

# NEW Horizons

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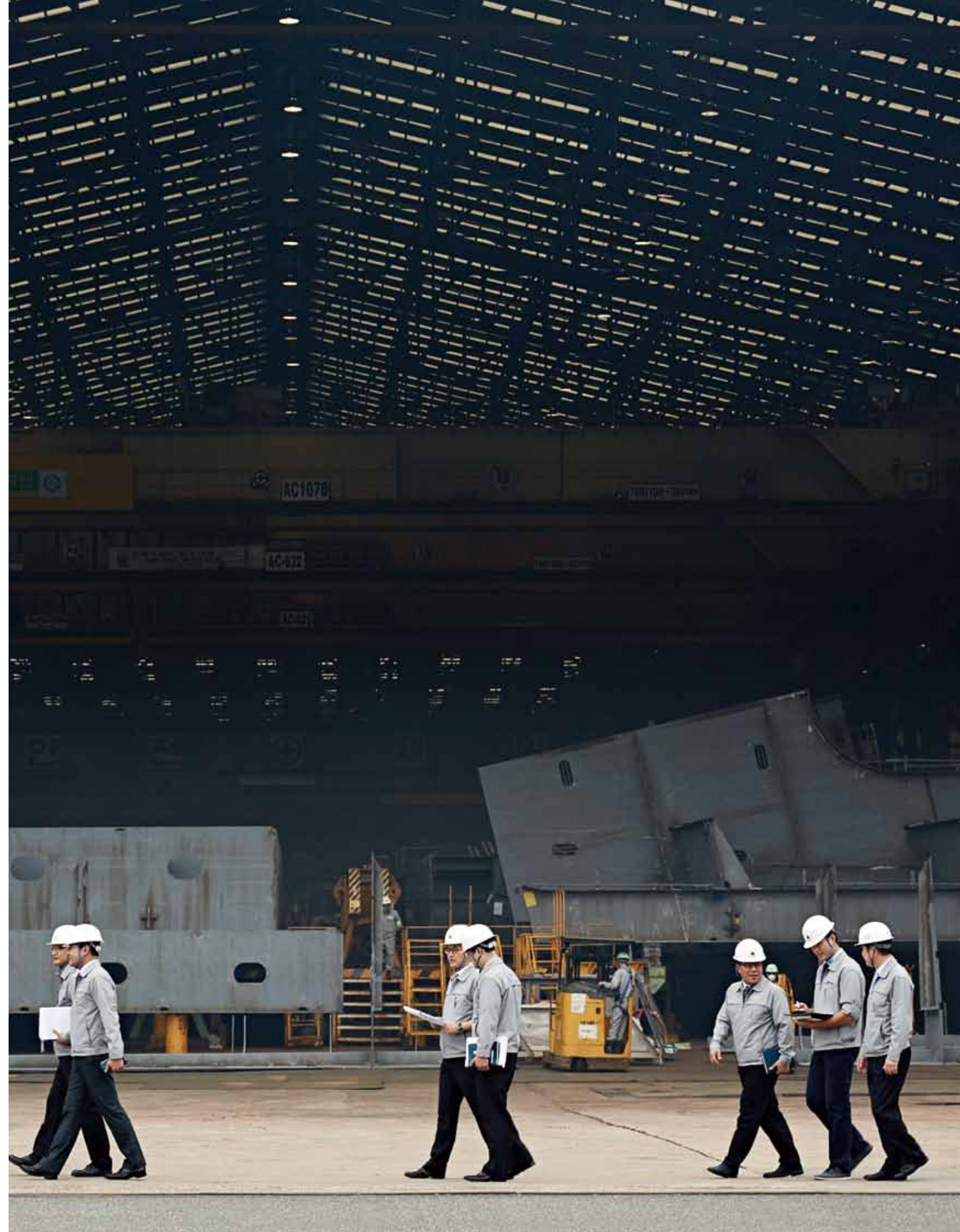
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# Eyes on The Future



*Choi Kil-seon*

Choi Kil-seon, Chairman & CEO



*Kwon Oh-gap*

Kwon Oh-gap, President & CEO

The prolonged delay in the global economic recovery and the persisting oil price slump continue to weigh on our overall business environment and performances. However, although such lean times bring down countless organizations and companies, they can and will rather serve as an opportunity for us to draw a bigger picture towards the future and reinvent ourselves. We are laying the groundwork for a big step forward with the confidence that we will achieve a turnaround in the not-too-distant future.

In the face of the stiff competition among our industry peers and continued market stagnation, enhancing productivity and quality management is urgently called for. I would like to take advantage of this space to brief our clients and shareholders about what we are doing to realize this goal.

First, in order to attain this year's order targets, the Shipbuilding Division has set its sights on restoring the competitive edge of its main line products and improving its profitability through rigorous activities of the newly-formed cost reduction task force team. It is also exerting efforts to upgrade its engineering capacity by beefing up its pool of skilled engineers and to achieve process normalization through closer cooperation across the relevant departments.

The Offshore & Engineering Division has placed top priority on maximizing the advanced outfitting in its project implementation. It will also further strengthen its en-

gineering capability from front-end engineering design to detailed product design as well as speed up the construction process by stepping up design standardization and component localization. Furthermore, it will continue its drive to improve its bottom line and to bring its six major onshore plant construction projects in Saudi Arabia and Kuwait to a successful completion.

The Engine & Machinery Division has renewed its commitment to provide highly efficient and eco-friendly propulsion systems as well as differentiated technological assistance and support for its clients, drawing on its strengths as the world's leading total LNG solution provider. To more effectively respond to its clients' needs, the division plans to set up an aftermarket service subsidiary in Europe. Moreover, it is reorganizing its non-engine machinery business in a bid to further boost its competitiveness.

The Electro Electric Systems Division has introduced a responsible management system linking the sales, design and production units by product, and realigned its sales organization for improved productivity and effective sales support. The division has also established an independent quality management system and set up the vision 2020 strategy to ensure sustainable growth of its business and to put its market and client oriented management into high gear.

The Construction Equipment Division's market and quality management policy has recently seen the division form its own reliability assessment center and adopt the ad-

vanced product quality planning (APQP). In addition, with a view to reinvigorating its overseas business network, the division will integrate the operation of the production facilities in China and make consistent efforts to normalize the Brazilian affiliate.

Last but not least, the Green Energy Division is making multifaceted efforts to boost its competitiveness such as upgrading its own accreditation technology, raising efficiency of its solar modules and executing process improvement while putting equal emphasis on continued cost saving and purchasing capability.

In parallel with these individual business division level initiatives, we set up in last June the "Future Planning Committee" tasked with identifying new growth engines, building a creative and healthy corporate culture and reorganizing businesses to better meet clients' needs and to adapt to the fast-changing technological environment. The committee is anticipated to draw the blueprint for our future and ensure its materialization on the back of active participation and feedback of our employees.

We will continue to lead technological innovation by providing eco-friendly and efficient solutions for our clients. We are also committed to working closely together with our partners to build the industrial ecosystem for mutual growth. We are confident that unlocking the collective wisdom from all our stakeholders is the key to our sustainable future. In this regard, we value your unwavering support and patronage. **HHI**



# New

# Roadmap for Sustainable Future

“We can actually come out of this committee with a roadmap of where we’re heading and how to get to that direction. We want as much of their input as possible, so that we can kind of decide, what’s a good direction and what our employees want.”

Alex Lee





“Committing to sustainability and taking action is a critical element in today’s corporate world in view of the deepening of uncertainties in the global economy.”

Demonstrating its commitment to sustainability, Hyundai Heavy Industries (HHI) is taking new steps to keep its employees engaged and motivated as it struggles to find ways to keep the company afloat in an industry mired in a deep recession.

Last June, HHI launched an in-house ad-hoc committee which will draw up a new roadmap for the company’s more sustainable future by pulling together inputs from employees at all divisions of the company. Committing to sustainability and taking action on it is a critical element in today’s corporate world in view of the deepening uncertainties in the global economy.

Company executives hope the new master plan, which will be put into place by the end of the year, will breathe new life into the global shipbuilding and heavy industries giant, its businesses, and its employees, opening a new chapter of employee engagement and new growth engines in the company’s history.

HHI is one of a handful of major corporations that will actually invite its employees to help determine its overall strategy.

The company’s leadership believes the key to sustainable competitive advantage is to make a balanced investment in profitability and the health of the organization.



## Communication

Above all, the Future Planning Committee, headed by HHI's Senior Executive Vice President Kim Jeong-hwan, 61, is committed to creating a culture of communication in which management and employees share common goals and work together to meet them in a proactive way.

"In the past, we focused on short-term plans for one or two years ahead. But it is necessary to think deeply about the long-term future of the company," said Kim, a 38-year industry veteran who is currently also serving as head of the Special & Naval Shipbuilding Division.

"We can actually come out of this committee with a roadmap of where we're heading and how to get to that direction. We want as much of their input as possible, so that we can kind of decide, what's a good direction and what our employees want."

Kim said employees want to know about what the company's future will be like, and stressed the importance of communication, especially in difficult times or during times of change.

"The key challenge is to get employees on board through a successful internal communications program," he said.

The committee, comprised of 60 energetic young leaders selected from every corner of the company, is asking employees to come up with ideas in conference rooms or online. Also planned are a series of town hall meetings with executives to discuss the company's long-term future, sustainability plans and efforts.

A key issue being discussed is how to change the company's strict corporate culture, dismantle rigid hierarchies and bureaucratic practices across the company to improve efficiency and productivity.

Employees are also asked to contribute opinions on issues as varied as sustainable growth options, safer workplace, enhancement of productivity and quality, advancement of technology, increasing customer satisfaction, development of superior talent, and incentives and rewards for employees.

It may be a tough task for HHI to reach a common ground on some sensitive issues and meet all different needs of blue and white col-

lar workers and young and elderly employees.

"We know that it is difficult to come up with a solution that will satisfy all the employees. However, we will try to suggest plans that they may think is reasonable," said Kim.

He said the committee will keep monitoring the progress in the plan to change the workplace culture, including the move to make meetings short and efficient.

"There have been suggestions to shorten meetings to improve efficiency in the past but things have failed and the ideas have been buried."

HHI, faced with slumping orders in its mainstream shipbuilding and other business units amid a global supply glut, suffered an operating loss last year of \$3 billion as cost overruns mounted in a number of new projects, and the company's leadership has pushed hard to boost profitability by slashing costs and overhauling the entire group.

The company cut the number of executives by a third to around 180, and about 1,500 employees have left the company under a voluntary retirement scheme.

In a statement addressed to all employees on June 1, President & CEO Kwon Oh-gap said the company would discontinue the voluntary retirement programs, saying its latest restructuring and cost-cutting efforts appeared to have paid off for the company.

"I believe that all employees now understand where our company stands and are willing to work together to overcome current difficulties. To gather our strength, the company has decided to end the "artificial" manpower restructuring," said Kwon.

In his statement, Kwon announced the plan to launch the Future Planning Committee, indicating the company's shift of focus to sustainability and employee engagement from the rigorous restructuring push.

The committee is an independent group under the direct control of CEO Kwon, and action plans drawn up by the committee will become a new roadmap for the company's long-term future, Kim said.

Kim said the committee's activities will be focused on two areas — searching for new growth engines of the company and creating a

**"In order to wisely overcome the current difficulties and change our business structure in line with customer needs and technological advances, now is the time to establish a creative and sound corporate culture."**





“Our company needs to maximize the capabilities of all divisions and transform itself into a system integrator from a simple supplier of products. And then we need to be transformed into a customer-friendly solution provider with hardware-software combination in the manufacturing business.”

new corporate culture to make the employees feel much better at work.

“The company is suffering from worsening profitability because of intensified competition, lower oil prices and decreased market demand.”

“In order to wisely overcome the current difficulties and change our business structure in line with customer needs and technological advances, now is the time to establish a creative and sound corporate culture,” said Kim.

He said the company’s corporate culture has been largely under the aura of Hyundai Group’s legendary founder Chung Ju-yung who transformed an empty stretch of beach in Ulsan into the world’s largest shipyard decades ago.

“At that time, our workers had to keep working day and night to catch up with advanced shipbuilding nations, so the collective spirit and teamwork was more important than creativeness of individuals.”

“But we have transformed ourselves into a “leading innovator” from a “fast follower.” This means we need to have a creative way of thinking.”

Since its establishment in 1972, HHI has

grown into the world’s leading heavy industries company by diversifying from shipbuilding to offshore engineering, industrial plant and engineering, engine and machinery, electroelectric systems, construction equipment and green energy business.

Core Talent

One of the major changes being implemented by the company is the introduction of a new performance-based salary system in which high performers will get much higher wage increases than poor performers.

“In order to boost competitiveness and bring in talented workers, we need to quickly establish a new pay system which will clearly distinguish the workers who are capable and work hard from others,” said Kim.

He said the committee has received many suggestions for a fair performance evaluation system and rewards for employees, and the new pay system will help address their concerns.

The company is also openly pushing ahead with plans to recognize superbly talented employees who will be put on a fast-



Kim Jeong-hwan Senior Executive Vice President, Head of the Future Planning Committee

track path in their careers in the company.

A total of 469 “core talents” have been identified firstly among the company’s white collar workers and there are special programs in place for them. The company urgently needs “core talents” especially in the field of engineering, Kim said.

He also stressed the importance of the company’s push for new business models.

“The Future Planning Committee will share the information and communicate with all the employees on the future trend and changing market environment, and I believe more creative and innovative ideas will come out.”

“My view is that our company needs to maximize the capabilities of all divisions and transform itself into a system integrator from a simple supplier of products. And then we need to be transformed into a customer-friendly solution provider integrating the hardware and software in the manufacturing business model,” he said.

“Founder Chung Ju-yung started and cultivated everything including all the existing businesses of our company, but now it is time to select new challenges and the new engine for growth by ourselves.”

Then he added, “There are many talented and devoted workers in our company. If we pull together their capabilities and focus our energy on innovation, I am sure we will be able to overcome current difficulties and get closer to HHI 3.0.

“The Future Planning Committee will join hands not only with the management but also with all members of our company, including subcontractors and clients to build a future for them.”

HHI is ready to get valuable inputs for the company’s new growth engine, sustainability and better corporate culture not only from its employees but also from its suppliers, subcontractors and the local community. Suggestions can be emailed to future@hhi.co.kr. **HHI**

Resilience,  
The Powerful Strength of  
Riding out Crises

Companies with a long established history are familiar with crises. They approach such obstacles not as isolated events but as basic market components integral to business. Subsequently, businesses have continuously developed by rebounding from setbacks and make greater achievements whenever a crisis is sensed. That said, companies that deal with crises effectively are known to have a strong resilience. Like the elasticity that enables a rubber ball to bounce back, this analogy is also applied in psychology to communicate how positive energy can help anyone overcome adversity or hardships.

Resilience is one of the most important factors that determine a company’s future. That is to say that the permanence of its place in an industry is guaranteed when it manages to practice its original values, even when a crisis comes its way due to changes in its surroundings. The story of Swatch, a leading watch brand in Switzerland, can be seen as a case that illustrates how resilience helped the country recover its dominance in the global market.

The wristwatch industry had been dominated by Switzerland for over 500 years. It was so much so that the country had occupied a third of the entire global market until the mid-1970s. But the country’s watch industry came to face the greatest crisis when watches manufactured and distributed in Asia, including Japan and Hong Kong, began to take over, using lower prices as an opportunity to dominate the market, along with new technological innovations in the 1980s.

Swatch was one of watch brands of the ASUAG-SSIH, which was formed in 1983 through the merger of two Swiss watch manufacturers, Société Suisse pour l’Industrie Horlogère (SSIH) and Allgemeine Schweizerische Uhrenindustrie AG (ASUAG). It survived the crisis by introducing a new idea that overturned conventional viewpoints on watches.

At that time, people tend to think that, once purchased, Swiss timepieces were to be used throughout a lifetime and handed down several generations. Swatch, however, changed that conventional notion by presenting colorful watches that incorporated modern designs at reasonable prices. From then on, people began to wear wristwatches according to the season and environment, and saw watches as a way to express their individuality, while recognizing them as a category of fashion.

Since then, Swatch has continuously launched Swatch Collections that comprise a range of low-priced watches. As a result, consumers started purchasing not one but several watches. Today, Swatch has grown into a huge corporation that produces more than 10 million watches on an annual basis through its 18 watch brands. **HHI**

\* Reference: Hyundai Speed, written by industrial writing artist group, Function, and published by INNOTANK  
1. The concept of “Resilience” began to be widely known when Joohan Kim (Professor, Department of Mass Communication at Yonsei University, and Director of Human Communication Lab) translated and used it in 2009.

The writer is a journalist based in Seoul.



# Briefing

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





Shipbuilding

# New Milestone of Delivering 2,000 Ships



Hyundai Heavy Industries (HHI) announced it delivered its 2,000th ship, another milestone in the global shipbuilding history on May 25. Since its establishment in the early 1970s when HHI took the world by surprise by simultaneously completing the shipyard and two 266,000 DWT VLCC in just two years after the ground breaking, HHI has left numerous footprints in the global shipbuilding industry including the world's first accumulated delivery of 1,000 ships in 2002 and the world's first accumulated 100 million gross ton ship production record in 2012.

*Ocean BlackLion*, a drillship ordered from Diamond Offshore marked the 2,000th ship HHI completed. The gross tonnage of 2,000 ships HHI built amounts to 126 million, twice the gross tonnage of total ships built last year worldwide. The top four most-delivered ships of HHI are containerships (583), bulk carriers (357), tankers (232) and VLCCs (147). Country-wise, Greece ordered the most ships of 254 followed by Germany with 238, Japan with 120 and Denmark with 101. Mr. Choi Kil-seon, (chairman & CEO of HHI said, "Today, we wrote a new chapter in the global shipbuilding history by delivering the 2,000th ship. As we have been over the past four decades, we will continue to stand firm as the global leader in the shipbuilding industry with tireless innovation and shipbuilding method improvement for the coming decades."

Shipbuilding

## Launching Korea's Second Minelayer



HHI launched its second minelayer *MLS-II Nampo* for the Korean Navy on May 27. The launching ceremony of the *MLS-II* was attended by Mr. Baek Seung-joo, vice minister of National Defense of the Republic of Korea; Mr. Kwon Oh-gap, president & CEO of HHI; and 100 other guests. The *MLS-II Nampo* is both HHI and Korea's second minelayer following *MLS-560 Wonsan* that was delivered in 1997 and are currently in operation. The *MLS-II Nampo* which can carry 120 crew members measures 114 m in length, 17 m in width and 28 m in depth with a displacement of 3,000 tons. The next-generation stealth minelayer is specially built to lay a large number of mines precisely at the designated spots in a short period of time. The *MLS-II Nampo* is scheduled to be delivered to the Korean Navy by October 2016.

Shipbuilding

## "Big Data Cloud Service for Analyzing Manufacturing Processes" for Domestic SMEs



HHI announced that the "Big Data Cloud Service for Analyzing Manufacturing Processes" jointly developed by Ulsan National Institute of Science and Technology (UNIST) and Korea ICT Convergence Network was selected as "The Smart Service Utilizing Big Data," a pilot project run by National Information Society Agency (NIA), an affiliated organization of Ministry of Science, ICT and Future Planning on June 12. Under the program, UNIST will provide user-tailored IT services including data analysis of manufacturing process and work-sites/warehouse; talent nurturing programs and consulting to enhance the manufacturing competitiveness of domestic small- and medium-sized companies (SMEs). Meanwhile, the Korea ICT Convergence Network will hold forums to share data analysis model cases.

Shipbuilding

# SkyBench Receives AIP From DNV GL



HHI received approval in principle (AIP) from DNV GL for SkyBench™, an innovative design concept for maximizing cargo loading capacity of large containerships on June 11. SkyBench is a mobile accommodation block that is mounted on rails and can move over the span of two 13m-long container bays. The SkyBench allows for additional storage as it utilizes the void space beneath the sliding block. Moreover, the safety of on-board crews is enhanced by the detachable design thanks to the buoyancy in case the ship sinks.

The 19,000 TEU containership with SkyBench can extend its cargo loading capacity by 450 TEU and is expected to secure an additional 2.7 billion Korean won (\$2.43 million) worth of shipping rate per year on the assumption that the containership operates 10 times per year on Europe-Asian route and charges \$530 per TEU. Mr. Yoon Moon-kyoon, COO of Hyundai Heavy Industries' Shipbuilding Division said, "As we have been doing over the past four decades, we will continue to provide quality ships that differentiate ourselves from others in terms of quality, reliability and technological capabilities to our valued clients. I believe that SkyBench, like many other previous technological breakthroughs we have shown to the world, will surely bring benefits to our customers."

Shipbuilding

## Receiving AIP for the World's First Gas Turbine-Powered LNG Carrier



HHI jointly developed the world's first gas turbine-powered 174,000 m³ LNG carrier with GE Aviation and Marine (GE), a leading industrial gas of turbine maker, and has secured Approval in Principle (AIP) on the vessel from the UK-based Lloyd's Register on July 7. The IMO Tier III-compliant 174,000 m³ LNG carrier is equipped with GE's gas turbine-based Combined Gas turbine Electric and Steam system (COGES 2.0). The vessel is expected to save shipowners or operators an estimated 20 billion Korean won (\$17.83 million) on the assumption that the LNG carrier operates for 20 years with an annual operating cost of \$720,000, since it does not need additional equipment to handle exhaust emissions. The gas turbine-powered engine is 60 percent lighter than conventional engines and will lower operating and maintenance costs accordingly.

Shipbuilding

## Winning Nine 14,000 TEU Containerships From Maersk



HHI won an order for nine 14,000 TEU containerships worth \$1.1 billion from Maersk Line, a Danish company on July 8. This contract is a part of Maersk Line's \$15 billion investment program which includes an option for an additional eight vessels scheduled to be delivered in late 2017. The ships, 353 meters long, will join the fleet of Maersk Line in 2017 and sail under the flag of Singapore. To date, HHI has delivered more than 50 containerships to Maersk Line since 2002, including 4,500 TEU WAFMAX vessels which were delivered in 2011-13. In that sense, Maersk COO, Soren Toft said, "We have a good relationship with HHI. The quality of their ships has always met the high standards we seek in Maersk Line."

Construction Equipment

# Rolling out 500,000th Construction Equipment



HHI handed over its 500,000th construction equipment to a client on June 2. The 500,000 construction equipment production record was achieved 28 years after the company introduced its first excavator in 1987. Although the company started the business with 426 new excavators in 1987, it has now emerged as a major player in the market with the broadest product range among Korean makers. HHI's product lines include 1.5 ton excavators, 30 ton forklifts, and Korea's largest 120 ton excavators. The company recently announced its eco-friendly and high efficiency HX series excavator models.

HHI has been active in making inroads into global construction equipment markets with five overseas production factories in China, India and Brazil. Through tireless efforts in R&D, differentiated customer services and marketing activities, HHI achieved \$2.7 billion in global sales in 2014. This year, the company seeks to secure \$3.0 billion in global sales. Mr. Rhee Sang-gi, COO of Construction Equipment Division of HHI, said, "We will continue to introduce new models with improved quality and performance and solidify our position as a reliable maker in the international construction equipment market."

Shipbuilding

## HHI and Accenture To Build Connected Smart Ships



HHI and Accenture are collaborating to design a "connected smart ship system" that will connect vessel operation information, on-board equipment and cargo status data, and port logistics information. The existing smart ship focuses on improving the eco-friendliness, safety and operation efficiency of vessels based on its status, operation data, weather, and ocean current data. By contrast, the connected smart ship can open a new service market by providing cargo transportation information, including vessel's status, port and land logistics to ship owners. The two companies will connect the Hyundai Intelligent Vessel Service, HHI's on-ship platform, and the Accenture Connected Platform Service, Accenture's land platform, with satellites by 2020.

Construction Equipment

## HX520 L, Hyundai's Largest Next-Generation Excavator



HHI has recently added to its excavator line up, HX520 L, a new heavy excavator that can meet growing demands in the market for strong, reliable and economical excavators. This Tier 4 F/ EU Stage IV compliant excavator will add value for its owner, since it represents the fruition of HHI's painstaking efforts to incorporate customers' input. HX520 L is among the all-new six HX Excavators ranging from 22-ton HX220 L to 52-ton HX520 L that HHI debuted along with 23 other construction equipment at INTERMAT 2015. In keeping with the tradition of Hyundai earthmoving equipment, all the excavator models that made its first appearance at one of the world's largest construction equipment exhibitions boast many updated features that live up to the market's expectations.

Companywide

# Developing "Sea Weather Forecasting System" in Cooperation With KIOST



HHI jointly developed the "Sea Weather Forecasting System" with Korea Institute of Ocean Science & Technology (KIOST) on July 20. The system will enable HHI to manage sea trial schedules of ships it builds at its Ulsan yard 72 hours in advance by analysing sea weather information such as wave height, wind speed and current patterns on an hourly basis in seven offshore areas including Ulsan, Gunsan and Jeju Island.

The weather system is also expected to minimize any possible delay in lifting work of the floating crane that may be caused by unexpected weather conditions by precisely forecasting the sea weather every 60 m in Mipo Bay and Jeonha Bay where HHI is based. The geographic information system (GIS)-based system can also display sea weather information on the specific spots on an electronic navigational chart.

The weather forecasting system HHI developed is linked to 530 weather research crafts across the nation and it can forecast 10 percent more precisely than other existing weather systems by analysing adjacent sea topography 16 times more accurately.

Companywide

## HHI and Ulsan Metropolitan City Opens Center for Creative Economy & Innovation



HHI announced that it jointly opened the Ulsan Center for Creative Economy & Innovation (UCCEI) with Ulsan Metropolitan City on July 15. The opening ceremony at University of Ulsan was attended by President Park Geun-hye; Ulsan City Mayor Kim Ki-hyun; Mr. Choi Kil-seon, chairman & CEO of HHI; Mr. Kwon Oh-gap, president & CEO of HHI; and 150 other guests. The center will serve as a springboard for domestic shipbuilding and offshore business to takeoff; an incubator for medical automation business; a bridge between MARU180, a private organization providing an open source platform of education, investment and networking for startups; and a facilitator for local 3D printing business.

Companywide

## Seamarq Hotel Celebrates Grand Opening



HHI built a new hotel named "Seamarq Hotel" on the shore of Gangneung beach, Gangwon-do, aiming to become a landmark for the 2018 PyeongChang Winter Olympics. The hotel celebrated its glamorous Grand Opening on June 26. The hotel was a reconstruction of the Gyeongpodae Hotel, established in 1971, the oldest hotel on the east coast of the Korean Peninsula. It was designed by Richard Meier, a winner of the Pritzker Prize and designer of Getty Center in Los Angeles. Seamarq Hotel features 150 rooms, a convention center, an outdoor stage, a swimming pool, and a Hanok (Korean traditional house).



# The Big Engine That Could

Teresa Lee

**“The quality of products made to order depends especially on the fingertips of every last laborer. My top priority is to make an environment where these laborers can do their jobs happily.”**

After 30-plus years at a job, a man comes to resemble his work. For Kim Ju-tae, senior executive vice president of Hyundai Heavy Industries (HHI) and head of its Engine & Machinery Division, his 32 years of developing engines seems to have turned him into a person that radiates positive energy.

“When HHI first began, we relied on imports for every engine part and equipment. But as engines are some of the most important parts when building ships, we began thinking we must make them ourselves,” said Kim, leaning across his reception room table besides a sheaf of visual aids for the interviewer.

HHI, as the world’s largest maker of ship engines, has more than 50 percent global market share for generators and more than 35 percent for vessel main engines.

Having led the original team that created HiMSEN, the first engine HHI developed and still the basic design on long-

selling models, Kim says the company dominates in ship propulsion partly due to its focus on what no one had focused on before — those who use the engines.

“Starting from around 1995, when we began making engines through technical partnerships with foreign firms, I was given the mission of creating our own engine. Since World War II, there had been no new ship engine that was commercialized successfully — countries like Japan, Germany and the U.S. had the technology, which was then spread around the world,” he said.

“How can we compete with companies with more than 100 years of history and differentiate from engines that have a trusted track record? I decided it would be hard to beat them on price or performance — instead, I focused on humanity.”

HHI’s engines have a concept called Hi-Touch — a portmanteau of sorts meaning they are made with human beings who use them in mind, unlike previous engines

# gine



Kim Ju-tae COO of Engine & Machinery Division

chiefly without as much thought to design or to pollution. The slides Kim first used to present the human-friendly concept are worth a thousand words — women in traditional garb represent older engines, while HHI’s new engine is represented by a beauty pageant queen in a swimsuit.

Kim, who majored in mechanics and as a matter of course was drafted to make engines at HHI, says it was possible to burn the midnight oil most nights for five years while developing HiMSEN simply because “engineers like to make things.” Since the engine debuted, positive market developments and events such as the Beijing Olympics created demand and buoyed up the division.

But with uncertain market conditions going forward, Kim wants to shore up his greatest resource — his people. He has been hosting face-to-face dinners with dozens of crews of employees most nights since he came to the position a year ago — and

now has teamed production crews and back-office personnel for closer acquaintance that will lead to better communication.

“We make massive things, but we’re not manufacturers who pre-produce — we’re builders that make products to order. The quality of products made to order depends especially on the fingertips of every last laborer. My top priority is to make an environment where these laborers can do their jobs happily,” Kim said.

Not much has escaped Kim’s eye in his quest to make a productive environment. The walls of the division, previously hung with pictures of engines, are now adorned with nature photos of birds and brushworks of inspiring Chinese characters — also a sign of Kim’s focus on the Chinese market.

“We once sold 700 billion Korean won worth of large engines to China alone. China is a tremendous market. But now that the Chinese economy has slowed, our en-

gine sales are down. After much consideration about whether to move forward or fall back, we think the only way to win is to make high-end products for China’s richest firms. That will be our direction,” said Kim.

A ready speaker and lecturer who has dipped into the humanities for breakthroughs in his engineering work, Kim has a wealth of bright ideas — including one where HHI no longer simply makes and sells engines, but has the digital post-sale management system in place for continuous care and periodical tune-ups.

The strength of HHI lies in its collective intelligence, he notes. “Workers do their jobs on their own judgment without someone having to order them every time. Our current potential comes from every single worker that carries out their jobs with diligence and creativity.” **HHI**

The writer is a journalist based in Seoul.



# Exploring New Opportunities in Marine Industry

Lee Erin

**“Even though overcapacity and the low oil price bring uncertainties, the marine market will recover eventually with the growing world population and increasing wealth in developing countries.”**

Jonny Nylund is a business director at Wärtsilä-Hyundai Engine Company (WHEC), a 50/50 joint venture between Hyundai Heavy Industries (HHI) and the Finland-based Wärtsilä Corporation. The joint venture was formed to meet new demand for eco-friendly and fuel saving dual fuel ship engines in 2007.

Wärtsilä and HHI, both recognized as pacesetters of the shipbuilding and marine engine market, have the robust and flexible capability to meet rapidly changing needs in the industry. Wärtsilä has a long-standing reputation as a global leader of power engineering solutions for marine, oil and gas industries, while HHI, as the world's largest shipbuilder, has a wealth of hands-on experiences and skilled workforce to produce wide ranges of engines fit for all kinds of ships it has built. Mr. Nylund comments on HHI's strengths as a shipbuilder, "HHI is a world-class provider of quality products. It has many opportunities with a strong track record. It

has both breadth and depth. That means the ability to build various types of ships, and combine various technical solutions."

He believes the combination of Wärtsilä and Hyundai can create more value for new demand in the marine engine business. Mr. Nylund says that Wärtsilä is always willing to explore new and existing opportunities in the business. Despite challenging market situation with overcapacity and slow contracting activity due to low oil price, WHEC continues to focus on the LNG market.

WHEC employs around 220 people in total and the revenue is exceeding \$250 million. Its flagship product, the Wärtsilä 50DF engine, is a state-of-the-art four-stroke dual-fuel engine, which can be run on natural gas, light fuel oil or heavy fuel oil. By switching over from gas to oil and vice versa during engine operation, it provides the ultimate "fuel flexibility" and gives off substantially lower emissions than oil-fueled engines, while generat-

# ustry



Jonny Nylund Business Director of Wärtsilä-Hyundai Engine Company (WHEC)

ing the same output whether it is running on gas or oil.

Wärtsilä 50DF engine was originally developed for LNG carriers, but the application has also expanded to other vessel types to meet more stringent environmental regulations and cost-saving operations. Mr. Nylund said that WHEC deserves to lead this industry trend through its technology and manufacturing forte. "WHEC is an established manufacturing company with strong focus on quality and customer satisfaction. We are proud of that, and we are constantly working to further improve."

On the prospect of the marine market, he is precautionary but positive, "The marine market has its ups and downs, and some ship segments may increase while others decrease. All these have an impact on the overall engine demand. Going forward, overcapacity and the low oil price is bringing some uncertainties over our industry. However,

the marine market will recover, because the growing world population and increasing wealth in developing countries will drive energy demand and cargo volume."

Mr. Nylund started his career in consulting after a brief internship in Wärtsilä. He re-joined Wärtsilä and was relocated to Shanghai in 2007 before coming to Korea this May. From this experience, he has been able to widen his understanding of the Asian corporate culture. "My first impression was a strong hierarchical setup in HHI compared to Wärtsilä. As far as I understand, HHI is impacted by the Confucian principles rooted in the Korean culture. However, such a cultural background is creating a group of hard-working people committed to deliver and make a difference."

Aside from business, Mr. Nylund, who has been here for only a few months, intends to make the best of his stay in Korea. "Korea is a very beautiful country. I have so far only

visited major cities, but I intend, in the future, to visit other areas, and perhaps climb some of the beautiful mountains you have."

A fan of sailing and boating, Mr. Nylund used to participate in sailing competitions in his native Finland. Maybe this was an early sign to work with the shipbuilder? "Now that I am located in Korea, I am very much looking forward to familiarizing with HHI, a world-class provider of quality products, and its people."

He is now searching for new opportunities in the new place and ever-changing business world. He also sees his new career with pride, "WHEC is a leading supplier of dual-fuel engines for LNG carriers. We will remain dedicated to serving our customers with reliable products and project deliverables in the future, even better than before. **HHI**

The writer is a copy editor of New Horizons.



# An Excellent Place To Experience Korea's Modern History and Economic Development

Touring the HHI's Ulsan yard is a good opportunity to feel the Hyundai spirit as well as understand Korea's modern history and economic development.

Ha Jeong-su



Hyundai-10000, the World's Biggest Shear-Leg Floating Crane

It is around 4:00 pm, a particularly busy time for Ms. Lee Chung, communications officer in Corporate Culture Department of Hyundai Heavy Industries (HHI). It is because she has to arrange a list of visitors who are scheduled to visit HHI's Ulsan shipyard the next day. From March, April, September to October—the peak tourist season for HHI—up to 20 teams visit the yard a day. Official statistics show approximately 14.4 million people of all walks of life have visited the Ulsan yard so far. During the last 10 years, about 160,000 people have visited the yard each year, and about 10 percent of them are foreigners. What is the core reason behind the lasting popularity of the HHI shipyard?

## The Largest Scaled Facilities

People who visit Ulsan yard can experience the largest-scaled facilities in the world, including the shipyard itself; 1,600-ton gantry cranes, dubbed as Goliath cranes; the world's biggest 10,000-ton shear-leg type floating crane; and the world's biggest drydocks of their kind. The list of facilities that are huge enough to amaze visitors can go on and on.

The yard covers about 13 million square meters, which includes 9 million square meters of production facilities, and 4 million square meters of apartment complexes, schools, recreational centers, and other welfare facilities. Considering its magnitude, it wouldn't be an exaggeration to say that the yard really looks like an island.

Especially, in April, the Discovery Channel team highlighted Hyundai-10000, the world's biggest floating crane HHI operates. Hyundai-10000 won the glorious title of "Symbol of HHI" from the two 1,600-ton gantry cranes. What makes Hyundai-10000 the new symbol of HHI is not just because it is new but because it has an unparalleled lifting capacity at one of the world's biggest offshore yards. Hyundai-10000 can lift structures about six times heavier than the Goliath cranes, hence its name. This benefit is not a mere talk but test proven as well under the watchful eye of Discovery Channel team on April 14. Hyundai-10000 lifted up a 6,500-ton topside module of Moho Nord tension leg platform HHI secured from Total in March 2013, creating a spectacular scene.



## Living Proof of Korean Economic Development

The biggest reason for major foreign media and ordinary visitors to come to Ulsan shipyard may be to experience Korea's modern history and economic development. According to visitors' feedbacks, the tour is considered as a great source for understanding the driving force of Korea's rapid economic development as well as Hyundai's history.

Since Korea gained independence 70 years ago, Koreans have been living a busier life than anyone else in the world. In particular, fathers in Korea went through turbulent times to support their family after the 1950s. Thanks to their sacrifice, a country that had been devastated by the war and poverty has been transformed into the world's 13th largest economy and 8th largest trader, a remarkable achievement in which the shipbuilding industry has played a key role.

In May, BBC produced a special program named "Working Lives" to spotlight the 70th Anniversary of Independence of the Republic of Korea and aired it all over the world in June this year. The program featured five work-

ing people in different fields — a shipbuilding company, an English academy, a traditional market, a household electrical appliance market, and Korean Augmentation to the United States Army (KATUSA) in Korea.

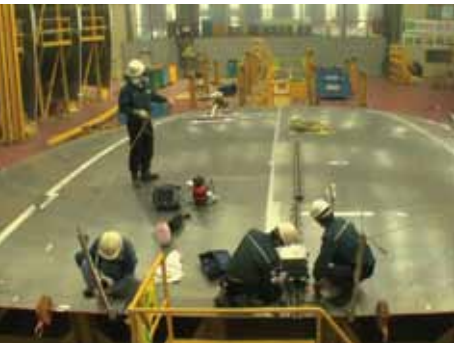
In this program, Mr. Lee Sang-bok, technical master in Quality Management Department of HHI, appeared as one of the main characters. Lee has been working more than 40 years at HHI, and now works as a quality inspector for various ships. Quality inspection is the most critical work with no exceptions. The importance of error-proof inspection cannot be more emphasized especially for LNG carriers. Even a tiny chasm in the containment tank installed on LNG carriers would cause catastrophic consequences such as huge explosion, so welding works have to be inspected in microscopic detail. This is what Mr. Lee does. BBC covered his work at the yard and personal life at home all day. "I joined this company when I was just 16. In the past 40 years, shipbuilding really has become the center of my life. I devoted all my youth to this company to find my identity and support my family", Lee said. Not only Lee but most of the senior work-

ers in HHI's Ulsan shipyard are all living proof of Korea's economic development. They have made HHI, the world's largest and leading shipbuilder, to what it is now.

More people are visiting HHI's Ulsan yard on the 70th anniversary of Korea's independence but, many visitors are worried about the recent slowdown of manufacturing businesses including shipbuilding sector caused by global recession, oil price collapse and China's economic downturn. But, it isn't anything new to HHI at all which has overcome a lot of obstacles including 1970s Oil Shock and 1990s Asian Financial Crisis through joining forces with the Hyundai Spirit (Creative Wisdom, Positive Thinking, Unwavering Drive) proclaimed by HHI's founder, Mr. Chung Ju-yung. For four decades, HHI has been accomplishing things thought to be theoretically and scientifically impossible. These accomplishments are due to the company's unwavering determination and endless efforts.

Feel the spirit as well as Korea's modern history and economic development through the HHI Ulsan Yard Tour. **HHI**

The writer is a copy editor of New Horizons.



Lee Sang-bok, Technical Master of HHI, on "Working Lives", BBC

# Smarter Way to Efficient, Green Technology In Shipbuilding

Kim Moon-ju

**K**ORMARINE 2015 is a major international exhibition where the major players in marine, shipbuilding, offshore, oil and gas sectors display their technological developments along with the latest trends of the year. The event will be hosted for four days from October 20th this year at BEXCO, Busan in South Korea.

For this event, Hyundai Heavy Industries

(HHI) will drive its competitiveness and growth in the sluggish shipbuilding market, under the catchphrase of "Smarter Way to Efficient, Green Technology in Shipbuilding." HHI will organize its exhibition area with four themes - Hyundai Heavy Industries Group, Smart Technology, Green Technology and Marine Equipment at hall 3, booth 3F05, BEXCO.

In times of trouble, innovation and cre-

ativity would be the best solution. KORMARINE 2015 would be the right place for you to take a glimpse of the solutions. HHI would be glad to welcome you at its booth and will be given an opportunity to explain the valuable solutions it has to offer. HHI would be pleased if you will find time to follow our invitation and is looking forward to seeing you in BEXCO this fall.

## KORMARINE 2015

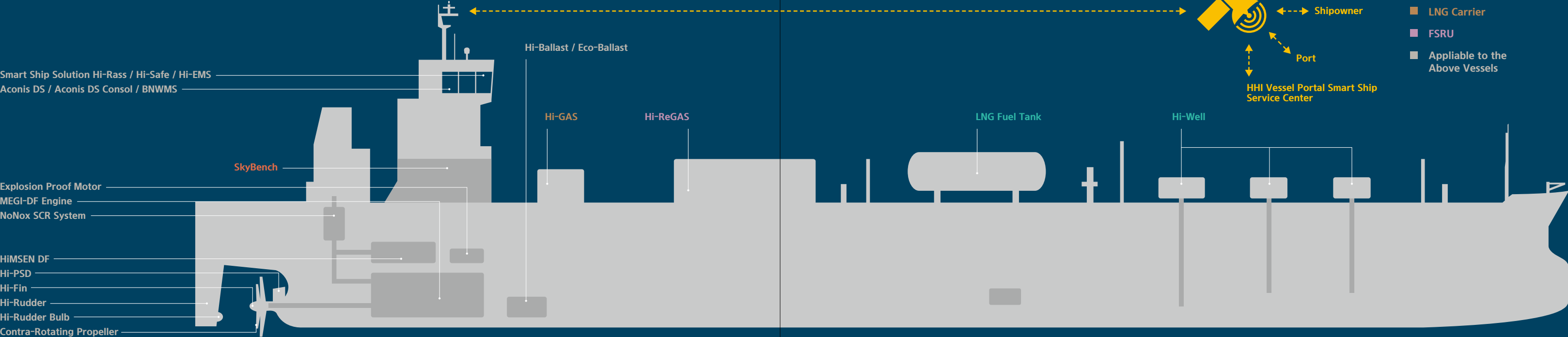
International Shipbuilding & Marine & Offshore Exhibition  
Oct. 20 (TUE) – 23 (FRI)



HHI's Booth 3F05, Hall3, BEXCO



# Smart Solutions for Efficient and Eco-Friendly Ship



## Hyundai Heavy Industries Group Section

HHI Group is leading the global shipbuilding, shipping, energy transport and exploration, and naval market with an extensive mix of commercial and special ships.

In this section, HHI teams up with its shipbuilding affiliates, Hyundai Samho Heavy Industries (HSHI) and Hyundai Mipo Dockyard (HMD), to show the latest technological developments, featuring new and advanced ships and offshore floater models as follows:

- Oceanographic Research Vessel (HHI)
- Heavy Construction Vessel (HHI)
- World's Largest Cylindrical Goliat FPSO (HHI)
- 84,000 m<sup>3</sup> LPG Carrier (HSHI)
- 30,000 m<sup>3</sup> Multi-Gas Carrier (HMD)

## Smart Technology Section

In an effort to weather the persistent global economic slowdown, tightening marine environmental regulations and a handful of unfavorable market conditions, HHI sheds light on the smart ways to efficient and eco-friendly technology in the shipbuilding sector for all relevant market participants at this biennial event.

In this section, HHI highlights recent technological breakthroughs and solutions to further solidify its leadership in the shipbuilding industry amid the fast-changing global market by showcasing a variety of solutions for fuel-saving and high-efficiency, gas-fuelled and smart ship technologies and environmentally friendly systems.

## Fuel-Saving and High-Efficiency Solutions

HHI has come a long way in pursuit of the efficient technology that can generate more with less resource. Here are some of the fruits of

our years-long dedication to improving ships' operation and saving operational costs.

- **SkyBench** is HHI's patented cargo loading expansion technology for containerhips. It enables a 19,000 TEU containership to load an additional 450 container boxes without physical enlargement by installing a sliding accommodation block over the container bays.
- **Hi-FIN** is an energy-saving attachment to the hub of the propeller. It generates countering swirls that offset the swirls formed by the propeller and thus improves propulsion efficiency.
- **Hi-PSD (Pre-Swirl Duct)** generates additional thrust compensating rotational losses caused by the pre-swirl flow. This add-on reduces vibration and cavitation by improving inhomogeneous wake distribution on the propeller plane.
- **Hi-Rudder** is a full spade rudder designed to generate an additional thrust and reduce low pressure peak, hence maximizing propulsive efficiency while minimizing cavitation erosion.

- **Hi-Rudder Bulb** eliminates the hub vortex induced by propeller rotation. Due to the recovery of propeller rotation loss, ship propulsion efficiency can be increased.

## Gas-Fuelled and Treatment Solution

HHI is committed to developing its integrated gas-fuelled and treatment solutions for ships to respond to the dynamics of environmental and economic demands in the shipping industry.

- HHI's integrated gas-fuelled ship system, **Hi-GFS**, is a total gas solution to build new types of ships propelled by liquefied natural gas as its main fuel. Its main features are as follows:
  - HHI's **LNG Fuel Tank** is optimized for different types of gas-fuelled ships offering greater flexibility to the clients' needs, including IMO Type B prismatic, IMO Type C cylindrical and Mark II FLEX membrane type LNG tanks.
  - **Hi-GAS** is HHI's remarkably designed proprietary LNG gas fuel supply system for dual fuel engines.

**Hi-GAS** can effectively supply high pressure cooled natural gas to the ME-GI engines while supplying low pressure LNG to the four-stroke DF generator sets.

— **ME-GI Two-Stroke Engine** is a dual fuel two-stroke main population system, developed in cooperation with MAN Diesel & Turbo in 2012.

— **HIMSEN DF** is a dual fuel four-stroke engine for electric power generation. Since 1991, HHI has been manufacturing HIMSEN engines and has completed an extensive model line-up from 0.5 to 26 MW.

- **COGES-Powered LNG Carrier** is powered by a propulsion system using gas turbines, COGES (Combined Gas Turbine, Electric & Steam). With its compact size and light-weight advantage, the hull resistance is reduced and cargo load capacity is increased. COGES-powered LNG carrier is also environmentally friendly: without any additional emission reduction equipment it meets the IMO Tier 3 emission regulation.
- **Hi-ReGAS (Hyundai Integrated Regasification System)** is engineered to vaporize the contained LNG and offload onto onshore pipelines. **Hi-ReGAS** uses sea water as the direct heating method to vaporize LNG, ensuring energy and space savings, easy operation and fast start-up and shutdown.

porize the contained LNG and offload onto onshore pipelines. **Hi-ReGAS** uses sea water as the direct heating method to vaporize LNG, ensuring energy and space savings, easy operation and fast start-up and shutdown.

- **Hi-ERS (Hyundai Innovative Economic Re-liquefaction System)** is an efficient and cost-effective boil-off gas (BOG) re-liquefaction system that condenses BOG from LNG containment tanks and burns it for fuel and then re-liquefies the surplus gas by recovering the cold energy of BOG.

## Smart Ship Solution

HHI's smart ship solution is an IT combined technology to provide safe and energy-saving solutions for the shipping industry by monitoring equipment and navigation information status in real time.

- **Connected Smart Ship** provides a wide range of ship voyage information including location, weather, and ocean current data, and onboard equipment and cargo status data



through the sensors in the ship. The operators can monitor a ship's status and condition, including any alerts and warnings, by real-time analytics and visualization tools on various operating and fleet history data. Through the connected data, the time required to transfer products from the ship to port and vice versa can be significantly reduced.

• **Smart Solutions**

— **Hi-RASS (Hyundai Intelligent Route Assessment Support System)** is a full-featured onboard voyage planning system providing the optimal route solution and the speed profile within predefined port arrival time.

— **Hi-SAFE (Hyundai Intelligent Safety Assessment and Support System)** enables the navigator to determine the appropriate actions to prevent unstable ship motions and to enhance safety of ship, crews and cargoes.

— **HiMSEN EMS (Engine Monitoring System)** enables operators to check the engine status in real time, and to automatically transfer alarming messages to the control tower for maintenance in case of abnormal operation.

**Green Technology Section**

HHI takes its passion for creativity into its products and services. As part of our commitment to make the world greener than we found it, HHI are turning new ideas into greener products.

• **Hi-Ballast System** can treat seawater by filtering and sterilizing bacteria and plankton bigger than 50  $\mu$  m through electrolysis. It can sterilize 8,000 m<sup>3</sup> of seawater per hour, reduce power consumption, and extend the life of the ballast.

• **Eco-Ballast System** sterilizes seawater using ultraviolet rays instead of electrolysis. Its UV reactor is specially designed for the ballast water treatment application to maximize the efficiency of the system, reduce the sediment load and remove large organism in the ballast.

• **NoNOx SCR System** is a selective catalyst reduction technology to reduce NOx in the exhaust gas of engines. Hyundai SCR system can reduce NOx up to 95 % and meet IMO's stricter emission requirements of Tier III regulation.

**Marine Equipment Solution Section**

HHI has a wealth of capabilities and experiences as a leading shipbuilder and marine equipment supplier that can provide best marine equipment fitted for all types of ships and tailored to clients' needs.

• **HiMSEN Engine (Hi-touch Marine & Stationary Engine)** is HHI's proprietary engine brand for propulsion and generation for marine and land-based use. Its compact design ensures economical and ecological operation for lower fuel consumption and NOx emission, and easy maintenance. In this event, HHI will showcase H34 DF, the latest HiMSEN dual fuel engine model.

• HHI's Engine & Machinery Division provides a total **Marine Propulsion Package** of propellers, crankshafts, and rudders which are most fitted for two- and four-stroke propulsion and generation engines.

• **Hi-Well Cargo Pumping System** is a hydraulically driven submerged cargo pump for chemical and product carriers, crude carriers and FPSO units. The system is designed for profitable cargo handling, efficient stripping and tank cleaning.

• HHI's Electro Electric Systems Division provides **Electrical Marine Equipment** products including dry-type transformers, generators, switchboards, control consoles, automation systems and panels.

— **Hyundai ACONIS-DS (Advanced Control and Integration System)** offers full integration of control and automation function in combination with bridge system, CCTV, internet and systems. The ACONIS-DS offers user-friendly graphic interface and remote maintenance and diagnosis feature.

— **Hyundai BNWMS (Bridge Navigation Watch Monitoring System)** is designed to monitor bridge activities and to detect malfunction which could lead to marine accidents. Hyundai BNWMS complies with IMO Resolution MSC. 128(75) and IEC 62616.

— **Hyundai Flame Proof Motor** has been supplied and tested in accordance with worldwide classification societies such as Lloyd, ABS, DNV, KR for marine use and IEC, NEMA, ANSI, IEEE, EN, API, BSI, AS, JS, KS, JIS for industrial application in water, power and oil and gas sectors.

**Program for Industry Visitors, Press Reporters and Investors**

Are you looking to join and experience the rich information on HHI's technology, products and services at KORMARINE 2015? HHI will organize special programs for industry visitors, press reporters and investors. It will be a good opportunity to enrich your knowledge and network with HHI and its people.

For industry visitors, HHI will organize two special booth tours at 2:30 pm on the opening day, October 20, and at 10:30 am and 2:30 pm on October 21–23. For registration, please contact Miri Kim at mrkim@hhi.co.kr by October 13, or come and register at HHI's booth 15 minutes before the tour during the exhibition. For those joining the tour, don't forget to bring your business cards to exchange for a HHI's special gift.

For media reporters and investors, HHI will arrange free registration, reportage and interviews with HHI's specialists along with PR materials. Those who are interested in joining the tour are required to contact MJ Kim at mncedar80@hhi.co.kr by October 13. Registration at the booth is unavailable. **HHI**

The writer is a copy editor of New Horizons.

**For more information, Please contact as follows**

• **Industry Visitor**

Miri Kim, Kormarine Organizing Officer  
mrkim@hhi.co.kr  
82-52-202-2345

• **Press Reporters & Interview**

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• **Investor**

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82-52-203-7053



# e-Navigation to Lead the Future of Maritime Safety

Mariners were able to access relevant information when a wide range of devices were introduced to ships along with the development of digital technologies in communication. However, their duties rather increased due to the complicated and varied information of such navigation and communication equipment, causing a rise in negligence in safety.

Consequently, people felt the necessity to comprehensively and systematically manage the variety of information and data that mariners receive, and the need for the e-Navigation system was addressed by the U.K.'s Transport Minister in November 2005. Since then, the maritime safety information system e-Navigation was conceived, and its demand has been increasing gradually through international bodies that are working to strengthen maritime safety along with the launch of standards set by the international maritime Geographic Information System (GIS).

Scheduled to be implemented in full scale from 2019, e-Navigation is “a comprehensive next-generation maritime safety management system

that shares all kinds of maritime information and data with other ships and onshore platforms in real time, by combining ship navigation and shipbuilding technologies with Information and Communication technology (ICT)”.

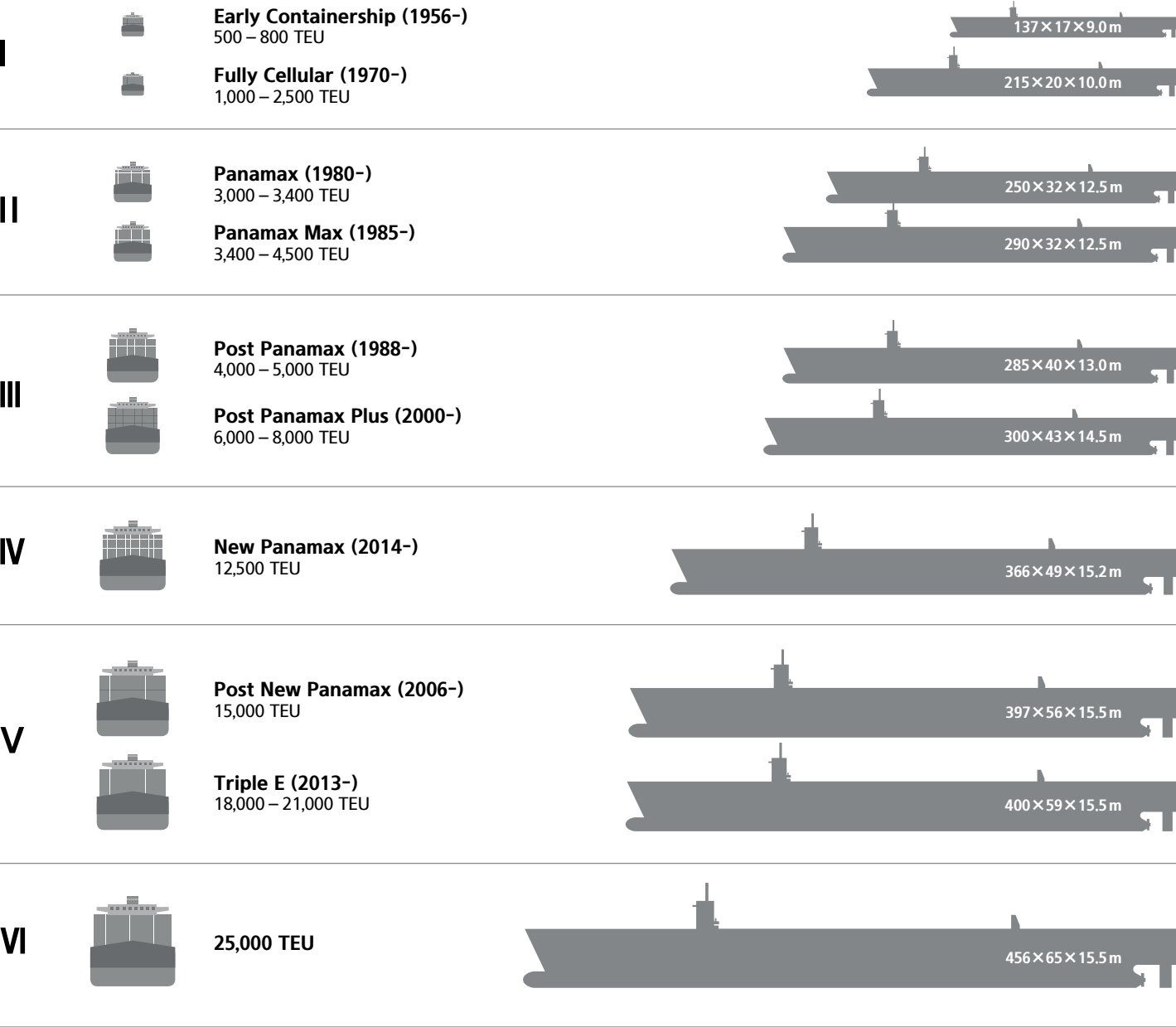
The e-Navigation system helps mariners sail safely by integrating and displaying a wide variety of electronic navigation equipment and devices inside the ships on the electronic navigation charts. In addition, e-Navigation not only confirms the ships' safety in real time through on-shore monitoring, but also supports the ships' operations by collecting and analyzing the data required for maritime safety.

As such, the introduction of the e-Navigation system covers both safety and efficiency by standardizing and internationally sharing maritime information. It is expected that e-Navigation will prevent maritime accidents by more than 30 percent and will also help with the integration of port operations. This includes speedy ship arrivals and departure procedures, as well as loading and unloading preparations, thus improving the efficiency of shipping, logistics, and transportation. **HHI**



# What will be The Maximum Size of Container Vessels?

Jeom Kee Paik



Given the international shipping industry’s need to lower operating expenditures, ship sizes have increased substantially in recent years and the capacity to carry more cargo increased in tandem at the same or lower costs. Container vessels have doubled in size over the last decade while total vessel costs per transported container have declined by approximately a third.

Increases in container vessel size have been long in coming. The average size of new container vessels delivered in the 1970s was 1,100 TEU but that figure had increased to 7,900 TEU by April 2015. At present the largest container vessel can carry 19,200 TEU, but vessels with capacities of more than 21,000 TEU will be operational in 2017. Some experts claim that cost savings will dry up at 24,000 TEU, but others are sceptical. It is thus important to consider the limits and possibilities of constructing ultra-large containerships.

Designs of vessels capable of carrying up to 21,000 TEU have been achieved primarily by expanding principal dimensions. Regulation requirements for strength have been met, but there have been deficiencies in terms of safety and structural weight, resulting in accidents such as the hull girder collapse of the 4,419 TEU containership *MSC Napoli* on January 18, 2007 and the 8,000 TEU containership *MOL Comfort* on June 17, 2013.

When traditional design codes and practices, materials, and maintenance procedures are used for vessels with new types of structures and purposes, safety problems are inevitable. Current ship structure design and engineering practices are prone to human error and uncertainties. As a result, the scantlings of structural members are sometimes too strong and at other times too weak. There is also deviation from the design requirements associated with goal-based standards and the occasional failure to follow common structural rules. In addition to functional requirements, health, safety, environmental and ergonomic requirements still need to be met to ensure

safe performance and integrity in extreme and accidental conditions.

In short, revolutionary design technologies are required to achieve both structural weight minimization, to improve fuel consumption and safety, and to ensure longer service life.

There is some doubt whether container vessels capable of carrying 24,000 TEU or above will achieve cost savings, given that up to 60 percent of current cost reductions in larger vessels are coming from more efficient engines rather than economies of scale. From another perspective, the OECD’s International Transport Forum (ITF) noted in its April 2015 report titled “The Impact of Mega-Ships” that larger vessels necessitate adaptations to port infrastructure and equipment and cause larger peaks in port traffic.

The ITF report suggested that the cost savings for the newest generation of container vessels are four to six times smaller than those from the previous round of up-sizing. Costs can actually increase at ports, the report suggested, because ultra-large container vessels contribute to congestion and add to the need for upgrades to bridge heights, river width/depth, quay wall strengthening, berth deepening and so on. Increased port income and savings to local shippers, importers and exporters may not outweigh these costs.

Yet, current increases in trading cargo volumes for particular routes will necessitate larger vessel sizes. As the World Shipping Council stated in a May 2015 article titled “Some Observations on Port Congestion, Vessel Size and Vessel Sharing Agreements,” capacities could grow up to 24,000 TEU or above.

Larger container vessels will certainly require ports to add infrastructure and make other operational adjustments, but the key benefit will be greater energy efficiency and less environmental impact. Most of the cost savings will come from reduced fuel consumption and thus lower CO2 emissions per TEU, which will meet environmental regulations.

As is also the case in aviation, sharing alliances in the shipping industry has brought economic benefits by allowing the customers of multiple liners to use the same larger vessels. Moreover, port congestion may not arise purely from increased vessel size. It seems more likely that larger vessels can be handled in more concentrated areas, creating efficiencies in stowage and sorting. Concentrating the cargo into fewer large vessels will also reduce supervision costs and improve operational capacity.

Despite the current challenges, it might be safe to say that ultra-large container vessels are the way of the future. **HHI**



**Dr. Jeom Kee Paik**  
Professor of Pusan National University and University College London  
President of the Korea Ship and Offshore Research Institute at Pusan National University



# Writing a New Mythology: HHI in Greece

Platon Son

The Greek mythology is known to have developed thousands of years ago from the Aegean Sea, which lies between the Greek and Anatolian peninsulas. The vast pantheon of gods seems to give life and significance to everything that’s Greek, from the ancient monuments that have now been reduced to rubble, to world-famous architectural wonders like Parthenon that still stands grandiose today. Moreover, being the source of the Western civilization as well as the Greek myth, Greece has been characterized by creativity, innovation and imagination. Hyundai Heavy Industries (HHI) is no

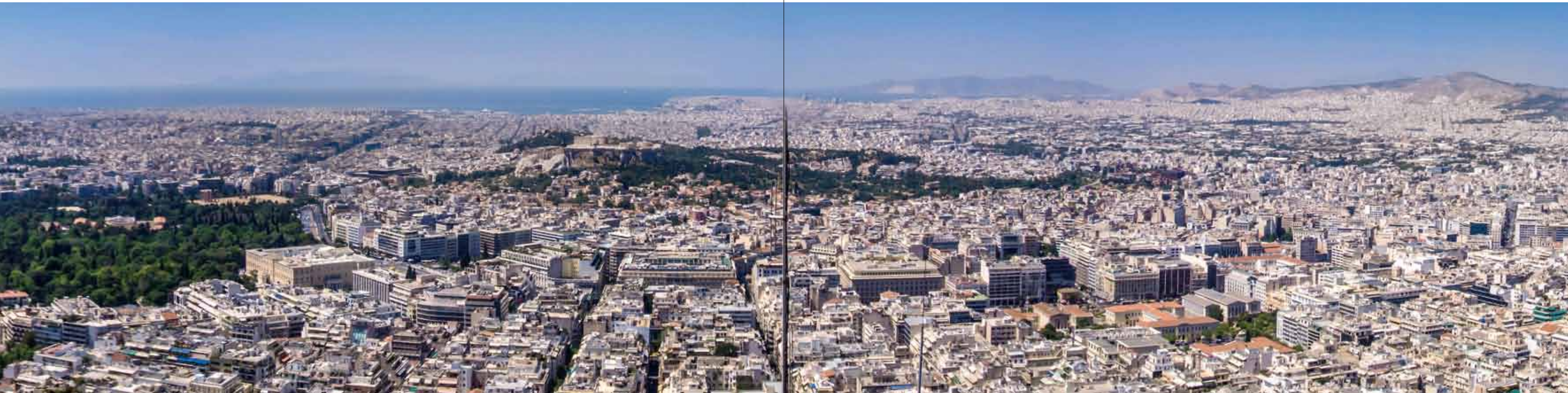
stranger to the Greek. Its very first ship order, which provided the seed money for what has now become the world’s largest shipbuilder, was placed by Mr. Georges S. Livanos, the incumbent owner of Sun Enterprises Ltd. and the brother-in-law of Mr. Aristotle Sokrates Onassis: Livanos ordered two 259,000 DWT crude oil tankers, impressed by the late Hyundai founder Chung Ju-yung who presented, in a classic attempt to win his heart, a 500 Korean won note bearing the picture of Korea’s first ironclad battleship. This milestone contract represents the start of the HHI mythology. Home to an 11 million population,

Greece has a flourishing tourism industry, with mountains covering 70 percent of its landmass and surrounded by 450 scenic islands. In particular, the country is indisputably the world’s shipping powerhouse with over 800 shipping liners in operation. Also, Greece and Korea share many in common, including geographical affinities, the history of foreign invasion, and the love of entertainment—maybe it is not a pure coincidence that HHI’s success stories started with the goodwill of a Greek owner. HHI Athens Office was founded on July 25, 1983. As of January 2015, HHI Athens Office

and Hyundai Mipo Dockyard (HMD) Athens Office were integrated, and now the integrated entity is responsible for marketing for new orders for HHI group’s five shipyards worldwide (namely HHI Headquarters, Hyundai Mipo Dockyard Headquarters, Hyundai Samho Heavy Industries (HSHI), HHI Gunsan and Hyundai Vinashin Shipyard), as well as after-sales management, to deliver impeccable customer service. The upmost priority of HHI Athens Office is to ensure a well-managed customer relationship, for which three ship sales officers and a local assistant comprise one team.

The office is situated near Paleo Faliro Beach that faces the Aegean Sea, providing easy access from Piraeus Port, Kifissia (old town center) and Glyfada (new town center) where a majority of shipping liners are located. Taking advantage of its geographical location, the office is also responsible for relationship management of ship owners in Southeastern Europe, including Italy, Turkey, Cyprus and even Israel. Through regular visits and interactions with various ship owners in a number of European countries, it has established a strong client network to enable the right response at the right time.

HHI Athens Office, since foundation, has attracted orders for about 440 ships starting with the bulk carrier newbuild orders of Ceres Shipping in October 1983, out of which 300 ships were successfully constructed and delivered by HHI and HSHI. By ship type, the newbuild orders since foundation to April 2015 consist of 150 tankers (including VLCCs and PCs), 65 bulk carriers, 50 container-ships and 40 gas carriers (including LNG and LPG carriers). Meanwhile, HHI Athens Office bagged an order for two 37,000 DWT product / chemical tankers from Thenamaris Ship Management in March 2000, and has since





HHI Greece Office, since foundation, has attracted orders for about 440 ships starting with the bulk carrier newbuild orders of Ceres Shipping in October 1983.

then received orders from Greece’s prestigious shipping companies for 80 product / chemical tankers, 20 gas carriers (including LPG and ethylene carriers), 30 bulk carriers and 6 pure car and truck carriers, tallying up to 140 ships which were constructed and delivered by Hyundai Mipo Dockyard. The long-standing relationship with Greek ship owners is not a mere coincidence, but an outcome of superb quality and on-time delivery, which is part of the myth that HHI is writing today.

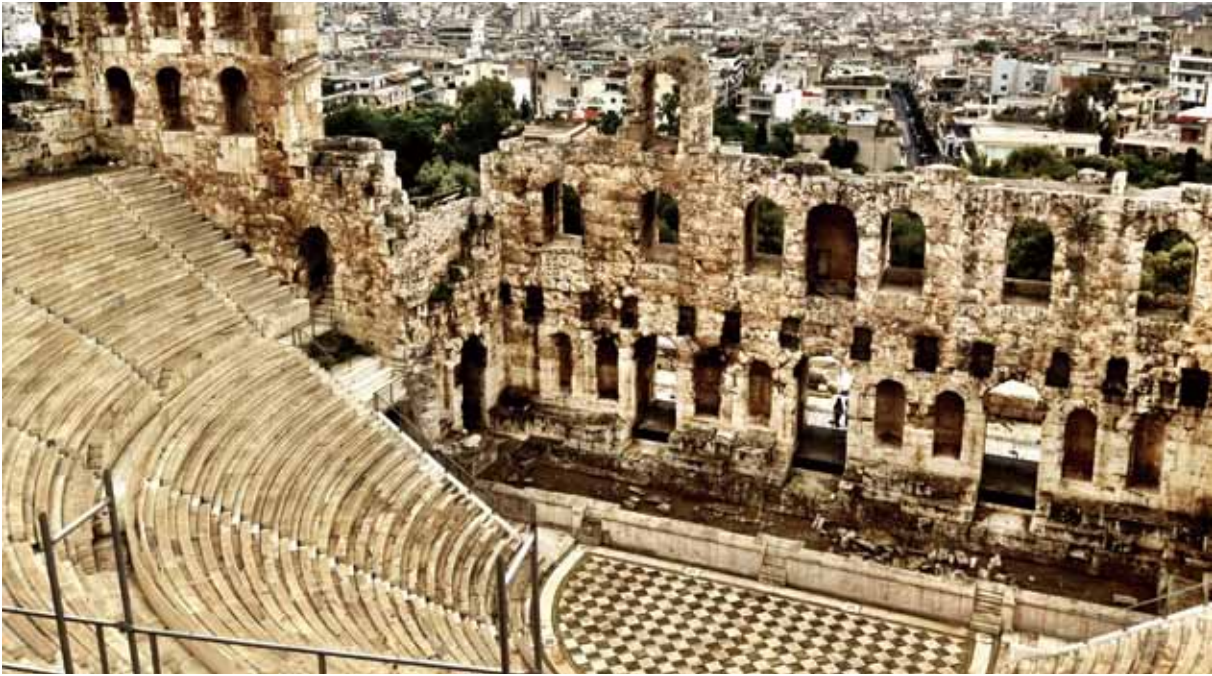
With Greece currently facing political and economic turmoil, it needs to be seen how major shipping lines will weather the

storm going forward. It is also true that HHI is feeling the strain of the global economic slowdown. From the beginning, the Greek ship owners and HHI were in the same boat, sharing the same fate. Adversities abound at times, but together they rode them over, the story of which became one important chapter of the shipbuilding and shipping history. There is no doubt that the epic tale will continue in the future, just like the Greek myths which have withstood the wear and tear of time and remain as solid as gigantic columns of the Parthenon. **HHI**

The writer is a manager at HHI’s Greece Office.



# The Odeon of Herodes Atticus, An Ancient Amphitheater Carrying The Culture of Ancient Greece



The ancient Greeks had a unique and thriving culture. Unlike other civilizations where mythological figures were mainly associated with dragons, monsters, and lightning, the Greeks believed that gods and goddesses resembled human beings. They were thought to have feelings that ranged from love to jealousy, causing them to wage wars against each other. Therefore, the ancient Greeks sculpted and painted such mythological figures and produced theatrical plays that told the stories of the gods, along with esteemed practices in the fine arts and architecture.

Not only were the actors and actresses important in ancient plays, but the songs sung by the choirs also played a significant part. Subsequently, the music had harmoniously developed with the plays. The ancient Greeks loved seeing the plays. Their popularity caused many theaters to be constructed throughout the empire, and the Odeon of Herodes Atticus is one of prime examples.

The Odeon of Herodes Atticus was built in 161 A.D. under the magnate Herodes Atticus (101-177 A.D.), a wealthy politician in Ath-

ens, in memory of his wife Aspasia Annia Regilla, who died in 160 A.D. Representing a story filled with romance and tragedy, the music hall was decorated luxuriously with marble and ceramic pieces. Later, the amphitheater was donated to the citizens of Athens, and has become a space to enjoy the arts and culture.

The ancient amphitheater of Herodeion was scientifically laid out so that the acoustics would reach everyone in the audience without added features. Although it is a colossal space that can accommodate up to 5,000 people, the sounds from the stage travel to the audience sitting in the front row, and to the back row, thanks to the engineering of the semi-circular venue.

Every year, the Athens & Epidaurus Festival is held from June to August in this majestic venue. Continuing a tradition that started in 1955, this Athens festival stages a variety of performances by different musicians, plays or classic films. Enjoy the arts and culture of modern Greece and take in the experience of ancient Greeks in the historical site. **HHI**





# Pressing The Road, Expressing Hyundai

## Hyundai Placed Home Nation in the Ranks of Automotive Powers

Shim Sung-won



There is a superhighway that many think played a key role in allowing Korea to cross the threshold into a developing economy from an underdeveloped country. And whatever you read about Korea's modern history, you cannot proceed without learning about the superhighway, along with three other names — Park Chung-hee, Hyundai and Chung Ju-yung.

It is well known that Hyundai Engineering and Construction Co. (Hyundai E&C), led by late founder Chung Ju-yung, ran parallel with South Korea's rehabilitation from the rubble of the fratricidal Korean War. However, not many know that Hyundai E&C's first major contract was to rebuild a bridge on the Nakdong River spanning the southeastern region of the country. The bridge was broken after witnessing a series of the severest battles during the early stage of the 1950-53 Korean civil war.

In 1957, Hyundai was hired to build five new bridges over the Han River that straddles Korea's capital city of Seoul, prompting the relentless Chung to aggressively bid on projects in which his company had little experience, compensating by hiring quick learners. Even though the contractor never built a highway, it was awarded Korea's first-ever overseas construction project, a \$5.2 million contract to construct the Pattani-Narathiwat Highway in Thailand in 1965. The project was successfully completed in March 1968, allowing Hyundai to learn a lot about building a large-scale highway like the Gyeongbu Expressway back in its home country.

The success in the Thai bidding meant that Chung was in the right place at the right time.

Chung lobbied the then President Park Chung-hee who was the virtual foreman when the Kyungbu highway was built, a product of a sheer "just-do-it" spirit at a time when the country had no capital, technology and know-how to build a highway. In this regard, Chung's ambition must have conformed to Park's blueprint drawn for a more prosperous Korea.

Visiting the West of the then divided Germany in 1964, the army general-turned-president Park Chung-hee was very impressed first with the so-called "Miracle on the Rhine," representing the economic re-

birth of West Germany from the debris of World War II and then with Bundesautobahn, or federal motorway. When Park returned home, he would often make sketches of road networks on a piece of paper whenever he had time. In 1967, for his presidential election campaign, he pledged to build a highway as a super corridor connecting Seoul and the country's largest port and second biggest city of Busan, a road that would transform the impoverished country to an industrialized one.

At the time, the term "highway" was unfamiliar enough to prompt many to raise their eyebrows when the government unveiled its ambitious, grandiose plans for nationwide land development and road construction in June 1967, shortly after Park was successfully re-elected as head of state.

The opposition party, spearheading the resistance, fervently dismissed the government move just as a plan to build a road for the excursions of the rich. "Why would a country with a GNP per capita of \$142 need a highway?" it protested. But Park did not give in. Without a penny in the budget, he mobilized military engineering squads and started building the highway between Seoul and Osan, three months prior to the official groundbreaking ceremony in February 1968.

### Faster, Cheaper, Stronger!

Proving that he is a master at achieving what he thinks he has to do, he won the bid to build the Gyeongbu superhighway, named after the first letter of capital Seoul's old name, "Kyungsung," and Busan, as it links the two metropolitan cities.

"Faster, Cheaper and Stronger!" This was a catchphrase during the construction of the Gyeongbu Highway. Construction started on February 1, 1968 and was completed on July 7, 1970. As mentioned before, opposition parties strongly objected to a highway whose construction cost was estimated at more than 40 billion won (\$46.6 million) at a time when the government's annual budget was only 160 billion won. However, the military-backed president made no bones about pushing ahead with the construction plan, even mobilizing the Army's engineer-

ing brigades at the very initial stage. Taking over a total of 9 million man-days and at the expense of more than 70 construction workers, the entire 428-kilometer economic artery was finally completed in 29 months.

"This is the outcome of the blood, sweat and determination of our people," the then President Park was quoted as telling an enthusiastic gathering at the opening ceremony of the Kyungbu Highway. "Through this project, we have proved our infinite capacity, energy and strength," Park continued. "Gaining such a sense of self-confidence has more meaning than the materialistic effects of the freeway."

Chung himself also beamed with pride when mentioning Gyeongbu Expressway. "Construction of the Gyeongbu Expressway opened up our country to modernization," he used to observe. That is, the highway, hailed as "the greatest of all the business founding fathers" created, still oversees the course of the country's miraculous economic advancement.

Under Chung's business motto that businesses had to work in concert with the nation and serve national interest, Hyundai won the government contract to construct such an unprecedented magnitude at a ridiculously low bid. More amazingly, Hyundai finished building Highway 1 within two years and five months. And so, the success incited Chung to expand his automobile arm, Hyundai Motor, beyond being just a subcontractor for American car brands as well as provoked Park to give the hungry tycoon a mission to build a real Korean car company. Reshaping the country to become home to a world-class automobile manufacturing conglomerate is also one of the most significant accomplishments the superb road has made to date. (For more on Hyundai's saga on the automobile sector, please refer to the Summer edition of the New Horizons.)

### More Pavements Toward Prosperity

The self-confidence Korea obtained from the successful construction of the Gyeongbu Highway encouraged the government to build other "backbone" freeways — Ho-



nam Expressway linking Seoul and the southwestern city of Gwangju (1973) and Yeongdong Expressway linking Seoul and the eastern city of Gangneung (1976). And these freeways definitely contributed to the birth of world-class steelmaker POS-SCO, the Yeocheon petrochemicals complex and other major industrial zones across the country.

This year marks the 45th anniversary of the country’s most treasured landmark road since it opened in July 1970. Many Koreans have walked through the historical, industrial and social implications of their very first expressway, which paved the way for the economic advancement that the country enjoys today. In addition, to celebrate the 40th year of the Seoul-Busan expressway’s completion in 2010, the state-run Korea Expressway Corporation published a collection of photos featuring major freeways in the country for distribution to universities and the National Assembly Library.

As most Koreans did not own a car when the highway was constructed, it was impossible to imagine the current traffic volume. New cities such as Pangyo, a mammoth-scale apartment complex, and Dongtan, an industrial district, have recently been created on either sides of the Gyeongbu Highway and Sejong City, the country’s de facto second capital city in the central Chungcheong Province, opened along the highway three years ago. As the speed on the highway has been getting lower, some people are proposing new ideas of building a double-decked highway or an underground highway in congested sections of the highway, in Seoul and its surrounding areas.

Currently, 33 inter-city expressway routes spanning more than 4,100 kilometers nationwide, form a web-like arterial road system with daily traffic of around over 4 million vehicles. The area connected by the freeway is home to some 60 percent of the nation's population and the generator of more than 60 percent of the nation's GNP and about 80 percent of industrial output.

In particular, many are now looking forward to the role the Gyeongbu Expressway is set to play as a section of the 20,557-kilometer (12,774-mile) Asian Highway 1 (AH1), the longest route of the Asian Highway Network (or the Great Asian Highway which is a 141,000 km network of roads running across 32 countries). The AH1 route links Japan, Korea, China, Hong Kong, Southeast Asian states, Bangladesh, India, Pakistan, Afghanistan and Iran to the border between Turkey and Bulgaria, west of Istanbul where it joins end-on with European route E80. Korea is also a part of the 10,475-kilometer AH6, which starts in Busan and stretches to the border between Russia and Belarus. The

project aims to make maximum use of the continent's existing highways, avoiding redundancy of establishing new ones.

As a matter of fact, life is one big road with lots of episodes and signs. Therefore, if you ride through the ruts, it’s best not to let it weigh you down. Chung perhaps followed this, daring to dive into a daunting task, the pavement of a road that proved to be so much more. He fled from hate, mischief and jealousy, refusing to bury his dreams and thoughts and thus making his vision a reality. Such self-worth of Chung and his Hyundai Empire still empower his fellow Koreans to drive on the Gyeongbu Expressway, dreaming of an even brighter path towards the future. **HHI**



The Gyeongbu Expressway (1970)

8,928,000<sup>Persons</sup>

Number of personnel involved during the construction period

1,650,000<sup>Units</sup>

Number of equipment units deployed during the construction period

16<sup>Companies</sup>

Number of companies

3<sup>Construction Engineer Corps</sup>

Engineering corps involved during the construction period

428<sup>km</sup>

Total length of Gyeongbu Expressway

KRW 42.9<sup>billion</sup>

Total working expenses

317

Number of bridges used for the construction

3,689,000

Number vehicles on the expressway at the time of its opening

34,000,000

Number of vehicles on the expressway in 1985

4<sup>Hours</sup>

Travel time between Seoul and Busan, shortened from six to four hours

# The Gyeongbu Expressway Construction In Numbers

The construction of the Gyeongbu Expressway, which stretches an astonishing 428 kilometers from Seoul to Busan, was carried out on such an unbelievable scale that it was called the largest-ever civil engineering project in Korean history. Written on the monument dedicated to the Gyeongbu Expressway, which was erected in the highest point as well as the midpoint between Seoul and Busan in Chupungnyeong, is the following phrase: “This road was completed in the shortest time frame in the world’s history of expressway construction, using only the financial resources and technologies of our country, in addition to the strength of our people.”

We streamlined the amazing record established with the Gyeongbu Expressway, whose construction began in February 1968 and which was deemed the largest project completed in the short period of three years. **HHI**

## Construction Period

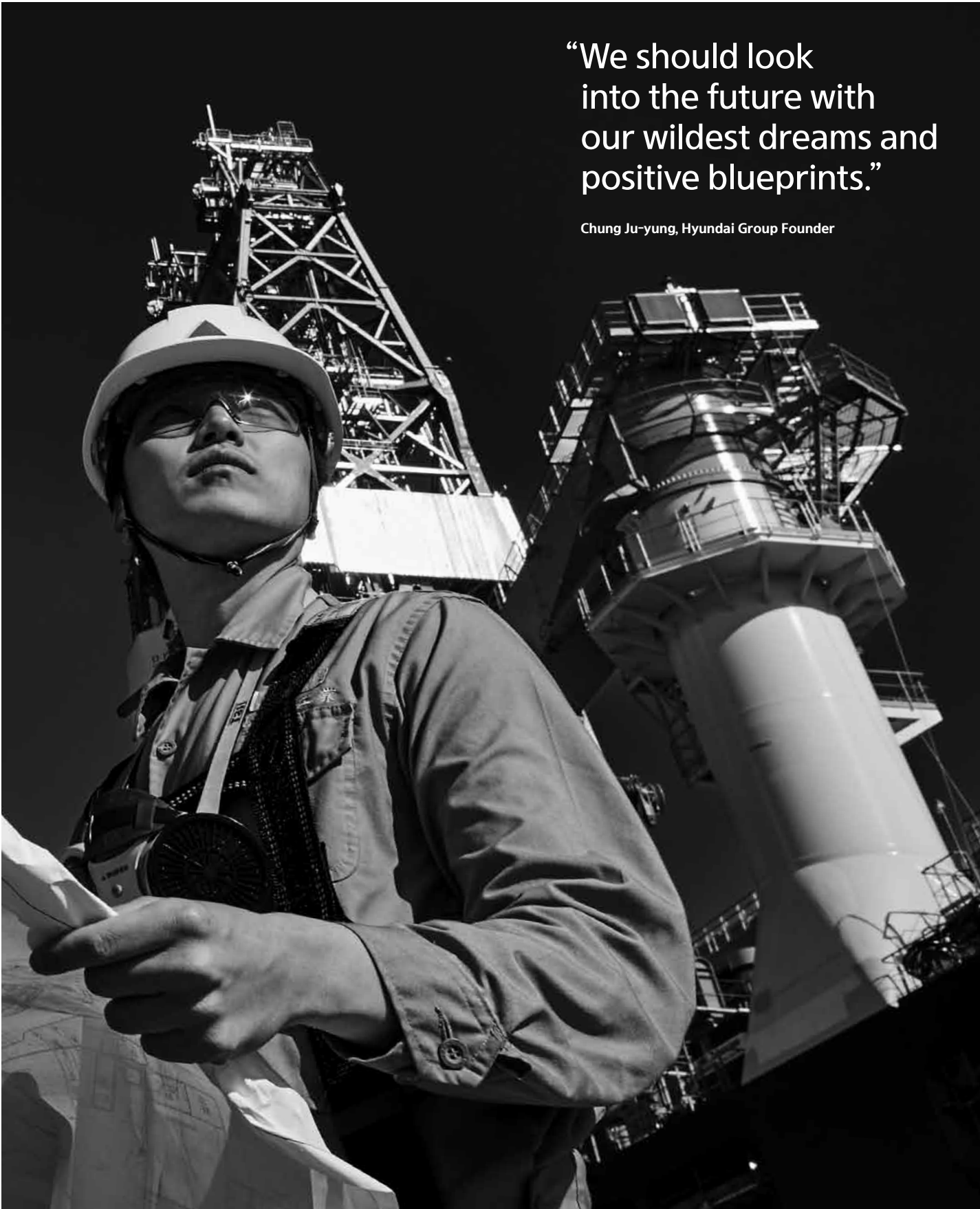
February 1, 1968 – July 7, 1970

## Opening Dates by Section

Busan – Daegu	122.1 km	December 19, 1969
Daegu – Daejeon	149.8 km	July 7, 1970
Daejeon – Cheonan	68.2 km	December 10, 1969
Cheonan – Osan	38.1 km	September 29, 1969
Osan – Yongin	14.2 km	December 30, 1968
Yongin – Seoul	23.6 km	December 21, 1968

\* Reference: Statics in “The Construction of Gyeongbu Expressway, The Main Artery of Korean Territory, Showing The Way (국토의 대동맥 경부고속도로 건설, 길을 보여주다)” by the National Archives of Korea (<http://theme.archives.go.kr/next/gyeongbu/roadStatistics01.do>)





“We should look into the future with our wildest dreams and positive blueprints.”

Chung Ju-yung, Hyundai Group Founder

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Jebel Ali, UAE	Tel 971-4-884-0566 Fax 971-4-884-0567
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Abuja, Nigeria	Nikorma Transport Ltd. Tel 234-9-460-85503 234-803-775-6984

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Al Khobar, Saudi Arabia	Hyundai Arabia Co., Ltd. Tel 966-887-7602

HHI Global Network





# Heavy Industries Happy Industries

Technology helps create the world that we dream of. Hyundai Heavy Industries pursues the happiness of the global community with its advanced technology. In the realm of heavy industries, our technology is everywhere, improving the quality of life and happiness of everyone. We are building a world of shared dreams.



Shipbuilding



Offshore & Engineering



Engine & Machinery



Electro Electric Systems



Construction Equipment



Green Energy