis Group
Builder: Namura Shipbuilding Co. Ltd.
Hull No.: 242
Ship type: Crude oil tanker
L (o.a.) x L (b.p.) x B x D x d: 273.97m x 263.00m x 47.00m x 23.30m x 17.126m
DWT/GT: 155,009t/80,591t
Main Engine: Mitsubishi 7UEC68LSE (18,630kW at 91.0rpm) x 1 unit
Classification: ABS
Completion: Mar. 26, 2004

*Nichioh*

Owner: Golden Pacific Maritime S. A. (Panama)
Builder: Universal Shipbuilding Corporation
Hull No.: 5005
Ship type: VLCC
L (o.a.) x B x D x d: 332.98m x 60.00m x 29.40m x 20.48m
Completion: Mar. 30, 2004
DWT/GT: 303,994t/159,872t
Main Engine: Hitachi Zosen-MAN-B&W 6S90MC-C diesel Engine
Speed, service: 16.1kt
Classification: NK

