



Imabari completes 1st 154,900m³ membrane type LNG Carrier



Imabari Shipbuilding Co., Ltd. has delivered the 154,982m³ LNG carrier, TRINITY ARROW (HN: 2258), to the Owner Trinity Transport S.A. at the Koyo Dockyard. The TRINITY ARROW is the first LNG carrier in a series of four to adopt GTT's M-III Membrane system and features a conventional steam turbine propulsion system. The vessel was developed and designed to visit as many LNG terminals in the world as possible. The vessel has left for its maiden voyage to the first loading port directed by an American energy company.

For the entry into LNG carrier construction, Imabari extensively studied and developed advanced performances and specifications as featured with a helicopter deck that allow entry to most LNG terminals. Particularly, the basic design of the hull form and optimum propulsion performance has been carried out with the 3D Lines System, CFD simulation, and tank tests. As a result, the vessel attained much higher speed than the designed speed with

much less fuel consumption at the sea trial.

The more rational hull construction and equipment comply with the Lloyd's Register's (LR) Rules and Regulations and effective notations such as ShipRight (SDA, FDA plus, CM), to ensure safe operation and navigation. For the FDA, the vessel employed LR design appraisal document of 40 year lifetime which is confirmed by LR's 3-D FEM analysis based on the intended service routes including North Atlantic, Middle East to Mediterranean and Europe, Middle East to North America, and Middle East to Asia, etc.

The vessel has four LNG cargo tanks, and the No. 1 cargo tank is the first to apply the "Trapezoidal tank in the horizontal direction" in the LNG world, which is very efficient not only volume-wise compared with an existing prismatic tank but also in gaining reduction of fuel oil consumption as a result of the advanced hull form.

The main hull structures and the cargo compartments
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are designed with double hull construction with double bottom, double side shells, and trunk deck forming an octagonal section. The bulkhead of each tank is provided with a cofferdam and space heated by circulating glycol water to keep the temperature above +5 degrees C due to the physical properties of the steel in accordance with the requirements of the IGC code.

The cargo containment system applies GTT's M-III membrane system, which is a cryogenic liner directly supported by the inner hull of the vessel. The M-III system consists of a primary barrier of 1.2mm thick SUS membrane with orthogonal corrugations, and the rule-requiring second barrier of Triplex membrane that is sandwiched by first and second glass fiber-reinforced polyurethane insulation foam layers. The insulation has a total of 270mm thickness, which allows maintaining LNG boil-off to below 0.15% a day during the voyage.

Imabari especially paid close attention to maintaining high levels of integration of the bonding quality man-

agement to follow GTT's latest Second Editions and SUS membrane welding management with the very strong support of the excellent LR site surveyor, preventing itself from repeating what has happened with forerunners.

Each cargo tank has two 1700m³/h submerged cargo pumps with a soft starting method and one 50m³/h cargo stripping/spray pump with a direct online method. One 550m³/h cargo pump is provided for emergency use.

The vessel is provided with an automatic ballast exchange system at sea taking into consideration the strength and stability, and safe operation in accordance with IMO rule requirements A868(20).

The vessel adopts the reliable conventional steam turbine UA-400 for the propulsion system considering redundancy for the propulsion power to have high operational capability and maneuverability. Two sets of main boilers are provided for the steam generating plants and can burn ordinary fuel oil, mixed with fuel oil and BOG, allowing appropriate burn-

ing of BOG as fuel. The fuel oil tanks are designed and arranged with double hull construction.

The main control system for machinery and cargo handling equipment forms part of the Integrated Automation System (IAS) and is managed by the distributed control system (DSC). The cargo control room located on the bridge can observe cargo loading conditions and monitor the progress in real time. Failure Mode and Effects Analysis (FMEA) is carried out on the IAS as whole.

Principal particulars

L (o.a.) x L (b.p.) x B x D x d: 289.93m x 276.00m x 44.70m x 26.00m x 12.073m

DWT/GT: 79,556t/108,010

Hold capacity: 154,982m³

Main engine: KAWASAKI UA400 steam turbine x 1 unit

MCR: 29,420kW x 81rpm

Speed, service: 20.15 kt

Complement: 46

Classification: Lloyd's Register of Shipping (LRS)

Completion: Mar. 31, 2008

Naikai delivers container carrier, CSCL KINGSTON, to Peony Shipholding

Naikai Zosen Corporation has delivered the container carrier, CSCL KINGSTON (HN: 716), to Peony Shipholding S.A. at its Innoshima Shipyard. The carrier has a container carrying capacity of 2,553TEUs, including 250 reefers.

The container holds consist of six compartments from No. 1 to No. 6, and

ten opening hatches. A full cell guide system is employed for each container hold.

The main engine is the super long-stroke type diesel type to reduce fuel oil consumption, and the ship propulsion efficiency has totally been improved with adoption of energy-saving stern hull form and a large-diam-

eter and five-blade propeller.

Safe ship operation at a port or in navigation is ensured with a bow thruster for easier berthing and unberthing, auto-heeling control equipment for safe cargo handling, and a collision avoidance assisting unit.

Principal particulars:

Length, o.a.: 199.93m

Length, b.p.: 188.00m

Breadth, mld.: 32.20m

Depth, mld.: 16.60m

Draught, mld.: 9.80m at full load

DWT/GT: 27,104t/33,651

Complement: 25

Main engine: Hitachi MAN B&W 7 S70MC-C diesel x 1 unit

MCR: 21,735kW (29,540ps) x 91rpm

NCR (90%): 19,560kW (26,580ps) x 88rpm

Speed, service: about 22.2kt

Classification: NK

Completion: May 30, 2008



MHI completes advanced roll-on roll-off type vehicle carrier AQUAMARINE ACE for MOL

Mitsubishi Heavy Industries, Ltd. (MHI) has completed construction of a roll-on roll-off type vehicle carrier, AQUAMARINE ACE, with a car carrying capacity of approximately 6,400 passenger car equivalents for Mitsui O.S.K Lines, Ltd. (MOL) at the Kobe Shipyard & Machinery Works on March 21, 2008. The AQUAMARINE ACE is the most advanced car carrier having the features of streamlined superstructure to reduce wind pressure, energy-saving and marine environmental-concerned measures, etc. The new car carrier adopts a very slim design for the hull below the water line. This streamlined design for the structures above the upper deck reduces the wind pressure more than ever. The double bottom construction is employed for the bunker oil tanks, which will reduce the risk of oil leak-

age from the tanks in the case of stranding. (Patent pending by MHI and MOL) The lube oil injection method into the main engine cylinder is changed into the jetting type. As a result, the consumption of the lube oil decreases, reducing particle substances in the exhaust gas. Every car deck can accommodate high-roof vehicles. The jumping slopes are introduced to directly connect upper decks with lower decks to facilitate car-handling work.

Principal particulars
L (b.p.) x B x D: 192.00m x 32.26m x 34.52m



Gross Tonnage: 60,143
Car carrying capacity: approximately 6,400 passenger cars (RT Type)
Main engine: Mitsubishi-UE 7UEC60LSII (P/U) diesel x 1 unit
Speed, service: abt. 20.65kt
Complement: 30 persons
Classification: Nippon Kaiji Kyokai NS*(RORO EQ C V), MNS*(MO)
Completion : Mar. 21, 2008

World record of total 60 mil. BHP achieved by Mitsui-MAN B&W diesel engines

Mitsui Engineering & Shipbuilding Co., Ltd. (MES) has achieved the accumulated production of 60 million brake horsepower, the world record of accumulated engine output in a single brand.

This world record was boosted by completion of the MITSUI-MAN B&W 6S50MC-C Mark 7 at its Tamano Works (Tamano City, Okayama Prefecture) which is installed on a 4.35 million cubic feet Chip Carrier for Mitsui O. S. K. Lines, now

under construction at Mizushima Works and Shipyard of Sanoyas Hishino Meisho Corporation.

In the wake of growing demand for new shipbuilding thanks to active ocean cargo transportation, production of diesel engines by MES is significantly increasing. Only two years and five months after MES achieved accumulated production of 50 million brake horsepower in October 2005, 60 million brake horsepower was reached. The annual production in fiscal year 2006 was 4.01 million brake horsepower and will be 4.52 million, which is the record for MES, in fiscal year 2007.

Since MES entered into the technical agreement with Burmeister & Wain, Denmark (presently MAN Diesel) in 1926, MES has been producing diesel engines with excellent records as a leading engine manu-

facturer of the world. MES is also strengthening the after-sales service of the engine business including the newly developed Marine Diesel Engine Performance/Life Expectancy Diagnosis System (product names "e-GICS" and e-GICSW), for which communications satellite and internet technology are fully utilized, and is committed to ensure high quality customer service.

Principal Particulars of latest Main Engine

Engine Type; MITSUI-MAN B&W Diesel Engine 6S50MC-C Mark 7
Length Overall: 6.44 m
Height: 8.58m
Width: 3.15m
Cylinder Bore: 500 mm
Piston Stroke: 2,000 mm
Mean Effective Pressure: 1.90 Mpa
MCR: 9,480 kW x 127 rpm (12,900 brake horsepower)
Date of Shop Trial: March 31, 2008



Sanoyas completes Panamax bulker, UNICORN OCEAN

Sanoyas Hishino Meisho Corp. has completed the 78,888DWT Panamax bulk carrier, UNICORN OCEAN (HN: 1266), for Takanaawa Line Inc. of Panama at the Mizushima Works and Shipyard.

This ship is the third of the new Sanoyas Panamax series of the 78,000DWT class. This new series has been developed based on the preceding series of 70,000 and 75,000 classes, which include over 70 vessels in total. The new series is one size larger than the predecessors in the deadweight and cargo hold capacity, which has been achieved by elongating the length between perpendiculars without changing the overall length and beam.

The ship has greatly been improved in both energy saving and cargo handling efficiency with sophisticated design. In addition, various systems are applied to the ship for environment ecology.

The energy consumption has been improved using the SANOYAS energy-saving device called STF (Sanoyas-Tandem-Fin: maximum 6% energy saving and excellent cost performance with simple structure), which is fixed on the stern shell, together



with a low-speed and large-diameter propeller.

The cargo-handling efficiency has increased with arrangement of the same hatch width for the cargo holds from No. 1 to No. 7 as well as wider hatch openings than the previous vessels. Dedicated fresh water tanks are provided to store hold-washing water from a large-capacity fresh water generator. A special fuel oil heating system is adopted for fuel oil storage tanks to avoid cargo damage by overheating.

Considering protection of environment, various countermeasures such as fuel oil tanks of double hull structures, light color and tar-free coating

for ballast tanks, holding tank for accommodation gray water and dirty hold bilge, and independent bilge segregation system for engine room, are incorporated.

Principal particulars

L (o.a.) x L (b.p.) x B x D x d: 225.00m x 219.00m x 32.24m x 19.90m x 14.379m

DWT/ GT: 78,888mt/41,662

Cargo hold capacity: 91,188m³ (grain)

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

MCR: 9,560kW

Speed, service: about 14.5kt

Completion: Mar. 13, 2008

Complement: 25

Classification: NK

Universal Shipbuilding Corporation completes Suezmax Tanker, GLADIATOR

Universal Shipbuilding Corporation delivered a Suezmax Tanker, GLADIATOR to Tourel Ltd. at the Tsu shipyard on March 26, 2008. The vessel is designed to carry crude oil



and dirty product, and the 28th vessel of this type built by Universal Shipbuilding Corporation. The vessel has high deadweight at shallow draft corresponding to the large cargo oil tank capacity, and exhibility for port restrictions. The vessel is designed to achieve safe, economical and environment-friendly transportation of cargo oil. The hull structure is designed for a fatigue life of 30

years (LR FDA Plus). The sophisticated hull form and Surf-Bulb (Rudder Fin with Bulb) achieve very high energy saving. The main engine and generator engine satisfy the IMO environmental requirements and the vapour emission control system meets the USCG regulations.

Principal particulars:

L (o.a.) x L (b.p.) x B x D x d: 274m x 263m x 48m x 22.4m x 16m

DWT/GT: 149,944MT/78,845

Loading Capacity: 170,046m³

Main engine: Sulzer 6RTA72 x 1 unit

Speed: 16.0kt

Complement: 31

Classification: LR

Completion: March 26, 2008



From left are Mr. Ogawa, Honorary chairman of Class NK, Ambassador Kitamura, Mr. Minami, and Mr. Kizawa, Managing Director of JSMEA

JSEA participates in Posidonia 2008

The Japan Ship Exporters' Association (JSEA) participated in the 21st International Shipping Exhibition Posidonia 2008 held at the Hellenikon Exhibition Centre in Helleniko, Greece, for five days from June 2 to 6. Posidonia 2008 attracted 1,729 companies and organizations from 80 countries, and was visited by over 17,320 people including the public.

At the opening ceremony held on June 2, Mr. Costas Karamanlis, the Prime Minister of Greece, gave the opening address. After the ceremony, the Prime Minister; Mr. Geroge Voulgarakis, the Minister of Mercantile Marine of Greece; Mr. Nicos D. Efthymiou, Chairman of the Union of Greek Shipowners; and honorable guests from related circles visited exhibition stands. Mr. Takanori Kitamura, Japanese Ambassador to Greece, and Mr. Sho Minami, JSEA vice-president, met the Ministers at the Japanese stand.

On June 4, Ambassador and Mrs. Kitamura, and JSEA vice-president Mr. Minami co-sponsored a cocktail party at the Athenaeum Inter-Continental Hotel with 940 guests including government officials and others concerned with the shipping and shipbuilding industries. The JSEA consisting of 12 Japanese shipbuilders participated with the



Japanese stand



From left in the front row are Mr. Voulgarakis, Mr. Minami, and Mr. Karamanlis at Japanese stand.

financial support of The Nippon Foundation and in cooperation with The Shipbuilders' Association of Japan. JSEA, the Japan Marine Equipment Association (JSMEA), and the Nippon Kaiji Kyokai (Class NK) contributed the national exhibition stand where Japanese shipbuilding technology was presented. Visitors were particularly attracted by newly-developed designs and technologies that were introduced with the plasma vision system and other displays.

Shipbuilders:

IHI Marine United Inc.

Imabari Shipbuilding Co., Ltd.

Kawasaki Shipbuilding Corporation

Mitsubishi Heavy Industries, Ltd.

Mitsui Engineering & Shipbuilding Co., Ltd.

Namura Shipbuilding Co., Ltd.

Oshima Shipbuilding Co., Ltd.

Sanoyas Hishino Meisho Corporation

Sasebo Heavy Industries Co., Ltd.

Shin Kurushima Dockyard Co., Ltd.

Sumitomo Heavy Industries Marine & Engineering Co., Ltd.

Universal Shipbuilding Corporation



At party



TOSA

Owner: Nippon Yusen Kaisha
Builder: IHI Marine United, Inc.
Ship type: Tanker
L (o.a.) x B x D x d: 333.00m x
 60.00m x 29.00m x 20.50m
DWT/GT: abt. 300,000t/160,000
Main engine: DU-SULZER 7RT-
 flex84TD diesel x 1 unit
MCR: 27,160kW x 74.0rpm
Speed, service: 16kt
Classification: NK
Completion: Mar. 31, 2008

**RBD CAPRI**

Owner: A Panamanian owner
Builder: Shin Kasado Dockyard Co.,
 Ltd. (Imabari Shipbuilding Co.,
 Ltd.)
Hull No.: 1468
Ship type: Bulk carrier
L (o.a.) x L (b.p.) x B x D x d:
 224.94m x 217.00m x 32.26m x
 19.50m x 14.119m
DWT/GT: 76,619t/39,737
Main engine: MAN B&W 6S60MC
 (MK 6) diesel x 1 unit
MCR: 10,320kW x 89.0rpm
Speed, service: 15.25kt
Complement: 25
Classification: NK
Completion: Feb. 29, 2008

**WINDSOR
ADVENTURE**

Owner: Keymax Maritime Co., Ltd./
 Fairmont Shipping (H.K.) Ltd.
Builder: Mitsui Engineering & Ship-
 building Co., Ltd.
Hull No.: 1666
Ship type: Bulk carrier
L (o.a.) x L (b.p.) x B x D x d:
 189.99m x 182.00m x 32.26m x
 17.90m x 12.55m
DWT/GT: 55,975t/31,247
Main Engine: MITSUI-MAN B&W
 Diesel Engine 6S50MCC diesel x 1
 unit
MCR: 9,480kW x 127.0rpm
Speed, service: 14.5kt
Classification: NK
Completion: March 26, 2008

**CHAMPION
PLEASURE**

Owner: Crux Maritime S.A.
Builder: Namura Shipbuilding Co.,
 Ltd.
Hull No.: 279
Ship type: Product carrier
L (o.a.) x L (b.p.) x B x D x d:
 241.03m x 232.00m x 42.00m x
 21.20m x 14.90m
DWT/GT: 105,852t/56,362
Main engine: B&W 6S60MC (MK
 6) diesel x 1 unit
Output: 11,770kW
Speed, service: 14.7kt
Classification: NK
Completion: Jan. 15, 2008

**FENGTUN FEI**

Owner: Erica Navigation S.A.
Builder: Oshima Shipbuilding Co.,
 Ltd.
Hull No.: 10491
Ship type: Bulk carrier
L (o.a.) x L (b.p.) x B x D x d: 235m
 x 226m x 43m x 18.55m x 12.904m
DWT/GT: 91,486MT/50,464
Main engine: MITSUBISHI
 6UEC60LSII diesel x 1 unit
Output: 11,910kW x 105rpm
Speed, service: 14.3kt
Classification: NK
Completion: January 16, 2008

**PROMETHEUS
LEADER**

Owner: Bacchus Shipping Pte. Ltd.
Builder: Shin Kurushima Dockyard
 Co., Ltd.
Hull No.: S-5502
Ship type: PCC
L (o.a.) x L (b.p.) x B x D x d:
 190.03m x 182.0m x 28.20m x
 31.25/14.32m x 9.326m
DWT/GT: 14,382t/41,886
Main engine: Kobe Diesel
 7UEC52LSE diesel x 1 unit
Output: 11,335kW
Speed, service: 19.5kt
Classification: NK
Completion: Mar. 26, 2008

