



## The Ship of The Year Award 2005 goes to Ferry ORANGE HOPE

*Special Prize for Maritime Technology to scientific research ship, CHIKYU*



The Japan Society of Naval Architects and Ocean Engineers has awarded its 16th Ship of The Year 2005 Award to the ORANGE HOPE (HN: 606), a 15,732GT high-speed ferry, delivered from Imabari Shipbuilding Co., Ltd. to the co-owners, Shikoku Kaihatsu Ferry Co., Ltd. of Ehime Pref. and the Japan Railway Construction, Transportation and Technology Agency in 2005. The screening committee was held in Osaka on May 26, and the award ceremony took place at the Nippon Kaiun Club in Tokyo on July 20, 2006.

The ORANGE HOPE, the 7th vessel of the Orange series, was developed with the owners' basic idea of the three-S concept (Safety, Speediness, and Serviceability), coping with the modal shift in transportation between Shikoku and Kansai areas. To alleviate congestion on the roads, the ferry carries vehicles together with drivers to their destinations. The ship construction is specialized for truck transport with three car decks, and the fourth deck is provided with completely independent compartments for drivers to rest.

The ferry is now plying between Niihama in Ehime and Osaka/Kobe. The vessel has an accommodation capacity

of 218 passengers and a car carrying capacity of 205 trucks with 9m long chassis. The car carrying capacity was increased by 47% over that of the consort, ORANGE 8, greatly contributing to activation of the local industry.

| <u>Size comparison</u> |                    |             |
|------------------------|--------------------|-------------|
|                        | <b>ORANGE HOPE</b> | ORANGE 8    |
| L b.p.                 | <b>168.00m</b>     | 150.00m     |
| B mld.                 | <b>27.50m</b>      | 25.60m      |
| D mld.                 | <b>18.15m</b>      | 13.21m      |
| D ext.                 | <b>6.515m</b>      | 5.516m      |
| DWT                    | <b>5,144mt</b>     | 2,952mt     |
| M/Eng. (MCR)           | <b>18,550kW</b>    | 19,860kW    |
| Capacity               | <b>205 trucks*</b> | 139 trucks* |
|                        | * 9m long chassis  |             |

The ORANGE HOPE with a single engine and single propeller was highly evaluated as a prize winner with its energy-saving effect and ensured safe operation. For energy saving, the new ferry was designed after close investigations and strict examinations with high technology of

*(Continued on page 2)*



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### The Ship Of The Year

the 3D Lines System, CFD simulation and tank tests, and the propulsion power requirement was decreased by about 6.6% as a whole despite larger dimensions than the ORANGE 8 employing the twin engines and twin propellers configuration. This also led to reduction of CO<sub>2</sub> emissions. When 205 trucks are transported by sea from Osaka to Matsuyama, Shikoku, about 9,300 l of fuel can be saved and CO<sub>2</sub> emissions decreased by about 29%.

For ensuring safe operation, the combined system of shaft generator and electric motor propulsion system was adopted for securing safe ship operation in an emergency. The system can generate electricity during navigation as a shaft generator, and in case of main engine stopping, the generator acts as the electric motor to turn the propeller. The switch over will be made automatically. With electric motor propulsion, the vessel can run at a speed of about 7.5 knots, enough to maneuver on the congested route in the Inland Sea. The vessel is equipped with the highest class navigation and communication systems for safety operations.

Other features include simultaneous roll-on/off of cars at three rampways (one at the bow, two at the stern) and smooth truck movement to upper and lower decks through one seesaw type and two movable type slopes, which are rationally arranged and shorten the time required for car handling. Berthing and unberthing are also facilitated with one bow and two stern thrusters.

#### ORANGE HOPE

L (p.p.) x B x D - d: 168.00m x 27.50m  
x 18.15m - 6.50m  
DWT: 5,144mt, GT: 15,732t  
Speed, service: 22.2kt  
Main engine: DU S.E.M.T.  
PIELSTICK 14PC4-2B x 1 unit  
Output: 18,550kW  
Truck carrying capacity: 154 trucks  
(12m long chassis)  
Passenger accommodation capacity:  
218 persons



### Special prize to CHIKYU

JASNAOE has awarded the Special Prize for Maritime Technology to the scientific research ship, CHIKYU (Earth), for its contribution to maritime and offshore societies through development of advanced technology concerning deep sea drilling. This will lead to the new frontier of the earth and life science for future of mankind. The ship was completed jointly by Mitsubishi Heavy Industries, Ltd. and Mitsui Engineering & Shipbuilding Co., Ltd. for the Japan Agency for Marine-Earth Science and Technology (JAMSTEC).

The CHIKYU has the most advanced deep-drilling capability to reach the mantle thanks to adoption of the riser drilling system. The ship will allow investigation of the inner structure of the earth to clarify environmental changes, earthquake mechanisms, or quest for life in the crust. The originality, innovation, and integrity of deep-drilling technology was highly praised.

The ship has the capacity to reach the mantle, which has not been achieved before. The ship measures 210.0m in overall length, 38.0m in molded breadth, and 57,087GT. The drilling derrick installed on the ship towers 121m (over water level), and weighs approximately 1,000t. This is one of the largest drilling derricks in the world, and is the first to employ the riser drilling system together with the dynamic positioning system as a deep-drilling research ship.

The riser-drilling system, which was developed and employed recently in offshore oil and gas fields, uses the mud circulation system, which allows control of the well bore pressure to achieve stable drilling and prevent collapse of the borehole wall. The system also has the blowout preventer (BOP) which protects the drilling ship and crew on board from the flow of gas, oil and other fluids. These advanced techniques have great advantages during deep drilling.

A non-riser type deep-drilling ship of the U.S., which is also a scientific research ship, holds the maximum drilling record of 2,111m. The CHIKYU aims at reaching further into the subsurface of the Earth. Currently, the ship will try to set a new record of drilling 7,000m deep below the sea floor at 2,500m water depth and then 7,000m drilling at 4,000m water depth. After trial operation, CHIKYU will participate in the Integrated Ocean Drilling Program (IODP).

#### CHIKYU

L (p.p.) x B x D - d: 192m x 38m x  
16.2m - 9.2m (L, overall: 210m)  
GT: 57,087t (International ton)  
Speed: 12kt  
Main engines/generators: 12ADD30V  
5,000kW x 6 units  
Auxiliary generators: 6ADD30V  
2,500kW x 2 units  
Azimuth thrusters: 4,200kW x 6 units  
Complement: 150 (crew: 100, re-  
searchers: 50)

## Kawasaki delivers 140,000m<sup>3</sup> LNG carrier, ARCTIC VOYAGER, to LLOYDS TSB

Kawasaki Shipbuilding Corporation has delivered the 140,000m<sup>3</sup> class LNG carrier, ARCTIC VOYAGER (HN: 1532), to Lloyds TSB Equipment Leasing (No. 1) Limited. The gas carrier has been constructed for the Norway Snowvit Project that is now being exploited by an industrial consortium headed by STATOIL of Norway and is now operated by a group company of Kawasaki Kisen Kaisha Ltd.

The service routes of the carrier are mainly from northern Norway to the northern east coast of America or to the southern European area. Therefore, the carrier is designed to endure cold sea weather conditions. The carrier has obtained the comfort class notation of COMF-V (1) for its noise and vibration level, offering a very quiet environment for the living quarters. An air conditioner with a thermal controller is provided for each cabin to maintain comfort in the private living space.

To reduce the work load on the crew, replacement of the sea water ballast during navigation is automated, and a high-lift rudder and a bow thruster are used to increase ship maneuverability at berthing and unberthing. The bridge installations and the arrangement that comply with DNV's notation NAUT-AW enable one-man operation during navigation or ship maneuvering within a port. More efficient and safer ship operation is possible ever than before.

Marine environmental protection is ensured by adoption of the double hull construction for the fuel oil tanks, a high-performance centrifuge for the bilge oil separation in the engine room, and other



measures taken against marine pollution. A forcible LNG vaporizer is provided to convert fuel gas. This permits economic transport coping with the changes in fuel oil prices.

To cope with increasing electric power demand due to large transport capacity, 6,600V high voltage distribution, which is the first employment for Kawasaki LNG carrier, is adopted for the power supply system to achieve safer and high quality electricity supply. The main engine, electric power generation, and cargo handling systems are all electronically controlled, and the integrated controlling and monitoring system is applied to every machine system. Consequently, rational operation management is achieved.

The carrier uses the wave observation system and stress sensors

attached to principal parts of the hull. With these, the wave conditions and generation of stresses are monitored and compared during navigation.

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### Principal particulars

|                                  |   |
|----------------------------------|---|
| L (o.a.) x L (b.p.) x B x D x d: | 289.50m x 277.00m x 48.40m x 26.50m<br>x 11.90m |
| DWT/GT:                          | 75,434t/118,571t                                |
| Cargo tank capacity:             | 140,618m <sup>3</sup> (at -163°C, 98.5%)        |
| Main engine:                     | Kawasaki UA-400 steam turbine x 1 unit          |
| MCR:                             | 27,000kW x 81rpm                                |
| Speed, service:                  | 19.3kt  |
| Complement:                      | 40  |
| Classification:                  | DNV   |
| Completion:                      | July 14, 2006                                   |



## MHI completes vehicle carrier, POSITIVE LEADER, for Oceanic Trader

Mitsubishi Heavy Industries, Ltd. (MHI) completed POSITIVE LEADER, a vehicle carrier, for Oceanic Trader S. A. of Panama at the Shimonoseki Shipyard and Machinery Works on July 13, 2006. The vessel is the sister ship of POSITIVE STAR and POSITIVE PIONEER, which were completed by MHI on Aug. 20, 2004 and on Feb. 15, 2005, respectively.

POSITIVE LEADER has the capacity to carry 3,930 passenger cars, including heavy vehicles such as mobile cranes, dump trucks, and bulldozers. Cargo vehicles can be rolled on and off from two shore rampways installed at the stern and mid part of the starboard side. The arrangement enables quick and efficient loading and unloading of vehicles.

The vessel has ten car decks, two of which are liftable car decks with hydraulic-drive jigger cylinders. The liftable decks can accommodate vehicles of various sizes. The clearance

between decks is 2.2m high that is adequate to accommodate high roof cars like a RV.

The main engine is the Mitsubishi UE type with the SIP (Swirl Injection Principle) lubrication system, which helps save fuel oil and lube oil consumption. The Mitsubishi Stator Fin is employed as an energy saving device, reducing fuel oil consumption. The combined effect of these installations reduces NO<sub>x</sub> and CO<sub>2</sub> emission for preservation of the environment.

### Principal particulars

L (o.a.) x L (b.p.) x B x D x d: 180.00m x 171.70m x 30.00m x 30.94m (10th Deck) x 8.20m DWT/GT: 10,862 mt/43,810t

Main engine: Mitsubishi-UE



8UEC50LSII diesel x 1 unit  
MCR: 11,560 kW x 127min<sup>-1</sup>  
NOR: 9,826 kW x 120min<sup>-1</sup>  
Speed, service: 19.9kt  
Speed (max. trial): 21.64kt  
Vehicle carrying capacity: 3,930 passenger cars (RT type)  
Complement: 24  
Classification: NK, NS\* (Vehicles Carrier) MNS\* (M0)  
Completion: July 13, 2006

## IHIMU completes 300,000MTDW type VLCC, KIHO

IHI Marine United Inc. delivered the 300,000MTDW type VLCC, KIHO (HN: 3199), to Dragon's Mouth Carriers S. A. on Aug. 28, 2006 at the Kure Shipyard. The vessel is designed to have the maximum hull form with maximum draft to pass the Straits of Malacca, Malaysia, or the so-called Malaccamax.

The KIHO has superior economical features for worldwide, Persian Gulf and Far East trade with its cargo load ability in the shallow draft condition able to pass the Straits of Malacca. For low resistance and fuel consumption, IHIMU's proprietary hull

form with the IHIMU LV Fin and AT Fin are adopted.

The reliable hull structure has been designed by advanced structural analysis technology. The structures and fittings of the double hull water ballast tanks have been well engineered to attain easy inspection, gas detection, inert gas introduction, and ventilation.

The KIHO is the world's first VLCC mounted with an electronically-controlled type diesel engine, DU-Wartsila 7RT-flex84T-D. Optimization of the engine tuning can be achieved at all load conditions, contributing to the

clean environment with low fuel consumption, low NO<sub>x</sub> emission, and less smoke.

Furthermore, ADMAX TSS (technical support system developed by IHI Marine

United Inc., DIESEL UNITED LTD., IHI Marine Co., Ltd.) is installed on the KIHO. This system constantly monitors and examines the whole plant of the vessel. All monitored information are displayed on one screen (sampling data are automatically sent to the ship management company, shipyard and engine builder by e-mail for sharing).

ADMAX TSS is useful to recognize problems at the early stage, and the proper timing for maintenance can be scheduled, which results in reduction of unexpected accident risk and life cycle cost of the vessel.

### Principal Particulars;

L (o.a.) x B x D x d: 333.0m x 60.0m x 29.0m x 20.5m  
DWT/GT: 300,866t/159,923t  
Main Engine: DU-Wartsila 7RT-flex84T-D diesel x 1 unit  
Output: 27,160kW x 74.0rpm  
Speed, service: 15.55kt  
Classification: NK  
Completion: Aug. 28, 2006



## MES completes 300,000DWT class DH VLCC KASAGISAN

—3rd Mitsui Malacca Doublemax with DH fuel oil tank—

Mitsui Engineering & Shipbuilding Co., Ltd. (MES) has completed construction of the 302,478DWT double hull VLCC, KASAGISAN (HN: 1645), for MOLTANK S. A. of Panama at the Chiba Works. KASAGISAN is the third vessel designed with the new hull form called the Mitsui Malacca Doublemax since the first vessel was delivered in May 2005.

Both the deadweight and the cargo tank capacity are maximized for efficient transport of crude oil of typical density. In view of ocean and global environmental preservation, the double hull has been applied to both

the vessel's hull and the fuel oil tank of the vessel, for which the double hull will become mandatory in the future regulations of International Maritime Organization (IMO).

The vessel equips the MIPB-Wing (Mitsui Integrated Propeller Boss with Wing), which is a newly developed device to improve propeller propulsion efficiency. The service speed and fuel oil consumption efficiency have been improved together with both advanced bow and stern form. The main engine adopts the electronic-control lubrication system for engine cylinders to decrease ship operation costs, and the steam turbo generating system is also employed, which recovers thermal energy from the exhaust gas of the main engine.

Other installations include the fixed type flam-

mable gas detecting system arranged in the ballast tanks and the pump room to confirm a safe working environment; GPS and differential GPS for ship positioning by satellite; electronic chart display and information system (ECDIS) and automatic ship identification system (AIS) that ensure safe navigation and ship operation; and color CCTV system in the engine room, which includes an alarm function in case of fire for monitoring from the wheelhouse and the engine control room.

Principal particulars

L (o.a.) x L (b.p.) x B x D x d: 333.00m  
x 324.00m x 60.00m x 28.80m x  
20.466m (extreme)

DWT/GT: 302,478t/160,216t

Cargo tank capacity (100%):  
354,689m<sup>3</sup>

Main engine: Mitsui-MAN B&W  
7S80MC-C diesel x 1 unit

MCR: 27,160kW x 76rpm

Complement: 30

Classification: NK

Completion: Aug. 2, 2006



## Naikai completes 45,000DWT product tanker, HIGH GLOW

Naikai Zosen Corporation completed the 45,900DWT product tanker, HIGH GLOW (HN: 694), for Golden Pegasus Navigation S. A. at its Setoda Works.

The beam of HIGH GLOW is maximized to go through the Panama Canal. The ship is designed with double bottom and double side shells, complying with the MARPOL requirements and can carry various products: petroleum products (light and heavy oils), crude oil, and palm oil.

The vessel has 14 cargo tanks including two slop tanks, the total capacity of which is 54,000m<sup>3</sup>. The configuration facilitates simultaneous loading of four types of liquid cargoes by allotting 25% of the total cargo capacity for each cargo. Four electric motor drive screw pumps with a capacity of 800m<sup>3</sup>/h are provided for unloading cargoes.

The HIGH GLOW has a slender hull to achieve high speed. A high forecastle prevents the bow from swashing and increases seaworthiness as a high-speed medium range product tanker, attaining energy saving. Adoption of a special rudder facilitates ship maneuvering in a narrow port. Thus the overall ship operation efficiency has increased.

The accommodation quarters are isolated from the engine casing to decrease noise and vibration. The crew can enjoy a quiet environment in the accommodation quarters.

Principal particulars

L (o.a.) x B x D x

d: 179.90m x 32.20m x 19.25m x  
11.65m

DWT/GT: 46,846t/28,245t

Cargo tank capacity: 55,158.9m<sup>3</sup>

Complement: 25

Main engine: Hitachi-MAN B&W  
6S50ME-C diesel x 1 unit

NCR: 8,530kW x 123min<sup>-1</sup>

Speed, service: 15.7kt

Classification: NK

Completion: July 31, 2006



**BRITISH COURAGE**

**Owner:** Charlotte Shipping Company Ltd.  
**Builder:** Mitsubishi Heavy Industries, Ltd.  
**Hull No.:** 2203  
**Ship type:** LPG Carrier  
**L (o.a.) x B x D x d:** 230.0m x 36.6m x 21.65m x 11.628m  
**DWT/GT:** 53,783t/48,772t  
**Cargo tank capacity:** 83,270m<sup>3</sup>  
**Main engine:** MAN B&W 7S60MC (Mk 6) diesel x 1 unit  
**Output:** 13,700kW x 104min<sup>-1</sup>  
**Speed, service:** 17.0 kt  
**Classification:** LR  
**Completion:** Aug. 31, 2006

**GLORIC**

**Owner:** Wavcrest Investment Co. S. A.  
**Builder:** Universal Shipbuilding Corporation  
**Hull No.:** 030  
**Ship type:** VLCC  
**L (o.a.) x L (b.p.) x B x D x d:** 329.99m x 316.00m x 60.00m x 29.70m x 21.523m  
**DWT/GT:** 298,495t/156,933t  
**Cargo tank capacity:** 340,219m<sup>3</sup>  
**Main engine:** Hitachi MAN B&W 7S80MC (Mk 6) diesel x 1 unit  
**MCR:** 25,090 kW x 78.6min<sup>-1</sup>  
**Speed, service:** 16.0kt  
**Classification:** ABS  
**Completion:** June 30, 2006

**SANTA LUCIA**

**Owner:** Mitsubishi Ore Transport Co., Ltd.  
**Builder:** Namura Shipbuilding Co., Ltd.  
**Hull No.:** 269  
**Ship type:** Bulk carrier  
**L (o.a.) x L (b.p.) x B x D x d:** 288.97m x 280.45m x 45.00m x 24.40m x 17.955m  
**DWT/GT:** 176,760t/89,726t  
**Main engine:** B&W 6570MC (Mk6) diesel x 1 unit  
**Output:** 16,860kW x 91.0rpm  
**Speed, service:** 16.30tk (at.85% MO)  
**Classification:** NK  
**Completion:** Aug. 4, 2006

**FILOMENA LEMBO**

**Owner:** Lepta Shipping Co., Ltd.  
**Builder:** Tsuneishi Corporation  
**Hull No.:** 1318  
**Ship type:** Bulk carrier  
**L (o.a.) x L (b.p.) x B x D x d:** 228.99m x 222.00m x 32.26m x 19.90m x 14.40m  
**DWT/GT:** 82,790mt/42,887t  
**Main engine:** MAN B&W 6S60MC diesel x 1 unit  
**Output:** 11,000kW x 98rpm  
**Speed, trial max:** 16.33kt  
**Classification:** NK  
**Completion:** June 5, 2006

**DREAM BEAUTY**

**Owner:** Dynamic Leader Shipping S. A.  
**Builder:** Shin Kurushima Dockyard Co., Ltd.  
**Hull No.:** 5328  
**Ship type:** Car carrier  
**L (o.a.) x B x D x d:** 186.03m x 28.20m x 29.43m x 8.52m  
**DWT/GT:** 15,119t/41,662t  
**Main engine:** B&W 8S50MC (Mk 6) diesel x 1 unit  
**Speed, service:** 19.2kt  
**Classification:** KR  
**Completion:** June 1, 2006

**NORD JUPITER**

**Owner:** Compania Flor de Vapores, A. S.  
**Builder:** Oshima Shipbuilding Co., Ltd.  
**Hull No.:** 10387  
**Ship type:** Bulk Carrier  
**L (o.a.) x L (b.p.) x B x D x d:** 225.00 x 220.00 x 32.26 x 19.39 x 14.189  
**DWT/GT:** 77,171mt/ 40,017t  
**Main engine:** MAN B&W 6S60MC (Mk 6) (Derating) diesel x 1 unit  
**MCR:** 9,326kW x 87.0rpm  
**NOR:** 7,928kW x 82.4rpm  
**Speed, service:** 14.5kt  
**Classification:** NK  
**Completion:** June 2, 2006

