

COVER STORY Survival of the Fittest in Shipbuilding Business





KOREAN CRAFT

What Looks Good Tastes Good

There is a saying in Korea – what looks good tastes good. It reflects the noble culture for food of old Koreans who wholeheartedly made even the smallest thing. The *ddeoksal*, a rice cake pattern maker which makes nice shapes with several patterns, would be the best symbolic icon for this wisdom. The *ddeoksal* is mostly made of wood or ceramic, with these stamps regarded as a fine work of art themselves. Cutting the rice cake into the right size and pressing the *ddeoksal* on it gently, the bold pattern stands out. Koreans used to wish for good fortune and longevity by engraving the yin-yang symbol, plaid, chrysanthemum, and fish. To celebrate, cheer up, or send a present on a special day, people express their feelings with rice cake of various patterns. **HHI Source - Master Kim Kui-suk (Moksan Craft Museum)**

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Aiming Higher with Eyes on Customer Satisfaction



Lee Jai-seong, President & CEO

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Well past the half way mark of the year, the world economy has yet to show signs of recovery and neither does the global shipping industry. Amid growing concerns that the prolonged, tepid growth could be a new norm, HHI is pushing ahead with our efforts to surmount the present challenges by optimizing the management of resources and maximizing synergy across the business divisions.

In particular, we are placing renewed focus on honing our competitive edge by keeping ourselves at the forefront of innovation and technology development attuned to ever changing market demands. While continuing to strengthen our core competencies, we are aiming higher with our sights firmly set on providing greater value for our clients.

We are pleased to report that we are on track to achieve our sales and order targets for this year without much difficulty. The Shipbuilding Division has already achieved 64.1% of its order target, winning orders amounting to USD 3.1 billion within the first half of this year. The division recently won an order from CSCL (China Shipping Container Lines) to build five 18,400 TEU container carriers, so far the largest of their kind. It has also received an order to build one semi-submersible drilling rig from Diamond Offshore. The Offshore & Engineering Division has achieved 90.2% of its order target for this year, winning orders worth USD 5.4 billion of the goal of USD 6 billion.

Despite increasingly tough competition in the global industrial plant construction market, the Industrial Plant & Engineering Division won the Shuqaiq Steam Power Plant (SSPP) Project in Saudi Arabia on August 4. The division is also just a few steps away from winning the contract to build a power and desalination plant in Kuwait worth USD 1 billion.

Given the heightened global interest in fuel efficiency, the Engine & Machinery Division, which started development of environment-friendly and fuel efficient marine and stationary engines early on, currently finds itself in an advantageous position. Moreover, it plans to further increase its revenues by expanding the application of its HiMSEN engines to offshore facilities. The Electro Electric Systems Division is facing tough competition from both the industry's leading companies and late starters. Nevertheless, it is gaining competitiveness through continued development of production technologies and streamlined project management.

The Construction Equipment Division's efforts to carve out overseas markets are paying dividends. Although the markets have shrunk to 2008 levels due to the world economic slowdown, the division's sales have been on a steady rise. Furthermore, with a view to further expanding its business, it has entered into a strategic alliance with Atlas Weyhausen, making continued efforts to create fresh demand.

The world economic outlook is murky at best, dominated by persisting uncertainties. Undaunted, Hyundai Heavy Industries is sailing forward steady and firm, guided by its passion for excellence and confidence to meet and prevail over any challenges. Whatever the future may have in store for us, our focus will always remain the same: bringing greater value and satisfaction to our clients.

Survival of the Fittest in Shipbuilding Business

By Alex Lee

1.6

"We are certainly in better shape than last year, but it is premature to say the shipbuilding market has recovered. Fundamentals have yet to be improved," said Kim Oi-hyun, HHI's president and COO of shipbuilding division.

A protracted maritime recession has driven the world's shipbuildprotracted maritime recession ers to fight for survival in increasingly choppy conditions. No one knows for sure when the industry will bounce back and many shipyards, big and small, are in grave peril.

After failing to meet its target last year, Hyundai Heavy Industries (HHI) is mounting an aggressive campaign to win more orders for its value-added vessels and boost sagging profits. It seems the world's biggest shipyard's shipbuilding division and its affiliated company, Hyundai Samho Heavy, are well on their way to achieving their 2013 order target of USD 12.5 billion for this year.

In the first six months of this year, Hyundai Heavy and its Hyundai Samho unit won USD 6.8 billion

worth of contracts, nearly 60% of the 2013 target.

By the end of this year, Hyundai Heavy's shipbuilding backlog is expected to rise to 20 months from around 18 months. The yard's once 30-month backlog has declined over the past years because of dwindling orders for new ships.

"We are certainly in better shape than last year, but it is premature to say the shipbuilding market has recovered. Fundamentals have yet to improve," said Kim Oi-hyun, HHI's president and COO of the Shipbuilding Division.

Mr. Kim, 59, a 38-year veteran who has witnessed the ups and downs of the world's shipbuilding industry, sees an only modest recovery of the global shipbuilding business in the

COVER STORY

coming years, though new ship prices might have already hit the bottom. "The market is expected to get better, but the pace of growth will not be as fast as before," said Mr. Kim.

"We are now seeing a light at the end of the tunnel," said Kim.

"Looking back at our past, there were many times when our docks were empty," said Kim. "When we overcome the current difficulties, there will be much better opportunities for us."

Hyundai Heavy, having diversified its vessel portfolio by building more sophisticated and fuel-efficient vessels, is relatively well positioned to weather the prolonged shipbuilding slump because of the shipping industry's move away from dry bulk carriers and tankers to higher value vessels.

Four years into one of the worst downturns to afflict the global shipping industry, hundreds of small to mid-sized shipyards are teetering on the brink of extinction as orders dwindle and lenders slash credit lines.

As one of the most striking reminders of the current global shipbuilding gloom, China Rongsheng Heavy industries, China's largest private shipbuilder and a major supplier of bulk carriers, said in July it was seeking emergency funding from the Chinese government and its largest shareholder.

STX Offshore and Shipbuilding, one of South Korea's leading shipbuilders, is also relying on emergency liquidity support from its creditors to survive.

Chinese Yards

Mr. Kim sees uncertainties in global economic outlook spelling more trouble for China, which has aggressively pushed to modernize its drydocks and close the technological gap with South Korean competitors in recent years. The huge expansion in China helped create a glut of low-tech vessels that has kept freight rates low and prolonged the agony for shipowners across the globe.

Debt-laden shipyards in China that otherwise should have gone bust were allowed to stay afloat thanks to increased policy loans by Chinse lenders under government control. But Beijing will not be able to keep providing a lifeline to what has now become an unprofitable business. Chinese shipyards are offering deep discounts for new vessels to protect market share from rivals in South Korea and Japan.

Chinese industry executives say as many as half of China's 1,600 shipbuilding companies are expected to go bankrupt or be acquired by larger rivals in the next two or three years.

In contrast to Chinese shipbuilders' gloom, South Korea's long established shipbuilders may benefit from the wave of consolidation in the shipbuilding sector and further strengthen their position as a major force after the recovery.

South Korea surpassed China last





"We need to further distinguish ourselves in technology, quality and services and make rapid progress. That's the key to open a new era."

year as the industry's most sought after shipbuilding nation, as shipowners become more interested in advanced and fuel-efficient vessels to help offset rising maintenance and fuel costs. In 2012, South Koreans won contracts worth nearly USD 30 billion, while Chinese yards received USD 18.2 billion worth of orders, according to World Shipyard Monitor published by Clarkson Research Services.

In the first half of this year, Chinese shipyards received USD 10.5 billion in orders, while South Korean builders received USD 18.5 billion, according to Clarkson.

In an efficiency drive, the container shipping industry has seen a trend towards building ever bigger vessels, which will also benefit Hyundai Heavy, a dominant supplier of ultra large box ships.

In January this year, Hyundai Heavy won a USD 600 million order from Seaspan for five 14,000 TEU containerships. The contract included an option exercisable by the owner to order five additional container ships of the same class to be built by Hyundai Heavy. Delivery is scheduled from 2015.

In May, Hyundai Heavy signed a contract to deliver five of the world's largest containership to China Shipping Containers Lines for USD 700 million. Each ship can carry 18,400 20-foot boxes. The new fuel-efficient ships will use a main engine that can automatically control fuel consumption in line with ship speed and sea conditions. It plans to hand over the vessels starting in the second half of next year.

China Shipping's purchase of the five vessels comes as new and bigger vessels delivered from Asian shipbuilders are expected to enter the market in the months to come, adding to a market already fighting overcapacity.

Hyundai Heavy is expecting to win more orders for such big containerships this year.

Mr. Kim said Hyundai Heavy's booming offshore engineering unit, which builds FPSO and other offshore drilling and production facilities, is well on track to surpass the 2013 order target of USD 6 billion. In the first half, the unit received about USD 5.4 billion worth of contracts.

China wants its yards to move up the value chain by building higherquality vessels and to become a player in the offshore engineering business, a lucrative sector in the generally depressed shipbuilding market.

Mr. Kim said it will take time for China to catch up to South Korea in production technologies of high-end vessels, "but we need to further distinguish ourselves in technology, quality, and services and make rapid progress. That's the key to opening a new era."

Technology

Mr. Kim said Hyundai Heavy's business focus will be in the area where the company has a technological edge over China, such as mega containerships, large LNG/LPG carriers, and offshore vessels.

"Technology is our key weapon," Mr. Kim added.

Mr. Kim said Hyundai Heavy has no plan to expand yards, but added the company will go ahead with R&D investment to develop new models of high-tech vessels and eco-friendly engines.

"We will go ahead with investment in R&D because right now is the best time for investment," said Kim.

He said the company is currently marketing its own new models of drillships and LNG carriers after developing them in accordance with customer needs. Hyundai Heavy has also developed a ship tank for LNG carriers, saving the company on royalty payments.

In July, Hyundai Heavy said its consortium had succeeded in developing "vessel digital radar" which can detect objects as small as 70 centimetres in diameter from 10 km away. Its core part, the solid-state power amplifier, has a lifespan of 50,000 hours, more than 16 times that of its predecessor.

The radar can be delivered for use in ships as early as next year.

In line with information technology development, HHI is embarking on a new project, Smart Ship 2.0, which will fortify its marine solutions.

The writer is a journalist based in Seoul



Roundup

Companywide Shipbuilding Offshore & Engineering Industrial Plant & Engineering Engine & Machinery Electro Electric Systems Construction Equipment Green Energy

Companywide

Hyundai Heavy Develops **Hi-Res Marine Digital Radar**



HHI announced on July 2 that it developed a next-generation high-resolution marine digital radar that can detect objects as small as 70 cm from 10 km away.

The new radar for ships is the fruit of a joint development project between HHI and nine organizations including state-run research institutes since July 2010.

The solid-state power amplifier of the new radar has a lifespan of 50,000 hours, which is about 16 times longer than that of predecessor. The

Companywide

Four Win Prizes in World **Skills Competition**

Four of HHI's employees won prizes at the 42nd World Skills Competition in Germany on July 7.

Mr. Won Hyun-woo won a gold medal in the steel-frame structure secfunctionality of the marine radar can be used for military purposes as well as on offshore facilities and airplanes.

Hyundai Heavy plans to commercialize the new digital radar by 2015 after approval from international classification societies in the second half of 2014.

"Starting with the development of this new marine digital radar, we aim to set up new technological standards in the global shipbuilding industry," said Mr. Hwang See-young, CIO of Hyundai Heavy.

tion, and Mr. Hong Jin-mu won a silver medal in the sheet metal section. Mr. Eun Sung-hyun, and Mr. Jang Junhee won bronze medals in distributive technique of communications network and plumbing sectors, respectively. The winners are all from HHI's Technical Education Institute. The competition's gold medal winner, Mr. Won, was also

recognized as MVP by recording the

highest score (98.94) in the competition.

ners including 46 gold medal winners and 14 silver medal winners since it

first participated in the World Skills

HHI Launches Navy's Second Frigate HHI unveiled the South Korean Navy's second 2,300-tonne frigate on July 18. The launching ceremony took place at Hyundai Heavy's shipyard

in Ulsan, attended by the Chairman of the Joint Chiefs of Staff, the Navy

The frigate is capable of carrying

maritime operations helicopters, and

is equipped with advanced radar sys-

tems, a 127-mm main gun, sonar sys-

tem as well as anti-aircraft and anti-

ship missiles. It has a maximum speed

of 30 knots and accommodates up to

named ROKS Gyeonggi, after the prov-

ince that surrounds the capital Seoul

and the western port city of Incheon.

The first frigate, ROKS Incheon, was

The Incheon-class frigate was

120 personnel.

chief, and other senior officials.

Shipbuilding

HHI has produced 88 prize win-

Shipbuilding

Hyundai Heavy Wins Order to Build World's **Largest Containerships**



HHI won a USD 700 million order for five 18,400 TEU containerships from China Shipping Container Lines (Hong Kong) on May 6.

The world's largest containerships will feature an electronically-controlled main engine and HHI's Eco-Ballast seawater treatment system.

The electronically-controlled

launched in January.

ROKS Gyeonggi will be delivered to the Navy next year and deployed for operation in 2015.

Shipbuilding

HHI Wins USD 750 Million Semisub Rig Order

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main engine will maximize fuel efficiency, and reduce noise, vibrations, and carbon emissions by automatically controlling fuel consumption to suit sailing speed and sea conditions. The EcoBallast system can treat 3,000 m³ of seawater per hour by filtering, and sterilizing bacteria and plankton bigger than 50 µm with ultraviolet rays.

HHI announced on May 30 that it won a USD 750 million order to build a semisubmersible drilling rig for Diamond Offshore.

The drilling rig, measuring 123 m in length and 96 m in width, can operate in waters 3,000 m deep with a drilling range of 12,200 m from the sea's surface. The rig is scheduled to The containerships, measuring 400 mm in length, 58.6 m in width and 30.5 m in depth, are scheduled to be handed over from the second half of 2014.

With this order, HHI has won orders for 10 ultra-large containerships this year including five 14,000 TEU containerships from Seaspan Corp. in January.



Industrial Plant & Engineering

Hyundai Heavy Wins USD 3.3 Billion Power Plant Order in Saudi Arabia



HHI won a USD 3.3 billion order from Saudi Electricity Company (SEC) to build the Shuqaiq Steam Power Plant (SSPP) in Saudi Arabia on August 4.

Hyundai Heavy, as the sole EPC contractor, will carry out the construction of the 2,640 MW oil-fired steam

Offshore & Engineering

Two Gorgon Modules Sail Out



HHI completed the production of two

power project on a turnkey basis including engineering, procurement, construction, commissioning, and testing. The Ulsan, South Korea-based EPC contractor will complete the project on the Red Sea coast, approximately 580 km to the south of Jeddah and

modules and sail out for the Gorgon Project on June 8. The modules weigh 4,237 tonnes and 1,827 tonnes, respectively. They are the eighth and

ninth of 51 modules for the project.

The Gorgon Project's scope includes a three-train, 15 million-metric-tonne-per-annum liquefied natural gas (LNG) facility and a domestic gas plant. The project is operated by the Australian subsidiary of Chevron (50 percent) in a joint venture with Australian subsidiaries of Exxon135 km north of Jazan, by 2017.

Hyundai Heavy also adopts the supercritical generator technology that the Company used in the USD 3.2 billion Jeddah South Thermal Power Plant (JSTPP) project it was awarded from SEC in October 2012. The supercritical generator is used to generate electric power by operating at such a high pressure that it uses less fuel and produces less greenhouse gases than other types of steam generators. Upon completion, the steam power plant will be able to produce enough electricity for about 2 million people.

The signing ceremony was attended by Dr. Al-Awaji, the Chairman of Board of Saudi Electricity Company; and Mr. Lee Jai-seong, president and CEO of Hyundai Heavy Industries, in Riyadh, Saudi Arabia.

In the Middle East, Hyundai Heavy has successfully completed and is currently executing more than 12,000 MW power and desalination plants worth USD 12.7 billion.

Mobil (25 percent) and Royal Dutch Shell (25 percent). First gas is planned for 2014.

Engine & Machinery

HHI Develops Mini Welding Robot for Shipbuilding

HHI announced on May 7 that it developed mini welding robots for building ships.

The compact design of the welding machine, measuring 50 cm by 50 cm

Engine & Machinery

Ballast Water Treatment System Accepted by US Coast Guard



HHI announced on July 25 that its electrolysis-based ballast water treatment system, HiBallast, was accepted as Alternative Management System (AMS) by the United States Coast Guard. This comes after the company won type approval from the International Maritime Organization (IMO) in 2011.

by 15 cm when its welding arm is retracted, can operate in confined areas inaccessible to human welders. The robot's six joints enable the machine to carry out almost all types of welding work at a similar speed usually done by a welder.

Moreover, a magnet on its body means the machine can be attached to steel walls or ceilings. Weighing just 15 kg, an operator can control three machines at the same time, increasing productivity threefold.

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According to the Standards for Living Organisms in Ships' Ballast Water Discharged in U.S. Waters, Final Rule, it is mandatory for all new ships built from December 2013 coming into and going out of US ports to install approved ballast water treatment systems. Hyundai Heavy believes the US Coast Guard's acceptance of HiBallast

With the installation of software for steel cutting, blasting, and painting, the robot can also perform these other shipbuilding roles. HHI plans to improve the robots to be usable for building onshore/offshore facilities and construction equipment. The mobile welding robots are scheduled to be used in building ships in HHI from the second half of this year.

Hyundai Heavy, South Korea's largest industrial robot manufacturer, also manufactures 20 models of car as AMS will play a positive role for the company to win more HiBallast orders for ships operating on US routes.

HHI is also aiming to win the US Coast Guard's approval for another ballast water treatment system, EcoBallast, by the first half of 2014. This system sterilizes seawater by using ultraviolet rays.

assembly robots, 10 models of LCD handling robots, and is in the process of developing various types of surgical robots in association with Asan Medical Center.



Construction Equipment

Hyundai Heavy Launches New Construction Equipment in Russia



HHI launched its brand new construction equipment including amphibious excavators and road building equipment in CTT2013, held in Moscow from June 4 to June 8.

Engine & Machinery

Hyundai Heavy Manufactures First **Centrifugal Gas Compressor**

HHI completed the shop performance test of its first centrifugal gas compressor on June 1.

The centrifugal type compressor, more compact and less noisy than other types of compressors, is used in onshore and offshore gas plants to transport high volumes of high pressure natural gas.

HHI has been cooperating with Mitsubishi Heavy Industries Com-

Both units were well received by visitors, with even the display being sold at the exhibition.

The CTT2013, one of the world's largest annual exhibitions of construction equipment, was attended by 1,038 exhibitors from 30 countries all over the world.

pressor Corporation with a technical license partnership since 2011. The Japanese company supplies the impeller and rotor while HHI is responsible for manufacturing, testing, and commissioning of the compressor, and supplying other parts.

The new gas compressor was delivered to KOGAS Masan Compression Station in June, and will come on stream from December this year with a 22 MW class gas turbine driver.

A centrifugal compressor is high performance turbo machinery that uses a high-speed rotating impeller

to increase the pressure of the gas, making it easier to transport through pipelines. Hyundai Heavy's gas compressor is capable of delivering 1,100 tonnes of natural gas per hour by pressurizing it from 4,500 kPa to 6.900 kPa.



Green Energy

Hyundai Heavy & KAIST Open Research Center



HHI signed a memorandum of understanding with KAIST (Korea Advanced Institute of Science and Technology) to establish the HK Research Center in the field of energy, water, environment, and sustainability on June 21, 2013.

Mr. Kang Sung-mo, president of KAIST; Mr. Lee Jai-seong, president & CEO of Hyundai Heavy; as well as more than 20 researchers from the joint research center attended the agreement

Engine & Machinery

HHI Wins a Press Line Order from Nissan



HHI won an order to build a press line on a turnkey basis for the first time from Nissan Motor Company on June 11.

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ceremony at KAIST's campus.

HHI will support R&D and operation costs for the HK Research Center for the next 5 years to jointly develop original technology in this field, and to establish business foundation for the future.

"We are expecting to secure a high level of technology for the future business based on our research result while KAIST strives for study," said Mr. Hwang See-young, CIO of HHI.

The press line, a cutting-edge cover panel production facility with automatic equipment system and four large presses including a 2,400-tonne press, will be delivered to Nissan's Russian plant in the first half of 2015.

Electro Electric Systems

HHI & EEIC Sign Switchgear echnical License Agreement

HHI held a ceremony for a technical license agreement for semi-knockdown switchgear with Saudi Ara bia-based switchgear maker EEIC

(Electronic & Electrical Industries Corporation) in Ulsan on July 2.

With this agreement, EEIC will import the switchgears made by HHI as semi-finished product and assemble them locally before delivery.



Construction Equipment

HHI Sends 80-tonne Long Reach Excavators to Jeddah Plant Site in Saudi Arabia

HHI sent two 80-tonne long reach excavators to Jeddah South Thermal Power Plant construction site in Saudi Arabia on June 13.

The excavators will carry out work on the site's 5.5-km-long seawall in August. The long reach excavators have a boom length of 10.80 m and arm length of 7.15 m.

HHI is building the 2,640 MW oil-fired thermal power project on a turnkey basis including engineering, procurement, construction, commissioning, testing, and transferring in Jeddah, Saudi Arabia.



Singapore, the Lion City

Global HH



Founded in 1819 by Sir Thomas Stamford Raffles as a British trading post, modern Singapore has grown from a settlement of 1,000 people to one of the most advanced cities in the world.

Singapore is located off the southern tip of the Malay Peninsula separated from Malaysia by the Straits of Johor. Only 140 km north of the equator, Singapore is highly urbanized although over half the country is covered by greenery and lush vegetation. Sixty-three islands make up Singapore and the process of land reclamation is creating more land for development.

Singapore has a diverse demographic mix. With a population of 5.3 million, about 20% are foreign workers or students. Of the 3.2 million that are citizens, 75% are Chinese, 14% are Malay, 9% are Indian, and the rest are Eurasian or from other groups. The fertility rate is the third lowest in the world and well below the levels required to replace the population. Consequently, about 40% of the population is made up of permanent residents or foreign workers/students as the government has been encouraging immigration to the country for years.

Hyundai Heavy Industries's Singapore Branch was established in 1996 with four business divisions.

Shipbuilding Division

Among many other business activ-



ities, Singapore Branch Office conducts marketing for shipbuilding business in Southeast Asia.

With various shipping segments in active operation, the marketing focuses on various ship types such as tankers, bulkers, container ships and LNG/LPG carriers.

As the global economy's centre of gravity shifts more to Asia, Singapore is in a unique position to attract shipowners and other related businesses, like shipbrokers and ship financiers (Singapore is the 4th largest financial hub, after London, New York, and Hong Kong).

As a result of persistent and vigor-

ous marketing endeavors in Singapore, 15 ships, roughly USD 2.1 billion in value, are under construction as of July this year in Korea.

Offshore & Engineering Division

The Offshore & Engineering Division conducts business marketing and offshore installation support. Many major oil & gas companies are located in the Asia Pacific region. Obeying orders from the head office in Korea, the offshore team in Singapore office mobilizes crews as per required job classification and supplies equipment as well as materials to derricks and pipe-lay vessels within the period of project mobilization. Their mission is to help the vessels to complete each project within the planned schedule in a safe way.

Electro Electric Systems Division

Singapore branch has staff dispatched from headquarters in Ulsan to provide onboard service for the ACO-NIS[™] alarm monitoring & control system, high & low voltage switchboard, HIMAP[™], ACONIS2000 PMS[™] power management systems, bridge navigation watch monitoring system (Hi-WMS[™]), and voyage data recording system (HiVDR[™]). Sales support service for all HHI electro electric products such as rotating machinery, switchgears, transformers, GIS, and LV & MV circuit breakers is also provided.

Engine & Machinery Division

The Engine & Machinery Division is the world's largest marine diesel engine builder with approximately 36% global market share. Singapore Branch Office supports customers by providing total service such as onboard service, technical advice, troubleshooting regarding 2-stroke engines, 4-stroke engines, propellers, cargo oil pumps, side thrusters, and turbines for boxships, tankers, bulk carriers, car carriers, and drillships.

Marina Bay Sands, a Miracle of 21st Century Architecture.



Though a small country (only 710 km²), Singapore punches well above its weight on the world stage. And Marina Bay Sands is the engineering and construction marvel symbolic of this country. The three buildings, each 200 m high, are inclined toward each other making the shape of the Chinese character ' λ ', meaning 'to enter'. The gradient between the 22nd and 23rd floors is 52 degrees, 10 times steeper than the Tower of Pisa in Italy. It could be said that the architecture symbolizes Singapore itself as home to people of Chinese, Malaysian, Indian, Eurasian, Armenian, Arabian, and Jewish descent.

The Sky Park, connecting the three buildings, gives Marina Bay Sands the shape of a ship. The Sky Park is 12,400 m², three times the size of a football stadium. It is used as a giant botanic garden with 250 trees and 650 kinds of plants. It also houses the world's longest swimming pool, at 150 m long.

The enormous urban entertainment center was designed by Moshe Safdie. The architect says he was inspired by card decks. Ssangyong Engineering and Construction carried out the construction work on this complex entertainment building. The interior of Marina Bay Sands is as gorgeous as its exterior. In the hotel lobby, there are many works of art, including those of American artist Antony Gormley and Rising Forest, 832.9m-tall ceramic pots, made by Zheng Chong-bin, a famous potter in China. The complex cultural space functions as a business, entertainment, shopping center and hotel and it has become a national lead attraction because more than one million people visit this place each year and a lot of jobs have been created. In this respect, it has been considered as the world-class model for effective growth.



$\begin{array}{c} \mbox{HHI's New Drillship} \\ HD \ 12000 \end{array}$

Amid persistently high oil prices and solid balance sheets, large oil companies have been expanding their investments, not only in geographical terms but also in larger, more efficient vessels.

Leading the way in offshore oil & gas discoveries is the drillship. Equipped with a drilling derrick and moon pool, drillships have extensive mooring or positioning equipment, as well as a helipad to receive supplies and transport staff.

Drillships work in water depths ranging from 2,000 feet to more than 10,000 feet (610 m to 3,048 m). Drilling equipment is passed through the vessel's moon pool and connected to the well equipment below via riser pipe, a somewhat flexible pipe that extends from the top of the subsea well to the bottom of the drillship.

Despite the downturn in the global shipping and shipbuilding industries in 2011, most global oil majors are expecting the current period of E&P expansion to last at least until 2017. Amid persistently high oil prices and solid balance sheets, large oil companies have been expanding their investments, not only in geographical terms but also in larger, more efficient vessels.

Demand for drillships has increased over the last few years in light of deepsea development and growing production. Hyundai Heavy has been in the spotlight for drillships with its compact design philosophy and willingness to work with owners and operators from the design stage to deliver custom-made drillships. Since its first drillship in 2010, Hyundai Heavy has won orders for 16 ships and already delivered 3 units to date.

JDP Between HHI & Lloyd's Register Since Lloyd's Register has wide experience in building drilling rigs including jack-up and semi-submersible rigs for the UK offshore area, HHI decided to establish a joint development project (JDP) with LR. HHI and LR have strong advantages in their own specialized fields. It is therefore desirable to share experiences and improve productivity and safety. The JDP put the wide beam drillship design through rigorous design, ship motion, fatigue, and FE analyses. HHI's lead engineers and Lloyd's Register's experts worked on design development on everything from hull structures, marine, mechanical, electrical, and drilling systems.

New Aspects on HD12000 Drillship HD12000 drillship measures 223.0 m in length, 40.0 m in breadth and 18.5 m in depth with transit speed of 11.5 knots (using aft three thrusters) and operating draught of 11.5 m.

Increased beam of 40 m allows larger variable load capacity (up to 24,000 tonnes) and reserved buoyancy for heavy duty work. Furthermore, HD12000 design can accommodate Cylinder Rig concept which can be an alternative for bigger derrick load requirement.

The arrangement of mud pumps & pits, P-tanks and riser hold on the inside of the hull provides a very large free deck area that is permanently available for tubular storage and third party equipment.

HD12000 drillship has fully dynamic positioning (IMO DP Class 3) compliant station keeping capabilities, with sufficient power to allow it to maintain position even in emergency situations and a patented thruster canister design which allows onboard inspection and maintenance of the thruster without having to be docked, leading to decreased drilling downtime.

Innovative hull form design based on HHI's innovative technology and long experience enables a high transit speed (reduced form resistance with integrated thruster pod to hull) with 40% less fuel consumption, enhanced sea-keeping performance (roll angle reduced by 20%), reduced interaction & thruster efficiency improvement and enhanced dynamic positioning capability (20% less fuel consumption).

Moreover, the forward deck shield reduces wind resistance, protects the forward mooring deck area from green water and adds additional safety to the muster area.

From HHI's experience with compact drillships (HHI-Gusto P10000 design), compartment arrangement has been improved and simplified for easy access and maintenance. In accordance with application of the inline arrangement of engine room, pump room, and HV switchboard room, the structural design and routing of the dynamic positioning system was simplified and improved. Also, moving the mud pump room and pit to the double bottom enhances stability and simplifies system/piping arrangement. HHI

HYUNDAI HD12000 DRILLSHIP

Main Particulars		Capability of HD12000
Setback Capacity	mt	1,587 - 2,200
Hook Load	st	Main : 1,250 - 1,600 Aux. : 750 - 1,000
Riser Tensioner	kips	3,500 - 4,500
Riser Storage Capacity		12,000 ft - 14,850 ft
BOP 1 & BOP 2		15K or 20K psi 7 - 8 ram
Crane		85 - 100 mt × 4 sets (Option : 165 mt AHC)
Bulk in Sacks	sack	6,000 - 10,000
HP Mud Pump	set	4 - 6
Thruster		5,000 - 5,500 kW (Hull mounting or Canister type)
Heave Compensators on Main & Aux. Well		Active Heave Compensated draw-works or CMC
Cylinder Derrick		Yes
FWD Deck Shield & Complement		Yes & 210 P or More



The Table as Follows Shows the Unique Features of HHI HD12000 Drillship.

Yoon Finds Life in Hyundai Heavy

By Grace Choi

Korean executives find it hard to balance between work and family due to heavy responsibilities. Tough competition often forces them to spend more time with their company colleagues than with beloved ones.

Mr. Yoon Moon-kyoon, a senior executive vice president of Hyundai Heavy Industries, represents company-focused workaholics even if he says his devotion is not against his will.

"Hyundai Heavy means life to me. I felt as if I was presented with my family and house like year-end bonuses at some point of my lifetime career," Mr. Yoon said. "One day, I came back home from work to find my children grown up a lot."

His remarks show how focused Mr. Yoon has been in his job for the last 33 years at the world's biggest shipbuilder.

Moreover, Mr. Yoon traveled only once with his wife for their honeymoon to Jeju Island, not newlywed favorites such as Hawaii or Guam. Work kept him from taking time to attend any of the entrance and graduation ceremonies for his son and daughter during the whole of their school years. They are now adults.

This summer, he is planning to take a family trip for the first time to Jeju Island. Looking back on his career, Mr. Yoon says he spent only 10% of his time on family things but put the same value both on work and private life.

He tries to share nearly most of

what's happening in the company with his wife and two children, which he believes helps him come close to his wife and children.

In addition, as they lived in the same apartment complexes near the shipyards in Ulsan, families of Hyundai Heavy workers formed a community and shared similar interests. Some of them moved to Gunsan and they continue to make outings together for dinner or mountain climbing over weekends.

As rains force half the yard workers to lay down their tools, the rainy season in July is a major concern for Hyundai Heavy families. On July 4, when this writer stepped into Mr. Yoon's office in Gunsan for an interview, it was raining heavily. He was looking out the window.

"As some of the shipbuilding process takes place outdoors, it is heavily exposed to climate challenges such as rain, snow, and wind," said Mr. Yoon who was named head of the Gunsan shipyard in January.

His duty also includes leading the Gunsan shipyard through climate difficulties and training yard workers who are younger and less experienced than those in the main Ulsan shipyard.

He is not a master in such engineering fields but he is in production management.

"If a manager is good at controlling the production site, it will help drive up productivity. That's why I feel pride in my supervising role," said Mr. Yoon who is called "micromanager" among his staff.

Hands-on management does not always result in positive results but his micromanaging style often worked in decades past. For example, 15 years ago when he was in charge of an assembly line in Ulsan, Mr. Yoon and his team were having a difficult time due to a demanding client.

"I participated in most of the meetings, encouraged yard workers to meet the client's demands, used to come back from dinner with the workers to hold an umbrella over their heads one night," he said. "I was very happy when the ship was delivered after a one month delay."

Mr. Yoon is expected to continue his micromanagement in the Gunsan plant to make a bigger contribution to the company's bottom line. Hyundai Heavy plans to deliver 13 ships this year – largely high-end ships such as container carriers and drilling rigs – from its Gunsan yard. It built a total 30 ships in 2012 there.

As the sea-level change of Ulsan is 0.5 meters during the ebb and flow but is 7 meters in Gunsan, Hyundai Heavy had to build the pier at Gunsan 6 meters deeper than that in Ulsan. As a result, the company invested a total of 1.3 trillion won (USD 1.2 billion).

He said the company has retrieved most of its investment in Gunsan due to new orders. "Hyundai Heavy means life to me. I felt as if I was presented with my family and house like year-end bonuses at some point of my lifetime career."

Interestingly, it set a record of delivering a bulk carrier one month before the yard was completed in March 2010.

However, a major challenge remains to be tackled in Gunsan: lack of skilled workforce.

"As our major workforce in Gunsan is in their 30s, they are energetic and at the same time are less experienced in their jobs," Mr. Yoon said. "So we brought some engineers from Ulsan to train them in fields such as welding, cutting, and painting."

Why did Hyundai Heavy select Gunsan as the site for a new shipyard when its smaller rivals went abroad? Samsung Heavy Industries, Daewoo Shipbuilding & Marine Engineering and STX Offshore & Shipbuilding built shipyards in China. Hanjin Heavy Industries went to the Philippines.

"We decided to build a new plant in Gunsan to avoid any leakage of technologies and to create jobs in the city," said Mr. Yoon. "I believe that Gunsan will be a stepping stone for HHI to fortify high tech and value added fields." added Mr. Yoon.

The writer is a journalist based in Seoul.



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Creating a New Future – The Glen Lyon FPSO

By George Deftereos

The Glen Lyon FPSO is the first project to be built under a new Global Agreement between BP and HHI reflecting BP's intent to establish deeper long term relationships with selected suppliers.



C chiehallion is one of Scotland's Omost prominent mountains, and like the mountain, Schiehallion oil field is a major asset for BP and its partners. The field, located in the UK's continental shelf 290 km west of Shetland, has been home to BP's Schiehallion FPSO since 1997. Having reached its original production goals and in light of the discovery of significant additional reserves, the company has decided that a new vessel is needed to maximize recovery from these material assets over the next 25 years. That's where Glen Lyon FPSO and Mr. Gerry McCarron come in.

Mr. McCarron has 27 years of experience working in the oil & gas industry and has worked previously with HHI teams for BP projects in Azerbaijan, Singapore, and Vietnam. He was also the startup and commissioning manager on the original Schiehallion FPSO and is excited to play a part in creating a new future for Schiehallion. Now, he is the delivery manager for BP's newest vessel. Measuring 270 m by 52 m, the Glen Lyon FPSO will have a production capacity of 130,000 barrels of oil a day and storage of1 million barrels. The FPSO will also be able to produce 220 million cubic feet of natural gas a day.

"While the original vessel had a

25 year design life, it has recovered its originally planned oil in 12 years but because of the extreme operating conditions we are seeing its operating efficiency decline. We believe there are significantly more oil reserves in this field so now we need a new vessel that can operate safely and efficiently for another 25 years," says Mr. McCarron.

The vessel is what BP describes as a 'harsh environment FPSO' because the operating environment west of Shetland is one of the most extreme in which to produce oil and gas. A facility operating in this area needs to withstand the severe environmental conditions that exist on the Atlantic margin. Lessons learnt from the original facility are reflected in the design of the Glen Lyon FPSO. The aim is to safely deliver oil and gas over the next 25 years, for the vessel to have a high uptime and reliability and to be efficiently operated and maintained. This will maximize the return on investment for BP and its partners. BP has a 33.35% stake in this venture and will operate the FPSO on behalf of its other partners, Shell with the majority stake holding of 54.5% and Statoil and OMV both with 5.88%.

Glen Lyon FPSO is being built to the requirements needed to operate in the UK Continental Shelf. Almost parallel to NORSOK standards, these requirements include ATEX, related to the safety of electrical systems; the European Commission's Pressure Equipment Directive, and all other governing European directives; as well as the many other regulatory and statutory compliance measures for the existing Quad 204 area.

Unlike a boxship or oil tanker,
Glen Lyon FPSO needs to meet both
the requirements for a seagoing vessel
as well as those for a production facil-panse of the North Sea.
The Glen Lyon FPSO is the first
project to be built under a new Global
Agreement between BP and HHI re-

ity. Mr. McCarron explains:

"We have class requirements to meet because we have a vessel until it is moored in field. Then it becomes a fixed production facility. In line with UKCS safety requirements we need to have a formal safety case approved that addresses our hazards and risks and how we mitigate them."

The design of the new FPSO is a collaborative effort with companies from around the world coming together to build a state-of-the-art facility. Engineering, procurement, construction, hull design, and hull commissioning will be carried out by Hyundai Heavy. KBR in Singapore has been responsible for the design of the topside's facilities, under HHI's management. The turret is being designed by SBM Offshore in Monaco and will be fabricated by Dyna-mac in Singapore. Because the biggest factor in startup (ie, how quickly can the facility be producing oil/gas) is the completion level when the facility leaves the shipyard, HHI will put all the pieces together in Ulsan, ensuring the FPSO is ready to operate when it arrives at the field.

When it arrives at the Schiehallion field, the facility will be connected to one of the largest subsea developments in the world. It will be anchored from the base of the turret to the seabed with 20 anchors, but it will rotate around the turret to make sure the facility is always pointed into the prevailing weather. Mr. McCarron says it can be quite disorientating if you're standing on the turret when the FPSO weathervanes, as one moment you can be looking at the bridge and the next all you see is the vast expanse of the North Sea. flecting BP's intent to establish deeper long term relationships with selected suppliers. In line with this intent, BP and HHI are also completing the topsides modules for the BP Clair Ridge Project. Recognizing HHI's capability to deliver to milestones and unmatched fabrication abilities, BP's Glen Lyon FPSO and Clair Ridge projects will lay the foundation for future collaboration between the two companies.

Why HHI? Along with fabrication ability, Mr. McCarron says the work ethic, the level of professionalism, and the people are what put Hyundai Heavy ahead of the pack.

"HHI capability is widely recognized. How HHI does business, work ethic, and professionalism, is very high. Hyundai people are committed to making both HHI and the client successful. The teams work very closely together, and the people are very close. We have many challenges ahead of us, but we have a very close relationship with HHI, focusing on safety, completing the work, and maintaining the relationship."

Perks of working in Ulsan are the many festivals and its proximity to Busan for the baseball and Gyeongju for the historical sites. In Ulsan with his wife Margaret, Mr. McCarron says she enjoys oil painting classes and walks in the bamboo forest near their apartment. One of his favourite pastimes is going to Lotte Giants baseball games, though because of a hectic work schedule his trips to see friends he made while in Geoje have not been as frequent as he'd like. Obviously, the rules are the same, but the atmosphere at Busan's Sajik Stadium is electric. It's yet another aspect of Korea that one has to experience for themselves.

The writer is a copy editor of New Horizons.

All New ForkLift, 10/13/15 BTR-9





Travel Speed (MAX)

Model	Km / h
10BTR-9	13
13BTR-9	13
15BTR-9	13

Gradeability (MAX)

Model	%
10BTR-9	18
13BTR-9	15
15BTR-9	13

HHI's Construction Equipment Division introduced its line of 9-series battery forklift trucks, the 10/13/15 BTR-9 in April. The newly designed threewheel counterbalance trucks will provide operators comfortable driving, increased productivity, and easy maintenance.

HHI developed this new line of forklift in light of European market demand for a smaller forklift which has a competitive price and better working efficiency in narrow spaces. The newly designed trucks feature a rear-wheel driving system to reduce costs as it uses only one motor while the previous line of forklift with frontwheel driving system uses two motors. The new model also adapts fixedwheel base type to improve safety and reduce friction between the ground and tires. HHI

VIEW POINT

US Shale Gas to Drive More LNG Carrier Orders

By Crystal Chan

Chipbuilders can expect to win Der LNG carrier orders as more US LNG export projects are approved. In what will become an increas-

ingly rare event, March passed with no new orders and only one delivery.

There were concerns in April when Flex LNG cancelled an order for four floating LNG (FLNG) vessels that was placed at Samsung Heavy Industries in 2008. The lack of financial support and the right project had delayed the commencement of vessel construction.

However, that was just a blip and since then, shipbuilders in South Korea, Japan, and China have been receiving new LNG carrier orders.

Year-to-date, 23 ships have been ordered, bringing the global outstanding orderbook to 107 ships of over 16.3 million cbm. South Korean shipbuilders remain the leaders in this segment, accounting for 77 of these outstanding orders.

April was an active month, with Nigeria LNG ordering six ships at Hyundai Heavy Industries and Samsung Heavy Industries.

More LNG carriers will be contracted as new projects emerge in Australia and the US.

The review and approval of projects to export US LNG to nations with which the US does not have free trade agreements is underway, with another project, Freeport LNG, being approved on May 17.

The Freeport LNG project expects to

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export a total of 4.4 million tonnes of LNG to Japan's Osaka Gas and Chubu Electric from 2017 and another 4.4 million tonnes to BP from 2018.

Osaka Gas and Chubu Electric will reportedly tender for up to nine LNG carriers to haul LNG from Freeport LNG. Both parties are negotiating with Korean shipbuilders and international shipowners.

Freeport will supply 14.7 million tonnes to Japan, which would require 27 LNG carriers.

Given Japan's annual shipbuilding capacity, analysts think 19 vessels will be placed with Japanese shipbuilders, while eight vessels will go to Korean shipbuilders.

LNG demand is also expected to grow steadily with increasing demand for clean energy.

While the Tohoku Earthquake and Japan's subsequent nuclear crisis in March 2011 precipitated a rush of speculative orders of LNG carriers, year-to-date orders have been founded on long-term supply contracts with Australian and US projects like Ichthys and Sabine Pass.

Korea Gas Corporation, South Korea's sole LNG seller, has declared that it would diversify its LNG supply sources to North America, in response to shale gas development, having primarily relied on the Middle East and Southeast Asia for LNG supplies.

For 20 years from 2017, KOGAS intends to import 3.5 million tonnes of LNG a year from the Sabine Pass project. KOGAS sold 36.55 million tonnes of LNG in 2012, up 8.9% from 33.57 million tonnes in 2011. It plans to sell 37.86 million tonnes of LNG this year, up 3.6% from 2012 figures.

China too, is increasing LNG imports to meet growing energy demands and national research estimates that it will need up to 100 LNG carriers by 2020, from just six units today. In 2012, China imported 14.68 million tonnes of LNG. That is set to double in the next five years and by 2020, China's imports could reach 60-100 million tonnes.

Expect more LNG carrier orders as even Canadian LNG export projects are pending approval. BG is seeking approval for its project in Prince Rupert, British Columbia. The first phase of the proposed Prince Rupert LNG project is expected to produce 7 million tonnes a year after beginning operations in 2021, while market conditions will determine if the second phase will come onstream.

The writer is a markets reporter with IHS Fairplay magazine



The Light at the End of the Tunnel

New Orders & Backlog

					(unit: USD mill	ion ,as of the end of Jun)
Divisions	2013	2013	2012	Achievement	YoY	Backlog
	Plan	Jun. (YTD)	Jun. (YTD)	(%)	(%)	(Delivery basis)
Shipbuilding	7,750	4,970	3,131	64.1	58.7	21,487
Offshore & Engineering	6,000	5,411	739	90.2	632.2	19,933
Industrial Plant & Engineering	6,000	158	514	2.6	-69.3	6,026
Engine & Machinery	3,100	1,432	1,197	46.2	19.6	3,807
Electro Electric Systems	3,160	1,032	1,340	32.7	-23.0	2,532
Construction Equipment	3,272	1,500	1,602	45.8	-6.4	-
Green Energy	394	133	131	33.8	1.5	128
Total	29,676	14,636	8,654	49.3	69.1	53,913

USD Exchange Rate



Sales in Second Quarter of 2013

The largest business division, the Shipbuilding Division's sales were KRW 4.47 trillion, at a similar level to the same period last year. The Offshore & Engineering Division increased its sales by 9.5% to KRW 1.24 trillion. The Engine & Machinery Division and the Construction Equipment Division's sales were KWR 422 billion and KRW 1.03 trillion, respectively, up 0.3% from the same period last year.

Other divisions' sales fell from the same period last year due to the unfavorable market situation and uncertainty.

New Orders

However, HHI showed a prodigious improvement in new orders. The Shipbuilding Division won orders worth USD 4.97 billion, achieving 64.1% of the annual goal of USD 7.75 billion in the first half. Offshore & Engineering Division received USD 5.41 billion in orders, accounting for 90.2% of its annual order target. These two divisions' performances cast away the worries of gloomy outlook.

High energy prices have led oil majors and deep sea explorers to invest in drillships and other offshore oil & gas production facilities. As evidence, drillship chartering contracts are being made at considerable prices at USD

454,000/day. Therefore, from the second half of 2013, drillship orders which have been held up are expected to be released. This trend might see more orders being placed at Shipbuilding and Offshore & Engineering divisions going forward.

The Industrial Plant & Engineering Division won USD 158 million in orders in the first half due to some planned major projects being postponed to the second half. However, the division won a USD 3.3 billion order to build the Shugaig Steam Power Plant (SSPP) in Saudi Arabia on August 4. The division is now well on track to achieve its new order target as it also bidding for other projects such as Al

Stock Metrics

					Aug 19,
	2009	2010	2011	2012	2013
High for the Year (Closing, KRW)	250,000	456,500	554,000	345,000	248,500
Low for the Year (Closing, KRW)	148,500	171,000	235,500	195,500	176,000
Closing, KRW	173,500	443,000	257,000	242,000	221,000
Market Cap. (Closing, KRW billion)	13,186	33,668	19,532	18,392	167,960
Foreign Ownership (%)	17.38	20.20	16.91	18.89	17.12
PER (H/L)	7.0/4.2	9.8/3.7	17.2/7.5	19.1/10.8	N/A
EPS (KRW)	35,705	46,594	31,751	18,031	N/A

dur North project in Middle East.

In line with the gloomy outlook of the shipbuilding market, orders for marine engines have decreased. The Engine & Machinery Division has taken USD 1.43 billion in new orders, accounting for 46.2% of its annual goal. To diversify its earnings, the division is expanding its independent four-stroke engine, HiMSEN, to offshore purposes.

The Electro Electric Systems Division posted new orders worth USD 1.03 billion, making 32.7% of its annual new orders goal. This result can be attributed to fierce competition in global markets.

The Green Energy Division's new orders slightly gained from last year,

Stock Performance



USD 133 million from USD 131 million. The division has new 5.5 MW turbine models for offshore use in the final stages of testing and expects to bring them to market in 2014.

Second Half Outlook

The shipbuilding market, especially commodity types, will remain prosaic until the first half of next year. In the meantime, the demand for eco-friendly and fuel efficient ships will drive the market.

A short-term solution to enhancing shipping and shipbuilding market is not visible, and mixed signals from the US economy continue to make its recovery uncertain.

Light and Shadow

Hyundai Heavy Industries continuously invests in R&D to overcome the precarious market.

HHI has received orders for several special purpose vessels such as OSV(Offshore Support Vessel) and accommodation vessel. As offshore energy development is growing, the demand for special ship will continue to increase. With a large and experienced workforce, HHI has a strong foothold in this business.

Low-Noise Design of Offshore Facilities

With growing interest for environmentally friendly offshore facilities such as drillships, FPSO, and FLNG, there is a concomitant demand increase in low noise and vibration design.

To address this issue, Hyundai Advanced Technology Institute (HATI) has developed advanced Noise and Vibration Control Methodologies through numerous analyses and experiments using large scale noise and vibration test facilities. The developed noise and vibration control methodologies consist of:

Noise Source Control

The main noise source in offshore facilities is the propulsion system including dynamic positioning and thrusters. Therefore, effective control of structure-borne noise from thruster is a crucial factor in designing low noise offshore structures. Setting up the analytic method, optimal control measure for structure-borne noise using constraint damping layer was proposed and was efficiently applied. Effective noise source control was confirmed to reduce cabin noise by 4-6 dB. It also reduces costs for noise control in accommodation areas.

Regarding offshore structures like FPSO, isolating living quarters from the topside with a mount can be a very effective method to reduce structure-borne noise. However, the isolation may cause serious structur-



al problems and extra time and costs may be needed to strengthen living quarters. Therefore, instead of isolating living quarters, machinery vibration was controlled with doublemount and transmitted structureborne noise was effectively reduced using constraint damping layer and floating floor. These alternative methods were applied to Goliat FPSO with huge cost reduction.

Unit Cabin Noise Control

In order to reduce the noise level inside the unit cabin, various kinds of measurements were carried out using a unit cabin mock-up. With the measurement and analysis results, the designs of wall and floor structures were modified and confirmed to be efficient in noise control. This optimal design for wall and floor of cabin has already been applied to various offshore structures including Usan FPSO.

Using the analytic prediction results for sound transmission loss (STL) based on Statistical Energy Analysis (SEA), new wall configurations with improved sound reduction properties were developed. High-performance wall configuration for offshore structure with Rw 65 dB was newly proposed and environmentally friendly configuration wall with honeycomb panel was also developed. These new configurations are expected to be effectual to reduce topside noise and to design low-noise living quarters.

HVAC Noise Control

HVAC noise is also a major noise source in offshore structures. Because the HVAC noise is closely connected to performance like flow rate and velocity, HVAC noise prediction method must be accompanied with performance review simultaneously at the design stage. Therefore, HHI newly developed an integrated prediction system for HVAC performance and noise. It is based on 3-D CAD System of HVAC (PDMS).

These kinds of noise control measures have been being successfully applied to various offshore structure designs. Based on these noise control measures, the low noise design guideline to satisfy NORSOK regulation including the cabin noise limit of 40 dBA was also successfully established. These results are expected to be valuable in designing environmentally friendly offshore structures.

Slow and Steady Improvement

By Terence Park

The Shipbuilding Industry to Slowly Improve

We believe the shipbuilding industry will continue to face challenges in the near-term, and many shipyards globally will not survive the present downturn. In the mid to long-term, we expect the industry to steadily improve, while structurally, we believe there will be a greater differentiation among shipyards as the offshore related segment continues to grow in importance, while greater emphasis is placed on eco-vessels amidst high oil prices.

Not Out of the Woods Yet, Consolidation Will Help

In the first half of 2013, the shipbuilding industry experienced a sharp rise in global new orders at 16.7 million CGT, which is up 40% YoY. While this sounds good, we believe ship prices have bottomed and we attribute much of the increase in new ordering activity this year to extremely low ship prices.

There is still excess shipbuilding capacity which we believe will continue to decline as low profitability and deteriorating balance sheets cause shipyards to become insolvent. In Korea alone, there were 33 Korean shipyards in operation after the global financial crisis and since that time, eight have gone bankrupt while 14 are in workout programmes, leaving just 11 shipyards that are considered to be operating under normal conditions. The picture is will not be much better in China.

34 New Horizons Autumn 2013 However, this is a healthy development since as excess capacity comes offline, it will close the gap toward balancing the demand for vessels with the industry's capacity.

Path to Recovery

While current conditions remain challenging, several factors will allow for improving industry conditions. We forecast a global economic recovery in 2014 and expect Europe to come out of recession which should improve global trade and ease ship financing. Continued scrapping will lower global fleet sizes while order backlogs decline. Rising freight rates and rising demand for vessels with fewer shipyards will eventually put pricing power back in the hands of the shipbuilders.

Differentiation and Growing Areas of Importance

Oil majors have long-term capex plans, and Wood Mackenzie expects budget to grow from USD 43 billion in 2012 to USD 114 billion in 2020. More money has been budgeted for deepwater exploration and production activity which will continue to require investment in drillships, offshore platforms, gas carriers and FLNG vessels. While only two FLNG vessels have been ordered to date, we have identified over twenty potential orders in the pipeline. Meanwhile, the development of shale gas has fuelled steady demand for LNG carriers. The Big 3 Korean shipyards currently dominate the offshore segment of the market having delivered 85% of all drillships, 66% of a LNG carriers, and 40% of a FPSO in the past decade. They are also the only shipyards that have the capability to produce FLNG vessels.

With oil prices expected to stay over USD 100 a barrel, the profitability of a vessel will be determined by its fuel efficiency, and in this environment the eco-vessel will grow in importance.

The shipbuilding industry is currently in the bad part of the cycle, but several factors such as improving economic conditions and improving demand will contribute to a steady recovery. The Big 3 Korean shipyards are well positioned as they maintain a lead in the offshore segment as well as the development of eco-ships.

The writer is an analyst at CLSA Securities.



Global New Order Versus Ship Price

From Missionaries to Gymnasts and Gorillas :

Baseball in Korea

While you won't find Fenway Franks or Rocky Mountain Oysters at a Korean ballpark, your options are only limited by what you can carry.

By George Deftereos

Baseball is the quintessentially American game. But, no other nation has arguably taken this game more to heart than South Korea. Though it was first introduced at Hwangsung YMCA (now Seoul YMCA) in 1906 by Presbyterian missionary Mr. P. L. Gillet, the game didn't have an official organizing body until 1981. As was par for the course at the time, the Korean government had a strong say in which conglomerates were allowed to develop teams. This is the reason that Korean Baseball Championship teams are more readily recognized



by their owner rather than their location; Lotte Giants, based in Busan and owned by Korean-Japanese food giant Lotte, compared with the New York Yankees. But without corporate involvement, no team in the league would exist.

The first Korean player to be signed by a US major league team was Park Chan-ho. He made his debut for the LA Dodgers in 1994 but only played two games that season. His first full season with the Dodgers was in 1996, and in 1997 he was named one of the MLB's best pitchers (though his best season was in 2000 with 18 wins and earned run average of 3.27). Coinciding with his performance, and the government's need to provide a distraction during the IMF crisis, Korean public television started broadcasting every game Park played, turning him into national hero.

While Korean baseball games follow most of the same rules as any other major league from around the world, it is the stands that make Korean baseball a cultural event. At big games in the US, Japan, and Korea, a celebrity usually makes the first pitch and more often than not manages to throw the ball straight into the ground or throw it widely and completely miss the catcher.

KOREAN PANORAMA



Not in Korea on July 5, when rhythmic gymnast Shin Soo-ji not only threw a pitch over the plate but also performed a complicated gymnastics move called an 'illusion'. This pitch was seen around the world, gaining 10 million hits on YouTube within a week and being shown on CNN and FOX Sports.

This summer's Korean blockbuster is shaping up to be the Korean-Chinese collaboration Mr. Go. The film follows the story of a Chinese circus gorilla that becomes a Korean major league superstar. What's not to love?

Food and drink is another thing Koreans do differently. While you won't find Fenway Franks or Rocky Mountain Oysters at a Korean ballpark, your options are only limited by what you can carry. Unlike stadiums in

the US, Korean teams do not place any restrictions on the types of food that can be brought in for the simple reason that there are no restaurants at the stadiums. It's not uncommon to see local fast food chains & mom-and-pop stores setting up tables outside the stadium selling everything from fried chicken to dried squid with Korean chili sauce to kimbap. Or for fans to bring with them the equivalent of a shopping trolley full of food, drinks, and snacks. At some stadiums, fans can even call local stores to place an order for food to be delivered to their seats.

Alcohol is also readily available at Korean ballparks, though not at the exorbitant prices usually associated with sporting events. The convenience stores scattered throughout the stadi-

um sell local beers and many international brands, as well other drinks including soju - a Korean distilled spirit - energy drinks, banana flavored milk, and bottled water. Spectators can also bring their own drinks, though they must be in plastic containers.

By far the strangest thing you'll see at any baseball game in Korea will be at the Lotte Giants home ground at Sajik Stadium. As the 7th inning comes to a close, rather than the traditional 7th inning stretch, attendants and security guards hand out orange shopping bags for fans to make into helmets. It's just another thing about Korea that needs to be seen to be believed.

The writer is a copy editor of New Horizons Picture | Lotte Giants, Newsbank

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