

NEW *Horizons*

Autumn 2012

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COVER STORY

Stretching Market Lead



KOREAN CRAFT

A Gemstone For *Beauty and Health*

From ancient times jade has been highly valued and has been fashioned into exquisite ornaments. Jade can be found in a creamy white form as well as other color variations, including green, yellow, and red. Nevertheless, the use of jade has a long history in Korea. Jade was used for ornaments and jewelry due to the belief that it is a sacred stone holding the energy of the universe like 仁 (virtue), 義 (faithfulness), 智 (wisdom), 勇 (valor). **HHI** Source - *DAEGU UNIVERSITY CENTRAL MUSEUM*



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Challenges Are Opportunities in Disguise



Lee Jai-seong
President & CEO

Though most of the world is still under the heat of the blazing summer sun, the chilly global economic climate has yet to react to such all-encompassing warmth. The economic recovery around the world has been weighed down by persisting uncertainties. There are nagging concerns that the euro zone's ongoing financial crisis will not be resolved in the near future. Moreover, the slow-down of the Chinese economy is casting doubts on the global economic outlook.

Nevertheless, HHI remains undaunted by the current global economic turbulence; we are confident that challenges are opportunities in disguise and current hardships can be a stepping stone for greater success. With this in mind, we are re-aligning the focus on our growth strategies and pushing ahead with our efforts to consolidate our core competencies.

At this moment, the world's shipbuilding industry is being buffeted by another massive wave of restructuring after the Lehman crisis. Despite the adversities, the Shipbuilding Division has recently succeeded in clinching orders to build the world's largest semi-submersible drilling rig as well as an ultra-deepwater drillship. On top of that, the division won an order to build 10 large

containerships worth USD 1.2 billion.

The Offshore & Engineering Division is grappling with this year's target of USD 5.2 billion dollars in new orders amidst fierce competition. After a spate of unsuccessful bids, the division kick-started its drive for business by winning orders worth USD 600 million in June alone. Furthermore, the division is also pulling ahead in bids for FPSO in Africa.

The Industrial Plant & Engineering Division is facing increasingly stiff competition in the international plant construction market. However, the division is still expected to beat competitors to win big ticket projects such as a power and desalination project in Kuwait and an LNG project in Nigeria. The division also seeks to expand into markets in Africa, Southeast Asia, South America, and Central Asia.

The Engine & Machinery Division is making aggressive efforts to carve out new markets with its recently developed, eco-friendly marine engine that runs on natural gas. The division also recently achieved sales of 1,000 packaged power stations, the mobile power plant equipped with the HiMSEN engine as its prime mover.

The Electro Electric Systems Division is also going through difficult times due to sluggish demand and

intensifying price competition. Struggling with these challenges to sustain steady growth, the division plans to further expand its market by tapping the cooperative networking of its overseas subsidiaries and supplementing its overseas client bases for greater access to potential markets.

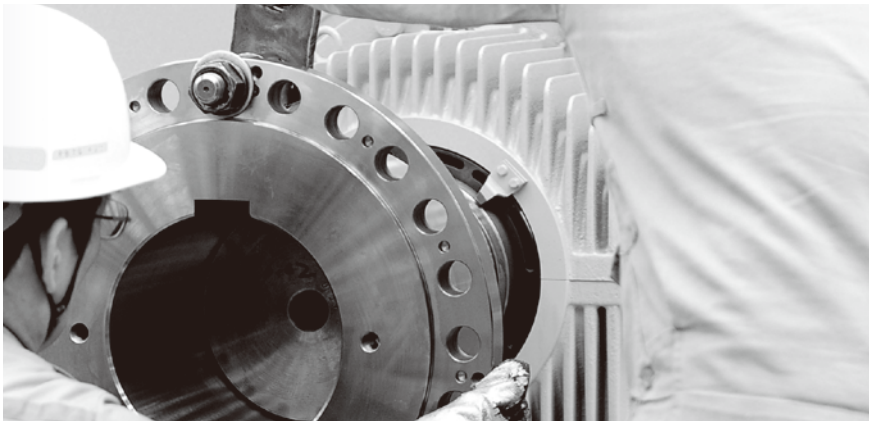
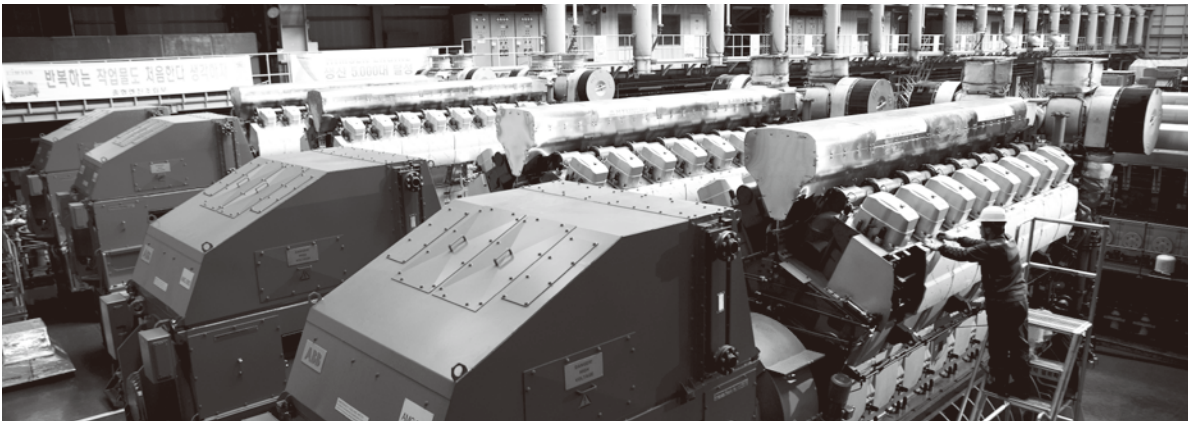
The Green Energy Division is in the final stretch of completing the design for the 5.5 MW offshore wind power turbine. As a result, HHI will now have a complete line-up of wind power turbines from the 1.65 MW and 2 MW onshore wind power turbines to the 5.5 MW offshore wind power turbines.

The Construction Equipment Division is successfully carrying out its role as one of the Company's new growth engines. In order to keep boosting sales around the world, the division is focusing on providing greater customer satisfaction through improved product support and financial services programs. Along with these efforts, the division remains committed to developing new models tailored to different markets.

While time and circumstances change, with HHI, our clients can be sure of at least one constant: our pursuit of excellence and our unwavering drive to bring the greatest value to you. **HHI**

Stretching Market Lead

By Alex Lee



Hyundai Heavy Industries, the world’s biggest shipbuilder and the dominant player in the global ship engine market, sees clouds of pessimism hanging over the world economy, but is hoping to turn the crisis into a good opportunity to stretch its lead over competitors.

The prolonged economic downturn is dashing hopes for a quick recovery in the global shipbuilding industry, and many shipbuilders and marine engine makers are being forced to suspend production or operate at significantly reduced capacity as orders dwindle and the credit market dries up.

Hyundai Heavy’s Engine & Machinery Division is also feeling the pinch, revising its sales target for 2012 to KRW 3.8 trillion, from KRW 4 trillion for 2011.

Mr. Kim Jeong-hwan, head of the Engine & Machinery Division, says smaller players are more vulnerable to financial shocks and many will fall victim to the industry’s current woes

while Hyundai Heavy’s market share will grow at their expense.

Hyundai Heavy is currently the world’s leading diesel engine builder with about 35 percent global market share.

“We expect that our market share will be about 40 percent this year due to aggressive marketing and our resilience,” said Kim.

Kim says the number of marine engines produced at Hyundai Heavy may be scaled down as shipowners across the globe review orders or postpone deliveries in the midst of a protracted slump.

Kim’s division rolls out a variety of products such as engines for marine propulsion, power generation, industrial robots, industrial machinery including press & conveyor systems, ballast water treatment systems, side thrusters, gas compressors, and industrial & marine pumps.

“This is not the time to try to make more money by increasing production

but the time to stick it out and get ready to pull ahead. I believe we have the reserve power to do so,” said Kim.

QR Codes

Kim was appointed head of the division this January after working for the company’s warship and submarine projects over the last 34 years. Since taking the helm, he has taken the initiative as he braced himself for his new career.

First of all, he placed QR Codes, a mobile device readable barcode, on Engine & Machinery Division employees’ business cards, foregoing the old-fashioned marketing format of using leaflets or catalogues.

The tiny black-and-white “quick response” squares embedded on business cards will immediately link customers to the division’s webpage as long as the user has a QR Code Reader on their smart phone.

The QR code has been well received by both employees and clients, and other divisions at HHI have joined

the Engine & Machinery Division in introducing the code on business cards as a new marketing and advertising tool.

Hyundai Heavy officials say the QR code and other Internet-based marketing initiatives also help improve the image of the world’s biggest shipbuilding firm. The Company is taking steps to embrace a future where technology reigns.

The division also made it much easier for users to gain access to Hyundai Heavy’s Engine & Machinery Division websites, news, and information relevant to the division’s business, products, and services.

These initiatives are paying off. The division is receiving many customer enquiries from around the globe that could lead to new orders, Hyundai officials said.

Kim sees the current shipbuilding downturn lasting at least one or two more years, and improved customer service and high-quality products are key for the Company in this challeng-

ing environment. “Probably we can see a partial recovery in the second half of 2013 at the earliest,” he said.

Kim said his division has been cutting costs but new facilities investment and technology development plans will not be put on hold.

“We increased the budget for investment and technology development to KRW 110 billion, up 22 percent from the originally planned KRW 90 billion earlier this year,” Kim said.

Much of the money will be used to upgrade “endurance testing” facility for marine engines and develop surgical robots.

The move is part of the Company’s strategy to emerge stronger when the current economic turmoil is over.

The Engine & Machinery Division is also pushing ahead with plans to extend its reach into global markets by developing products tailored to customer needs. It predicts that this year’s new orders will be around USD 3.2 billion, on par with last year.

New Engines

At the centre of the division’s key business strategy is broadening its client base by developing high-powered and environmentally friendly engines.

The division has aggressively pushed to boost sales and brand recognition of its Hyundai HiMSEN Engine.

The latest HiMSEN model H35/40GV is a gas-fuelled engine which emits 20 percent less carbon dioxide than diesel engines and reduces NOx emissions by 97 percent to reach the world’s lowest level of 50 ppm. The Company started exporting the model in June this year.

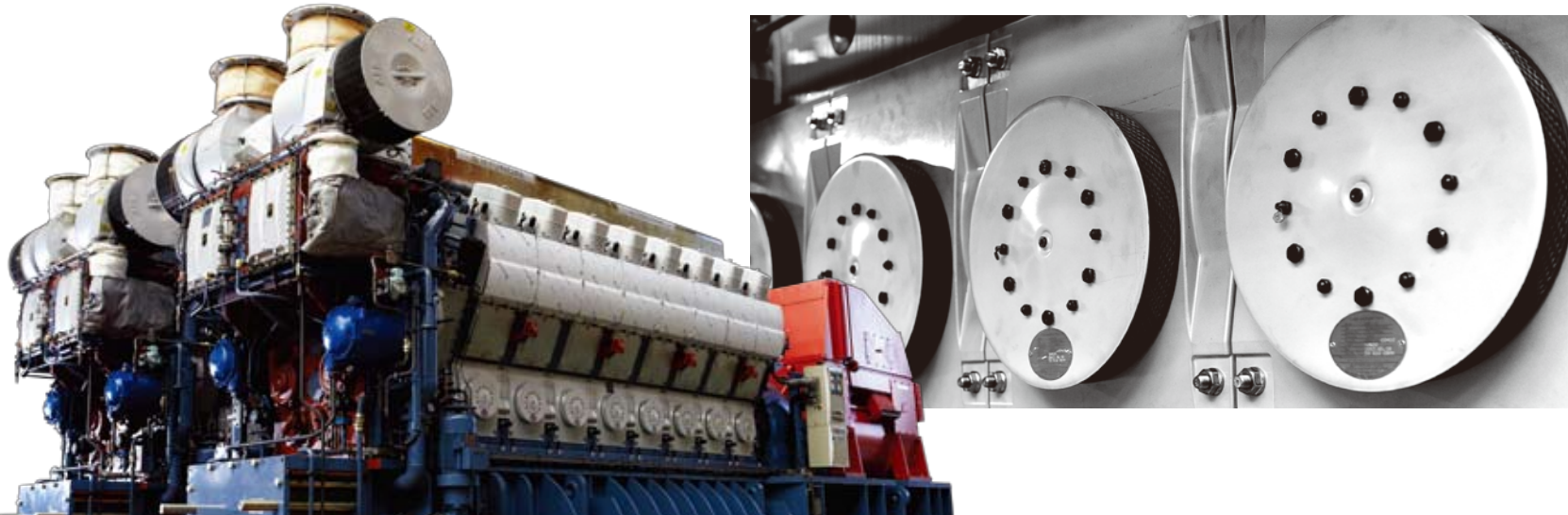
Due to increasing oil prices and strengthening regulations on emissions, the demand for gas engines is increasing, Hyundai officials say.

In a drive to broaden the market-reach of the HiMSEN four-stroke brand, Hyundai Heavy is also planning to roll out a four-stroke dual-fuel medium-speed series over the next few years.

The HiMSEN can be used for ma-



“This is not the time to try to make more money by increasing production but the time to stick it out and get ready to pull ahead.”



Since entering the industrial robot market in 1985, Hyundai Heavy has made great strides to become a Top 5 robot maker

rine or land-based generators, and marine propulsion.

The division is also planning to build super long stroke G-type engines. They will be used as prime movers in very large crude carriers (VLCC). Their longer stroke reduces engine speed, thereby paving the way for ship designs with unprecedented high efficiency. The shipping industry is currently debating whether or not VLCC lay-out speed should be reduced to 13 knots from the existing 15 to 16 knots.

Marine engines currently account for 78 percent of the division's total sales, but Hyundai officials forecast the proportion will dwindle to about 50 percent within three years.

China, Hyundai Heavy's major engine market, is increasingly taking "nationalistic policies" to protect its domestic shipbuilding industry while the euro zone crisis persists, dimming prospects for the division's marine engine sector, Kim said.

"We are exploring markets in Ja-

pan, Singapore, India, Vietnam, Brazil, and Russia," Kim said.

Now the division's immediate focus is to secure growth momentum in non-engine sectors such as Packaged Power Stations (PPS) and Diesel Power Plants (DPP), industrial pumps, and robots.

In the power generation sector, Hyundai Heavy has reaped great success with the containerized PPS.

Earlier this year, the Company received orders for about 100 PPS units, which will be delivered to projects in the Middle East and Africa by the end of this year.

The PPS is popular as it is mobile and easily installed in remote areas with hostile environments where it is difficult to build power generation facilities or transmit electricity. It is less vulnerable to natural disasters and boasts fuel-efficiency and low operating costs.

Hundreds of PPS have been installed in Cuba, making Hyundai Heavy a dominant player of power

plants in the energy-starved country. In fact, Cuba's 10-peso banknote features the slogan "Revolucion Energetica" (Energy Revolution) over a picture of a Hyundai PPS. Hyundai Heavy held a congratulatory ceremony for its 1,000th Packaged Power Station on July 12 in Ulsan.

Robots

Hyundai Heavy forecasts 2012 sales in the engine sector will fall by 6.5 percent while sales in the fast-growing robot sector will rise by 13.6 percent.

Since entering the industrial robot market in 1985, Hyundai Heavy has made great strides to become a Top 5 robot maker.

With car makers such as BMW, Ford, and Renault planning to expand their existing assembly plants, demand for Hyundai Heavy's welding robots will be strong, Kim said.

It is also venturing into the surgical robot sector. **HHI**

The writer, Alex Lee, is a journalist based in Seoul.



HHI Roundup

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

Companywide

HHI Management Visit Industry Exhibitions



HHI President & CEO Mr. Lee Jai-seong attended Posidonia 2012 in Athens, Greece on June 4.

Posidonia, one of the three largest shipbuilding & marine equipment exhibitions, was attended by 1,870 exhibitors and 18,547 visitors from around the world.

With Mr. Lee’s “hands-on” approach, HHI won a USD 210 million order for a 162,000 m³ LNG carrier from Tsakos Shipping. The order also includes an option for one more same-class vessel.

Mr. Choe Byeong-ku, COO of HHI’s Construction Equipment Division, made trips to exhibitions in France and Russia in May this year. The results were a contract for 2,100 units of construction equipment worth USD 170 million.

gram has now been expanded to 10 courses including machinery, electronics, CAD, and industrial robots. Student intake has also increased from 780 (in 1972) to 3,100 annually.

Through this program, technical trainees gain the skills needed to be part of the world’s biggest shipyard



Companywide

HHI’s 200th Technical Trainee Class

HHI ended the 200th class of technical trainees of the Institute of Technical Education on July 8.

HHI’s Institute of Technical Education was created 40 years ago to train employees in the technical skills needed to work in the shipbuilding industry. The first class of 267 students graduated in September 1972. Since then, most of the 36,000 graduates have found work with HHI or other businesses involved in shipbuilding. In 1972, the Technical Trainee Program offered three courses; welding, shipbuilding, and piping. The pro-

and R&D innovator.

Companywide

HHI Group Security Operating Committee

HHI held the 2012 Group Security Operating Committee with affiliates Hyundai Mipo and Hyundai Samho on June 29.

HHI Group’s Security Operating Committee, including President & COO Mr. Kim Oi-hyun, discussed security improvement measures for subsidiaries, technology leakage prevention measures for design and production, and building a coordinated response system against cyber-terrorism.



Shipbuilding

Order for Biggest Drilling Rig

HHI bagged an order to build a semi-submersible drilling rig for Fred Olsen Energy on May 28. Hyundai Heavy, as a turnkey contractor, will undertake all works for the USD 700 million project. The contract also includes an option exercisable by the owner to order an additional same-class drilling rig.

The rig will be built at Hyundai Heavy’s Gunsan Shipyard. Equipped with a 1,650 ton Goliath Crane and the world’s largest drydock at 1.3 million DWT, the Gunsan Shipyard has delivered 26 ships since its establishment in 2010.

The semi-submersible, measuring

Shipbuilding

USD 655 million Drillship Order



HHI won an order to build the fourth new ultra-deepwater drillship for Diamond Offshore Drilling Ltd. on May 8. The total cost of this project, including commissioning, spares, and project management, but excluding capitalized interest is expected to be approximately USD 655 million.

The vessel, measuring 229 m by

36 m with an operating depth of 3,600 m, is scheduled to be delivered by the fourth quarter of 2014.

The new drillship will be of the same efficient and safety-enhancing design, Gusto P10000, as Diamond Offshore’s three other units currently on order with Hyundai Heavy. The design helps to stabilize the drillship while

operating and to use less fuel by having the thrusters operating in tandem. Design specifications also include location controlling system, computer propulsion system, and seven ram blowout preventers Hyundai Heavy uses to bring enhanced safety benefits to the drillship.

123 m in length and 96 m in width with an operating depth range of 70 m to 3,000 m, will be built according to NORSOK standards. These standards are applicable to rigs operating in the adverse conditions of the North Sea. When completed in March 2015, this semi-submersible rig will be the



biggest ever built and able to drill to depths of 12,200 m.

Shipbuilding

USD 1.2 Billion Containership Order

HHI won a USD 1.2 billion order to build ten 13,800 TEU containerships from a Greek shipowner on June 29. Evergreen Marine will charter these megaships.

The containerships, measuring 368 m in length, 51 m in width, and 30 m in depth, are scheduled to be delivered from the second half of 2013 to the second half of 2014. The vessels will use 10 percent less fuel compared to existing similar class containerships.

Since LNG carriers, drillships and semi-submersible drilling rigs have been the only bright spot of the global shipbuilding market recently, Hyundai Heavy’s winning of the ultra-large containerships order shows that there is a market for excellence in shipbuilding.



Offshore & Engineering

USD 600 Million Offshore Projects

HHI received three orders for offshore projects worth USD 600 million in June. The orders are for an offshore oil & gas production platform to be installed in Canada, onshore plant modules to be operated in Alaska, and a semi-submersible rig to be operated in the Gulf of Mexico.

HHI plans to complete and deliver the USD 400 million offshore oil & gas production platform by August 2015. The platform will meet the C-NLOPB safety and environmental regulations for offshore platforms operating in the harsh weather conditions of the North Atlantic Ocean.

HHI also clinched a USD 100 million order from an undisclosed client to build six onshore plant modules to operate in Alaska. The modules, to be handed over by June 2015, will be able to produce 200 million



ft³ of natural gas and 10,000 barrels of oil per day.

The Company also added a USD 100 million order to build a semi-submersible offshore rig for LLOG Explo-

ration to its order book. The USD 100 million contract also includes an option exercisable by the owner for an additional same-class offshore facility.

270 m in length and 30 m in width, is scheduled to be delivered to the Schiehallion Field, west of the Shetland Islands, by the end of 2014.

Engine & Machinery

President of Ecuador Visits HHI Workers

Mr. Rafael Correa, President of Ecuador, visited Jaramijo Diesel Power Plant in Ecuador on June 5 to inspect HHI's world-beating packaged power plants ahead of the facility coming online on June 10, and to thank HHI's workers for their hard work.

The 140 MW Jaramijo Diesel Power Plant, installed 250 km southwest of the capital Quito, is now producing 5 percent of Ecuador's total electricity.

This project is the latest in several deals HHI has clinched in Ecuador, including installations in Quevado, Santa Elena, and Galapagos Islands. The total power plants installed so far in Ecuador is 139 PPS and 18 DPP, together producing 339 MW of electricity.



Engine & Machinery

Providing SCR for Drillships

HHI supplied 18 gas emission reduction systems for three drillships or-

Engine & Machinery

Hyundai Heavy Begins Exporting Eco-Friendly Marine Engines

HHI started exporting the eco-friendly gas engine Hyundai HiMS-EN H35/40GV after completing test runs on June 18. The new gas engine runs on liquefied natural gas rather than heavy crude oil and has a maximum power output of 13,000 bhp. The HiMS-EN H35/40GV can be used to generate power for onshore power plants, commercial ships, and offshore facilities including drillships.

The new engine emits 20 percent less carbon dioxide than diesel engines, reduces NOx emissions by 97 percent to reach world's lowest level of 50 ppm, and improves engine performance by 47 percent.

HHI will export the engine to an onshore gas-powered power plant in the Middle East after final paint and



packing work.

Mr. Kim Jeong-hwan, COO of Engine & Machinery Division said, "Due to high oil prices and strengthening regulations on emissions, the demand for gas engines is increasing. We expect these high-output gas engines to help Hyundai Heavy expand

our product lines, diversify target markets, and boost sales."

With a 35 percent share of the diesel engine market, Hyundai Heavy plans to be in the Top 3 for gas engines with a 15 percent market share by 2013.

dered by Rowan in June 2011. The eco-friendly Selective Catalytic Reduction (SCR) system can reduce NOx emissions by as much as 95 percent by using an HHI-developed catalyst to separate NOx into nitrogen and water.

Analysts forecast the demand for the gas emission reduction system will surge in 2016 when International Maritime Organization Tier III emission limit regulations come into effect. Under those maritime regulations, ships built from 2016 must reduce NOx emissions by more than 80 percent of Tier I.

Along with the SCR type, Hyundai Heavy is also developing an Exhaust Gas Recirculation (EGR) type gas emission reduction system.

The Company also completed a test run of green gas marine engines

emitting 20 percent less carbon dioxide than diesel engines and reducing NOx emissions by 97 percent to reach the world's lowest level of 50 ppm.



higher short circuit capacity than existing similar circuit breakers. Production costs were also reduced through optimized design, modularity, and HHI's automated manufacturing method.

The new air circuit breaker has been certified by KS, KERI, and DEKRA. With the upcoming KEPIC certification, HHI intends to enter the shipbuilding and nuclear energy market by 2013.

Offshore & Engineering

Steel-cutting Ceremony for Quad 204 FPSO

HHI held a steel-cutting ceremony for BP's Quad 204 FPSO in Pohang on July 2.

The ceremony was attended by project officials including Quad 204 Project Manager Mr. Graham Stewart and Project Management 1 SVP Mr. Kim Sook-hyun.

The Quad 204 FPSO, measuring



Electro Electric Systems

HHI Unveils Low Voltage Air Circuit Breaker

HHI unveiled the U-Series low voltage air circuit breaker on May 31.

This new air circuit breaker is 20 percent smaller and has 30 percent



Electro Electric Systems

Electric Bus Unveiled at Busan International Motor Show



HHI and Daewoo Bus Corporation presented the new electric bus (New BS110EV) at the Busan International Motor Show in BEXCO, Busan on May 24.

With double the battery life of other electric buses, this bus achieves a high service ratio through two 120 KW electric motors (EPOCH 240). The bus only needs to be recharged every 120 km, which compares favor-

ably with gasoline buses. Moreover, it only takes 10 minutes to fully recharge.

The New BS 110EV features HHI's core electric equipment and technologies ranging from Motor Control Unit, Auxiliary Control Unit, DC/DC Converter Unit, Power Distribution Unit, Battery Management System, and Battery Pack.

Industrial Plant & Engineering

IGD DAS Modules Sail Out

HHI dispatched the last shipment of modules for the IGD DAS project on July 22. The Company received the USD 1 billion EPIC project from Abu Dhabi Gas Liquefaction Company (ADGAS) in 2009.

With the last shipment dispatched,



tember 2013. The plant will consist of 24 modules with a production capacity of one billion ft³ of gas per day.

Construction Equipment

Intermat 2012 in France

HHI displayed construction equipment at Intermat 2012 in Paris, France from April 16 to April 21.

At the expo, HHI presented the new eco-friendly 9A Series and hybrid excavators that are 25 percent more fuel efficient. The most significant difference between the new 9A Series and the 9 Series is the introduction of EU Stage IIIB and Tier 4 Interim compliant diesel engines.

The new 9A Series has reduced exhaust emissions and improved fuel economy while still retaining the reliable power and comfort of the 9 Series. The result is a leaner and greener excavator. Among other models on display at HHI's booth was the flagship 120-ton R1200-9 excavator. The all new excavator was the biggest machine on display at Intermat. The R1200-9 is powered by the high-performance 23 L, 6-cylinder Cummins QSK23-C rated at 760 hp (567 kW).

Intermat is one of the three biggest construction equipment events in the world. This year, 1,500 companies from 43 countries attended.



Construction Equipment

M&T 2012 in Brazil

HHI participated in M&T EXPO 2012 in Sao Paulo, Brazil from May 29 to June 2. M&T EXPO is the biggest con-

Construction Equipment

HHI Builds Playground at Indian School



HHI built a playground at Zila Elementary School in Pune, India on May 31. HHI also built a waterway near the school to prevent flood damage during the rainy season and repaired the road between the village and the school.

HHI also donated 500 books to schools in the area on June 27. Since launching the Construction Equipment Division's manufacturing arm

in India, the company has continuously contributed to the community as part of Hyundai Heavy's Corporate Social Responsibility policy.

HHI aims to have a market share of 17 percent in India's construction equipment market this year through brand awareness, and working with the community and local business to meet social needs.

struction equipment exhibition in Brazil and is held every three years.

HHI launched the 9S Series of excavators and displayed 17 models of backhoe loaders, wheel loaders, and forklift trucks. The Brazilian construction equipment market is expected to continue growing as various infrastructure projects such as express railways, express highways, and hy-

plant will serve as its South and Central America base.



Green Energy

Highest Efficiency Solar Cell

HHI achieved copper-contact selective emitter solar cells 19.7 percent conversion efficiency on April 23. This is the highest efficiency rate for a selective-emitter solar cell.

HHI's Green Energy Research Institute has improved UNSW's original laser-doped selective emitter technology to create its solar cell by copper plating with a full-area aluminium-alloyed back electrode. A laser-based selective doping process was combined with a plating technology to form copper contacts at the front electrodes without silver paste, resulting in a significant reduction in costs.

"The new solar cell is a critical milestone in our ongoing effort to improve the performance of our photovoltaic products while reducing the production costs," said Mr. Lee Choong-dong, COO of Green Energy Division.



HiTLMS:

Hyundai Intelligent Transmission Line Monitoring System



The Comprehensive Management Solution for Power Transmission Systems



Smart Sensor



HiTLMS | Hyundai Heavy Industries developed a new transmission line monitoring system, HiTLMS (Hyundai Intelligent Transmission Line Monitoring System) and received KERI (Korean Electro Technology Research Institute) certification in 2011. Currently it is being tested in the Jeju Smart Grid Pilot Project.

HiTLMS allows comprehensive management of transmission systems such as line sag/tension, ice loading on cable, galloping, natural disaster monitoring, and dynamic line rating applications.

HiTLMS consists of Smart Sensor and Master. The Smart Sensor measures crucial data from transmission lines and delivers the data to Master through wireless communication. It makes possible the reliable and efficient management of power transmission systems.

Smart Sensor | The Smart Sensor is a sensor device for on-line measuring of transmission line status. The

Smart Sensor has micro-sized internal sensors to measure transmission line conditions such as conductor temperature, line current, ambient air temperature, wind speed, and wind direction. It also has GPS and can take photographs. Operational power for Smart Sensor is harvested directly from the transmission line. Using the latest wireless communication technologies such as Wi-Fi mesh, WCDMA, and GSM, it is possible to transmit the measured data to Master.

Master | The Master is the user interface of the Smart Sensors. It delivers crucial transmission line information such as calculations, estimates, and warnings to power system operators. Since it provides flexible interface with standard communication such as DNP3.0, Modbus, SOAP and OPC, it is easy to share Master's data with third party systems. Additionally, with web and security technologies, users can access Master through mobile devices such as a smart-phones and tablet PC. **HHI**



Packaged Power Stations Light up Galapagos Islands

Galapagos, Ecuador – May 23, 2012
Hyundai Heavy Industries (HHI) completed installation of two Packaged Power Stations (PPS) in Galapagos Islands, Ecuador on May 23.
The completion ceremony was attended by Mr. Esteban Albornoz, Minister of Ecuador’s Electric Power Ministry; Mr. Jorge Torres, Governor of Galapagos Islands; Mr. Eduardo Barredo, General Manager of Corporación Eléctrica del Ecuador (CELEC); and Mr. Kim Jeong-hwan, COO of Hyundai Heavy’s Engine & Machinery Division in Santa Cruz.
The donated PPS, capable of generating 3.4 MW of electricity, can provide power for more than 5,000 households.

Hyundai Heavy donated the PPS at the request of CELEC to replace the existing power generating facilities in an effort to ease power shortages in the region.
“The donation of two PPS is in appreciation for Ecuador’s recognition of Hyundai Heavy’s reliable PPS technology. We hope the PPS play a key role in easing Galapagos Island’s power shortage and work as a catalyst to expand the power facilities market in the North America region,” said Mr. Kim Jeong-hwan.
Hyundai Heavy’s PPS have gained a reputation as reliable mobile power plants through their operations in disaster areas including Japan in 2011, Chile and Haiti in 2010, and Cuba in 2008. **HHI**



Cuba 10 Peso Note

Hyundai PPS in Latin America

Hyundai Heavy Produces 1,000th Packaged Power Station

Ulsan, Korea – July 12, 2012
Hyundai Heavy Industries (HHI), announced on July 12 that it produced its 1,000th Packaged Power Station (PPS). The 1,000th PPS is one of 65 units ordered by Sinohydro Corporation in March this year.
The congratulatory ceremony was attended by Mr. Xiong Lixin, vice president of Sinohydro; Mr. Lee Jay-seong, president & CEO of Hyundai Heavy; and Mr. Kim Jeong-hwan, COO of Hyundai Heavy’s Engine & Machinery Division. The 65 PPS were delivered to Angola in July.
The PPS, using the HiMSEN engine as its main mover, is a mobile power plant that fits into a 40-foot container. Its mobile design makes it ideal for use on islands or other re-

mote areas where a traditional power plant would be impractical. These plants are also designed for rapid deployment in disaster areas.
Since its first delivery to the Dominican Republic in 2001, Hyundai Heavy has exported the mobile power generators to 22 countries including Cuba, Chile, and Iraq. Hyundai Heavy’s PPS played a crucial role in providing a stable power supply in earthquake-hit Haiti and Chile in 2010, and tsunami-hit Japan in 2011.
In his congratulatory remark, Mr. Lee Jay-seong said, “This occasion is not just for celebrating how many PPS we have exported but for giving us an opportunity to think of how we can create new value, and bring light to the world from this technology.” **HHI**





HHI:

Making a Safe & Eco-Friendly Workplace

By Peter Lee

One day in June 2010, 48,000 packs of rice cakes were handed out to jubilant workers at Hyundai Heavy Industries in Ulsan. It was not to celebrate a birthday, as is usually the case with ricecakes in Korea. Rather, it was to celebrate a milestone in HHI's safety management.

For the first time in its history, HHI had no accidents for seven weeks for its 45,000 workers, including those at subcontractors. That translates to 15 million work hours. Given the rough and tumble nature of shipbuilding work, and the size of the workforce, it was a remarkable achievement – a result of the determination of all HHI family members to make their workplace safe by adhering to strict safety rules and regulations. “15 million work hours without any accidents were made possible because all HHI employees worked hard to make their workplace safe,” says Mr. Park Joong-soon, the executive vice president in charge of Gunsan Shipyard and former chief officer of HHI's

HSE. “We will protect individual safety and enhance HHI's competitiveness by firmly establishing a voluntary safety culture.”

Indeed, HHI is one of the safest workplaces among global shipbuilders. Due to a number of ambitious programs and campaigns to reduce accidents, its accident rate fell from 1.11 percent in 2006 to 0.42 percent in 2009, far below the Korean shipbuilding industry's average of 1.41 percent or the Korean manufacturing industry's average of 0.7 percent. HHI has designated one day a week as “Safety Communication Day” and even carried out the Safety UCC Contest to raise awareness of safety among its workers. These programs were introduced with a realization that workplace safety cannot be achieved without the voluntary participation of all workers. Without a voluntary safety culture, stringent safety rules and regulations are often ineffective.

Another example of the voluntary safety culture is the Safety Train-

ing & Demonstration Center established in 2005 to allow HHI workers and contractors to experience simulated workplace accidents so that they can prevent them from happening. So far, the training center has attracted more than 100,000 visitors from not only HHI, but also its partners and subcontractors and even government agencies. Many leading Korean companies, including POSCO and Kia Motors, send their workers to the center. Politicians and civil servants as well as students and teachers also visit to learn how to avoid industrial accidents. New workers with less than one year of work experience find the place very helpful as they can predict serious risk factors at actual workplaces through the experience. The center provides various simulation experiences, such as falling or fire. “Accidents decreased notably because workers with the experience are able to cope with dangerous situations more effectively,” says Mr. Lee Tae-beom, a senior vice president at HHI's HSE.

HHI's safety programs have three goals: an accident-free workplace; employee health promotion, and positioning as an eco-friendly company. A total of 254 employees work in four safety-related departments. While the accident rate hovers at around 0.25 percent, HHI plans to lower that to 0.1 by 2015. This year, HHI's goal is to achieve 20 million accident-free work hours, or nine weeks. For that purpose, executives attend safety meetings twice a week. All heavy equipment is specially monitored to prevent accidents. Loaders, for example, are equipped with rear-view cameras and alarm systems. Through incident & injury free (IIF) activities, all workers are constantly reminded of possible dangers. Those with good safety records are given special awards every month. Those who identify potential risks also receive various awards. These efforts are not limited to HHI workers. Contractors and partners are also given constant support from HHI to establish an integrated safe environment system.

HHI is also renowned for its environmental protection efforts. To become a leading green growth enterprise, HHI has operated an environmental management system since 1997, which follows ISO 14000 standards. Every year, HHI's environmen-

tal management records are posted on its website to allow all stakeholders to review them. To raise employees' awareness of the environment, annual environment innovation evaluations are conducted.

In order to reduce greenhouse gas emissions and cope with climate change, HHI has set gas reduction targets. For 2012, its greenhouse gas production will be cut by 1.26 percent. For that purpose, diverse energy conservation programs, such as electricity peak management, are underway. Lighting and other facilities were overhauled to reduce electricity consumption. Efforts are also being made to cut city gas consumption. In July 2010, HHI built a 1.65 MW wind power generator to reduce its reliance on fossil fuels and cut greenhouse gas output. As a result, HHI secured 2,300 tons of greenhouse gas emission rights.

To reduce air pollution, HHI is following air control standards that are 50 percent more stringent than the industry average. Heating facilities were renovated with an investment of KRW 50 billion to use eco-friendly LNG. RTO (Regenerative Thermal Oxidizer) facilities were set up in Ulsan in order to cut the output of VOCs and to recycle energy. For waste management, HHI actively re-

cycles its garbage. It also built a waste incineration plant equipped with a pollution prevention system as early as 1996.

In a bid to reduce the production of VOCs created in the process of painting, HHI signed a voluntary agreement in 2007 with the Ministry of Environment and regional authorities. The Company invested KRW 124.7 billion from 2007 to 2011 and reduced VOC production by 30.1 percent. In 2011 alone, the output was cut by 51.8 percent. More specifically, HHI developed eco-friendly paint and built new painting facilities, while renovating and replacing pollution-control equipment.

For environmental protection, HHI is also working with local communities. Its employees clean near-by rivers more than ten times a year. They also work to clean the seashore and nearby mountains with locals through various meetings and activities. All these efforts are paying off in the form of a better and cleaner environment, making HHI a true leader in green growth. Together with its remarkable safety records, HHI's vigorous environmental protection efforts bring the company a reputation as a responsible corporate citizen. **HHI**

The writer is a journalist based in Seoul.

“Accidents decreased notably because workers with the experience are able to cope with dangerous situations more effectively.”



A Virtual Working Simulation System for Wheel Loader

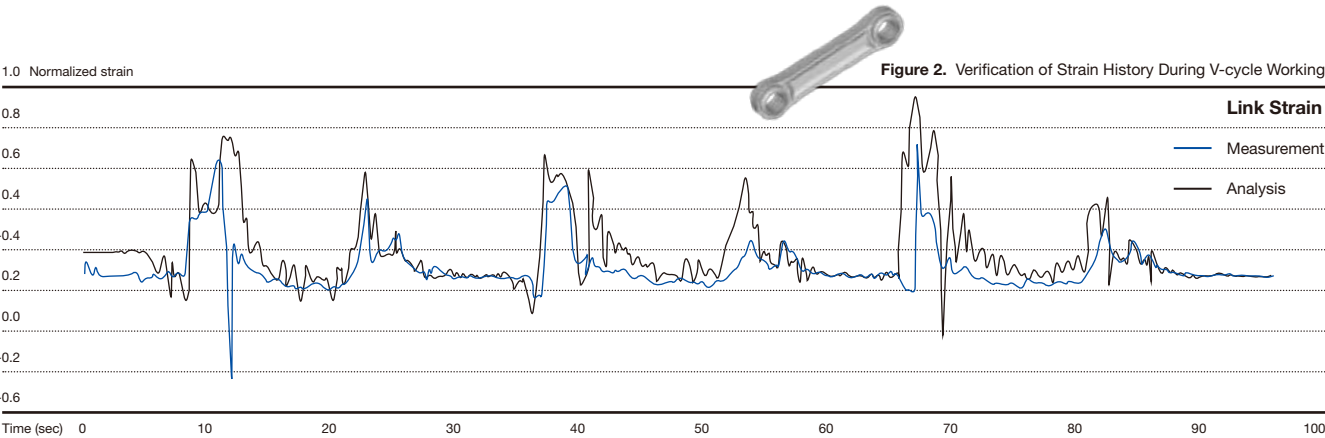


Figure 1. Virtual Equipment Model of Wheel Loader

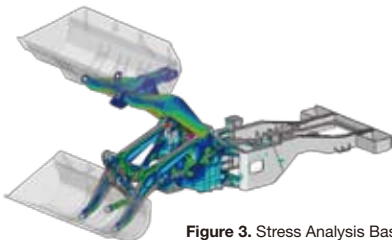


Figure 3. Stress Analysis Based on Flexible Multi-body Simulation

HHI has developed a virtual working simulation system for wheel loaders. The system enables designers to quickly and effectively evaluate the dynamic response of the wheel loader during field operations in the initial design stage. This facilitates structural design optimization prior to making prototype models.

The virtual model in the system is mainly composed of a virtual equipment model and a soil-tool interaction model. The equipment model is implemented as a multi-body dynamics model including attachments and front, rear frames as shown in *Figure 1* to re-

flect the dynamic characteristics of the actual equipment. The soil-tool interaction model is designed to mimic the interaction forces between the bucket and the soil during various operation stages.

The accuracy of the simulation has been verified by the comparison with the measured data for various working scenarios. For example, the strain history of a structural member during the V-cycle working was compared. There was a good correlation between the predicted results and the observed results, as shown in *Figure 2*.

The reaction forces at every joint

were extracted and the basic design parameters such as working range and, maximum lift capacity were investigated for the specific joint configuration and hydraulic cylinder type. Flexible modeling can be integrated into the virtual model, in which the load and stress analyses can be carried out at the same time as shown in *Figure 3*. As a result, the structural safety can be easily and accurately evaluated in advance under various working modes considering basic functional requirements. It is thus expected that design time and cost as well as maintenance cost will be substantially reduced. **HHI**

Carbon and the Energy Economy

By Rick Bush



Feed-in tariffs, demand response, offshore wind, electric vehicles. These are some of the issues and terms that define us today. Add to these smart grids, hydraulic fracturing, and utility-scale solar. Catastrophic events including Deepwater Horizon and Fukushima have also impacted our energy future. But, perhaps no 21st century issue will have a bigger impact than our desire for a low carbon future.

Unfortunately, today's economic malaise is colliding with our vision for a robust energy future. Europe, with its expanding financial crisis, is experiencing severe turmoil and angst. North America is only now creeping back to economic health, having suffered a banking meltdown and a collapse in housing markets. High-growth countries are losing markets for their goods and services. Worldwide, high unemployment levels are leading to high turnover of elected officials.

However, we can't let these short-term issues derail our long-term integrated energy plans. We need to seize the opportunity to take major energy steps today. Our energy issues are too critical to our economy to ignore. And we have the technologies to employ today. Let's look at what earlier investments in technology are bringing us:

- Smart grid customer solutions
- Regional gas-fired generation
- Mass-market electric vehicles
- Advanced storage batteries and flywheels
- Superconducting cables
- Fuel cells

I'm sure you could add a few technologies to this list.

So, how do we move from a carbon-intensive past toward a carbon-neutral future? I am quite encouraged by activities in Europe. Take the time to go online (www.roadmap2050.eu) and read *Roadmap 2050: A Practical Guide to a Prosperous, Low Carbon Europe*. I thought the authors were being euphemistic when they put the words practical and prosperous in the same title as low carbon. But this energy roadmap makes sense. Of course, it is one thing to come up with a plan and quite another to execute it. So let's see whether Europe has the fortitude to follow through.

This document looks at options Europe can take to assure that 95 percent of its electric power comes from de-carbonized sources by 2050. Investments across the continent would have substantial results in lowering carbon emissions. This plan has offshore wind coming down from the Baltic and solar coming up from the Sahara. Additional bulk energy sources would include traditional hydro, nuclear, and fossil fuel with carbon-capture. Adding pumped storage in the Alps and this plan starts to make shape. This plan would add up to:

- 136 GW of additional transmission capacity
- 5,000 sq km of solar panels
- 100,000 new and replacement wind turbines
- 200 million electric and fuel cell vehicles
- 100 million heat pumps for buildings or city districts

Worldwide, each country and region has different needs and resources. Russia has tremendous natural gas reserves, so you will see small gas-fired generating stations being placed close to load centers. With half the carbon of coal, this move to gas makes sense.

Spain has taken a global lead in renewables. But with 9 GW of wind and 3 GW of solar, system operators have found the need to back up intermittent renewables with natural gas.

We are seeing great progress in China too. At the 2010 World's Fair held in Shanghai, energy initiatives were front and center. With up to 100,000 visitors a day, attendees were treated to a self-healing and automated distribution grid, a 100 MW offshore wind farm, 5 MW of photovoltaic power and 330 kW of battery storage. Add to that smart appliances and electric vehicle charging stations, and we had a window into our energy future.

This is such an exciting time to work in the energy industry. We have the opportunity and obligation to address incredibly complex and contentious issues, including global warming. But we also have this once-in-a-lifetime opportunity to build out our next-generation power grid. A grid that will provide our children and their children access to secure, low-cost electricity. **HHI**

The writer is the editorial director of Transmission & Distribution World magazine.

Powering the Sochi Olympics : EnergoStroy-MN & HHI

...customer service, staff involvement
in the management process, and establishing
a feedback process.

Mr. Shamil R. Murtazaliev graduated an engineer from Ivanovsky Power Engineering Institute and also earned a PhD in economics. His engineering specialization was in automation and power distribution, which makes him a perfect fit for the work EnergoStroy-MN and HHI are embarking on in Russia.

According to Mr. Murtazaliev, EnergoStroy-MN started with an idea to combine professional builders, energy, equipment specialists, and like-minded people well versed in the business.

As time has shown, the company achieved its desired results - increased volumes and the trust of customers. Mr. Murtazaliev says that now the company is one of only a few capable of building any size power grid project in the shortest time, using the most modern equipment and best practices. To date, EnergoStroy-MN has com-

pleted more than 100 projects all over Russia, from substations up to 750 kV to transmission lines.

The company also has a network of 15 branches and its own production bases, special equipment, high voltage laboratories, and highly qualified & experienced specialists.

Taking into account the level of technology development in the energy sector, as well as the experience of cooperation with foreign partners, the company established the Centre for Innovation. The challenges facing the Centre include the use of Russian and foreign partners with developments in the implementation of innovative projects - digital, gas-insulated substations, the introduction of energy efficient technologies and elements of the Smart Grid.

Because of its rich experience in implementing large-scale projects, EnergoStroy-MN was one of the first

companies involved in the construction of Olympic venues in Sochi.

The Poselkovaya 220 kV Substation was the pilot project with Hyundai Heavy Industries. The substation's 110 kV GIS was first delivered and installed in Russia. Following that successful installation, Hyundai Heavy's switchgears were installed at other sites as well; 110 kV Laura Substation, 110 kV Rose Hutor Substation, and 220 kV Psou Substation.

These projects are not only necessary elements of the infrastructure of Olympic sports facilities, but also EnergoStroy-MN's "business card".

"Due to the fact that our experts trained in HHI's Ulsan plant, our company is now ready to offer the customer a full range of Korean equipment, with installation, commissioning, and testing at the facility. This is very important to build our competitive advantage," Mr. Murtazaliev says.

It's also no secret that the Russian market has huge potential. Rising demand for new facilities and replacement of obsolete equipment requires quality supply to meet the requirements not only today but also tomorrow.

Demand is also growing for Smart Grid technology and renewable energy sources. Policy priorities for the selection of a supplier of equipment which is produced in Russia help to ensure that foreign companies have opened up local production. It is important to note that HHI was one of the first to do so. By opening the GIS plant in the Far East, HHI has strengthened its position in the market of electrical equipment in Russia and the region as a whole.

The company is developing rapidly, and is striving to improve management. At the heart of the management system are well-known principles: focus on customer service, staff involve-

ment in the management process, and establishing a feedback process.

Therefore, Mr. Murtazaliev believes he needs to anticipate customer requirements, to offer innovative solutions. After agreeing on the basic principles of project implementation, the performers within the company should be able to influence its performance and make adjustments to ensure the most efficient execution. If you have accurate information about the current project at each stage, you can then manage quality.

Experience in projects allows you to evaluate and see what needs to be improved. He says they are implementing a process approach, which allows us combines several methods into one flexible management system that aims for continuous improvement and is ready for today's challenges...

"Looking to the future, we must always seek new opportunities. We

need to develop new market segments - not an easy process, but necessary. We follow current trends, we strive to bring our experience to bear on market needs," says Mr. Murtazaliev.

In addition to traditional areas - construction of power facilities, installation and commissioning of equipment, the company is also starting several new projects. For example, the creation of a plant for the production of composite materials in demand in the industry.

"Through our experience with HHI, we have noted several advantages of working with a Korean corporation." One of them is a highly qualified staff. The chief engineers who worked on our sites as attaches in Sochi solved a range of issues. To articulate what distinguishes an HHI-man: responsiveness, expertise, and professionalism. These qualities will have been noted by our customers as well. **HHI**



Shamil R. Murtazaliev, President

Electro Electric Chief Looking For Opportunity Amid Crisis

By Grace Choi



Mr. Kwon Oh-shin,
senior executive vice president
& COO of Electro Electric Systems Division

Drawn by mega construction projects in the Middle East, Kwon Oh-shin, then a 26-year-old signal officer, studied at nights to prepare for an examination to enter Hyundai Group. He made it in in 1975 as he was discharged from service.

“I didn’t know much about Hyundai Group but I wanted to join overseas construction and heavy industrial projects, rather than consumer goods production,” says Mr. Kwon, senior executive vice president in charge of Hyundai Heavy’s Electro Electric Systems Division.

Hyundai Heavy Industries came

as a surprise to him because he applied for Hyundai Engineering & Construction, at that time part of the conglomerate, rather than the shipbuilding unit. “Hyundai Group sent me to the Ulsan shipyard right after I joined and I happily accepted the transfer to the industrial city,” Mr. Kwon said, reflecting on his 37-year career at the world’s No. 1 shipbuilder.

In a clear sign of his decades-long dedication to the Company, he said Hyundai Heavy is the second-best thing in his life, after his wife.

Mr. Kwon has been involved in engine & machinery operations for

more than three decades but this year he took on a new task: pilot the struggling Electro Electric Systems Division through the current global economic downturn.

Hyundai Heavy has had a hard time in recent years due to declines in demand for electro electric products needed for power plants, substations, and ships because orders have plunged amid the slowing global economy. “The Company is passing through a multi-stage crisis but I believe crisis always comes with opportunity,” said the executive. Putting pressure on the business is a combina-

With the mottos of ‘heaven helps those who help themselves’ and ‘charity begins at home,’ he put a top priority on harmony at home and the Company

tion of the euro zone debt crisis, declining oil prices, and tougher competition among rivals.

To ride out the difficulties, Mr. Kwon is determined to “march forward without retreat” through dialogue and collaboration with the 3,100 workers at the division.

Since he took control of the division in January, he has regularly taken time to meet workers over tea or soju. He asks them to stick to the basics to avoid any mistakes or accidents on the job.

With the mottos of ‘heaven helps those who help themselves’ and ‘charity begins at home,’ he put a top priority on harmony at home and the Company. For example, he makes it a rule to get up at 4:45 am during the week to meditate and have a cup of tea. “What I pray for the most is workers finishing work without an accident and returning home safely.”

In addition to his morning routine, he loves to take a walk along the reservoir near the home with his wife in the evenings. He does not smoke and has two sons.

“When I was young, I enjoyed sports games such as baseball and basketball,” he said. “But these days, I’m a big fan of walking.”

Mr. Kwon, who also heads the executive supporters’ association for Ulsan Hyundai FC, and regularly goes to Ulsan Munsu Football Stadium to cheer on the local team. “But I am not

a good football player,” he adds, with a smile.

Seven months have passed in his new role but market conditions still remain uncertain, with investments in power-related facilities shrinking and oversupply continuing to weigh on product prices after the 2008 financial crisis.

However, he is determined to expand overseas markets to survive the ongoing hardships, and is aiming for a 17 percent year-on-year increase in sales.

The Electro Electric Systems Division currently operates four overseas subsidiaries - two in the US, one in China, and one in Bulgaria. Its fifth subsidiary will soon open in Russia.

In 2012, Hyundai Heavy is targeting sales of KRW 3.2 trillion (USD 2.9 billion) in the electro electric business, or 12 percent of the Company’s sales target of KRW 26.905 trillion.

To achieve this, Mr. Kwon says the Company will need to eliminate all possible factors in advance that may delay production to ensure on-time delivery and put quality management before anything else.

Looking ahead, he said electro electric equipment has a bigger growth potential compared to ships given the world’s electro electric markets reached KRW 196 trillion last year but shipbuilding’s stood at KRW 100 trillion.

Out of the division’s sales tar-

get of KRW 4.9 trillion in 2015, the Company aims to earn 16 percent of it from overseas subsidiaries and the remaining 84 percent from exports from Korea.

In a move to boost exports, the Company is planning to raise the number of overseas agents and distributors from the existing 146 and incorporate its sales network with Hyundai Corporation’s. Hyundai Heavy owns a 22 percent stake in the trading company.

He said HHI has strength in the electro electric field compared to its rivals given it offers the “total solution” ranging from generation to power transmission & distribution.

As shown in an F1 racing car model displayed in his reception room, the Electro Electric Systems Division is developing auto parts for electric powered vehicles as a new growth engine.

“We are particularly interested in charging equipment for electric cars and expect a great synergy from a partnership with Hyundai Oilbank,” he said.

He sees the division as a total solution provider of heavy electrical equipment under even harsh economic environment by developing a global management system and new products, reinforcing product competitiveness, and serving customers effectively. **HHI**

Hyundai Power Transformers USA, Inc.

“Now we can really begin to challenge ourselves by propelling the company and the community forward.”

On November 18, 2011, residents of Montgomery, Alabama saw the opening of Hyundai Power Transformers USA, the newest affiliated factory of Hyundai Heavy Industries. This USD 108 million investment located at Interstate Industrial Park, raises high expectations.

When Hyundai Power Transformers USA began searching for a place to build its first transformer facility in the United States, the company wanted to find a location with good community support. HPT also looked for a place that had high-quality team member resources. The company wanted a community that supported their values, success strategies, and work ethic.

Many states in the southeast were competing for the major employer and the related economic impact, and many communities in Alabama hoped to lure Hyundai Power Transformer USA as well.

Montgomery is willing to take on

the new industrial challenges that come with having an international company in the area. HPT heard that there was a good workforce here that wanted to work, that the infrastructure could support the company's workload, and that the people of Montgomery were supportive of different cultures. The local and state teams were here from the beginning to support the company. The community also supports the needs of HPT's team members, including education support and locating homes.

Hyundai Power Transformers USA was set up for several reasons. The business strategy of producing, exporting, and selling transformers from Korea had its limitations, the potential growth of small and medium transformers in the American market is bright, and the improvement of competitiveness within America's eastern regions were some of the key factors which led to the construction of HPT.



Confederate Memorial at Montgomery Alabama



Hyundai Power Transformers USA's production is already underway at the 7,091 m² manufacturing facility, which includes a winding area, an assembly floor, a 500 kV test lab, a fabrication shop and offices. The Montgomery plant is a full service transformer factory, and boasts field service technicians to better serve clients on site. When in full operation, the factory will employ 500 workers and will have the capacity to produce 200 transformers annually.

“Our clients have voiced a need for a high-quality power transformer supplier in this market, and so we built our plant there,” said Mr. Lee Gyou-chul, Hyundai Power Transformers USA's president.

“In order to make our company the most efficient and cost-effective for the customer, we needed to have a plant located closer to our customers,” explained Lee. A North American location, particularly in



the southeast, allows Hyundai Power Transformers USA to provide service to most customers within a day. “Being able to assist our customers in a fast and efficient way is the focal point of our commitment to providing the best transformers and service in the world,” Lee said.

On February 24, 2012, Hyundai Power Transformers USA completed the first transformer in the Montgomery facility. The first unit, designed for Kansas City Power and Light, is an oil-immersed transformer weighing 65 tons and measuring 15 feet tall. The transformer was built, tested, disassembled, and then shipped to the customer job site where Hyundai Power Transformers USA’s field services team supervised the installation and commissioning.

After the completion of this first transformer, Hyundai Power Transformers USA production moved forward with two additional transformers

shipped to Southern California Edison and Calpine. Each transformer manufactured by Hyundai Power Transformers USA is designed exactly to the customer’s specifications and goes through stringent quality checks and tests to verify it fully meets their requirements.

The company is currently in the final stage of a National Grid project and has begun fabrication on Central Maine Power and LSP Energy transformer projects. The time it takes to build transformers is decreasing as Hyundai Power Transformers USA is experiencing rapid increases of both efficiency and capacity in order to maximized output.

All of Hyundai Power Transformers USA’s approximately 140 team members contributed in manufacturing the company’s transformers, from the design engineers to the office staff and, of course, the production team. Mr. Mukund Bhagwat, the Senior Manager of Operations at Hyun-

dai Power Transformers USA, knows exactly what goes into creating such complicated products.

“Building a transformer is a complex process which requires team work involving marketing, technical sales, quotations, design, purchasing, accounting, human resources, and various production processes to complete the project in harmony,” says Mr. Bhagwat.

“We are very pleased with the progress that we have made so far,” says Mr. Lee. “We are proud of our Team and together we are dedicated to Hyundai Power Transformers USA’s success.”

According to Mr. Lee, now is also the time to begin accelerating the company’s growth. “Now we can really begin to challenge ourselves by propelling the company and the community forward. We can continue on our path of becoming a “Global Leader” of medium and large power transformers in North America!” **HHI**

Civil Rights Movement in MONTGOMERY ALABAMA



Montgomery, Alabama may be a quiet, peaceful city nowadays, but modern history tells a long story of how this small city became the backbone of the African American civil rights movement. In the mid 1900s, most residents in Montgomery were African Americans. What lit the flames of civil rights movement was Rosa Parks’ refusal to yield her bus seat to a white man on December 1, 1955. As a result, she was arrested and this led to the Montgomery Bus Boycott Rosa Parks, however, was not alone in this fierce struggle; Dr. Martin Luther King (the pastor of Dexter Avenue Baptist Church at that time) and E.D. Nixon (lawyer and local civil rights advocate) established the Montgomery Improvement Association to effectively organize the boycott. Due

to all these efforts made by many people, in June 1956, US District Court Judge Frank M. Johnson ruled that Montgomery’s racial segregation concerning bus seats was unconstitutional. After the decision of the US Supreme Court in November, the city of Montgomery abolished the existing discriminative bus system which ended the boycott and allowed African Americans to sit anywhere they wanted on buses. The case of Rosa Parks served as the catalyst for the following Selma to Montgomery marches which eventually led to the passage of the Voting Rights Act in 1965. The Boycott marked the first important involvement of the public in the civil rights movement and the emergence of Dr. Martin Luther King, Jr. **HHI**

ULSAN HYUNDAI FOOTBALL CLUB



Korean Football’s Roaring Tiger



The Ulsan Hyundai Football Club, one of the 15 teams competing in the K-League (the Korean professional soccer league), was founded on December 6, 1983 in Incheon as Incheon Hyundai Tigers. It was the fourth professional soccer team to be created in Korea. The club adopted the mascot of a tiger, the king of the animal kingdom in Korea, with the ambition to dominate the domestic football league. In keeping with its early dream, Hyundai FC has been consistently among the leading teams of the K-League.

In 1984, the first year of its participation in the K-League, Hyundai FC caused an uproar by finishing second. Two years later, the club went on to win the cup for the first time.

In 1987, Hyundai FC moved its home base to Gangwon Province due to the nationwide rearrangement of home bases and then finally adopted Ulsan as its headquarters in 1990, beginning the era of professional soccer in Ulsan.

With Ko Jae-wook taking the helm at the end of 1994, Ulsan Hyundai FC reached third place in the K-League and won the Adidas Cup in 1995. The following year, the club won the top spot in the K-league and the cup tournament for the first time. It also went on to place third in the 1996 Asian Cup Winners’ Cup.

In 1998, Ulsan Hyundai FC changed its sponsor to Hyundai Heavy Industries. With strong backing from the new sponsor, the club cemented

its place as a leading club in the K-League by reaching second place in the league in 2002 and 2003, and first after the regular season in 2005.

In 2006, Ulsan Hyundai FC won the A3 Championship with teams from Korea, Japan, and China competing. In the same year, it also reached the semi-finals of the Asia Champions League.

In 2007, the club won the cup tournament and in the subsequent year clinched the right to compete in the Asian Champions League by beating Chonbuk FC in a play-off. At the end of 2008, Kim Jung-nam, who led the club for nine years, passed the mantle on to Kim Ho-kon.

2011 saw great results for the club: it won third place in the FA Cup, became the winner of the Korean League Cup and runner up in the K-League. Finishing the regular league in 6th place, the club got a new nickname, “iron rod”, by persisting with strong team work despite the grueling league schedule.

Moreover, in July of the same year, the team achieved the 400 win milestone after defeating Kangwon FC in an away match 2:1.

Ulsan Hyundai FC has two goals this year: winning both the K-League and Asia Champions League. The club is in the leading pack in the domestic league and is the only team among the four Korean teams to have reached the quarterfinals of the ACL.



Helping out the Local Community

As a professional soccer club based in Ulsan, the club is actively engaged with the local community. It has put great effort into developing youth soccer in the region by hosting a youth soccer tournament every year and donating generously into the youth soccer development funds. The club is also nurturing young talent by creating through its own youth soccer team and giving the team various support including accommodation.

The Ulsan Hyundai FC has also put equal emphasis on helping the needy in the local community. It has been consistently visiting neighborhoods with generous gifts.

The Ulsan Munsu Soccer Stadium has a seating capacity of 44,474 and is the home ground of Ulsan Hyundai FC. Completed in April 2001, the stadium hosted 2002 FIFA World Cup matches. In its vicinity, the stadium also has such sports facilities as Munsu Swimming Center and Munsu Baseball Park. This area is frequented by many sports-loving Ulsanites.

Whenever and wherever Ulsan Hyundai FC plays, the ‘Cheoyong Warriors’ are there to cheer them on. At home, these hardcore fans can be found in the N Block. Anybody interested in rooting for the club can join in the N block at Munsu Soccer Stadium and cheer for the club at the top of his or her voice. **HHI**

Seeing a Light at the End of the Tunnel

New Orders & Backlog

(unit: USD million)

Divisions	2012 Plan	2012 Jun. (YTD)	2011 Jun. (YTD)	Achievement (%)	YoY (%)	Backlog (Delivery basis)
Shipbuilding	9,113	3,131	8,520	34.4	-63.3	20,329
Offshore & Engineering	5,200	739	3,225	14.2	-77.1	13,525
Industrial Plant & Engineering	5,000	514	813	10.3	-36.8	6,048
Engine & Machinery	3,600	1,197	2,168	33.3	-44.8	4,288
Electro Electric Systems	3,727	1,340	1,588	36.0	-15.6	3,043
Construction Equipment	3,139	1,602	1,581	51.0	1.3	-
Green Energy	773	131	235	16.9	-44.3	176
Total	30,552	8,654	18,130	28.3	-52.3	47,319

Stock Metrics

	2008	2009	2010	2011	Aug. 17, 2012
High for the year (Closing, KRW)	438,000	250,000	456,500	547,000	345,000
Low for the year (Closing, KRW)	115,500	148,500	171,000	237,000	217,500
Closing, KRW	199,500	173,500	443,000	257,000	248,500
Market Cap. (Closing, KRW billion)	151,62	13,186	33,668	19,532	18,886
Foreign Ownership (%)	14.80	17.38	20.20	16.91	18.90
PER (H/L)	11.7/3.1	7.0/4.2	9.8/3.7	17.4/7.4	N/A
EPS (KRW)	37,340	35,705	46,594	31,751	N/A

Sales in Second Quarter of 2012

Shipbuilding Division’s sales were KRW 4.4 trillion, down 4.5% from the same period last year. The sales of Offshore & Engineering Division and Electro Electric Systems Division are up 39.6% and 34.5% respectively.

Other divisions’ sales have decreased from the same period last year due to the unfavorable market situation.

New Orders

HHI received new orders worth USD 8.7 billion, achieving 28.3% of the annual goal of USD 30.6 billion in the first six months. The worries cast by

the European debt crisis continue to investor and market confidence.

However, high energy prices have prompted oil majors and deep sea explorers to invest in drilling ships and other offshore oil & gas production facilities. This trend should see more orders being placed at Shipbuilding and Offshore & Engineering divisions going forward.

On the back of ordering for LNG-related projects such as LNG carriers and drilling rigs, the Shipbuilding Division has booked orders worth USD 3.1 billion in the first half of the year.

The Offshore & Engineering Division received orders worth USD 739

million, fulfilling 14.2% of its year target of USD 5.2 billion. The Industrial Plant & Engineering Division won USD 514 million in orders in the first half. The divisions will secure a large order in the second half and expect to achieve their new order targets as they are participating in bids for large projects in Africa and the Middle East.

In line with the sluggish outlook of the shipbuilding market, orders for marine engines have decreased. The Engine & Machinery Division has taken USD 1.2 billion in new orders, accounting for 33.3% of the annual goal.

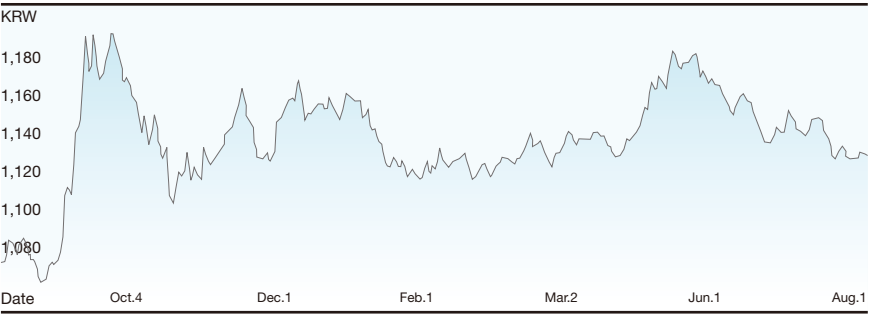
The Electro Electric Systems Division posted new orders worth USD

Stock Price

HHI’s stock price hit 52-week low on July 25. This was mainly due to low new orders, as experienced across the industry.

USD Exchange Rate

Source: KEB



Stock Performance



1.34 billion, making 36% of its annual new orders goal. This result can be attributed to the weak recovery in the American construction industry. The Green Energy Division’s new orders also decreased, to USD 131 million from USD 235 million a year earlier. These results are in line with the reduction of support in Europe for solar energy and the glut of suppliers. However, 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 2013. After acquiring the gearbox maker Jake in 2011, the division is now accelerating its marketing and R&D and waiting

for the market to bounce back.

Second Half Outlook

Container shipping volume is likely to rise in 2H according to Mr. Lee Sang-woo, an analyst at Hana Daetoo Securities. The possibility of a Greek exit from the euro zone and bailouts for Italy and Spain have escalated concerns of a euro zone collapse.

The US economy is posting modest growth with its quantitative easing program, but the economy is not in a position to sharply increase imports. Thus, Chinese exports are slowing, translating into falling container shipping volume in 2Q.

A short-term solution to the European crisis is not visible, and mixed signals from the US economy continue to make its recovery uncertain. Unless the Greek issue leads to extremes in 2H, the European economies will likely ease austerity measures in 2H, relative to 1H.

In addition, given expectations of export-boosting measures by the Chinese government, overall trading volume should rise in 2H vis-a-vis. 1H. However, there will be no great change given relatively high product inventory levels in the US and Europe. **HHI**

Newbuilding Market Will Recover in 2013

By Feynman Jeon

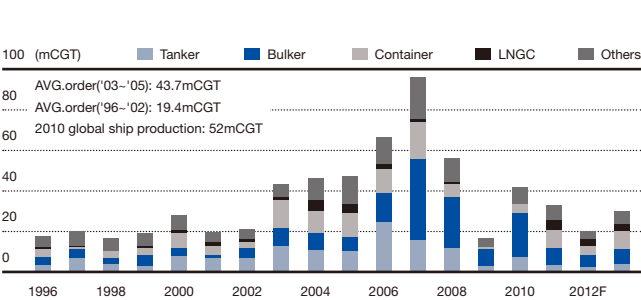


Figure 1. Global commercial ship orders: YoY 47% in 2013

Commercial vessel orders are forecast to increase significantly in 2013 due to digestion of supply glut

In 1H12, the average monthly order volume of commercial vessels fell to the 1.3 million CGT level experienced in 2009 when the shipbuilding industry was hit hard by the financial crisis. Korea's Big 3 shipbuilders are securing orders as large as their sales by through high value-added vessels such as LNG carriers, drillships, and offshore production units. On the other hand, other shipbuilders relying heavily on commercial vessels are suffering from a sharp contraction in order backlogs due to the extremely low level of orders. Even though the Big 3 are showing comparatively better performance, they are also in desperate need of the recovery of the commercial vessel market.

Fortunately, I believe that commercial vessel orders will bottom out in 1H12, before making a gradual recovery in 2H12 and then increasing further in 2013 and 2014. The annual commercial vessel orders are predicted to sharply shrink to 20 million CGT (-38% yoy) in 2012, but to rebound to 29 million CGT (+45% yoy) in 2013 for the following:

First, ship finance will likely hit a trough in 1H12, before making a gradual recovery in 2H12. European banks

are required to meet the Core Tier-1 capital adequacy ratio of 9% by the end of June 2012. Thus they were presumed to reduce issuing loans for commercial vessels during 1H12 as these are classified as risky assets. In 2H12, however, ship financing is expected to recover on a gradual basis with the finalization of recapitalization of European banks.

Second, 2013 will be the last year for the oversupply created by the excessive shipbuilding orders made during 2006-2008 and 2010-2011. In other words, vessel delivery will plunge starting in 2014. This means that unless an appropriate level of shipbuilding orders are placed in 2013, the commercial vessel market will face a supply shortage in late 2014 and 2015.

However, we can expect order growth only from a handful of cash-rich shipowners as shipping companies are expected to report only marginally improved earnings in 2013.

Even though commercial vessel orders will recover in 2013, 2013E orders of 29 million CGT are 44% smaller than the global ship production capacity of 52 million CGT (ie, 2010 global shipbuilding volume).

Order increase from container-ships will lead the commercial vessels new order in 2013

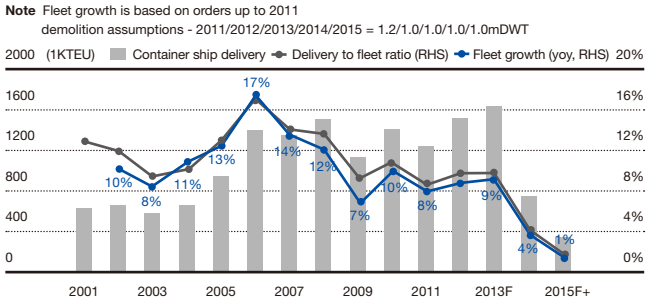


Figure 2. New container deliveries will sharply decline in 2014

By ship type, we expect container ships to see the steepest order growth. This is because containers saw the lowest supply glut (6% of total fleet considering the peak idle rate as of March 2012) compared with other ship types, and container ship operators are expected to post net profits in 2013. In addition, the Panama Canal expansion will be completed in April 2015, which should create replacement demand for Panamax and sub-Panamax container-ships on the Trans-Pacific routes. According to Alphaliner, 38% of their fleet (986,000TEU) on Trans-Pacific routes is Panamax and sub-Panamax containerships which are expected to be replaced with super-sized containerships after the expansion.

Conclusion

Worries over the eurozone crisis and uncertain outlook for new orders in 2H12 still exist. However, new orders of deepwater drilling rigs and offshore production units, which are the Big 3's main products, will continue if WTI price returns to the USD 90 range. In addition, increasing containership orders from 2013 will place the Big 3 in a less competitive environment. HHI

The writer is a shipbuilding & machinery analyst at Daishin Securities.

Korean panorama



YANGDONG VILLAGE : A JOURNEY INTO JOSEON DYNASTY KOREA

By George Deftereos

Hyangdan sits on a prominent hill near the centre of the village, commanding an impressive view of the surrounding mountains and thatched houses below



Yangdong Village in North Gyeongsang Province has been inhabited in some form or another since Korea's Bronze Age, based on archaeological discoveries made in the area. In its current form, the village was founded during the Joseon Dynasty (1392 – 1910) when members of the Son Clan of Wolseong were allowed to build their homes along the banks of the Hyeongsan River. Shortly afterwards, the Son Clan patriarch's daughter married Yi Beom from the Yi Clan of Yeogang. As it was customary at the time for the husband to relocate to his wife's village, the couple moved into Mucheomdang (National Treasure No.411). Mucheomdang was built at the same elevation as the primary residence of the Son Clan (Seobaekdang: Important Folklore Material No.23) and serves as home to descendants of the Yi Clan even to this day.

While the village was home to many literati during the Joseon period, it's most famous resident was Yi Eon-jeok (1491 – 1553), son of Yi Beom and one of Korea's 18 sages. Sometimes going by the pen name Hoejae, he entered public service in 1514 after passing the literary section of the civil service examinations. Over the course of his career he was expelled and re-hired several times due to the political ambitions of the entrenched Hungu power elites and the Sarim scholars (seonbi). When

the Hungu faction finally prevailed in 1545, Yi was exiled to Ja-ok Mountain where he spent the rest of his time teaching. In Yangdong Village, his legacy can be seen in the 99-room Hyangdan (National Treasure No. 412) and Oksan Seowon.

Hyangdan was commissioned by King Jungjong (1488 – 1544, r. 1506 – 1544) in 1543 for Yi Eon-jeok to care for his ailing mother. The house was originally built with 99 rooms, the maximum number of rooms for a non-royal residence, but now only 56 rooms survive. Unlike other houses belonging to the nobility, Hyangdan was built as a permanent residence and so is of a relatively simple design. The main building resembles the Chinese character 'moon'. Adding the servant's quarters, which were built to look like the Chinese character for 'day', and a partition made the house resemble the Chinese character 'to use'. The house sits on a prominent hill near the centre of the village, commanding an impressive view of the surrounding mountains and thatched houses below.

Thatched roof houses make up the majority of the homes in Yangdong Village. These are typically located on lower ground as they were the dwellings of lower classes in the village. Many of these homes are occupied to this day, so it is fairly common to see lumps of fermented soybean drying next to satellite dishes



Seowon were private institutions that functioned as Confucian shrines and as preparatory schools for the national civil service examinations

and modern mailboxes. Some of the houses also serve as restaurants, souvenir shoppes, and tourist centres.

Oksan Seowon
Oksan Seowon is a historic site built in 1572 by the governor of Gyeongju in honour of Yi Eon-jeok. The seowon were the most common education institution in Korea during the mid- to late Joseon Period. Though a few were founded by royal decree as early as 1418, most were established after the last great literati purge in 1545 when Sarim scholars were forced to return to the countryside. For the most part, seowon were private institutions that functioned as Confucian shrines and as preparatory schools for the national civil service examinations.

While in theory all classes of Joseon society could participate in the examinations (except for those who worked as butchers, basket weavers, tanners, or were slaves), only the established aristocracy (the yang-

ban class) had the luxury of devoting much of their childhood and early adulthood to studying for the exams.

On the other hand, if a yangban family failed to produce a government official for three generations, they would lose their status as yangban. As these exams were essential to not only maintain one’s social standing but also as virtually the only means of rising through the social ranks, the demand for seowon as well as government-run schools increased accordingly. Over time, the seowon became the power bases for political factions and cliques so the palace was forced to curtail their influence by first requiring new seowon to be opened by royal charter and then stripping existing seowon of their tax exempt status. Eventually, of the over 700 seowon all but 47 seowon were closed by royal edict in 1871, and while most of the seonbi protested these closures, none of the closed seowon ever reopened. **HHI**



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