

MHI delivers JAMSTEC's deep sea drilling vessel, *CHIKYU*



Mitsubishi Heavy Industries, Ltd. (MHI) has constructed and delivered *CHIKYU* (the Earth in Japanese), a deep-sea drilling vessel, to the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) on 29 July, 2005.

The construction order was placed by JAMSTEC with MHI and subcontracted to Mitsui Engineering & Shipbuilding Co., Ltd for the marine part including the dynamic positioning system. The vessel has been built for the purpose of scientific research. It can drill up to 7,000m deep under the sea floor to obtain continuous core sampling in 2,500 m deep-sea areas. Since delivery, JAMSTEC has been performing training operations with *CHIKYU* and then the vessel will be involved in the Integrated Ocean Drilling Program (IODP).

CHIKYU is the most advanced deep-drilling vessel with the capacity to reach the mantle, which has not been

achieved before. *CHIKYU* measures 210.0m in overall length, 38.0m in molded breadth, and 57,087GT. The drilling derrick installed on the vessel towers 121m (over water level), and weighs approximately 1,000t. This is one of the largest drilling derricks in the world, and *CHIKYU* is the first to employ the riser drilling system as a deep-drilling research vessel. The riser drilling system, which has been 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 the collapse of the borehole wall.

The system also has the blowout preventer (BOP) which protects the drilling vessel and crew on board from the flow of gas, oil and other fluids. These advanced techniques have great advantages during deep drilling. The present

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MHI completes JAMSTEC's deep sea drilling vessel, CHIKYU

non-riser type deep-drilling vessel of the U.S., which is also a scientific research vessel, holds the maximum drilling record of 2,111m. *CHIKYU*, equipped with the riser drilling system, aims at reaching the further deep subsurface of the Earth. Currently, the vessel will try to set a new record of drilling 7,000m deep below the sea floor at 2,500m water depth. In the future, the final goal will be drilling to 7,000m under the sea floor at 4,000m water depth, to reach the mantle. JAMSTEC is now conducting several System Integrated Tests to verify the performance of each system off Shimokita Peninsula and Suruga Bay.

Main specifications

Class: NK

- Ice class: IB
- Length (o.a.): 210m
- Breadth (mld): 38.0m
- Depth (mld): 16.2m
- Draught (mld.): 9.2m
- Gross tonnage: Abt. 57,087t
- Max. complement: 150
- Propulsion system
- Bow tunnel thruster: 2,550kW (3,470PS) x 1
- Forward azimuth thruster: 4,200kW (5,710PS) x 3
- Aft azimuth thrusters: 4,200kW (5,710PS) x 3
- Ship speed: Abt. 12 Knots
- Generator output
- Total: 35,000kW
- Main generator: 5,000kW x 6
- Aux. Generator: 2,500kW x 2
- Operation capability for water depth
- Riser drilling: 2,500m
- Length of drill string: 10,000m
- Blowout preventer (BOP): 15kpsi W.P.

Derrick



Derrick: Height 70.1m x Width x 18.3m x Length 21.9m x Hanging Capacity: 1,250ton

Bridge



The bridge includes a series of control equipment for vessel movement (engine and ballast control, control console for the DPS, the acoustic positioning system, etc.)

Azimuth thrusters



Side thruster at the bow of the vessel 2550kW x1

Azimuth thruster at the bow of the vessel 4200kW x 3

Azimuth thrusters at the stern of the vessel 4200kW x 3

Dynamic positioning system (DPS) (provided by MES)

The system maintains the position of the vessel, counteracting the drift from wind, waves and sea currents. While the system continuously identifies the vessel's location detected by GPS (Global Positioning System), the six azimuth thrusters work together to achieve optimum feedback control of the position. This is the most crucial component of a deep-sea drilling vessel.

Drilling floor (below): The drilling derrick stands on the drill floor. This derrick includes many drilling mechanisms. For example, a finger board/

belly board is used for supporting joined pipes on the middle shelf of the derrick.



MES completes disaster response ship for Indonesian Government

—Built at local shipyard with MES technical cooperation—

Mitsui Engineering & Shipbuilding Co., Ltd. (MES) has completed construction and delivered the disaster response ship, *KN. Alugara* (HN: 1642) for the Directorate General of Sea Communication of Indonesia. The delivery ceremony was attended by the Minister of Communications, Hatta Radjasa, at the Port of Surabaya in July this year.

The vessel is the second of two orders placed by Tomen Corporation. The first vessel was built by Niigata Shipbuilding & Repair, Inc., a subsidiary wholly owned by MES, in December last year. The vessels were procured for serving in the Straits of Malacca-Singapore, the major sealane between the Gulf and the Far East. Planned activities include preventive patrol of sea disasters, rescue work in an accident, fire-fighting, and taking measures for an oil spill accident. This project was achieved based on a yen loan extended by the Japanese government.

The *KN. Alugara* has special equipment for the purposes of rescue, spilt oil recovery, fire-fighting, and emergency. The vessel is expected to cope with the increasing sea disasters and problems in the area. Such incidents have become serious international problems but not limited to Indonesia.

In Indonesia, no suitable disaster response ships had been available. Therefore, Indonesia had requested MES to deliver the vessels earlier, and MES coped with the shortening of the



construction period in various areas of ship design and construction. Due to such efforts, delivery was earlier than the contract delivery date.

Ship construction was carried out at PT. PAL Indonesia located in Surabaya, and Niigata Shipbuilding that has construction experience of the first ship supplied shipbuilding materials and machinery for the ship. The company also provided technical and designing assistance and supervision for the local shipyard under the control of MES.

In this project, training for the crew was also implemented concerning handling of main machinery, etc. in the course of shipbuilding. After the *KN. Alugara* was stationed at Bitung Harbour, the crew received training about handling of equipments for fire-fighting and for spilt oil recovery.

Main features

- 1) Coordination and command to cope with rescue activities and measures in marine disasters, which will be taken by respective

authorities.

- 2) Pilot for ships that navigate the Straits of Malacca-Singapore
- 3) Sea accident investigation and rescue (including fire-fighting, and towing of a diving support ship)
- 4) Recovery of spilt oil
- 5) Chemical treatment of spilt oil

Emergency equipment

Salvage equipment (dry and wet diving use); Oil recovery units (oil boom skimmer, inflation type skimmed oil storage tank, etc.); Spilt oil treatment agent spraying equipment; Spilt oil analyzer; Other ship fire extinguishing devices; and Towing hook

Principal particular

L (o.a.) x B (mld.) x D (mld.): 60.01m x 8.00m x 4.50m
 Gross tonnage: 530t
 Main engine: Marine high-speed diesel engine 1,620kw (2,200PS) x 2 units
 Speed, navigation: 17.6kt
 Complement: 51
 Classification: BKI (Biro Klasifikasi Indonesia)



Training for recovery of spilt oil (left) and fire-fighting activity (right)



SKD completes 3,599DWT molten sulfur carrier

Shin Kurushima Dockyard Co., Ltd. has completed the *Hestiana* (HN: 5251), a molten sulfur carrier of 3,599DWT, for Fukurokuju Maritima S. A. The vessel has a special construction for the specific purpose of molten sulfur transport. Molten sulfur, which is used as a material to produce fertilizers, is now transported from Japan or Korea to China.

The temperature of the molten sulfur should be maintained at 135 - 145 °C. If the temperature decreases below 120 °C or increases over 154 °C, the molten sulfur rapidly becomes highly viscous. Thus thermal control is important for transport of the material. An independent tank system is employed for keeping the cargo at high temperature. Cargo tanks are made of steel with heat insulation of glass wool, which covers the tank. Inside the tank, heating coils are installed to pass steam and maintain the required temperature.

Sulfur has low flammable danger or toxicity to humans. However, molten sulfur contains impurities of hydrogen sulfide and sulfur dioxide that are highly toxic. Hydrogen sulfide is very flammable and may cause an explosion. Accumulation of hydrogen sulfide inside the cargo tank must be avoided. Therefore, vapor containing hydrogen sulfide from the cargo is forcibly ventilated from the air phase of the cargo inside the cargo tank with fans which send fresh air inside. The fresh air is previously heated through the heaters to not cool the cargo. If the vent post line is blocked by the cargo, it may cause a hazard. So the vent line and vent valves are provided with heat tracers to prevent adhesion of the cargo to the vent.

The cargo pumps used for cargo



handling are the deep well and electric motor driven type.

Principal particulars

Owner: Fukurokuju Maritima S. A.
Builder: Shin Kurushima Dockyard Co., Ltd.

Hull No.: 5251

Ship type: Molten sulfur carrier

L (o.a.) x L (b.p.) x B (mld.) x D (mld.)
x d (mld.): 95.02m x 89.95m x
14.00m x 7.60m x 5.616m

DWT/GT: 3,599t/2,849

Main engine: Hanshin LH38L
(Hanshin LH38L)

Speed, service: abt. 13.0kt

Classification: NK

Completion: April 2005

Kawasaki Shipbuilding Corporation and Kawaju Techno Service Corporation have jointly delivered a newly developed training simulator for main turbine operation of an LNG carrier to Kawasaki Kisen Kaisha Ltd. This simulator can provide operators with training quality of the same technical level as actual operation of the main turbine plant of LNG carriers.

The simulator can reproduce the complete mechanical functions of the main turbine plant, the simulation model of which is constructed using data obtained from the LNG carrier built by Kawasaki for the Qatar

Kawasaki delivers main turbine operation simulator for LNG carriers to K Line

Project. It is equipped with a control panel following the ECC (Engine Control Console) standard.

The simulation operation can be performed via the control panel. The simulator also provides manual operation training and manipulation training of switches and valves at the engine room, electrical room, and boiler

and turbine plant in the environment of virtual reality using CG (Computer Graphics).

Reality in simulation has increased with start-up and mechani-

cal sounds involved in machine operation. About 500 operation problems were prepared for the simulation program. This allows effective onshore training to cope with operation problems, which are difficult to carry out on board.

The new simulator is also provided with a newly developed Engine Room Tour System. The software program includes animation images and 360-degree still images and can reproduce a precise engine room image on a computer screen. Using the system, crew, particularly newcomers in an LNG carrier, can easily learn about the engine room arrangement together with shapes as though they walked in the engine room.

Kawasaki has previously developed some useful training simulators for handling LNG cargo, oil cargo, etc., and the new development has been added to the simulator lineup to contribute to ensuring safe ship navigation and handling of cargoes.



Koyo completes Aframax type crude oil tanker for Nippon Oil Tanker Corporation

Koyo Dockyard Co., Ltd. has delivered the Aframax type crude oil tanker, *Negishi Maru*, to Nippon Oil Tanker Corporation. The vessel has entered the shuttle service between Kiire Port, Kagoshima (a hub port) and some oil terminal ports in Japan.

The vessel is mainly engaged in coasting services. However, it is equipped with the latest installations and safety measures to meet the requirements of the international trade. The following features are considered for the shuttle services: (1) unloading operation within 24 hours, (2) easy maintenance, (3) easy and safe operation in cold districts, and (4) adequate measures for environmental protection.

The cargo compartment of the vessel consists of 14 cargo oil tanks and 2 slop tanks, and the cargo compartment is protected with double hull construction. They are the sloshing-proof type at any cargo level. Thus, the vessel can meet various cargo load-

ing conditions. Each ballast tank has an inclined ladder and large manholes to easily achieve maintenance and inspection.

The vessel has three independent main cargo pipeline systems, allowing simultaneous loading of three grades of cargo oils with three cargo oil pumps. Each has 2,500m³/h capacity and is driven by a steam turbine. Smooth and easy cargo oil handling operation is remotely controlled at the cargo control room. Electric float type level gauges are installed in all cargo oil tanks and slop tanks.

The main engine is a MITSUBISHI MAN B&W 6S60MC-C, which is a 2-stroke diesel engine with electronic cylinder lubricating system. An auxiliary boiler (MAC-55B) is installed. It can burn heavy fuel oil in usual boiler operation, and can also burn diesel oil up to the rated capacity with



automated combustion control to prevent the environmental pollution.

Navigation safety is ensured with such installation as an automatic identification system, a video data recorder and other latest equipment for navigation and radio communication.

Principal particulars
 L (o.a.) x B x D x d: 246.80m x 42.00m x 21.30m x 14.798m
 DWT/GT: 106.650t/58,225t
 Main engine: MITSUBISHI MAN B&W 6S60MC-C x 1 unit
 MCR: 13,530KW x 105.0rpm
 Speed, service: 14.55kt
 Complement: 30
 Classification: NK
 Flag: JAPAN
 Completion: July 2005

Mitsui Engineering & Shipbuilding Co., Ltd. (MES, president Mr. Takao Motoyama), Hudong Heavy Machinery Co., Ltd (HHM, chairman Mr. Yang Jiafeng), and China State Shipbuilding Corporation (CSSC, president Mr. Chen Xiao Jin) have agreed to establish a joint venture company CSSC-MES Diesel Co., Ltd., for manufacturing and sales of marine diesel

MES Concludes Joint Venture Agreement for Marine Diesel Engines in China

engines and concluded the joint venture agreement on July 5, 2005 in Shanghai, China.

Three companies, on the approval

of the joint venture project by the Chinese government which is now in process, will immediately set up the joint venture company and will start manufacturing in the latter part of 2007 to achieve an annual production of 1 million horse-

power in 2008. The joint venture company eyes the possibility of 3 million horsepower production in the future by expansion of the facility.

MES, as a top manufacturer of marine diesel engines in Japan, is now strengthening its production system to achieve 5 million horsepower production annually. The participation to this joint venture is expected to synergize with the diesel engine business of MES as well.

CSSC is the biggest shipbuilding group in China and has nine big shipyards under its umbrella. HHM is the No. 1 marine diesel maker in China, with a 60% market share in China. The establishment of the joint venture company will surely keep up with the engine demand by Chinese shipbuilding which is expected to expand rapidly in the future.



NIE CHENG GEN, Vice President (left), and Takao Motoyama, President Representative Director (right)

P&O Nedlloyd Michelangelo

Owner: Michelangelo Star
Schiffahrtsgesellschaft MBH &
Co. KG

Builder: IHI Marine United Inc.

Hull No.: 3193

Ship type: Container Carrier

L (o.a.) x B x D x d: 335.0m x 42.8m
x 24.4m x 14.0m

DWT/GT: 97,517t/94,724

Main engine: DU-Sulzer 12RT-flex
96C x 1 unit

Output: 61,900kW x 94.0rpm

Speed, service: 24.5kt

Classification: Germanischer Lloyd

Completion: June 15, 2005



Sea Confidence

Owner: Greenfield Shipholding Co.,
S.A.

Builder: Oshima Shipbuilding Co.,
Ltd.

Hull No.: 10392

Ship type: Bulk carrier

L (o.a.) x B x D x d: 188.50m x
32.26m x 17.15m x 12.143m

DWT/GT: 52,677mt/29,377t

Main engine: Kawasaki-MAN B&W
6S50MC-C (Derating) x 1 unit

Speed: 14.80kt

Classification: BV

Completion: June 3, 2005



African Robin

Owner: Handbell Shipping S.A.

Builder: The Hakodate Dock Co.,
Ltd.

Hull No.: 802

Ship type: Bulk carrier

L (b.p.) x B x D x d: 167.76m x
29.40m x 13.70m x 9.56m

DWT/GT: 31,982t/19,783t

Main engine: Mitsubishi
6UEC52LA diesel x 1 unit

Speed: 14.4kt

Classification: NK

Completion: Aug. 30, 2005



Jin-Ei

Owner: Giulietta Maritima S. A./
Ocean Link Maritime S.A.

Builder: Universal Shipbuilding Cor-
poration

Hull No.: 037

Ship type: VLCC

L (o.a.) x B x D x d: 332.98m x
60.00m x 29.40m x 20.832m

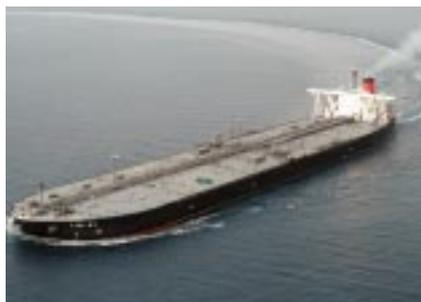
DWT/GT: 299,998t/160,007t

Main engine: MAN B&W 6S90MC-
C diesel x 1 unit

Speed, service: 15.65kt

Classification: NK

Completion: Sept. 16, 2005



Cape Provence

Owner: Fuyo Kaiun Co., Ltd.

Builder: Namura Shipbuilding Co.,
Ltd.

Hull No.: 249

Ship type: Bulk carrier

L (o.a.) x L (p.p.) x B x D x d:
288.97m x 279.00m x 45.00m x
24.40m x 17.955m

DWT/GT: 177,022mt/89,651t

Main engine: Mitsubishi
6UEC68LSE diesel x 1 unit

Output: 16,860kW x 91.0rpm

Speed, trial max.: 17.40kt

Classification: NK

Completion: July 13, 2005



Peppino D'Amato

Owner: Takanawa Line Inc.

Builder: Sanoyas Hishino Meisho
Corp.

Hull No.: 1229

Ship type: Bulk carrier

L (o.a.) x L (p.p.) x B x D x d:
225.00m x 217.00m x 32.26m x
19.30m x 13.995m

DWT/GT: 75,698mt/38,849t

Cargo hold capacity: 89,201m³

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

Output: 12,200ps

Classification: NK

Speed, service: 14.5kt

Completion: Sept. 28, 2005

