Japan Marine United established for extensive business services  
—Merger of Universal Shipbuilding and IHI Marine United—

Japan Marine United (JMU) was newly established by the management integration of Universal Shipbuilding Corporation (USC) and IHI Marine United (IHIMU) on January 1, 2013.

Combining the respective engineering resources and strength of the seven domestic shipyards at Ariake, Kure, Tsu, Maizuru, Isogo, Tsurumi and Innoshima and two technical research centers in Tsu and Yokohama, JMU will provide its customers with more extensive range of products, services, new ideas and concepts through our four core business: Merchant Ship Business, Naval Shipbuilding and Repair Business, Engineering Business, and Life Cycle Business.

The various synergies of these two companies can make it possible for us to expand our product lineup, to improve the productivity of each shipyard, and to accelerate product development with our sufficient design capacity. In addition, JMU will make the most of its expanded capabilities and optimized organization for responding to large-lot orders, procuring equipment and materials under more competitive terms.

Through such efforts, this newborn company will attempt to establish our close ties and mutual trust between the clients in the world and to become the world’s leading company in the marine and offshore industry.

**Merchant Ship Business**

Based on the world’s top class technological resources, sufficient equipment and massive experience for shipbuilding of USC and IHIMU, JMU can provide various products, such as tankers, bulk carriers, container carriers, gas carriers, OSVs (offshore support vessel) and car ferries and so on. With an impressive construction record and state-of-the-art technologies, JMU builds highly economical and eco-friendly merchant ships for all over the world.

Furthermore, JMU will contribute to the offshore development through construction of Floating oil and gas Production, Storage, and Offloading unit (FPSO, FSO), drilling and production unit (Jack-up rigs, Semi-submerged rigs, Drill Ship etc.) and floating structures for offshore wind farms, as well as of offshore support vessels (OSVs) and various type of working vessels.

**Naval Shipbuilding and Repair Business**

JMU has delivered various type of naval ships, patrol ships and specialized ship for Japanese Government, such as the helicopter destroyer “Hyuga”, Aegis destroyer “Chokai”, Antarctic observation ship “Shirase”, mine-sweeper “Enoshima”, Icebreaking patrol vessel “Soya”, Helicopter-carrier patrol vessel “Daisen” and so on. JMU’s five shipyards at Kure, Maizuru, Isogo, Tsurumi and Innoshima are supporting and making an important contribution to the operation of naval ships of the Japan Maritime Self-Defence Force and patrol vessels of the Japan Coast Guard.

**Engineering Business**

By the proven technologies and a lot of experience for shipbuilding, JMU provides design and construction support for various product, such as “DEEPDISH” upgrading work for semi-submerged rigs, the vessel with CRP (Contra-Rotating Propeller) propulsion system , the offshore structures, for instance, FPSO, FSO, FSRU with IHI-SPB (Self-supporting, Prismatic Shape IMO type B) tank system and technical assistance for shipyards worldwide.

(Continued on page 2)
Mitsubishi Heavy Industries, Ltd. (MHI) completed construction of the ASTOMOS EARTH (HN: 2283), an LPG carrier with a tank capacity of 83,426m³, and delivered the vessel to Astomos Energy Corporation at the Nagasaki Shipyard & Machinery Works on August 31, 2012. This vessel is the first of the MHI third-generation LPGC, which was developed, based on the MHI first and second generation LPGC series having many delivery records (49 vessels).

This new LPGC has been designed with the concept of environmentally friendly, easy and flexible operation and maintenance and high reliability as main features.

Higher propulsive performance having less vibration compared with the conventional LPGC was achieved by the sophisticated hull form, optimum design of propeller and Mitsubishi-Reaction fin. Furthermore, the main engine complies with NOx limitation Tier II, and low sulfur fuel can be used to comply with SOx limitation of SECA (SOx Emission Control Area).

Various improvements are adopted for efficient and flexible cargo operation such as the increase in the unloading rate by auxiliary cargo pumps, elimination of loading restriction, cargo manifold arrangement to be fitted to various terminals, etc. In addition, the unbalanced cargo capacity is allocated to each cargo tanks to achieve the flexible cargo transportation.

Higher reliability was achieved by IMO IGC-type B independent tank newly developed based on the feedback from long experience, design expertise accumulated through construction of MOSS-type LNG carriers and the state-of-the-art structural analysis system MHI-DILAM (Direct Loading Analysis Method).

**Principal Particulars**

- **L (o.a.) x L (b.p.) x B x D x d:** 230.0m x 219.0m x 36.6m x 21.65m x 11.575m
- **Gross tonnage:** 47,950
- **Cargo tank capacity:** 83,426m³
- **Main engine:** MITSUBISHI UE-7UEC60LS II diesel x 1 unit
- **Output:** 13,000kW x 100min⁻¹
- **Speed, service:** 17.0kt
- **Classification:** NK
KHI delivers bulk carrier NEUTRINO to Southern Pacific Holding

Kawasaki Heavy Industries, Ltd. delivered the 58,612DWT bulk carrier, NEUTRINO (HN: 1697), to Southern Pacific Holding Corporation at its Sakaide Works on October 12, 2012. The vessel is the 21st state-of-the-art bulk carrier of the 58,000DWT series developed by Kawasaki.

The vessel has a flush deck with a forecastle and five holds that are designed for optimum transport of grains, coals, ores, and steel products. Four 30t deck cranes are installed along the center in between hatch covers to facilitate cargo handling at ports that lack cargo handling facilities.

The vessel employs the latest in technology to achieve maximum fuel economy, including an energy-saving main diesel engine, highly efficient propellers, the Kawasaki rudder bulb system with fins (RBS-F), as well as a bow designed to reduce wave resistance, which all contribute to the vessel’s enhanced propulsion performance.

The main engine and generator engine comply with Tier II NOx emission standards set by the International Convention for the Prevention of Pollution from Ships.

Principal particulars

---

Imabari constructs 200th 28,000DWT bulk carrier

The Imabari Shipbuilding Company group completed construction of the 200th 28,000DWT type bulk carrier, KING RICE, at the shipyard of I-S Shipyard Co., Ltd. on October 29, 2012. It was a commemorative event for the group.

The first vessel of the 28,000DWT-type bulker series was the STELLAR BENY completed in 1990, and the group achieved building of the 100th vessel of the same series in March 2009. During the period of 19 years, vessels of the series gradually gained reputation in shipping areas. 200th delivery has been attained in three years and six months following the 100th vessel, thanks to the reputation widely known as “IMABARI 28” by the ship owners and operators worldwide.

For the future, the Imabari group will hold the basic concept at the initial development stage of the 28,000DWT bulk carrier and continue to develop the vessel to be eco-friendly and fuel-conscious by considering oil-cost increase and the environmental conservation.

Principal particulars (KING RICE)

---

### KHI delivers bulk carrier NEUTRINO to Southern Pacific Holding

**L (o.a.) x L (b.p.) x B x D x d:**
179.00m x 194.00m x 32.26m x 18.10m x 12.65m

**DWT/GT:** 58,612t/33,084

**Cargo hold capacity:** 73,614m³

**Main engine:** Kawasaki-MAN B&W 6S50MC-C7 diesel x 1 unit

**MCR:** 8,630kW x 116rpm

**Speed, service:** about 14.5kt

**Complement:** 25

**Classification:** NK

**Registry:** The Marshall Islands

**Delivery:** October 12, 2012

---

### Imabari constructs 200th 28,000DWT bulk carrier

**L (o.a.) x B x D x d:**
169.5m x 27.2m x 13.6m x 9.8m

**DWT/GT:** 28,000t/17,070

**Main engine:** Hitachi-MAN B&W 6S42MC (Mark 6) diesel x 1 unit

**Output:** 5,850kW x 129rpm

**Speed, service:** 14.0

**Completion:** Oct. 29, 2012
Mitsui Engineering & Shipbuilding Co., Ltd. (MES) recently completed an open hatch type general cargo carrier of 72,800DWT, RAVEN ARROW (HN: 1836), which had been under construction at its Chiba Works, and delivered it recently to her owner Mi-Das Line S.A., Panama.

The vessel has a large cargo hold capacity of more than 86,600m³ and is the 1st vessel of its series.

1. The Vessel is one of the largest open hatch general cargo carriers in the world with eight box-shaped cargo holds and four jib cranes for handling cargo.
2. The vessel has three pairs of piggyback-type hatch covers to have large hatch openings.
3. The vessel has large hatch openings, which have no protruding object, and higher structural reliability with the characteristic structure of the hatch corners.
4. In consideration of carrying forest products, bulkheads of cargo hold have no protruding objects and dehumidifier system is provided.
5. Fittings for container and packaged lumber loading are fitted on the hatch covers.
6. A hydrodynamic energy saving device on the rudder achieves good propulsive performance.
7. MITSUI-MAN B&W Diesel Engine 5S60ME-C8 is a light, compact and high output electronically controlled engine complying with MARPOL NOx restriction for exhaust gas.
8. The bow thruster and high-lift rudder enables good maneuverability in port.
9. The vessel has a ballast water treatment system for protection of marine environment in advance of forthcoming entry into force of Ballast Water Management Convention.

<table>
<thead>
<tr>
<th>Principal Particulars</th>
</tr>
</thead>
<tbody>
<tr>
<td>L (o.a.) x L (b.p.) x B x D: about 210.00m x 202.00m x 36.00m x 20.20m</td>
</tr>
<tr>
<td>DWT/GT: 72,871t/46,295</td>
</tr>
<tr>
<td>Main engine: Mitsui-MAN B&amp;W 5S60ME-C8 (Mark 8) diesel x 1 unit</td>
</tr>
<tr>
<td>MCO: 9,450kW x 89rpm</td>
</tr>
<tr>
<td>Speed, service: 14.5kt</td>
</tr>
<tr>
<td>Complement: 30</td>
</tr>
<tr>
<td>Classification: NK</td>
</tr>
<tr>
<td>Registry: Panama</td>
</tr>
<tr>
<td>Delivery: November 27, 2012</td>
</tr>
</tbody>
</table>

Universal Shipbuilding Corporation delivered the 180,000DWT bulk carrier, CAPE GENESIS, to Leo Ocean S.A. at the Tsu shipyard on October 25, 2012. This is the fourth vessel of new design series of Dunkirkmax bulk carriers that achieved large deadweight under restrictions for ship's dimensions. The vessel has double side skin construction for cargo holds and fuel oil tanks in order to reduce flooding risk due to side damage and improve cargo handling.

The vessel is equipped with high propulsion efficiency and energy saving devices, SSD (Super Stream Duct) and Surf-Bulb (Rudder Fin with Bulb), in front of and behind the propeller respectively.

<table>
<thead>
<tr>
<th>Principal particulars</th>
</tr>
</thead>
<tbody>
<tr>
<td>L (o.a.) x L (b.p.) x B x D x d: 292.0m x 287.9m x 45m x 24.5m x 18.15m</td>
</tr>
<tr>
<td>DWT/GT: 182,097MT/93,031</td>
</tr>
<tr>
<td>Loading capacity: 193,396m³</td>
</tr>
<tr>
<td>Main engine: MAN B&amp;W 7S85ME-C diesel x 1 unit</td>
</tr>
<tr>
<td>Speed: 15.35kt</td>
</tr>
<tr>
<td>Complement: 25</td>
</tr>
<tr>
<td>Classification: NK</td>
</tr>
<tr>
<td>Completion: October 25, 2012</td>
</tr>
</tbody>
</table>
Oshima Shipbuilding Co., Ltd. delivered the 56,023DWT open hatch type general cargo carrier, SAGA FORTUNE, to SAGA Shipholding (Norway) AS on November 6, 2012. The vessel is the fifth post-Panamax bulk carrier of the 92,000DWT type with the wide breadth. The hull is designed and constructed by complying with the Common Structural Rules (CSR).

The vessel is mainly designed to carry coal to electric power stations in Japan. The wide beam and shallow draft helps achieve more efficient cargo handling compared with conventional ships engaged in the same trade.

The vessel uses high-performance mooring equipment and large-capacity ballast pumps. The former makes berthing and unberthing easy, and the latter facilitates cargo-handling operation, respectively.

The main engine is the long-stroke, low-speed, and fuel-efficient type. The Namura flow Control Fins (NCF), rudder fins, and a high-efficiency propeller are also equipped. The combined use of these contributes to increase propulsive performance.

The central fresh water cooling system is used for cooling the machinery in the engine room to achieve easy maintenance. Water ballast tanks of this bulk carrier conform to the requirements of IMO Performance Standard for Protective Coatings (PSPC).

Principal particulars
- L (o.a.) x L (b.p.) x B x D x d: 199.90m x 194.00m x 32.26m x 19.50m x 13.30m
- DWT/GT: 56,023t/37,441
- Main engine: Diesel United WARTSILA 6RT-flex50B diesel x 1 unit
- Speed, service: 15.0kt
- Classification: DNV
- Flag: Liberia

Oshima completes SAGA FORTUNE, open hatch general cargo carrier

Namura Shipbuilding Co., Ltd. delivered the Kiyo, a 92,353DWT bulk carrier at its Imari Shipyard & Works on November 7, 2012. The vessel is the fifth post-Panamax bulk carrier of the 92,000DWT type with the wide breadth. The hull is designed and constructed by complying with the Common Structural Rules (CSR).

The vessel is mainly designed to carry coal to electric power stations in Japan. The wide beam and shallow draft helps achieve more efficient cargo handling compared with conventional ships engaged in the same trade.

The vessel uses high-performance mooring equipment and large-capacity ballast pumps. The former makes berthing and unberthing easy, and the latter facilitates cargo-handling operation, respectively.

The main engine is the long-stroke, low-speed, and fuel-efficient type. The Namura flow Control Fins (NCF), rudder fins, and a high-efficiency propeller are also equipped. The combined use of these contributes to increase propulsive performance.

The central fresh water cooling system is used for cooling the machinery in the engine room to achieve easy maintenance. Water ballast tanks of this bulk carrier conform to the requirements of IMO Performance Standard for Protective Coatings (PSPC).

Principal particulars
- L (o.a.) x B x D x d: 234.90m x 38.00m x 20.00m x 12.80m
- DWT/GT: 92,353t/50,927
- Main engine: MAN B&W 6S60MC-C (Mark7) diesel x 1 unit
- Speed, service: about 15.0kt
- Complement: 25
- Classification: NK
- Flag: Liberia

Principal particulars
- L (o.a.) x B x D x d: 199.90m x 194.00m x 32.26m x 19.50m x 13.30m
- DWT/GT: 56,023t/37,441
- Loading capacity: 64,514m³
- Main engine: MAN B&W 6S60MC-C (Mark7) diesel x 1 unit
- MCR: 64,514m³
- Speed, service: 15.0kt
- Classification: NK
- Flag: Liberia
ETERNAL TRIUMPH
Owner: Clio Marine Inc.
Builder: IHI Marine United Inc.
Hull No.: 3331
Ship type: Bulk carrier
L (o.a.) x B x D: 190.00m x 32.26m x 18.10m
DWT/GT: 55,830t/31,538
Main engine: DU-WARTSILA 6RT-flex50 diesel x 1 unit
MCR: 8,890kW x 116.0rpm
Classification: NK
Registry: Singapore
Completion: September 25, 2012

TTM HOPE
Owner: New Hope Maritime S.A.
Builder: Sanoyas Shipbuilding Corporation
Hull No.: 1309
Ship type: Bulk carrier (Handycape type)
L (o.a.) x L (b.p.) x B x D x d: 245.00m x 238.00m x 43.00m x 21.65m x 15.40m
DWT/GT: 119,496t/64,642
Cargo hold capacity: 135,717m$^3$ (grain)
Main engine: MAN B&W 6S60MC-C diesel x 1 unit
MCR: 13,560kW
Classification: NK
Completion: September 25, 2012

TSUBAKI
Owner: Kyushu Shosen Co., Ltd.
Builder: Naikai Zosen Corporation
Ship type: Passenger/car ferry
L (o.a.) x B x D: 86.50m x 14.50m x 10.40m
DWT/GT: 577t/1,599
Vehicle: 18 units (8t truck basis)
Passenger: 482
Crew: 18
Main engine: Daihatsu 6DCM-32e diesel x 2 units (twin screws)
MCR: 2,942kW x 750/186 min$^{-1}$
Speed, trial max.: 20.733kt
Classification: JG

PACIFIC TOPAZ
Owner: Hexad Shipping S.A.
Builder: Onomichi Dockyard Co., Ltd.
Hull No.: 575
Ship type: Crude/product tanker
L (o.a.) x B x D: 182.5m x 32.20m x 18.40m x 19.05m
DWT/GT: 50,000t/28,426
Main engine: MITSUI MAN-B&W 6S50MC-C diesel x 1 unit
Speed, service: 15.2kt
Classification: ABS
Registry: Liberia
Completion: October 23, 2012

CORAL AMETHYST
Builder: Shin Kurushima Toyohashi Shipbuilding Co., Ltd.
Hull No.: 5740
Ship type: Bulk carrier
L (o.a.) x B x D x d (ext.): 224.98m x 32.26m x 19.85m x 14.328m
DWT/GT: 78,092t/41,963
Main engine: B&W 6S60MC-C diesel x 1 unit
Speed, service: about 14.5kt
Classification: NK
Registry: Panama
Completion: October 2012

HANJIN ROSARIO
Builder: Tsuneishi Shipbuilding Co., Ltd.
Hull No.: Sno.1468
Ship type: Bulk carrier
L (o.a.) x B x D x d: 228.99m x 32.26m x 20.05 x 14.40m
DWT/GT: 82,158t/43,004
Main engine: Mitsui MAN B&W 6S60MC-C (Mark 7) diesel x 1 unit
Speed, service: 14.5kt
Classification: KR
Registry: Panama
Completion: January 18, 2013