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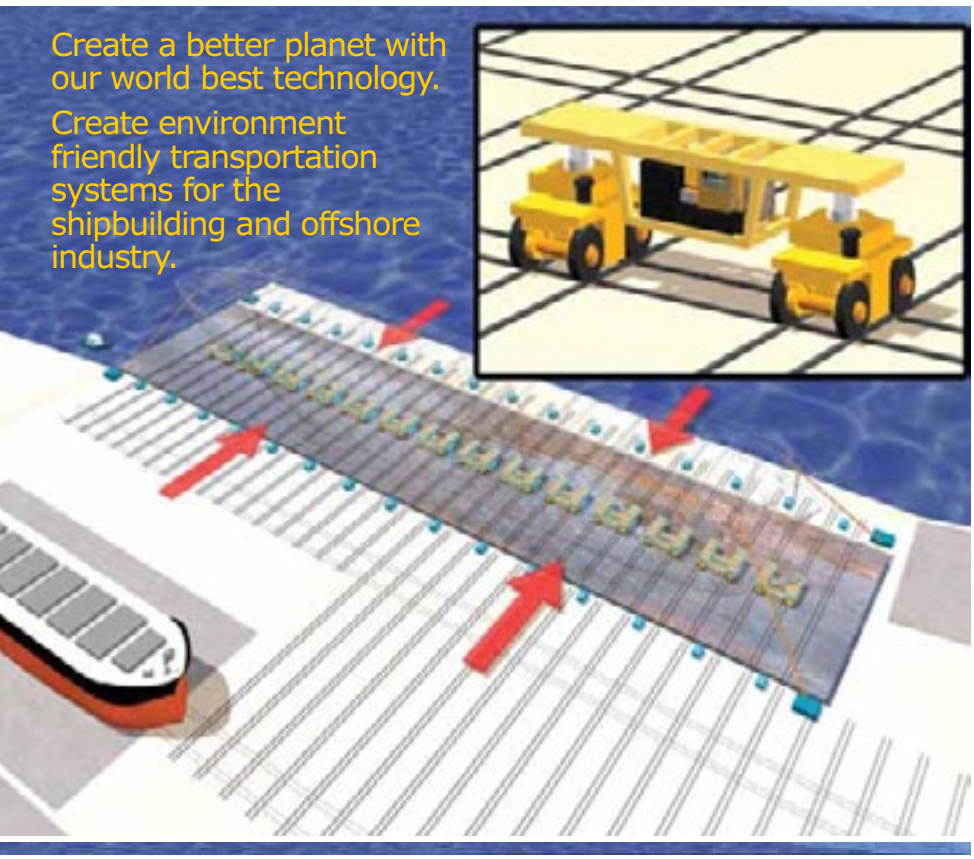

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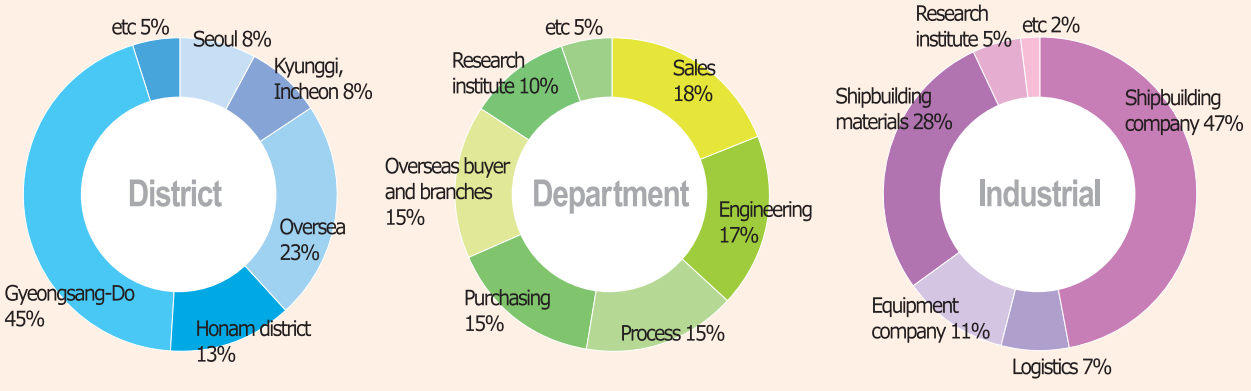

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Cho Young-bin, Managing Director of Dassault Systèmes Korea, was officially commended by the Mayor of Daegu Metropolitan City

Dassault Systèmes announced that Cho Young-bin, Managing Director of Dassault Systèmes Korea, was awarded a commendation from the Mayor of Daegu Metropolitan City on January 3 in recognition for his important contribution to the transformation of Daegu into a knowledge-based R&D city, advancement of 3D convergence industry, and development of local talents and expertise in research.

Cho Young-bin, Managing Director of Dassault Systèmes Korea, has played a leading role in relocating the global R&D center of Dassault Systèmes to Daegu and taken a supporting role in boosting the development and wider adoption of 3D PLM solutions for various domestic and overseas customers. In addition, he has focused on nurturing experts in the fields of 3D and PLM by leveraging on various collaboration projects that involve the industry and universities and developing highly effective training programs.

Moreover, he has been at the forefront of efforts to turn Daegu Metropolitan City into a knowledge-based R&D city and a hub of 3D convergence industry. Specifically, he has been actively involved in the supra-regional projects driven forward jointly by Daegu City, Gwangju City, and South Gyeongsang Province, which aim to impart fresh momentum into the development of 3D convergence industry, and serves as Chairman of Korea 3D Convergence Industry Forum.

The global R&D center of Dassault Systèmes, which opened in Daegu in 2010, has increased the number of workforce from 16 at the outset to 22 currently and plans to step up its recruitment drive in 2012. Dassault Systèmes headquarters dispatched 7 senior researchers to Dassault Systèmes' R&D center in Daegu, who provide technical guidance to local researchers. Particularly, Dassault Systèmes' R&D center in Daegu, which is dedicated to developing and supporting the solutions for the shipbuilding industry, has accomplished tangible results in just 1 year after its establishment. Specifically, it played a pivotal role in the partnership formed between Dassault Systèmes and Daewoo Shipbuilding & Marine Engineering (DSME) last year.

Dassault Systèmes is also taking an active and vigorous approach to developing local talents and expertise. In September 2010, Dassault Systèmes opened Dassault Systèmes Certified Training Center in Keimyung University, Dagegu, offering the best courses with excellent instructors. Furthermore, Dassault Systèmes Certified Training Center is open to the employees of other companies and students of other universities in the region, as well as the students of Keimyung University, which reflects Dassault Systèmes' full commitment to developing local experts in the fields of 3D and PLM. The clients and vendors in this region encourage the recruitment of local talents who completed the courses at Dassault Systèmes Certified Training Center.

Cho Young-bin, Managing Director of Dassault Systèmes Korea, said, "The unsparing cooperation of Daegu Metropolitan City has been the vital part for the early success of the global R&D center. We will work even more closely with Daegu Metropolitan City in our endeavor to help Daegu evolve into a hub of 3D convergence industry."

Cho Young-bin, Managing Director of Dassault Systèmes Korea, was officially commended by the Mayor of Daegu Metropolitan City on January 3 in recognition for his important contribution to the development of knowledge-based 3D convergence industry.

HHI set new record, winning its 34th World Class Product certificates

Hyundai Heavy Industries (HHI) added 3 products to its list of 'World-Class Products 2011', which brings the total number of HHI's World-Class Products to 34, the largest number nationwide.

HHI announced that its 3 products - a very large ore oil carrier (VLOO), LCD handling robot and flameproof motor - were selected by the Ministry of Knowledge Economy (MKE) as the World-Class Products on

HHI's VLOO, recently placed on the list of the World-Class Products

December 21. Thus, the total number of HHI's World-Class Products rose from 31 to 34. Moreover, HHI set a record for the most World-Class Products nationwide for 2 consecutive years in 2010 and 2011.

The VLOO, selected as the World-Class Product this time, is a combination carrier which was developed to effectively cope with the increasingly trend of diversification in freight transport demand and transport regions, and HHI is the world's only shipyard capable of constructing this type of VLOO.

LCD handling robot is a state-of-art robot deployed on LCD production line, transporting the plate, panel and glass, and incorporates excellent controlling, clean sealing, contamination prevention technologies. HHI is the world's third largest player in this field. The flameproof motor is an industrial motor, designed to withstand the explosion pressure and avoid exposure to flames in case of explosion inside the motor, and has captured 14% of share in the global market, the third largest worldwide.

HHI has received World-Class Product certificates for a total of 34 products including power generation system, large engines, excavators, etc, which illustrates HHI's dedication to developing technologies and expanding sales capability, since its first World-Class Product was selected with honor in the field of shipbuilding in 2001, the year when the World Class Product system was introduced.

An official from HHI explained, "An increasing number of our products have gained reputation in the global market for excellent quality and technology in the fields of offshore/plant, engine machinery, electrics /electronics, etc, as well as shipbuilding sector. It reflects that HHI has successfully made the transition to become a global powerhouse in the heavy industry sector."

HHI held a naming ceremony for its first ships of this year

Hyundai Heavy Industries (HHI) kicked off this year with its first naming ceremony for this year, taking the first step towards its delivery target of 93 ships for 2012.

HHI held the naming ceremony for its first ships of this year at its Ulsan offshore plant on January 6, which was attended by about 50 officials, including Gang Chang-joon, Chief of Marine Division of HHI, ship owners' delegates, etc.

The ceremony was held to mark the naming of the 2 units of 318,000-ton very large crude carrier (VLCC) ordered from the India-based GESCO (the Great Eastern Shipping Co., Ltd.) in April 2010, which were christened by the wives of the ship owner's officials. These ships were named 'Maneklal Ujamshi Sheth' and 'Ardeshir H Bhiwandiwalla', respectively, after the former owner and founder of GESCO.

The construction of ships, which began in May and July last year, respectively, was completed in about 8 months. One unit will be delivered to the ship owner after the naming ceremony, while the other unit is scheduled for delivery by mid February.

These ships, which measure 319m in length, 60m in width, and 30m in height, has a maximum speed of 16.3 knots (30km/h) and will operate around the world.

HHI set a target of delivering 93 ships for this year, including Aegis destroyers, very large containerships, etc, to maintain its leading position in the global shipbuilding market. Specifically, HHI aims to establish a high tech platform in the LNG-FPSO and subsea sectors to extend it reach into new markets and set a new milestone in the shipbuilding and offshore plant industries.

Meanwhile, HHI set a new order target of USD 23.6 billion (including the order intake of Hyundai Samho Heavy Industries) for this year, approximately 17% up from the previous year, in the shipbuilding and offshore plant sectors alone.

New organisational structure for Inmarsat brings renewed focus on core markets

Inmarsat has begun the process of including its subsidiary companies within a new organisational structure that will align the Inmarsat business more closely to core vertical market segments and continue to support both direct and indirect distribution of its services.

As of 1st January 2012, Inmarsat Solutions, led by Jim Parm, is responsible for Inmarsat's global direct and indirect sales and marketing delivery. Inmarsat Solutions now operates through four new market-facing business units:

-Inmarsat Maritime, led by Frank Coles, focusing on worldwide commercial maritime opportunities;

-Inmarsat Government US, led by Mike Wheeler, focusing on US government opportunities, both military and civil;

-Inmarsat Government Global, led on an interim basis by Ronald Spithout, focusing on worldwide (ie non-US) civil and military government opportunities;

-Inmarsat Enterprise, led by Ronald Spithout, focusing on worldwide enterprise, energy, media, carriers, commercial aviation and M2M opportunities.

These new global business units will be supported by a new group, Commercial Services & Support, which will provide cross-business unit services such as customer support, product and service management, channel development, commercial management and marketing communications.

The Stratos, Segovia, and Ship Equip operations are now providing their services within the relevant business units, and will use the 'Inmarsat' brand name.

Stratos, a global provider of mobile and fixed satellite communications solutions and one of Inmarsat's two largest distributors, was acquired by Inmarsat in April 2009; Segovia, acquired by Inmarsat in January 2010, provides secure end-to-end communication solutions in support of the US government strategic and tactical initiatives worldwide; Ship Equip, which provides VSAT maritime communications services to the shipping, offshore oil & gas and fishing markets, was acquired by Inmarsat in April 2011.

Despite the alignment of the Inmarsat group's direct and indirect sales activities into business units, Inmarsat does not intend to change its policy of distributing its services primarily through independent channel partners, comprised of its network of distribution partners and service providers with whom Inmarsat has worked successfully over many years. The Inmarsat restructure is expected to provide further support to independent channel partners through greater coordination between Inmarsat and its channel partners.

"Inmarsat has been delivering mission-critical satellite communications services for customers who operate beyond the reach of terrestrial networks for more than three decades," said Rupert Pearce, CEO, Inmarsat. "We have led the mobile satellite services market as a wholesale organisation. This restructure will build on that by bringing us closer to our partners and customers, making us more responsive to their needs and more efficient in the delivery of our services."

"It streamlines our decision-making process and focuses our activities on the primary markets we serve. It enables us to fully leverage our end-to-end capability - from managing the satellite network, to delivering solutions to end users through our highly-motivated channel partners who add global reach and value-added services to our core service proposition."

"Our goal is to grow Inmarsat's overall business through both direct and indirect channels. We are committed to continue working with our high-performing independent channel partners who can differentiate themselves with sector knowledge and experience. By minimising the overlap between the Inmarsat businesses, we can better target our investment into market development activities that benefit our entire distribution channel."

DSME held a commencement ceremony for students admitted to DSME Heavy Industry Training School

Dawoo Shipbuilding & Marine Engineering (DSME) held a commencement ceremony on January 5 for the high school graduates selected through open recruitment for the post of technical officer, which began in September last year as part of DSME's effort to identify and train the talented workforce and develop their skill to the level of an expert in the heavy industries and ultimately create a social culture focusing on professional competence rather than education background.

The commencement ceremony, held at DSME Heavy Industry Training School (formerly called 'Nammum Total Training Center'), was attended by Nam Sang-tae, CEO and President of DSME, government

and local officials such as Lee Yeoung-mahn, President of the DSME's Heavy Industry Training School, Lee Jae-pil, Minister of Employment and Labor, Jung Woon-chan, Chairman of the Win-Win Growth Commission, Yun Yeong, a member of the National Assembly, Gwon Min-ho, Mayor of Geoje, etc, as well as the 104 students who are the first batch of aspirants entering the Heavy Industry Training School and 400 parents of these students. The commencement event featured an introduction to the DSME Heavy Industry Training School, its courses, promotional movie footage, tour around the shipyard, etc, to help the parents have better understanding of the company.

DSME Heavy Industry Training School sent letters in September to the principals of about 2,300 high schools nationwide with respect to the open recruitment after the application process began. For effective recruitment process, DSME designated internal recruiters who were organized into 15 teams based on regions and directly visited about 700 high schools, offering recruitment sessions. The shortlisted candidates were announced in mid October. The internal recruiters made the rounds in 12 regions throughout the country in late November, and the names of successful candidates who passed personality and aptitude tests were announced in mid December.

The competition rate was 1 out of 32 in this open recruitment drive to hire high school graduates for the post of technical officers, which was launched for the first time in the shipbuilding industry. It heralded a change to the present Korean society which puts excessive emphasis on academic elitism and is extremely education-oriented to the extent that most high school students head to universities.

Particularly, this recruitment attracted the applications from students in many different types of high schools, e.g., special purpose high schools such as foreign language high schools, art high schools, North Korea student defectors, etc, as well as general high schools and specialized high schools. Successful candidates were selected from a total of 94 high schools located across the country including Jeju and Gangwon Provinces, and women accounted for 28% of all who made it to the final list of selected candidates.

DSME Heavy Industry Training School will offer orientation sessions to its first batch of 104 newcomers for 1 month following the commencement event, and have very specialized curricular tracks. The training programs are designed to develop expertise in occupational specialty in the global heavy industries, and include basic education courses such as liberal arts, social science, cultural studies, language, arts and physical education, etc, professional course such as design, engineering, production management, business administration support, etc, and practical learning courses.

The newcomers to DSME Heavy Industry Training School were hired as regular employees the moment the commencement ceremony wrapped up and will be equipped with practical work experience equal to or exceeding that of university graduates if they successfully complete the 7-year in-house and external training programs and thus will qualify for more benefits compared to university graduates.

Nam Sang-tae, CEO and President of DSME, remarked in the commencement ceremony, "I urge you to take pride in being a member of DSME, a company rooted in trust and enthusiasm. I will ensure that all of you become the nation's most excellent talents."

SSME reaffirmed determination at the top of Byeokbang Mountain to achieve business goal

Sungdong Shipbuilding & Marine Engineering (SSME) held a mountain-climbing event on July 7 to reaffirm the determination to achieve this year's business goal.

Joined by Ha Seong-yong, President of SSME, employees of SSME, Presidents of vendors, etc, this event which aimed to help boost inspiration to implement the company's business direction and plan for this year and lay the stepping stone for another great leap forward, epitomizes the fortitude to overcome the crisis.

During the business briefing session, held before the mountain climbing, Ha Seong-yong, President of SSME, announced 4 major business policies which would serve as the basis for key tasks and normalization of business with a specific focus on operational diversification to increase order intake, effective management system oriented towards quality improvement/revenue generation, systematic management environment conducive to outstanding per-

formance, promotion of corporate culture based on enthusiasm and self-initiatives.
They braved the freezing weather and reached the top of Byeokbang Mountain, located at an altitude of 650m and in the vicinity of the company, as part of effort to boost their courage and determination to restore the business condition and establish a leading position in the global market.
Ha Seong-yong, President of SSME, stressed during the mountain-climbing event, "Everything depends on the way you look at things. The transformation of company and society start with you and your mindset of taking the lead. Despite difficult business environment, innovation and transformation are ingrained in the DNA of SSME"
During the mountain-climbing event, employees of SSME placed the banners conveying the message of environmental conservation along the mountain trails and cleaned the surrounding area. In addition, they encouraged the participants by offering various events like the themed rest area for contemplating and refreshing, ballon-flying wishing the very best for the new year.

SSME held a mountain-climbing event on January 7, reaffirming the determination to achieve the business goal for 2012. The person dressed in black in the middle is Ha Seong-yong, President & CEO of SSME.

Anti-Freezer provides the best protection of pipes in industrial sites during freezing temperatures

Special attention needs to be paid during freezing temperatures in industrial sites because frozen pipes can result in work stoppage.
Anti-Freezer, a freeze protection apparatus developed by Sudo Premium Engineering, is the being considered as effective winter protection against pipe freeze-ups in frigid temperatures as the frost/freeze warning is issued for the industrial sites due to the cold wave sweeping the country.
This product was invented based on the fact that constant flow of the water helps to prevent the pipes from freezing. The temperature detection system, a patented technology, automatically sends the water out when the water temperature reaches the freezing point, thereby preventing the pipes from freezing. Furthermore, it does not require additional cost for maintenance or electrical power.
This new product does not pose any risk of fire that may be caused by overheating, short circuit, electrical leakage, unlike the hot-wires that have been commonly used to prevent freezing. It has the advantages of proven high reliability without malfunction even at 30°C below zero and is well accepted as a new solution to prevent freezing in large manufacturing plants and industrial facilities.
The pipes at the exposed point external to the shipyards or steel mills are at a relatively high risks of being frozen or bursting in winter.
An official from a shipyard said, "We had to leave a tap running to prevent the pipes from freezing or busting in winter. But now, we have installed the Anti-Freezer, an effective freeze protection apparatus, and dramatically reduced water consumption. Above all, Anti-Freezer makes it unnecessary to pay close attention to pipes during freezing temperatures and increases work efficiency as a result."
Previously, workers at a port facility in Pyeongtaek had to drain all water from the pipes and inject compressed air into the pipes for 3 hours every night to prevent the water from freezing in pipes which supply water to the ship. This Anti-Freezer helps save labor and costs at the same time.
An official from Sudo Premium Engineering said, "Anti-Freezer incorporates unique technology and has a proven reliability, and has been adopted fast in large industrial sites potentially vulnerable to major

Anti-Freezer installed at port

damage or loss caused by burst frozen or burst pipes. Furthermore, Anti-Freezer is being installed in residential facilities, village drinking water systems, etc, as well as large industrial sites. Its sales have quadrupled compared to the same period of previous year."

Anti-Freezer is also exported to many countries including France, Germany, Ireland, Italy, China, United States, Canada, and various sequel products are planned to be launched.

New Year Greeting Ceremony of Shipbuilding & Offshore Industries was held

'New Year Greeting Ceremony of Shipbuilding & Offshore Industries 2012' was held at Nurimaru in Busan on January 2, 2012. This ceremony, an annual event held in January, is co-organized by 7 organizations to appreciate the efforts of those in the shipbuilding and offshore industries and promote harmony and collaboration among industries, universities and research institutes.

This ceremony was attended by about 150 people including government officials, delegates from industry and research institutes, such as Vice-Minister Yoon Sang-jik of the Ministry of Knowledge Economy (MKE), Nam Sang-tae, Chairman of Korean Shipbuilding Industry, Park Yoon-so, President of Korea Marine Equipment Association (KOMEA), etc. Participants reaffirmed their determination to play a part in taking the shipbuilding and offshore industries to the next advanced level.

Vice-Minister Yoon Sang-jik of MKE said, "I urge the domestic shipbuilding and offshore industries to become the pillar of nation's industry also this year. The global shipbuilding and offshore markets will see even fierce competition, and the domestic shipbuilding and offshore industries will have to manage this crisis well and cement its leading position in the global market."

He added, "The government is paying close attention to the trends in the global shipbuilding and offshore markets and domestic shipbuilding industry. Large shipyards need to work closely with small and medium-sized shipyards to cope with difficult business environment. I hope that all those in the shipbuilding and offshore industries would solidify their determination to overcome obstacles and challenges and the government will also do the same throughout this year."

DSME completed the Indonesian submarine upgrade project

Daewoo Shipbuilding & Marine Engineering (DSME) successfully completed the submarine upgrade project and delivered the upgraded submarines to the Indonesian Navy.

DSME announced that it held a hand-over ceremony for 'Nanggala', a 1,400-ton submarine, at its Okpo shipyard on Geoje island in South Gyeongsang Province on November 20. The ceremony was attended by related officials of the company, officials of Indonesian Navy, etc.

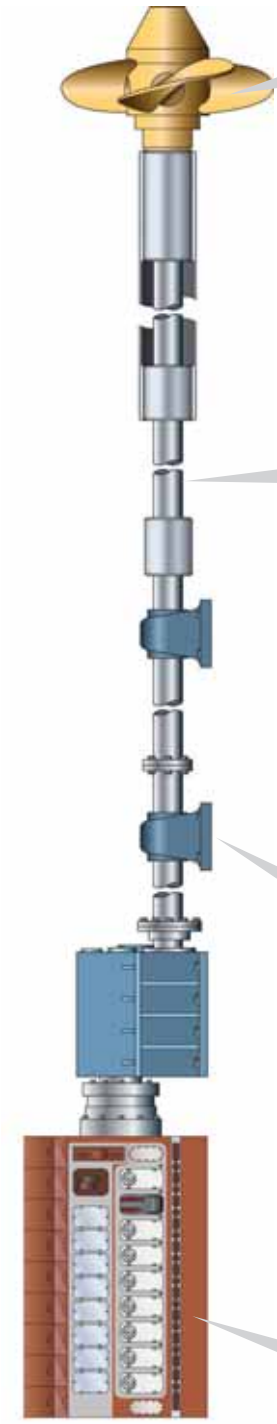
'Nanggala', which measures 59.5m in length and 7.3m in width, has a submerged displacement of 1,420 tons and surface displacement of 1,285 tons. It has the underwater maximum speed of 21.5 knots (approximately 39.8km/hr) and the surface maximum speed of 11 knots (20.4km/hr). DSME was awarded a project upgrading Indonesia's submarine in 2003 and contracted again for a project to upgrade Indonesia's 209 class submarine in 2009.

The hand-over and acceptance ceremony were held at the Trust Hall of DSME's Okpo shipyard on January 20. Chung Sang-wook (right), Director of DSME, Colonel Tunggul Suropati (middle), the chief supervisor of Indonesian Navy, and Gang Eui-hwan (left) of Daewoo International, are shaking hands in the signing ceremony.

This submarine arrived at DSME's Okpo shipyard on Geoje island in December 2009 and underwent overhaul for about 25 months which included the installation of new radar, combat system, sonar, etc, and involved cutting and disassembly of the hull and replacement of submarines' old equipments. DSME, which has completed 2 projects upgrading and overhauling Indonesian submarines, has gained trust with Indonesian government and won a submarine export deal which marked the first Korean export of submarine.

An official from DSME said, "The successful completion of Indonesian submarine upgrade project this time, following the first project of the same kind in 2006, reaffirms DSME's position as a global leader in submarine construction field. We will cement our leadership in the global submarine market by successfully building the 3 submarines ordered from Indonesia last year."

Marine industry moves forward thanks to laser precision alignment

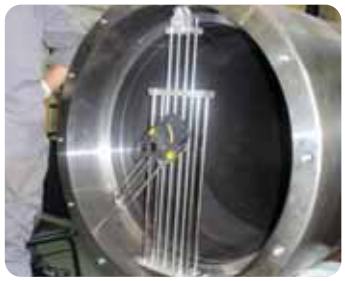


PROPELLER

LEVALIGN Ultra

STERN TUBE

CENTALIGN Ultra
(unmounted shaft)



LONG SHAFT

ROTALIGN Ultra
(mounted shaft)

CENTRALIGN Ultra
(unmounted shaft)

MAIN ENGINE

ROTALIGN Ultra
(mounted crank shaft)

CENTRALIGN Ultra
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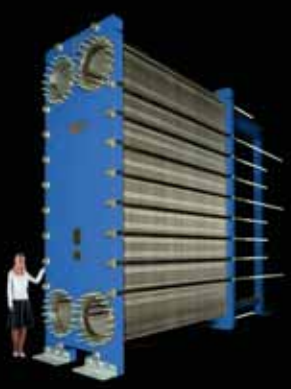

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Major domestic shipyards' plan for 2012

Major domestic large and medium-sized shipyards have established new business objectives and mapped out strategies that will shape their direction as 2012 dawned. The New Year addresses by the CEOs of respective shipyards imply that 2012 is expected to be much more challenging for the shipyards that strive to secure new growth engines and expand their internal capabilities amid the global economic downturn.

HHI is the world's top heavy industry Group

Hyundai Heavy Industries (HHI) marks its 40th anniversary in 2012. Lee Jai-seong, President & CEO of HHI said in the New Year address, "Year 2012 is a meaningful year that marks the 40th anniversary of HHI. HHI has overcome many adversities and made great strides over the last 4 decade based on the pioneering and challenging spirit of late chairman Jeong Ju-young. As a result, HHI has evolved into a total heavy industry Group operating in a wide range of sectors including refining/petrochemicals, international trade, finance, resource development, etc, as well as shipbuilding, offshore, plant, engine, electrics/electronics, construction equipments and green energy. HHI is poised to turn itself into the world's best heavy industry Group based on its achievements over the last 40 years."

Lee Jai-seong, President & CEO of HHI, mentioned that he expected that the business environment would be extremely unfavorable in 2012. He pointed out that the sustained global crisis in the wake of the Lehman Shock in 2008 increased the likelihood of global depression. In addition, he said that the exchange rate instability and drastic fluctuations in raw material prices, etc, were making the business environment unpredictable.

However, HHI has effectively surmounted difficulties through proper diversification of portfolios, advancement into new market, partnership with domestic and overseas companies, continuous technological development, etc, whenever it faced adversities such as oil shock, sluggish shipbuilding market conditions, financial crisis in the wake of IMF bailout condition, restructuring of affiliates, etc.

Lee Jai-seong, President & CEO of HHI, stressed, "Economic conditions are always fluid. We will be able to overcome all crises through wisdom and dedication, even if the business environment worsens. We will have to take countermeasures in agile and flexible manner by analyzing the ramification and spill-over effects of the rapidly changing business environment." For that, he called upon each business division to establish sales strategies tailored to the market environment, leverage the opportunities arising from changes in the markets, and effectively control and minimize business risks.

This year, HHI set a target of USD 30.6 billion in new order and KRW 27.6 trillion in sales, up 19.6% and 9.5%, respectively, from the previous year.

Lee Jai-seong, President & CEO of HHI, said that he would ensure effective financial management, strict management of whole cash flow in company, and focus on securing the working capital, so that the company can cope with the worst-case scenarios that can be envisaged for the business environment in 2012.

This year, HHI plans to take measures for collaborative business processes involving various business units in order to boost the synergic effect and map out the measures to create synergic effect with other affiliates of the Group. Moreover, HHI plans to solidify its leading position in technology which has been the backbone of its growth and maintain its competitive edge in productivity and sales.

Lee Jai-seong, President & CEO of HHI, identified the areas essential for achieving the goal of year 2012; strong growth engine, expansion of core capabilities, global business system, safe and pleasant workplace.

01 02

01. Lee Jai-seong, President & CEO of HHI
02. HHI's LNG-FPSO

First, secure strong growth engine.
HHI's growth engine consists of its core business that creates new revenue stream and the business that focuses on strengthening the future capabilities. The core business is vital for strengthening and maintaining competitive edge, while the business that focuses on strengthening the future capabilities will be indispensible for strengthening the market position and putting the new business early on track.
Second, expand core capabilities.
HHI will increase its core capabilities to dominate the market in rapidly changing business environment and maintain differentiated competitiveness advantage over competitors.
Third, establish global business system.
HHI will make full-fledged inroads into its target markets based on its global strategy and provide the products and services tailored to the needs of market and customers, while expanding its global business capabilities to effectively manage its position in overseas markets and drive forward its localization strategies.
Fourth, make the place safe and pleasant.
HHI will focus on increasing the awareness of the employees toward the safety and health and mature employer-employee relationship based on trust and cooperation.

Lee Jai-seong, President & CEO of HHI, said, "Reaching the age of 40 is called "bulhok," as quoted in a verse in the Confucian Analects, which means a point in life where a person is not disturbed by anything and is free from perturbation. Marking the 40th anniversary this year, HHI will make progress to achieve goal consistently."
He stressed, "This place, a barren sand field 4 decades ago, has become the site of the world's largest heavy industry Group. Let us write an chapter in our history by making concerted efforts."

DSME strenghens its offshore business

Daewoo Shipbuilding & Marine Engineering (DSME) recorded the second largest amount in its annual contract value in 2011 since its establishment, and exceeded the milestone of the KRW 10 trillion in sales and KRW 1 trillion in operating profit for 2 consecutive years, thus cementing its leading position in the global market.
DSME will keep a close watch on changing market conditions in 2012 as the financial crisis, such as the current Eurozone crisis, can recur despite recent upturn in new orders in the shipbuilding and offshore sectors amid slow recovery of global economy from 2010, and will not let down

03 04

03. Nam Sang-tae, President and CEO of DSME
04. Semi-submersible rig

its guard even after having beaten off the competition from Chinese rivals because the Chinese shipbuilders, supported by Chinese government, can overtake Korean shipbuilders anytime.

Nam Sang-tae, President and CEO of DSME, said in his New Year address, "I anticipate that tangible results will begin to show up from 2012, the second year of F1 and 2 strategy that started to be implemented in 2011. Currently, DSME is facing watershed moment for its transition from a manufacturing company to a total engineering company. We have to take initiatives to ensure successful transformation."

DSME has laid out 3 major business objectives for 2012 in order to meeting its target of KRW 4 trillion by 2020.

First, secure unmatched competitiveness in major business.

The shipbuilding and offshore sectors, the major business area of DSME, are seeing cutthroat competition, although the related markets have yet to fully recover. DSME's orderbook in the shipbuilding sector and offshore sector was split 5.5:4.5 last year, but the ratio is expected to change to 3:7 or 2:8 this year because its offshore business is likely to comprise larger portion. Thus, DSME is moving to further increase its technology capabilities vital for the development of next-generation products and secure competitive advantage in the offshore sector and enhance its cost competitiveness through effective management, while offering supportive system as total solution.

Second, secure future growth engines.

DSME will make full-fledged entry into offshore wind power market by developing new wind power products while focusing on winning orders for ships and offshore facilities used for offshore oil and gas exploitation. In addition, DSME will also make entry into the market for offshore plants and subsea sector, an untapped segment of offshore plant market. For that, the collaboration between the headquarters and affiliates for production and operations and globally competent manpower are essential.

Third, take the initiative in following those 2 business directions.

Nam Sang-tae, President and CEO of DSME, said, "This year, we will take up the issue of the company's disposal. However, we have to work in the belief that every one of us is the owner of the company, regardless of who becomes the shareholder. We have to take the initiative and actively cope with problem."

Besides, DSME will pursue co-growth with its vendors, overcome external challenges based on seamless communica-

tion and cooperation between the management and labor, and continue to fulfill its social responsibility. Additionally, DSME will adhere to ethical standards of management and put the workplace safety above all else.

Finally, Nam Sang-tae, President and CEO of DSME, put an added emphasis on safety in every day life. He said, "A variety of products will be built in the yard at a time also this year. We must take safety as no. 1 priority. Although the management and labor exerted a great deal of effort and raised awareness toward zero incidence workplace, we need to do more to achieve the goal of zero incidents in workplace."

STX pursues stable growth

Gang Deok-soo, Chairman of STX Group, presented 'responsible management' as the keyword of year 2012 in his New Year address, emphasizing stable growth with substance.

He said, "As the effects of the Eurozone crisis and global economic uncertainty will persist in this year, we must take the initiative and turn crisis into opportunity in the rapidly changing environment by putting the responsible management into practice."

Moreover, he presented the stable growth with substance as the key objective for year 2012, and put forth 5 major directions; growth in order intake and aggressive marketing, upturn in revenue based on innovation and efficiency, competitive edge in manufacturing, foundation-laying to achieve the Vision 2020, and manpower development.

Gang Deok-soo, Chairman of STX Group, urged all affiliates to fully leverage their resources and capabilities and gain firm foothold in strategic markets because order intake and sales are fundamentally important for all business activities and revenue creation. Additionally, he emphasized the need for securing manufacturing competitiveness to offer the best quality products and services that can fulfill the needs of customers while enhancing the profitability by drastically restructuring the business process.

He also urged all affiliates to lay the cornerstone for continued growth essential for achieving the Vision 2020 by increasing the efficiency and identifying new business opportunities. He also called upon them to put an increased focus on developing professional manpower who can take leading role for the future growth of the Group, like farmers prepare seeds for the upcoming spring.

For 2012, STX set a target of KRW 43 trillion in new orders and KRW 33 trillion in sales, which is up 43% and 14%,

05 06

05. Gang Deok-soo, Chairman of STX Group
06. LNG carrier

07 08

07. Choi Won-gil, President & CEO of HMD
08. Product carrier

respectively, from previous year. STX Group achieved KRW 30 trillion in new orders and KRW 29 trillion in sales last year.

Gang Deok-soo, Chairman of STX Group, said, "Special achievement requires special preparation. Let us do our best to ensure that our thorough preparation can lead to the results which we can be proud of."

HMD puts forth Global Leader Vision

Hyundai Mipo Dockyard (HMD) set an annual target of 83 ships worth USD 3.2 billion in new orders, KRW4 trillion in sales, and USD 3.2 billion in export. HMD plans to deliver 81 ships (excluding 18 HVSs) and improve productivity by 5%. Besides, HMD budged KRW 80 billion for securing new land and improving production facilities, etc.

Hyundai-Vinashin Shipyard (HVS) in Vietnam aims to increase productivity by 23.8% and achieve around USD 480 million in sales this year.

HMD announced the 'Hyundai Mipo Global Leaders Creating the Future' to achieve business objectives this year. It put forth its business direction for 2012, such as stronger competitiveness, creation of future growth engine, and safe workplace.

For that, Choi Won-gil, President & CEO of HMD, emphasized 4 things to employees.

First, expand the core capabilities.

HMD has built an extensive track record in newbuilding over the last decade and has emerged as the world's top producer of medium-sized ships.

Choi Won-gil, President & CEO of HMD, said, "As our strongest competitive advantage comes from the construction of high quality ships, we have to be fully committed to achieving the highest standard of workmanship."

Second, secure new growth engine.

The recent business environment is characterized by fierce competition that threatens the survival of company. Furthermore, many shipyards are faced with urgent situation as they are running out of work due to the steep drop in new orders and cancellation of orders amid the sustained global financial crisis. He pointed out the need for securing competitive advantage in technologies and production capability of high value-added vessels which are recently in high demand in order to overcome such difficulties.

Choi Won-gil, President & CEO of HMD, said, "We need to secure proper amount of work based on the principle of selection and concentration to ensure continued growth and development."

Third, stimulate the communication to deepen the trust.
Choi Won-gil, President & CEO of HMD, stressed, "The corporate culture in which employees assist and help each other like family is the most valuable intangible asset that makes a company strong. We will evolve into a company with unmatched competitiveness based on seamless communication and deep trust."
Finally, he put an emphasis on the harmony between labor and management and safety at workplace.
HDM which has seen no labor dispute or strikes over the last 15 years has an exemplary corporate culture that promotes coexistence between labor and management, has inspired hope and trust to customers and all people in Korea and has been vital for the growth of the company. He emphasized that its exemplary labor-management relationship model should be further developed into a model for the coexistence between labor and management.
Moreover, HMD plans to proceed with drastic reform and improvement of equipment and take safety as top priority in an attempt to make 2012 as the starting year of zero incidence.
Meanwhile, HMD predicts that 2012 will be a tough and challenging year and is making itself fully prepared to cope with difficulties arising from the current global economic downturn.
Choi Won-gil, President & CEO of HMD, remarked, "The late Chairman Chung Ju-young said that our prosperity is the nation's prosperity and the nation's prosperity means that we are prosperous. Let us keep that in mind and actively cope with difficulties."

SSME focuses on business normalization

Ha Seong-yong, President & CEO of Sungdong Shipbuilding & Marine Engineering (SSME), said, in his New Year address, "Imjin year is a combination of word 'Im' which means the water flowing from 10 celestial stems and black color and 'Jin' which means the dragon according to the Chinese Zodiac. Therefore, Imjin year means the Year of the Black Dragon that comes every 60 years. 2012 is a year in which the dragon that remained submerged in water for a long time ascends to heaven. Like the ascending Black Dragon, we have to overcome difficulties wisely and bring our business back to normal conditions this year."
SSME, nominated as defense contractor by the government in 2011, has upgraded its business structure and secured a new growth engine that propels the company into the defense industry, and has successfully entered the offshore

09 10

09. Ha Seong-yong, President & CEO of SSME
10. Containership

plant market when it was contracted for the construction of FSO (Floating Storage and OIffloading) units and shuttle bunkers. SSME was awarded a contract for 8,800TEU containerships in recognition of its excellent ability to build high value-added vessels, and has achieved remarkable results in terms of technology and productivity. Particularly, SSME won the USD 2 Billion Export Tower Prize in only 4 years after it delivered its first ship in 2007.

Ha Seong-yong, President & CEO of SSME, said, "We are faced with the most difficult crisis despite this splendid growth because we did not appropriately respond to the global financial crisis and the external and internal business environment. Furthermore, we will encounter many difficulties in the course of this year, such as unfavorable business environment both at home and abroad and gloomy outlook for shipbuilding market. However, we can bring our business back to normal conditions if all employees of SSME and its affiliates make concerted efforts."

He stressed, "Lately, creditors agreed upon the framework for normalizing the business of SSME and adopted the measure to bring our business back to normal conditions. Now, we have to normalize our business in 2012 and make this year as the starting point of sustained growth."

For that, SSME will drive forward 4 major strategies in 2012.

First, expand the capability to win orders by diversifying the business portfolio.

SSME plans to take revenue-based selective approach in winning the contracts based on the principle of selection and concentration, increase its capability to win orders and establish a supportive system for product development, production and contracting, while expanding its purchase capability in order to put itself in a better position to obtain orders.

Second, establish an effective business system with a primary focus on quality enhancement and revenue creation.

SSME plans to proceed with quality enhancement activities and improve its business system to effectively meet the requirements of customers, as well as focus on business innovation to strengthening competitiveness. In addition, SSME plans to ensure effective management of issues at hand or risks related to its business, inject fresh momentum into the effort to achieve steady growth by focusing on revenue creation and cash flow, and solidify its corporate image as a company at the forefront of transparent and ethical business management.

Third, establish the systematic business to create positive results, including performance-based personnel management system, business information system and others.

SSME will pursue simple and speedy performance-oriented systematic management rooted in business innovation, secure leading technologies to effectively fulfill the changing requirements of customers, and upgrade production system to ensure high quality, enhance competitiveness in technology and strengthen cost competitiveness.

Fourth, establish a corporate culture that encourages employees to take the initiative with enthusiasm.

SSME will pursue coexistence with vendors by playing a supportive role while establishing a corporate culture based on trust, cooperation, family-like solidarity, and spontaneous involvement. By doing so, SSME will enhance its external image and firmly establish a corporate culture oriented towards trust and cooperation, mature employer-employee relationship, and fulfill social responsibility.

Ha Seong-yong, President & CEO of SSME, said, "We have a freezingly cold winter, but spring is already right around the corner. I am sure that SSME will sail smoothly if all employees of SSME make concerted efforts with vigor and confidence to bring our business back to normal conditions in 2012." He added, "Let us joint in this endeavor with positive attitude and enthusiasm to turn SSME into a global leader."

SPP is in quest for qualitative growth

SPP Group achieved remarkable results in 2011 even amid economic downturn. SPP Shipbuilding captured over 50% share of global newbuild MR tanker market in 2011, the year of merger, even in the sluggish shipbuilding market, thus solidifying its leading position in the niche market.

The 3 Yulchon companies in Yulchon Industrial Complex in South Jeolla Province launched full-fledged operations. Particularly, another chapter in the history of SPP was written when the electric furnace of SPP Yulchon Energy became successfully operational.

2012 is a meaningful year for SPP Group which marks the 10th year since its launch of the shipbuilding business, the driving force behind its growth.

Lee Nak-young, Chairman of SPP Group, said in his New Year address, "We have gone through many adventures and challenges over the last decade. However, we emerged successful, and it was every one of you who played a leading role. I explored a range of strategies that will shape the future of SPP as 2012, a meaningful year, dawned."

11 12

11. Lee Nak-young, Chairman of SPP Group
12. Bulk carrier

He said that the sustained economic downturn may put brakes on the growth of SPP that has made significant strides thus far. He pointed out, saying "Now, we must pursue qualitative growth to strengthen our leading position, instead of quantitative growth that we have achieved over the last years. We have to strengthen quality-oriented business process and seize opportunities to achieve spectacular economic growth rates surpassing those that we saw in the past 10 years."

For that, SPP Group will focus on innovation and systematic business in 2012 to make further improvements on aspects that were overlooked previously.

Lee Nak-young, Chairman of SPP Group, stressed, "The key driver of SPP's growth in the past years was the recruitment of talented professionals who had extensive experience with advanced technologies. However, we had lukewarm enthusiasm for creating new things and accumulating unique technologies. It is time that we should drive innovation in our business process and emerge even stronger."

He urged all employees, whether they are executives or staffs, to adopt an innovative mindset in all areas ranging from production through design to management support, devote themselves to the transformation of SPP.

In addition, Lee Nak-young, Chairman of SPP Group, said, "The primary driving force behind SPP's growth is the value of human and professional manpower. However, we have to accumulate such value by establishing well-organized systems, as well as facilitate the transfer of relevant experience, to ensure continued enhancement of corporate value. By doing so, we can further elevate and maintain the value of company and SPP."

He noted that the quintessential aspect of systematic management is to swiftly respond to the changing environment and ensure efficient management of organization without reliance on human.

For that, SPP will systemize the whole business processes, map out strategies to cope with crises, and produce operation manuals designed to generate identical results.

Lee Nak-young, Chairman of SPP Group, urged, saying "We hold the key to our future. Let us plan and act when others are worrying about uncertain future, and reaffirm our determination and put it into practice."

Shipyards become even smarter

Domestic shipyards are stepping up the effort to build smart yard as LTE communication network is being rolled out. Hyundai Heavy Industries (HHI) and Daewoo Shipbuilding & Marine Engineering (DSME) signed MOU with SK Telecom in October and December of 2011, respectively, to set up the LTE-based Smart Work system and are making full-fledged move to turn themselves into smart yards.

Domestic shipyards are accelerating the pace to turn themselves into smart yards as LTE (Long Term Evolution), which is 5 times faster than current 3G connections, is ready to spread.

Hyundai Heavy Industries (HHI) signed a MOU (Memorandum of Understanding) with SK Telecom to set up a LTE-based Smart Work on October 20, 2011, and Daewoo Shipbuilding & Marine Engineering (DSME) entered into a MOU with SK Telecom to construct LTE network in a bid to build a smart yard on December 20 of the same year.

Shipyards usually need to transfer large quantities of high capacity data in order to check the design drawings, operation site conditions, etc, and furthermore, real-time collaboration takes on an added importance. 4G LTE network is 5 times faster than 3G network when downloading and 7 times faster in uploading, and about 2 times faster than WiBro (Wireless Broadband). Thus, 4G LTE network will further enhance efficiency.

HHI became the nation's first shipyard to build smart yard

HHI signed an agreement with SK Telecom at its Ulsan headquarters on October 20, 2011, to set up LTE communication network and embarked on a full-fledged effort to build LTE-based Smart Work.

Under the agreement, SK Telecom will build LTE communication network that covers the entire area (including the shipyard) of HHI' Ulsan headquarters occupying 6.15 million m^2 (approximately 2 million pyong) by the end of 2011 and supply LTE smartphone, the high-speed Smart Work device, to all employees of HHI.

As SK Telecom will set up 9 LTE base stations and 39 optical repeaters in HHI's Ulsan headquarters, HHI which has used the current 3G communication network for managing its logistics system, etc, thus far will be able to dramatically increase the efficiency of its work through the ultra high-speed transmission of massive data.

The 4G LTE-based Smart Work system will help ensure time-efficient communication between the site and office and the inter-site communication and enable ultra

HHI and SK Telecom entered into an agreement in a signing ceremony on October 20, 2011. The photo shows Ha Seong-min (left), President of SK Telecom, and Lee Jae-sung (right), President & CEO of HHI.

HHI's Ulsan shipyard

DSME and SK Telecom entered into a strategic agreement to build 4G LTE-based smart shipyard in a signing ceremony on December 20, 2011. The photo shows Park In-Sik (right), Executive Vice President and Head of Enterprise Business Division at SK Telecom, and Lee Yeong-mahn (left), Vice President and Director of DSME.

DSME's Okpo shipyard on Geoje island

high-speed transmission of large amounts of data, such as design drawings, etc, in the shipyard which is about 800 times larger than a soccer field.

Both companies expect that 4G LTE-based Smart Work system will dramatically enhance productivity of HHI, considering that email with high capacity graphic file or video clip attached can be exchanged instantly via smartphone and the ultra-high definition videoconferencing will be held frequently, as well as enable speedy management of various systems such as production, logistics, administration, etc. Moreover, HHI plans to introduce additional systems necessary to further improve work environment and work efficiency, etc, and speed up the adoption of the Smart Work at the Group level.

Lee Jae-sung, President & CEO of HHI, remarked, "We will cement our position as the world's best shipyard by actively responding to the rapidly changing communication environment and building IT environment optimized for sites."

DSME to become the nation's first to build LTE network

DSME entered into a strategic agreement with SK Telecom to build 4G LTE-based shipyard in a signing ceremony held on December 20, 2011 at its Okpo shipyard on Geoje island and is poised to set up the ultrafast generation LTE-based Smart Work system.

Under this Agreement, SK Telecom will build LTE communication network that covers the entire area of DSME's shipyard occupying 4 million m^2 (approximately 1.21 million pyong) by the end of 2011 and supply the ultrafast smart LTE smartphones and tablet PCs to the executives and major personnel. In addition, the company will supply these mobile devices to all employees of DSME by 2012 as the pilot project makes transition to main project. SK Telecom will set up 10 LTE base stations and 40 optical repeaters throughout DSME's Okpo shipyard on Geoje island. Thus, DSEM has become the first shipyard nationwide to build the smart shipyard communication environment solely based on LTE network.

Having signed this MOU, the LTE-based network will enable DSME to manage various systems such as production, logistics, administration, etc with greater efficiency, manage the quality control in real time, and track surplus materials related to the offshore sector, etc. Furthermore, the LTE capabilities will enable the email with high capacity graphic file or video clip attached to be exchanged instantly via the smartphone and also allow ultra-high definition videoconferencing to be held frequently.

Special works related to the shipbuilding will become much easier. Previously, the real-time quality control to ascertain whether the ship is being built according to the design drawing involved a complex process wherein the QC (Quality Control) and ship owner's inspector compare the design drawing and the site, affix their signature to the inspection documents and return to the office to save the photos and documents on computer. In contrast to that, photographing, signing, and saving the data on computer can be completed instantly via the tablet PC, thus dramatically saving the time and shortening the procedure.

Lee Yeong-mahn, Vice President and Director of DSME, said, "The LTE technology will be vital for enhancing the safety and efficiency of production site and reinforcing the competitiveness of DSME's products. We will fully leverage the smart shipbuilding system to evolve into the world's best total heavy industry Group."

Bird's eye view of Hyundai FLNG which was developed independently by HHI and recently received AIP from DNV

Hyundai LNG-FPSO, Korea's first indigenous model

Hyundai Heavy Industries (HHI) announced that it developed the nation's first LNG-FPSO with its pure technology and received Approval In Principle (AIP) from the Norwegian certification group Det Norske Veritas (DNV). Thus, HHI has become the world's only company capable of independently designing and building LNG-FPSOs.

Hyundai Heavy Industries (HHI) completed development of its own LNG-FPSO (Floating, Production, Storage, and Offloading) for the first time nationwide, injecting fresh momentum into its efforts to make inroads into the market for high value-added offshore plants.

HHI announced that its Hyundai FLNG received the Approval in Principle (AIP) from the world-renowned Norwegian certification group Det Norske Veritas (DNV) on January 5.

LNG-FPSO is a floating offshore facility which can preprocess, liquefy, store and offload the crude oil from deepwater gas fields at -163°C. Hyundai FLNG measures 355m in length, 70m in width, and 35m in height, which is 3.5 times larger than a soccer field, and has an annual production capacity of 2.5 million tons of LNG and storage capacity of 193,800m^3 of LNG. In particular, LNG-FPSO consists of hull with the floating production and storage units and the topside with the preprocessing, liquefaction and offloading units. Having successfully developed this Hyundai FLNG, HHI has become the world's only company capable of independently undertaking EPIC (Engineering, Procurement, Installation, and Commissioning) which encompasses the entire processes ranging from the design to the test-run of the topside and hull.

Hyundai FLNG demonstrated perfect turret mooring performance, rotating around the turret in response to the winds, tides and waves, in the simulated marine environment with the most violent

weather conditions of the last century and proved to have high stability with the operational rate of 93% exceeding that of onshore plants in a mock-up testing conducted in the wave tank facilities at MARIN (Maritime Research Institute Netherlands) in late 2011 for the AIP.

Turret mooring allows the vessel to rotate and adopt the optimal direction of the least resistance to the combined forces of wind, waves and tides. The rotating part of the mooring structure is the turret connected to the mooring cable. Recently, the turret mooring system is being used on FPSOs in the deepwater oil fields.

The market for LNG-FPSO - deployable in about 2,400 small and medium-sized offshore gas fields worldwide with reserves of 100 million or less, as well as large offshore gas fields - is expected to steadily expand, considering recent surge in demand for natural gas amid sustained high oil prices and concern over the safety of nuclear power in the aftermath of Japan's nuclear disaster.

Kim Yoon-chun, Senior Vice President of HHI in charge of the LNG-FPSO development, said, "Hyundai FLNG has cost-effective and efficient production capability and its construction can be completed fast within about 45 months. We will make vigorous efforts to increase our orderbook as small to medium-sized gas field and large gas field exploitations expand."

HHI has an extensive track record of building 11 ultra large FPSOs, the largest number worldwide, and unmatched expertise in LNG projects. In June 2011, HHI won an order from the Norway-based Hoegh for the construction of the world's first LNG-FSRU.

Meanwhile, HHI was designated in June 2011 as the core organization by the LNG Plant R&D Center under the Ministry of Land, Transport and Maritime Affairs to undertake development of design/construction technology for LNG-FPSO plants with an objective of developing indigenous LNG-FPSOs by 2016.

DSME Construction exceeded the KRW 1 trillion milestone

DSME Construction joined the '1-trillion-won club', registering a total of KRW 1.06 trillion in annual contract value. The company won KRW 770 billion worth of orders in construction sector and KRW 290 billion worth of orders in civil engineering sector last year.

DSME Construction has a robust and well-balanced orderbook that consists of public construction projects worth KRW 390 billion (including the contract to build apartment complexes for Korea Land and Housing Corporation and the construction project for Korea Housing Guarantee Corporation), social overhead capital (SOC) projects worth KRW 240 billion, and private-sector construction projects worth KRW 430 billion project (including the contracts to build Elcru apartment complex in Sacheon and Knowledge Industry Center building in Chungmuro).

DSME Construction's orderbook has tripled since 2008 despite sluggish construction market still reeling from the global financial crisis. Riding the momentum of growth, DSME Construction set a target of KRW 1.21 trillion in new orders and KRW 5.1 trillion in sales for this year and is focusing on further expanding its sales capability and increasing order intake from global market. Last year, DSME Construction participated as shareholder in Raintree PM which was set up jointly with funding from construction companies, financial institutes, etc, under the leadership of Korea Asset Management Corporation to speed up disposal of soured property financing (PF) loans. DSME Construction was granted the priority right to bid for multiple projects and is the priority negotiator on several projects.

In addition, DSME Construction is vigorously proceeding with the construction of shipyards, ports, and rear complexes in countries where DSME, its holding company, has made inroads. Particularly, DSME Construction is carrying out the first phase in the construction of the accommodation facility (total project value: KRW 90 billion) for the managers of Oman Repair Yard in cooperation with local company. Furthermore, DSME Construction is currently moving to win orders from Zvezda Shipyard of Russia, Salalah Airport of Oman, Paenal Shipyard of Angola, etc.

A world leader in renewable energy

DNV has acquired 74.3% of KEMA's shares, creating a world-leading consulting and certification company within the cleaner energy, sustainability, power generation, transmission and distribution sectors.

DNV and KEMA will form a world-leading energy consulting, testing and certification company that can drive the worldwide transition towards a safe, reliable, efficient and clean energy ecosystem. DNV KEMA will consist of all 1,800 KEMA employees and 500 employees from DNV's renewable energy and sustainability activities. The new company will be led by Thijs Aarten, the CEO of KEMA, and headquartered in Arnhem, the Netherlands. Mr Aarten will report to a Supervisory Board chaired by DNV CEO Henrik O. Madsen.

"By joining forces, 2,300 experts will meet the needs of an industry in rapid transition and growth. The combination of cleaner fossil-fuel-based power generation and the increased use of renewables will truly make a global impact. This is the strategic rationale behind DNV's biggest investment ever which, along with DNV's other 8,000 employees engaged in supporting our maritime, oil & gas and other customers, makes DNV a leading global player in third party and technical advisory roles," said Leif Arne Langøy, the Chairman of DNV's Board of Directors.

Henrik O. Madsen, CEO of DNV

Strategic and cultural match

KEMA's activities are highly complementary to those of DNV's existing renewable energy and sustainability businesses and all these activities will be integrated to form one compelling service offering to the global energy sector. Services will cover the entire energy value chain from energy source to end user, including wind energy, carbon capture and storage, carbon trading, energy efficiency, power generation, transmission and distribution, and energy-related testing, inspection and certification.

The global energy sector is heading for significant changes and investments. The International Energy Agency (IEA) estimates that USD 10 trillion will be

spent between 2010 and 2030. Stricter environmental regulations and increased fuel costs will drive a transition towards cleaner fossil fuel and more cost-effective power generation. This transition, including that towards integrating more renewable power into the energy grids, will require system-wide changes. In the US, Europe and Asia, the shift is already under way and will be partly supported by the introduction of smart grids or intelligent energy networks.

"In DNV, we have found a solid, innovative and international partner that has the same strategic vision, purpose and values as our company. For decades, KEMA has been a highly respected global energy consultant and provider of energy-related testing, inspection and certification services. Both KEMA and DNV have strong traditions as independent leading players with world class technical and business knowledge and growth ambitions," said Thijs Aarten, the CEO of KEMA.

"Over the past two decades, we have become a leading certifier and technical adviser on renewable energy. But to fulfil our ambition of really impacting our customers' transition towards a low carbon economy we need to also provide independent certification and technical advice to the power generation, transmission and distribution sector. KEMA is globally recognised in this mission sector and is thus a perfect strategic fit," said Henrik O. Madsen, the CEO of DNV.

"Through organic growth and acquisitions, we have built significant capacity relating to renewable and cleaner energy, such as wind and solar energy and carbon capture and storage. In addition, DNV has recently developed power transmission and distribution capabilities, a field in which KEMA is already a global leader. The acquisition of 74.3% of KEMA's shares is a huge step towards achieving our ambitions and widens our portfolio, which includes our traditional maritime and oil & gas businesses," said Mr. Madsen.

"DNV KEMA's core markets are in Europe, North America and China and the new company will benefit our customers by providing them with a broader portfolio of services across the entire energy value chain," added Mr. Aarten.

While DNV becomes the majority shareholder with a 74.3% share, Alliander retains its holding (25.4%) as does Cogas (0.3%). The transaction is subject to the approval of the US, Dutch and German competition authorities.

Targeting the small and medium market with mid range solutions

Rockwell Automation Korea opened this year's first media event at its headquarters in Seoul on January 10, which was attended by its major officials and magazine journalists specializing in related fields. The company announced that it would make aggressive inroads into the market for the mid range integration architecture system this year.

Rockwell Automation Korea held a media roundtable event on January 10, attended by its major officials, including Choi Seon-nam, President of Rockwell Automation Korea, and magazines journalists specializing in automation and related fields. During the event, Rockwell Automation presented its achievements in 2011, new products slated for release in 2012, its major strategies and others.

Media roundtable event held at the headquarters of Rockwell Automation Korea on January 10

Strong growth in 2011

Choi Seon-nam, President of Rockwell Automation Korea, commented, "Rockwell Automation Korea achieved USD 6 billion in sales, up 22% from the previous year, spurred by the strong growth in Asia Pacific region, the fastest-growing region in the world. Specifically, we achieved a remarkable growth rate of 31% in Korean market compared to the previous year, outpacing the growth in China and India."

This splendid performance of Rockwell Automation Korea was driven by the balanced revenue stream from the products and solutions, such as control product lineup and inverter, etc, and services, and the fast growth that the company achieved in various industries including LCD glass, automobile and tyre, general industrial machinery, steel, EPC, and other sectors. Another contributor to the remarkable growth of Rockwell Automation Korea - which has strength in the control sector - is the strong performance of the company in the field of motor control center (MCC) integrating the control and power in a way tailored to the requirements of customers who prefer solutions to simple products.

Choi Seon-nam, President of Rockwell Automation Korea, added, "We have fully leverage our in-house programs, such as the leadership training and workshop, etc, designed to develop professional manpower and expertise over the last 3 years as part of effort to inject fresh momentum into our business growth."

Rockwell Automation Korea set a higher target which is 22% higher compared to the previous year and is poised to aggressively target new markets such as the EPC sector, etc, by actively proceeding with the headquarters' 3 global business strategy, i.e., Plant-wide Optimization, Sustainable Production, and Machine Builder Performance.

New growth engine

Lee Soon-yeul, Director in charge of Marketing, said, "Recently, rebalancing has become the keyword for the world economy. Rockwell Automation is moving to seize opportunities to dominate emerging markets. Specifically, Rockwell Automation Korea has recently increased investment in facilities and R&D in emerging markets such as Asia, East Europe, etc, and takes proactive approach throughout the product development process to fully meet the requirements of emerging markets,

Choi Seon-nam, President of Rockwell Automation Korea

Employees of Rockwell Automation who attended the media roundtable event. The photo shows Deputy General Manager Choi Tae-neung, General Manager Nam Soo-hyeok, Keith Mcpherson, General Manager Yoo Woo-yeul, General Manger Chung Jeong-joo, Deputy General Manager Park Min-hyeon, and Director Kim Sang-soo (from the left).

unlike the previous years when we placed primary focus of business on advanced markets."

Currently, Rockwell Automation Korea is offering products and solutions suited for advanced markets and emerging markets. The company can fully meet the requirements of both productivity-oriented advanced markets and emerging markets making transition to an advanced level. Lee Soon-yeul, Director in charge of Marketing, explained, "The key driver behind the growth of Rockwell Automation Korea will be the process solution founded on the Logic platform and integrated architecture, equipment manufacturing, safety and manufacturing information system, solutions for consumer goods and food businesses in emerging markets."

The prevailing trend in current automation market can be summarized as the supply chain, productivity, and sustainability, while general customers put an added emphasis on overall optimization of plants, productivity enhancement, and sustainable production. Rockwell Auto mation is well positioned to adapt to these trends of automation and fulfill the requirements of customers based on its wide range of products and solutions that include controller, visualization & software, intelligent motor controller, industrial networks, safety, control components, and service solutions.

Many new products slated for release in 2012

Nam Soo-hyeok, General Manager, said, "We will give priority to customer value and add more capabilities to new products. This year, our key focus will be the dualization that supports high availability solutions covering both I/O and top level servers."

Park Min-hyeon, Deputy General Manager, remarked, "This year, mid range products will be a theme thrust to the limelight. New mid range system control platform will enable high performance small and medium applications."

Rockwell Automation plans to launch a variety of mid range solutions, such as scalability, Allen-Bradley CompactLogix PAC, servo drive, I/O, visualization, simplification tools, etc, this year. Compact Logix 5370 products, which incorporate the embedded switching technology, support DLR enabling continuous production even when network is disconnected. CompactLogix 5370 L3, launched in January, is optimized for both simple system and small-to-medium complex equipment. CompactLogix 5370 L1 optimized for small OEM equipment will be rolled out in February, and CompactLogix 5370 L2 will make debut in May.

In addition, Rockwell Automation Korea will release Kinetix 6000M/DM in March after it launched Kinetix 350 Single-axis EtherNet/IP servo drive. Kinetix 6000M/DM integrates drive and motor and can reduce the panel size by up to 70%.

Yoo Woo-yeul, General Manager, said, "Rockwell Automation Korea has invested over KRW 500 billion in the PlantPAx process automation system over the last 5 years. This year, we will launch

PlantPax 2.0. PlantPax's high availability, device integration, asset management, design productivity, batch and sequence scalability will allow plants to achieve optimization."

Kim Sang-soo, Director, said, "GuardLogix L7S, which we will launch in upcoming April, is an integrated safety product featuring the command to handle analogue input, along with the drive providing safety capability, and the enhanced hardware power component. We plan to expand our focus to safety based on consulting approach beyond products."

He added, "The upcoming release will include the large capacity air-cooled inverter incorporating heat-pipe technology, and high voltage inverter for marine application. Moreover, we will hold seminars and roadshows of varying intensity and size and strengthen EtherNet/IP based intelligent MCC business."

The intelligent MCC can maximize the time available to the production line through accurate prediction and preservation. Based on that, Rockwell Automation will bring the focus of its sale to oil/gas and petrochemical fields and actively target domestic EPC companies striving to win contracts abroad.

High voltage inverter for marine application - PowerFlex 7000 medium voltage marine drive

Main propulsion and thruster systems are among the most costly - and energy-intensive - applications aboard vessels. With power ratings from 600kW to 24MW, the liquid-cooled PowerFlex 7000 marine drive provides the soft-starting and variable speed control to significantly improve energy efficiency. At the same time, these drives implement advanced intelligent motor control technology to enable real-time condition monitoring and control of processes.

The PowerFlex 7000 marine drive simplifies ship's power structure with Direct-to-Drive technology. This technology combines an Active Front End (AFE) rectifier, SGCT power semiconductors and common mode voltage protection so users can connect directly to shipboard generation systems - without a bulky isolation transformer. They can also connect any new or existing motor directly to the drive without additional motor filtering.

The result? Lower capital investment, faster installation, fewer parts - and a much lighter, smaller footprint.

Built for higher flexibility, controllability and protection, the PowerFlex 7000 marine drive provides load sharing control for various propulsion schemes - and is ideal for redundant propulsion drive systems. To help prevent blackout conditions, the drive features a unique built-in power limit interface that manages the drive power consumption with respect to the load and available generation capacity. And if users' application requires dynamic braking, it can be designed into the drive with an optional integrated package.

Sea conditions, propeller blade frequency and other equipment operation cause unique shock and vibration conditions aboard ships. The PowerFlex 7000 marine drive incorporates sheet metal, bracing and mechanical modifications specifically designed to meet shipboard installation, mitigate vibration - and comply with marine standards.

From initial system programming to operation and maintenance, the PowerFlex 7000 marine drive is designed for ease-of-use and maintainability. Installation and set-up wizards simplify commissioning and start-up. And the integral, multi-lingual operator interface delivers online messaging and system alerts to make it easy to control and monitor users' system.

A straightforward design and front access to the equipment - plus simplified tools and instruction sets - reduces Mean Time to Repair (MTTR). Rockwell Automation's patented PowerCage enables power semiconductor device change-out in less than ten minutes.

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Emerson has become a partner in NCE Subsea

The World leading technology company, Emerson Process Management, has become a partner in NCE Subsea. This marks the first time that one of the NCE Subsea member companies forms a partnership with Emerson. Emerson expects that this partnership will serve a bigger part of Emerson Process Management.

"To us this is about increased visibility, but we also feel we have something to offer NCE Subsea," said Hege Forus, Information Manager at Roxar, which is owned by Emerson Process Management.

This is the first time one of the NCE Subsea member companies has been made a partner. "We hope that this partnership will serve not only Roxar, but also a bigger part of Emerson Process Management," says Forus.

Uniting the region

Roxar is a technology company with 12 years' experience in the subsea market. The company offers specialist expertise in advanced 3D reservoir modelling, and was among the first to develop software tools of this kind. In addition, the company comprises an instrumentation division focusing on the development and supply of measurement equipment for monitoring of fields in production. "We are the eyes and ears down in the reservoir, and we ensure that production is as efficient as possible," said Forus.

In her opinion, NCE Subsea plays a central role in the further development of Western Norway as a subsea region. "At present, Bergen and Stavanger are not promoted as one region, and often appear as competitors. This is the two cities, and counties, in the country - maybe in the world - with the highest density of subsea companies. It would be far more beneficial to join forces. We thus feel that Western Norway more often should be presented as one united region. This is an area we will focus on as part of our collaboration with NCE Subsea," said Forus.

Lowering the threshold

Forus believes that one of NCE Subsea's key functions is providing a professional forum, and this is maybe of particular importance to the smaller companies.

"The subsea sector comprises a number of pioneering companies, and these are often small in size. For such enterprises, it is incredibly important to gain access to a forum in which various issues and challenges can be discussed. The network offers unique expertise. Roxar was itself a pioneer in its field, and we are very familiar with the challenges these companies are facing. In this area we have a lot to offer, and by being instrumental in the strengthening of companies in the network Emerson Process Management will be part of a stronger entity," said Forus.

Professional exchange of experiences is also an important element, but this is far

from the only advantage the network has to offer. NCE provides an arena where new companies can meet potential customers and collaboration partners. "We know from experience that establishing contact with the right customers can sometimes be a challenge, but through NCE Subsea this threshold is lowered," said Forus.

Internationalisation

One of the key reasons for Emerson Process Management to get more involved in this centre of expertise is its focus on internationalisation. This is an area to which NCE Subsea is fully committed.

"To us, internationalisation is essential. We are an international company, and 60% of our turnover comes from markets abroad. It is clear that NCE Subsea has something to offer us in this area, but we also bring experience that may be useful to others in the network," said Forus.

New high performance marine fuel device

Professor Lee Gui-Ju, Department of Naval Architectural Ocean Engineering, Chosun University, recently developed the Crown Duct which is installed between the hull and propeller to increase efficiency of propeller. The Crown Duct was proved to reduce fuel consumption by 4.5% in a mock-up testing at SSPA Sweden.

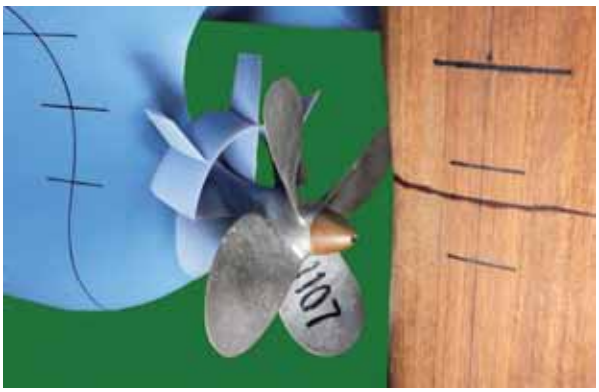
Professor Lee Gui-Ju, Department of Naval Architectural Ocean Engineering, Chosun University

Professor Lee Gui-Ju, Department of Naval Architectural Ocean Engineering, Chosun University, developed the Crown Duct that can dramatically save marine fuel consumption. Professor Lee was awarded a project (KRW 350 million in research expense) by SPP Shipbuilding to develop a ship energy saving device and successfully developed the Crown Duct after 1 and a half year of research.

Excellent fuel-saving effect

Crown Duct, which is installed between the hull and propeller to increase efficiency of propeller, was proved to cut fuel consumption by 4.5% in a mock-up testing conducted 3 times at SSPA Sweden. The fuel-saving enabled by the Crown Duct is considered to surpass that of other devices being developed around the world. The Crown Duct is expected to save fuel worth approximately KRW 120 million per ship based on annual savings in ship operation costs. Considering the ship age of 20, the estimated projection of fuel-saving is KRW 2.4 billion per ship.

5 students engaged in this research project were granted scholarship and were trained on a long-term basis at the Institute for Flow Research in Japan and Flowtech in Sweden 4 times over the period of 7 months. Park Hee-joo and Yang Seon-hee (graduate students, Department of Naval Architectural Ocean Engineering) were hired by SPP Shipbuilding through a special employment program and are scheduled to begin work from February.



Crown Duct

Publishing many research articles related to eco-friendly ships

Professor Lee Gui-Ju obtained a master's degree at Stevens Institute of Technology, United States, and a doctor's degree in Engineering at Inha University. He served as senior researcher at Maritime Research Institute of Hyundai Heavy Industries (HHI) and has been a professor at Chosun University since 1995. He published 11 articles in SCI Journal, and conducted 45 research projects, including the research on the environment-friendly small and medium-sized ships (National Research Foundation of Korea), and has filed applications for 10 patents.

In addition, he served as chairman of BK21 Local University-Fostering Project Group, Korean representative of International Society for Circulating Water Tank, chairman of Korea and Russia Technology Center, director of Marine Society of Ocean Engineers, a exam question setter for national examination, a master review member, etc. Currently, he is serving as a member of steering committee of Korea Water Tank Test Council, director of Society of Naval Architects of Korea, a member of review board for the research projects of Korea Maritime Institute and National Research Foundation of Korea, and technical advisor at Korean Maritime Police.

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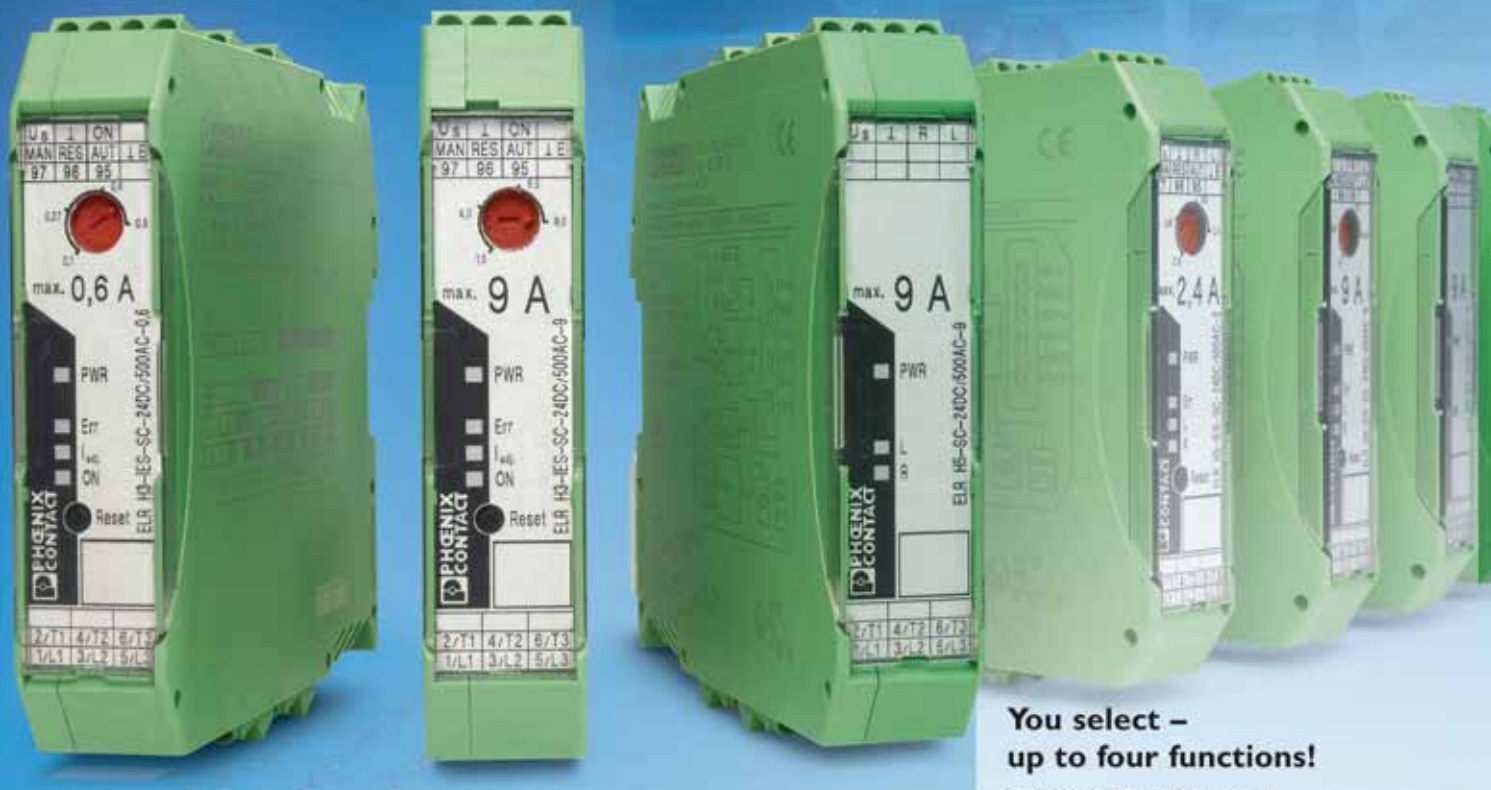

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Outlook for the shipbuilding industry in 2012

Hong Seong-in, a researcher at Korea Institute for Industrial Economics & Trade, predicted in his recent report related to the outlook for the shipbuilding industry in 2012 that shipyards would face a slump in new orders for almost all types of vessels such as large containerships and LNG carriers while the placement of orders for offshore plants will increase on the back of high oil prices.
In addition, he speculated that the downward pressure on ship prices would continue and the small and medium-sized shipyards would increase the extent of restructuring.

Trends in 2011

Swelling orderbook in the 1st half

The shipbuilding industry saw a significant upturn in the combined orderbook dominated by the containerships and LNG carriers in the 1st half of 2011 as the markets for flagship vessels of major domestic large shipyards showed strong growth. However, the combined orderbook fell sharply amid the contagious global financial crisis.

The orderbook swelled in the 1st half of 2011 due to upswing in new order for ultra large containerships since the 2nd half of 2010 and steep increase in new order for LNG carriers amid the surge in demand for LNG in the wake of Japan's nuclear crisis. However, the monthly new order intake has declined by as much as 18.9% since the 2nd half amid the economic downturn triggered by the spreading Eurozone crisis. The variation in orderbook differed, depending on the type of vessel. New orders for containership and LNG carriers rose approximately by 190% and tenfold, respectively, in late September 2011 compared to the same period of previous year. By contrast, new orders for oil takers and bulk carriers decreased by approximately 76.0% and 66.0%, respectively. The declining order placement for universal vessels led to severe order drought for small and medium-sized shipyards. In particular, nearly all companies have been put under serious financial strain since the outbreak of financial crisis and are undergoing restructuring as a result.

The sluggish oil tanker and bulk carrier markets continue to face overcapacities aggravated by the speculative order placements and downturn in the shipping market amid global economic recession, and consequently show little sign of recovery.

The offshore plant market, which showed strong performance amid sustained high oil prices, is faced with slump in new orders which is attributable to the difficulty in financing, etc, as global economic uncertainty is deepening. As of late September 2011, new orders for offshore plants increased 34.4% year-on-year to 12.10 million CGT, propelled by the upswing in new orders for the flagship vessels of large

domestic shipyard, which surpasses 7.3 million CGT recorded by Chinese rivals 2 years ago by wide margin.

Declining order backlog

The order backlog increased temporally along with the upturn in new orders until the 1st half of 2011, but fell again thereafter. The declining order backlog led to a fall in the shipbuilding volumes compared to the same period of previous year.

Even if the delivery delay is taken into account, the order backlog decreased 8.7% year-on-year to 42.20 million CGT as of late September 2011 as new orders remained flat. Thus, the shipbuilding building decreased 1.7% year-on-year to 11.8 million CGT as of late September 2011, which is 1.9 million CGT less than that recorded by Chinese shipyards.

Considering recent performance, the rate of decline in the order backlog slowed amid the upturn in new orders in the 1st half of 2011, and the order backlog is projected to have decreased by approximately 1.3% year-on-year to 14.71 million CGT as the vessels on delivery delay started to be built.

Meanwhile, the export which accounts for approximately 95% of total production volume, is projected to have increased about 10.4% year-on-year to USD 54.2 billion, including the vessels on delay delivery, based on the value of shipbuilding and offshore contracts awarded when the ship prices were higher.

The import in 2011 is projected to have decreased by approximately 11.9% to USD 4.59 billion as the inbound delivery of hull blocks from China stops is completed amid the fall in the shipbuilding volume and the previously ordered bulk carries join the fleets.

Changing conditions and outlook for domestic and overseas markets

Persistent overcapacity woes

The bulk carrier market is suffering from overcapacity and has slowed down since the 2nd half of 2010. With the oil tanker market is recovering very slowly, the market for containerships has also seen a decline in new orders since the

Table 1. Prospect for turnaround in shipbuilding industry

	Factor of increase (positive)	Factor of decrease (negative)
Order intake	-Increased likelihood of additional orders for offshore plants amid sustained high oil prices	-Slump in new orders for all types of ship due to the contagious global financial crisis -Delay in the normalization of ship financing -Serious loss from the persistent slump in the market for major products of small and medium-sized shipyards (oil tankers, bulk carriers)
Production	-Increased productivity resulting from investment in information/communication technology at the production site -Continued construction of the secured volumes of ships	-Declining order backlog -Continued restructuring of small and medium-sized shipyards (closure, court receivership, etc)
Domestic consumption	-Continued availability of ship fund	-Worsening financial condition of domestic shipping companies -Domestic ship financing and shipping companies' placing orders with foreign shipyards (China)
Export	-Consecutive export based on delivery schedule -Export of offshore plants	-Persistent slump in shipping market -Completion in the construction of high-priced ships and reduction in volume of ships built for overseas ship owners
Overall evaluation	-Sharp downturn in new orders due to the contagious global financial crisis after the 2nd half -Restructuring speading to medium-sized shipyards due to the worsening financial conditions of small and medium-sized shipyards -Although the operation ratio increased as a result of the upswing in new orders placed with large shipyards until the 1st half, the production decreased and the operation ratio fell in the 2nd half compared to the 1st half. -As the volume of construction and export of high-priced ships, including the ships on delivery delay, decreases, the export based on amount continues to fall, as well as import (inbound delivery of blocks and bulk carriers from abroad).	

2nd half of 2011.

Particularly, the overcapacity in the market for ordinary commercial ships, such as bulk carriers, oil tankers, containerships, etc, which dominated the orderbook, is expected to persist for the time being amid the global economic recession despite a reduction in the number of moored ships and growth in the amount of aging ship dismantling.

The bulk carrier freight rates have steadily declined since the 2nd half of last year and BDI index dropped below 2,000, while the World Scale (WS), the freight index designed to express tanker rates, remains weak and the Howe Robinson Container Index fell below the mark of 600 points (shipping companies reach the break-even point when the BDI index is over 3,000 and Howe Robinson Container Index is over 800).

Order drought faced by small and medium-sized shipyards

Large shipyards saw a steep upturn in new orders until the 1st half of 2011. By contrast, small and medium-sized shipyards are hit hard by the slowdown in their major markets and have suffered from mounting financial difficulties, and consequently, are undertaking the restructuring.

Large shipyards secured massive amount of new orders for drillships, FPSOs, ultra large containerships, LNG carriers, etc, until the 1st half of 2011, meeting their annual targets. However, 90% of all small and medium-sized shipyards entered a restructuring process. Particularly, small and medium-sized shipyards are put under heavy financial strain as the slowdown in the markets for oil tankers, bulk carriers - which are their flagship products - persists. Most small and medium-sized shipyards are still reeling from the difficulties left behind in the wake of Korea's financial crisis in the late 1990s and not in a position to bring their business back to

normal conditions. Currently, small and medium-sized shipyards have the deficits that have ballooned due to the 'knock in knock out (KIKO)' problem and over-investment, and over 90% of small and medium-sized shipyards that export ships are undergoing retrenchment process. These small and medium-sized shipyards also face difficulty in obtaining RG (Refund Guarantee) which is issued with shipbuilding contracts, in addition to the sluggish market for their flagship products.

Rosy outlook for the export of offshore plants

There are no significant changes to products in the export market of shipbuilding industry because product types and their demand do not change fast. The export of drillships, FPSOs, etc, are expected to increase by approximately 10% based on the order backlog in 2012. However, the export of universal vessels, engines, etc, are expected to decrease slightly due to the base effect and others. The export of bulk carriers are also expected to decrease as the delivery of existing orders is almost completed and small and medium-

Table 2. Outlook of strong/weak performance of products in the export market of shipbuilding industry

Products (parts) with strong performance in the export market	Products (parts) with weak performance in the export market
-Export of drillships and FPSOs slightly increased (approximately 10%) due to the construction of volumes already secured	-Export of containerships and oil tankers - the types of vessels which have maintained a certain export level - declined due the base effect -The export of marine engines to China is expected to decrease because China increases production in China. -The export of bulk carriers decreased due to the completion of contracted shipbuilding volumes and restructuring of small and medium-sized shipyards

sized shipyards which dominate the bulk carrier market undergo retrenchment.

Outlook for 2012

Upturn in new orders for offfshore plants

The offshore plant sector is expected to see continued placement of new orders for drillships, FPSO, LNG-FPSO, LNG-FSRU, and platform supply vessels (PSVs), etc, if high oil prices are sustained. The markets for most types of vessels, as well as large containerships and LNG carriers, which have shown brisk performance in the 1st half amid the contagious global financial crisis and overcapacities, are expected to see a slump in new orders. The bulk carrier market which suffered from severe overcapacity is slowing down again after showing signs of recovery as BDI rebounded from previous declines and rose temporarily to 2,000 points, and the containership market is slumping. This trend is expected to continue for the time being. Meanwhile, small and medium-sized shipyards - which have no alternative course but to win new orders for product carriers, small and medium bulk carriers, etc - are expected to put under even more severe strain in addition to the difficulties arising in connection with the retrenchment.

Newbuilding ship prices keep declining

Newbuilding ship prices which have sharply fallen since the outbreak of global financial crisis have risen by approximately 3.4% based on the price index in 2010. However, the sluggish market conditions, declining prices of steel plate, etc, have caused the newbuilding ship prices to fall by approximately 1.4%, and this downward pressure on the newbuilding ship prices is expected to persist for some time to come.

Based on the type of ship, the fall from the peak prices was 29.9% and 17.6% for containerships and LNG carriers, respectively. Newbuild bulk carrier and oil tanker prices fell approximately 47.4% and 33.0%, respectively, from the peak prices. This downward trend is expected to continue for the time being. The variation in the ship prices is expected to be influenced by the supply of steel plate, considering that the declining steel plate prices amid increased supply lead to a fall in the ship prices.

Downturn in shipbuilding volume

Although the rate of decline in the order backlog slowed until the 1st half of 2011, the shipbuilding volume is expected to keep dwindling in 2012 in the aftermath of the post-financial crisis order drought, increasing number of vessels on delivery delay, and shrinking order backlog.

The decline in the volumes of ships built will be attributable to the increasing number of vessels on delivery delay amid the Eurozone crisis and the sharp downturn in new orders that had persisted until the 1st half of last year since the outbreak of global financial crisis. In 2012, the shipbuilding volume is expected to decrease approximately 13.1% year-on-year to 6.65 million CGT in the 1st half and slide 8.7% year-on-year to 6.45 million CGT in the 2nd half. On an annual average, the shipbuilding volume is expected to slide 10.9% to 13.1 million CGT.

Despite the delivery of large projects such as offshore plants, the downward trend in export growth will continue due to the declining shipbuilding volume and completion in the construction of ships ordered when the ship prices were high.

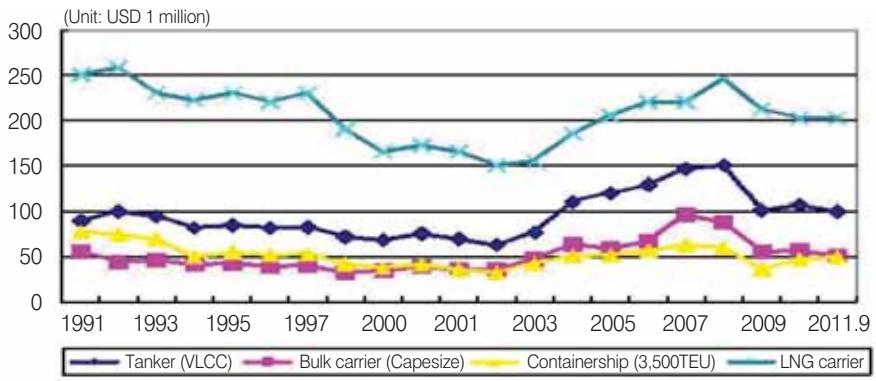

Fig. 1 Trend of ship prices based on type of ship

Table 3. Outlook for the supply in the shipbuilding industry

Type	2010	2011			2012		
		1st half	2nd half		1st half	2nd half	Production
Production	1,491 (3.5)	765 (1.6)	706 (-4.7)	1,471 (-1.3)	665 (-13.1)	645 (-8.7)	1,310 (-10.9)
Import	5,214 (7.0)	2,020 (-11.0)	2,572 (-12.6)	4,592 (-11.9)	1,814 (-10.2)	2,371 (-7.8)	4,185 (-8.9)
Domestic consumption	105 (4.0)	48 (-4.0)	50 (-9.1)	98 (-6.7)	43 (-10.4)	45 (-10.0)	88 (-10.2)
Export	49,112 (8.8)	31,905 (29.9)	22,305 (-9.1)	54,210 (10.4)	28,750 (-9.9)	20,880 (-6.4)	49,630 (-8.4)

Note: 1. The number in the brackets represent the variation compared to the same period of previous year. The unit is 1 million CGT for production and domestic consumption and USD 1 million for export and import (MTI 746).
2. The import also includes the inbound delivery of blocks produced in China.

The export is expected to diminish 9.9% year-on-year to USD 28.8 billion in the 1st half and shrink 6.4% year-on-year to USD 20.9 billion in the 2nd half. On an annual average, the export is expected to decrease 8.4% to USD 49.6 billion.

Meanwhile, the import is expected to slide 10.2% to USD 1.81 billion in the 1st half and shrink 7.8% to USD 2.37 billion in the 2nd half, considering the bulk carriers built at Chinese shipyards are joining the fleets and the inbound delivery of hull blocks processed at the local plants has decreased. On an annual average, the import is expected to fall 8.9% to USD 4.19 billion.

Investment in information/communication technology

Large shipyards are expected to expand investment in RTE (Real Time Enterprise) for digital shipyard and maintenance/repair of some existing facilities. Shipyards, faced with sustained declines in new orders, have no incentive to make investment in facilities and expand shipbuilding capabilities. Instead, they will increase investment necessary to fully leverage the information and communication technology in shipbuilding. With IMO's EEDI regulations slated for implementation, investment in green ships has been expanding and the R&D investment is expected to increase in the diversified sectors and new ship sector.

Major issues of 2012 and countermeasures

Small and medium-sized shipyards that carry on the shipbuilding business under the control of creditors will be put under greater pressure for restructuring if the slowdown in the shipbuilding market persists in 2012.

Restructuring of medium-sized shipyards will have huge negative impact on the entire shipbuilding industry, as well as local economy, considering the massive refund guarantees provided by financial institutes in conjunction with order backlogs and sheer size of jobs created by internal and external vendors.

Small and medium-sized shipyards are expected to have inadequate capability for diversification, unlike large shipyards, and will need to diversify their business portfolio for market risk diversification. Besides, the government will need to provide support to small and medium-sized shipyards based on their prospect for growth.

In 2012, ship owners are expected to have a growing demand for green ship as the IMO's EEDI regulations are slated for implementation next year, and this trend towards green ship is expected to gather momentum if the high oil prices are sustained.

The government needs to support shipyards in coping with the IMO's EEDI regulations, support development of core technologies for green ship to ensure differentiation of related market from general markets, and expand infrastructures.

Shipyards will need to make intensive investments in the development of green ship models, propulsion systems reducing the emissions of CO_2, and new-concept next-generation growth engine, so that they can compete effectively with advanced countries dominating the environment-friendly green ship markets based on the development of essential equipments and ship models related to green ship.

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Domestic shipyards maintain world's top spot in terms of new orders in 2012

The Ministry of Knowledge Economy (MKE) and Korea Shipbuilders' Association (KOSHIPA) recently announced that 11 major domestic shipyards set new order target of USD 54 billion for 2012 with an increased focus on offshore plant and LNG sectors. Although the Eurozone crisis overshadows the outlook for new orders in 2012, domestic shipyards are expected to sweep new orders for offshore plants and LNG carriers.

The Ministry of Knowledge Economy (MKE) and Korea Shipbuilders' Association (KOSHIPA) announced in late January that 11 major domestic shipyards[1)] set new order target of USD 54 billion for 2012 and make vigorous effort to increase order intake.

Domestic shipyards with strength in producing offshore plants and LNG carriers which are expected to dominate new orders are very likely to maintain world's top spot in terms of order intake in 2012.

Domestic shipyards to maintain world's top spot in 2012

The prevailing forecast is that the global new orders will decrease in 2012 compared to the previous year, overshadowed by the supply glut of ships, global economic recession, sluggish ship financing, etc, as the uncertainty over the Eurozone's ability to resolve the crisis and global economy's path to recovery. Clarkson Research Services predicted in September 2011 that new orders would decline by approximately 9.7% in 2012 compared to the previous year.

1) Hyundai Heavy Industries (HHI), Daewoo Shipbuilding & Marine Engineering (DSME), Samsung Heavy Industries (SHI), Hyundai Samho Heavy Industries (HSHI), Hyundai Mipo Dockyard (HMD), Hanjin Heavy Industries & Construction (HHIC), STX Offshore & Shipbuilding (STXOS), SHINAsb, Dae Sun Shipbuilding & Engineering, Sungdong Shipbuilding & Marine Engineering (SSME), and SPP Shipbuilding

The general view is that the glut of ships will hinder the shipbuilding market from rebounding fast even if positive signals are sent out by the market such as the global economic recovery and mitigation of financial crisis, etc.

Meanwhile, there will be constant new orders for offshore plants and LNG carriers, spurred by the prospect of high oil prices, upturn in the demand for natural gas in the wake of Japan's nuclear disaster following the massive earthquake, and active large-scale offshore resource exploitation projects (Lchthys gas field of Australia, Shtokman gas field of Russia, Egina oil field of Nigeria, etc).

Thus, domestic shipyards which has the unmatched technology and capability in the construction of high value-added ships, such as offshore plants, LNG carriers, etc, are expected to maintain top spot in the global shipbuilding market in terms of new orders in 2012.

Offshore plants are expected to be the major contributor to the upswing in domestic new order intake, considering that domestic shipyards set new order target of approximately USD 18.5 billion in offshore plant sector alone for this year. Specifically, 3 major domestic shipyards - Hyundai Heavy Industries (HHI), Daewoo Shipbuilding & Marine Engineering (DSME), Samsung Heavy Industries (SHI) - predicted that the offshore plants would account for approximately 50% of total new orders.

Strongest growth in the offshore plant sector in 2011

Domestic shipyards (all shipyards except the 11 major shipyards) won 48.2% (13.55 million CGT) of global new orders in 2011 according to the Clarkson data, reclaiming the world's top spot in 4 years. Significantly, the solid performance of domestic shipyards came in the midst of unfavorable conditions such as an decrease of 30.5% (28.11 million CGT) compared to the previous year in the global new order placements in 2011, sluggish ship financing in the aftermath of European financial crisis, a delayed economic recovery in the advanced countries.

Domestic shipyards swept the entire global orders for FPSO (1 unit worth USD 680 million), LNG-FPSO (1 unit worth USD 2.41 billion), and LNG-FSRU (4 units worth USD 1.06 billion), and clinched 77% (26 units worth USD 14.22 billion) of global orders for drillships, 84% (38 units worth USD 7.72 billion) of global orders for LNG carriers and 74% (80 units worth USD 10.76 billion) of global orders for large containerships with a capacity of over 8,000TEU, thus proving their unmatched leading status in the global market for high value-added ships and offshore plants.

Domestic shipyards' order intake rose 43% in 2011 from the previous year

According to the shipbuilding statistics published on January 5 by the Korea Shipbuilders' Association (KOSHIPA), the combined shipbuilding orders of the KOSHIPA's 9 affiliated member companies stood at 11.63 million CGT (266 units) in 2011, up 42.6% (based on CGT) from the previous year. Their combined shipbuilding orders reached 8.15 million CGT (320 units) in 2010.

Based on the quarterly period, their combined shipbuilding orders stood at 71 vessels with 2.775 million CGT in the 1st quarter, 124 vessels with 5.46 million CGT in the 2nd quarter, 44 vessels with 0.405 million CGT in the 3rd quarter, and 27 vessels with 0.989 million CGT in the 4rd quarter. The combined shipbuilding orders increased by 187.4% and 195% in the 1st and 2nd uarter, respectively, compared to the previous year, but slided 16.6% and 21.4% in the 3rd and 4th quarter, respectively, compared to the previous year.

Based on the type of vessels, containerships and LNG carriers dominated new orders, while tanker and bulker orders fell. Containerships accounted for 45% (106 vessels with 52.37 million CGT) of all new orders, the largest proportion. New orders for LNG carriers reached 41 vessels with 33.85 million CGT, comprising 29.1% of total new orders. New orders for tankers and bulkers stood at only 38 vessels with 765,000 CGT and 27 vessels with 428,000 CGT, respectively.

The shipbuilding volume stood at 13.56 million CGT of 426 vessels, up 6.8% from 12.7 million CGT of 376 vessels in 2010.

Based on the type of vessels, the shipbuilding volume of containerships and tankers rose 35.4% and 25.8% each to 4.797 million CGT and 3.494 million CGT, respectively. Meanwhile, the shipbuilding volume of bulkers rose 18.7% to 2.54 million CGT while the shipbuilding volume of LNG carriers increased 6.1% to 829,000 CGT.

The order backlog stood at 33.32 million CGT at the end of 2011, down 3.6% from 34.56 million CGT in 2010. Based on the type of vessels (based on CGT), containerships accounted for 40.6% (13.53 million CGT) of total order backlogs, the largest proportion, followed by tankers and bulkers that comprised 22.3% (7.444 million CGT) and 13.7% (4.55 million CGT) respectively.

Table 1. Trend in order intake

Type	2010		2011	
	No. of ship	Unit: 1,000 CGT	No. of ship	Unit: 1,000 CGT
st quarter	58	1,214	71	2,775
2nd quarter	126	2,798	124	5,462
3rd quarter	91	2,885	44	2,405
4th quarter	45	1,258	27	989
Total	320	8,156	266	11,631

Source: KOSHIPA (based on its 10 member companies)

Table 2. Order intake based on type of vessels

Type	2010			2011		
	No. of ship	Unit: 1,000 CGT	Proportion (%)	No. of ship	Unit: 1,000 CGT	Proportion (%)
TK	108	3,023	37.1	38	765	6.6
BC	133	2,507	30.7	27	428	3.7
CONT	48	1,912	23.4	106	5,237	45.0
LNG	-	-	-	41	3,385	29.1
Others	31	714	8.8	54	1,816	15.6
Total	320	8,156	100.0	266	11,631	100.0

Source: KOSHIPA (based on its 10 member companies), Note: Tanker includes COT, PC, and CT.

Table 3. Trend in shipbuilding volume

Type	2010		2011	
	No. of ship	Unit: 1,000 CGT	No. of ship	Unit: 1,000 CGT
1st quarter	97	3,023	97	3,043
2nd quarter	101	3,447	122	4,271
3rd quarter	104	3,749	109	3,140
4th quarter	74	2,479	98	3,105
Total	376	12,699	426	13,559

Source: KOSHIPA (based on its 10 member companies)

Table 4. Shipbuilding volume based on type of vessels

Type	2010			2011		
	No. of ship	Unit: 1,000 CGT	Proportion (%)	No. of ship	Unit: 1,000 CGT	Proportion (%)
TK	141	3,345	26.3	132	3,494	25.8
BC	54	1,440	11.3	121	2,540	18.7
CONT	109	4,411	34.7	103	4,797	35.4
LNG	22	1,922	15.1	10	829	6.1
Others	50	1,581	12.4	60	1,899	14.0
Total	376	12,699	100.0	426	13,559	100.0

Source: KOSHIPA (based on its 9 member companies), Note: Tanker includes COT, PC, and CT.

Table 5. Trend in order backlog

Type	2010		2011 3rd quarter	
	No. of ship	Unit: 1,000 CGT	No. of ship	Unit: 1,000 CGT
Late March	1,284	40,727	1,088	35,395
Late June	1,307	40,433	1,081	36,039
Late September	1,298	39,786	1,018	35,608
Late December	1,119	34,557	941	33,316

Source: KOSHIPA (based on its 9 member companies)

Table 6. Order backlog based on type of vessels

Type	2010			2011		
	No. of ship	Unit: 1,000 CGT	Proportion(%)	No. of ship	Unit: 1,000 CGT	Proportion(%)
TK	337	10,808	31.3	270	7,444	22.3
BC	332	6,841	19.8	223	4,550	13.7
CONT	282	12,979	37.7	280	13,529	40.6
LNG	11	879	2.4	45	3,711	11.1
Others	157	3,050	8.8	123	4,082	12.3
Total	1,119	34,557	100.0	941	33,316	100.0

Source: KOSHIPA (based on its 9 member companies), Note: Tanker includes COT, PC, and CT.

Honeywell is the leading supplier of Automation Systems (IAS) for LNG carriers and newer generation, flexible LNG vessels.

Integrated Automation Systems for LNG vessels

Honeywell is a leading supplier of Integrated Automation Systems (IAS) for LNG carriers and newer generation, flexible LNG vessels, which allows customers to improve productivity, lower operating costs, capitalize on key business opportunities, improve asset utilization and boost profitability.

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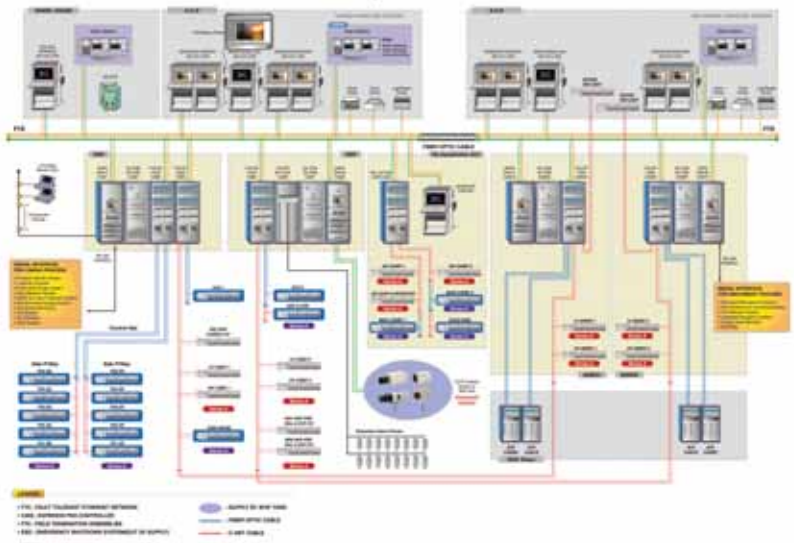
Honeywell is the leading supplier of Integrated Automation Systems (IAS) for LNG carriers and newer generation, flexible LNG vessels. Honeywell has the experience and expertise in LNG transportation, along with proven IAS technology, to keep ships running safely under harsh conditions. Honeywell offers solutions that span the entire spectrum of LNG operations, from liquefaction, shipping, regasification and beyond. Honeywell solutions integrate production, processing and transportation operations, and link them with security, safety, commercial, regulatory and environmental functions. As a result, customers can improve productivity, lower operating costs, capitalize on key business opportunities, improve asset utilization and boost profitability.

Honeywell's IAS is powered by the Experion Process Knowledge System (PKS) which provides a single system to automate and integrate vessel subsystems for efficient, safe and reliable operation. Honeywell's IAS goes beyond traditional control systems in how it optimizes operations and maintenance, and automates routine activities.

Honeywell's UniSim simulation technology offers dynamic high-fidelity modeling capabilities. This software is used for the design of onboard gas management systems and validation, and to enhance the design, validate the approach and confirm control strategy functions in a closed loop environment.

Honeywell's Experion PKS supports a set of rich, full-function applications and technologies that ensure safe shipboard operations. These include:

- *Fit for offshore duty with approved process controllers, safety controller, networks, servers and operator workstations*
- *Greater availability with fault tolerant and redundant options for controllers, networks, servers and workstations*



LNGC IAS system overview

- *Simplified operations with consolidated process controller and safety controller technology, offering up to SIL 3 rating for the company's Safety Instrumented Systems (SIS)*
- *Experion provides a common HMI across process control, safety controllers and packaged equipment controls with standardized options available for integration of other systems such as video surveillance, accommodation systems, packaged equipment controls and more*
- *Improved operator response during both upsets and normal operations with Abnormal Situation Management (ASM) features*
- *Better management of instrumentation assets with excellent support for Foundation Fieldbus, HART, DE and Profibus-DP based instrumentation*
- *Excellent features for segregation of duties, management of viewing and control authorizations, cyber security, and "black box" style event recording*
- *Standardized control algorithms for all aspects of LNG vessel operation from cargo transfer, compressor controls, BOG and steam management, onboard LNG re-gassification and re-liquifaction, duel fuel management, power generation and load management*

Single-source supplier

Honeywell has supplied more than 100 automation integrated automation systems for all types of LNG carriers, traditional steam, low speed diesel with re-liquefaction on board, dual fuel electric and vessels with re-gasification on board. We are also currently engineering the very first LNG FPSO. No other vendor has this breadth of experience.

Honeywell solutions integrate production, processing and transportation operations, and link them with security, safety, commercial, regulatory and environmental functions.

Honeywell is also the only automation systems vendor that participates in the Abnormal Situation Management (ASM) Consortium. The company works alongside consortium partners to identify best practices and incorporate them into its solutions. All over the world, LNG carriers trust Honeywell to manage their onboard systems.

Future technology (7): Offshore drilling technology

The quest for oil and gas will push drilling operations towards more complex and more demanding wells in deeper waters, towards more complex reservoirs, and towards Arctic areas. There will also be increasing pressure to drill faster and more efficiently in mature fields enabling development of small reservoirs, and to increase the oil recovery from existing fields. Thus, there will be demand for both heavy, deep-water rigs and for more specialised and lighter units. Common for both is a drive to move more of the equipment and operation subsea, but complete subsea drilling operations are not expected to be commercially available in 2020.

DNV

Introduction

Production rates from mature fields are declining rapidly. In the Gulf of Mexico, production from mature fields is falling by 20% per year. This downward trend is forcing the oil and gas industry to drill ever deeper and to explore more complex reservoirs. However, this is a costly exercise. A deepwater well typically costs between USD 100m and USD120m, while a comparable figure for shallow water wells in the Arabian Gulf is USD 16m (2010 values). Simultaneously, production from existing reservoirs must also be increased.

Where will we be in 2020?

A key word for development towards 2020 is diversity. Heavy deepwater units will drill in even deeper waters and explore more complex reservoirs. At the same time, lighter units will be used for intervention and enhanced oil recovery (EOR) activities in mature deep and shallow water. Yet another type of vessels will be used for decommissioning. All these solutions will be powered by real-time monitoring and advanced control systems, significantly reducing drilling time. Innovative concepts, such as complete subsea drilling, are expected to be at prototype stage and not commercially available before 2020.

Diverse drilling and intervention solutions

A key word for the development towards 2020 is diversity. Rather than "one-size-fits-all" advanced deepwater rigs, capable of taking on a range of assignments, the development of a series of specialised units seems more probable.

Heavy deepwater units, reaching reservoirs 15,000-30,000 feet below sea level, will be part of the equation. This type of unit will be needed for developing, for example, the pre-salt discoveries in Brazil at reservoir depths from 17,749 to 21,325 feet.

Within the next decade a market for decommissioning of subsea wells should also be expected. This activity will start in the UK in 2015 followed by Norway in 2020, and we expect this market will be taken by specialised decommissioning units, rather than by traditional deepwater rigs.

A third trend is towards specialised rigs for completion and work-over activities, targeting the need for well maintenance activities in mature oil and gas fields. Higher maintenance and intervention activities are needed in order to squeeze more oil and gas out of existing reservoirs, so called EOR.

Extreme materials for extreme wells

Towards 2020, operation is anticipated at pressures above 20,000 psi and at temperatures above 200°C. These extremes of pressure and temperature, in combination with high levels of H_2S and CO_2, will drive the use of Corrosion Resistant Alloys (CRAs).

The various systems involved in oil and gas exploration and production are often examined in isolation and not from an integrated, holistic perspective. Hence it is unclear which risks may be posed by these interactions in the long-term. This is further compounded by difficulties in inspecting and determining the relevant conditions and status of systems,

and by operational changes that may occur as a field ages (e.g., souring, higher water content, etc.).
Holistic, interactive risk methods are anticipated towards 2020, together with development of tools that utilize different sources of information, including topside sensor measurements and models to extrapolate the conditions down hole, in order that aging systems can be effectively managed.

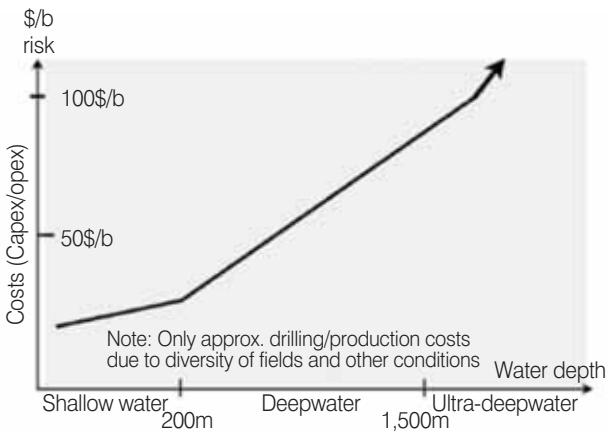
Real time monitoring - increased hit rate and reduced risk

There is explosive growth in the volume of well data being produced. Integration of real-time drilling information with down hole logging tools will enhance logging of down hole pressures, geological data, and drilling performance. This will assist in the early detection of drilling problems, accurate wellbore placement, and improvements in production performance.
Data from nearby wells, in combination with reservoir models, will contribute to effective wellplanning and accurate well-core placement, reducing uncertainty and improving operations. More accurate operational load history could also improve maintenance and reduce non-productive time. Systems for integrated operation will allow more onshore involvement in drilling and well operations, and support the offshore crew in handling challenging operations and situations.
The explosive growth in realtime information, backed up by rapid development of better algorithms and improved control and management systems, will result in drilling speeds increasing significantly towards 2020.

Complete subsea drilling

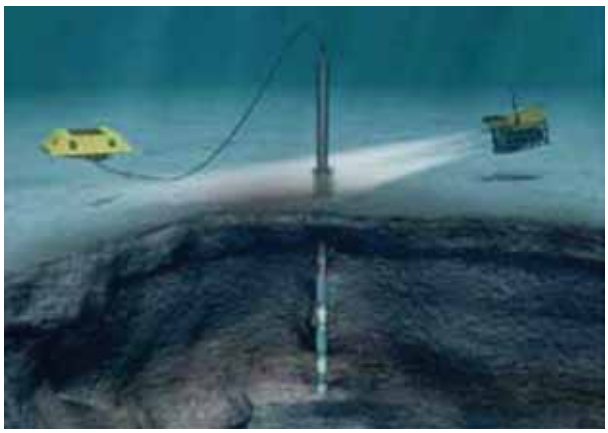
Operation of large drilling rigs forms a significant part of the drilling costs. Day rates for deepwater drilling rigs in 2010 are typically between USD 400k and USD 700k.
Significant advantages could be gained if all the drilling equipment could be moved to units positioned on the seabed, rather than using conventional floaters. Developers of this new technology claim that subsea drilling will contribute to the following improvements: (i) elimination of the requirement for use of large drilling rigs and all the related logistics, thereby decreasing environmental impact and limiting the disturbances to wildlife and fisheries; (ii) reduced emissions to air or sea, and (iii) reducing safety hazards for personnel.
Several concepts are under development, and the proposed solutions appear promising and elegant. However, considerable work remains to be done. We expect that subsea drilling will be at a prototype stage by 2020, but that floaters will still be the dominant platform for deepwater exploration.

Depth: Cost ratio and required oil price



Moving into ultra-deepwater will oil price climbs above USD 70-100 per barrel. Source: Business Insight

Autonomous subsea drilling



The Badge Explorer, which drills and buries itself beneath the ground carrying a full package of logging sensors.
Source: www.bxpl.com

Conserving energy with a SLMS based on NI LabVIEW and NI Single-Board RIO

MIR Energy Solutions which use NI LabVIEW and the NI Single-Board RIO-9601 have resulted in a highly flexible and customizable system reducing the energy costs by 25% and maintenance costs by as much as 40%.

National Instruments Korea

• The Challenge:

Creating an intelligent Street Light Monitoring System (SLMS) that reduces energy and maintenance costs, can be programmed remotely, and features graphical visualization options for reporting performance and cost savings.

• The Solution:

Developing a wireless monitoring and control system based on NI Single-Board RIO hardware and NI LabVIEW software that allows users to remotely switch and dim street lights from the control centre based on schedules and events to dramatically reduce street light energy consumption and associated CO_2 emissions. The system also tracks lamp failures and provides remote reporting options using a geographical information system (GIS) and a web-based application.

An intelligent Street Light Management System (SLMS) consists of energy efficient lighting system, lamp driver/ballastok, gateway for lamp management and IT infrastructure and ERP for system control and management.

Mir Energy Solutions developed an intelligent gateway using the NI Single-Board RIO 9601 for communication and control. The modules internal FPGA's has customized for multi-channel ADC, UART and DIO and this system has further expanded for RF module interface, RS485, 4-20mA ADC input, 24V digital IO amongst other features for communication with energy meters, acquiring analog data from current transformers and DIO operation for controlling relays and contactors. The software for this system has developed using LabVIEW real-time to perform in the most rugged and fail safe mode. Each gateway was effectively communicating and controlling around 200 lamps through RF network and the collected lamp information and meter data was transferred to the remote server for further monitoring & analysis.

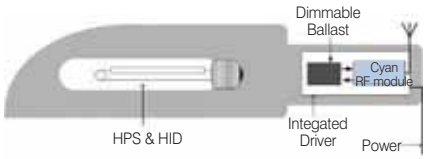


Fig. 1 MIR Energy Solution's custom made electronic ballast system

The gateway developed using the NI Single-Board RIO-9601 was also used in monitoring and alarm functioning in the lamp management like power failure (Black out), restoration, day glowing of lights, tampering, load fluctuation and voltage fluctuation.

Mir Energy Solution's in-house developed electronic ballasts were more efficient than magnetic ballasts in converting input power to the proper lamp power, resulting in an overall lamp-ballast system efficacy increase also there was a tremendous improvement in power factor.

The central Monitoring Station is programmed to remotely switch on/off, change schedules and generate reports on daily/monthly/yearly/event basis.

User interface

The control system user interface is implemented as a Windows application running on a standard PC. The application is highly flexible and can be customized easily. It pro-

Fig. 2 Reporting on various parameters

Fig. 3 Daily log sheet

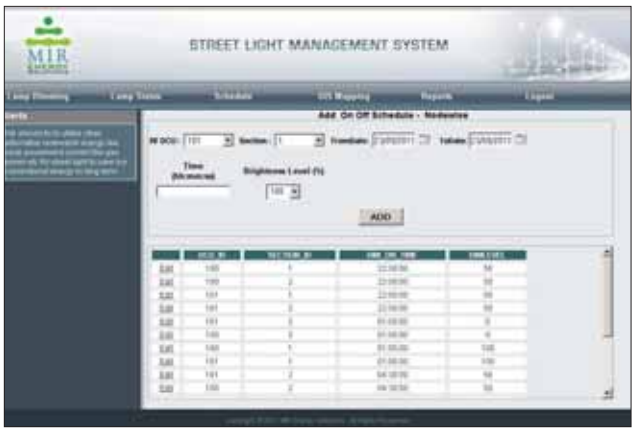


Fig. 4 Scheduling and configuration user interface

Fig. 5 Energy savings report

vides manual and automatic remote control, status monitoring and diagnostics, for individual lamps, assigned groups of lamps, or whole streets.

Asset Management System

Asset management assists the acquisition, use and disposal of assets to make the most of them and to manage the related risks and cost over the entire life and provides the user with information of various assets related data.

Data Acquisition System

This module of the system facilitates the collection and recording of data coming from the different sources like lamps, feeder pillars, meters and storing into a centralized database for continuous communication of the feeder control unit to server and automatic data transmission to the server.

Manage schedules & Dimming lamps

The system also allows calendar based scheduling on streetlight feeder pillars & remotely switching on/off & dim street lights from the control centre.

Management Information System

MIS provide relevant information at each level of the organization in a timely and accurate manner in the form of analytical, graphical and availability reports.

Outage Management System

The system provides alerts via SMS & email to authorized person. System sends notifications to the users via

Fig. 7 System architecture

Fig. 6 Geographical location report

email/SMS/GUI for preprogrammed parameters & provides alerts like power failure, load fluctuation, voltage fluctuation, tamper conditions.

Geographical Information System

A GIS provides network representation & visualization of power system resources. GIS contain special symbols represent the current state of the electrical network.

Conclusion

The SLMS is user friendly and reliable solution which provides centralized monitoring & diagnosis of remotely located street-lights. It is capable of reducing energy costs by as much as 25 percent or more by dimming lamps during off-peak hours and installing efficient electronic ballasts in street light luminaries. It also reduces maintenance costs by as much as 40 % or more. The system also automatically records lamp burn hours and can store records of maintenance events. The Web Publishing feature provides an easy, effective, and low investment means of accessing data. After a successful demonstration of the above solution, the Cochin Naval Base MES division authorities have sanctioned a pilot project in the foreshore area.

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STX Europe secured orders for cruise ships and special purpose vessel in a row

STX France, the subsidiary of STX Europe, won an order for 2 cruise ships from Viking Ocean Cruises, an affiliate of Viking River Cruises, on December 21 (local time). Furthermore, additional orders are expected to follow on as both companies are in discussion on the 1 optional vessel deal.

These cruise ships will measure 230m in length and 26.5m in width and has 444 cabins with a carrying capacity of 1,332 including the passengers and crews. These vessels will be delivered to the ship owner in 2014 and the 1st half of 2015, and operate in the Mediterranean Sea serving the customers from the U.S., U.K., and Australia.

Meanwhile, STX Finland received an order for 1 next-generation offshore patrol vessel from the Finish Border Guard on the same day.

This offshore patrol vessel will be built at Rauma shipyard in Finland and delivered to the ship owner by November 2013. Particularly, this offshore patrol vessel is designed to carry out specific functions such as environmental protection, as well as the border safety.

This offshore patrol vessel, which measures 96m in length and 17m in length, can operate on both liquefied natural gas (LNG) and marine diesel and has the ice-breaking capability. Moreover, this offshore patrol vessel incorporates various technologies for ensuring energy efficiency and stable operation.

An official from STX said, "This cruise ship contract can be seen as a positive signal for our strong performance in 2012. We will exert more effort to spur the growth in new orders in 2012."

Image of the offshore patrol vessel ordered to STX Finland from the Finish Border Guard

Nexans was awarded a project to build a new ultra high-voltage submarine power cable link

Nexans recently signed a turnkey contract with REE (Red Eléctrica de España), the Spain's power system operator and owner of power transmission grids, for a project to link 115 km ultra high-voltage submarine power cable between the Spanish Island of Majorca and Ibiza. The contract is valued at over EUR 90 million.

This project aims to link the Balearic Islands and the Iberian Peninsula in a bid to ensure stable supply of high-quality electricity and is a part of investments which REE has been making. Additionally, this project will contribute to increased efficiency, reduced costs and emissions of CO_2.

In early 2011, REE completed the ROMULO project that linked the 400MW ultra high-voltage direct current (DC) transmission cable between Span's 400kV grid and the island of Majorca. In that project, Nexans designed, manufactured, and supplied 240km DC submarine power cables.

Having signed this contract, Nexans will extend the 132kV AC XLPE insulated submarine cable link to the island of Ibiza. The 100MW link to be built in this project will set 2 new world records for being the longest seamless 3-core ultra high-voltage AC connection and the deepest submarine cable laid at depths of 750m.

Dirk Steinbrink, Nexan's Executive Vice President in charge of High Voltage &

Underwater Cables Business Group, said, "We are very pleased that REE awarded this contract to Nexans to undertake the turnkey project to strengthen the power infrastructure in Balearic Islands. Nexans will again bring its proven expertise, as demonstrated in the previous ROMULO DC project, offering unmatched turnkey capabilities in the design, manufacturing, installation, protection works, test-run, etc, for ultra high-voltage submarine power link system that can fulfill any requirements of customers with regard to AC and DC technology, voltage, length or installation depth."

The submarine cables will be manufactured into finished products at the Nexans' specialized manufacturing plant in Halden, including the optical communication products manufactured in Rognan facility. This project will include the 24km single core ultra high-voltage underground power cable from the Nexans' plant in Charleroi, Belgium and accessories from Nexan's Cossonay plant in Switzerland, besides the 115km submarine cable manufactured at Nexans' plant in Halden.

C/S Nexans Skagerrak, which is Nexan's cable-laying vessel for delivering and installing the seamless single length submarine cable, has 7,000 tons of turntable, thus playing a crucial role in this project.

The submarine cable to be used in this project will be also delivered and laid by C/S Nexans Skagerrak. In addition, the submarine cable will be laid below the seabed using the CapJet system. The installation and test-run will be conducted between 2013 and 2014.

DSME to export 3 units of 1,400-ton submarines for the first time nationwide

Daewoo Shipbuilding & Marine Engineering (DSME) signed a contract with the Indonesian Navy on December 20 for the construction of 3 submarines, thus becoming the first domestic shipbuilder to export submarines.

Under this contract, DSME will build 3 units of 1,400-ton submarines. This contract is valued at approximately 1 trillion 300 billion (approximately USD 1.1 billion), the single largest defense export contract in the history of Korea.

DSME President & CEO Nam Sang-tae (right) and Defense Facilities Agency of the Indonesian Defense Ministry Major General Ediwan Prabowo (left) are shaking hands after signing the contract to build submarines at the Indonesian Ministry of Defense on December 20.

DSME has pushed ahead with precise sales strategies over the last 5 years that it mapped in phase in order to win this submarine construction deal from the Indonesian government. DSME successfully completed a project for upgrading Indonesian submarines and another project for a depot maintenance in 2003 and 2009, respectively, and its solid relationship of trust with Indonesian government has played a key part in winning this deal to export submarines for the first time nationwide.

These submarines will have an LOA (length overall) of approximately 61.3m, capable of accommodating 40 crews. In addition, these submarines will be equipped with 8 weapon tubes to launch a variety of torpedoes, mines, and guided missiles. DSME plans to deliver all of the 3 submarines to the Indonesian Navy by the 1st half of 2018.

Thus, DSME will become the nation's 1st exporter of submarines built with indigenous technology that has made significant strides since it constructed its 1st submarine weighing 1,200 tons with the technological support of Germany in late 1988.

Particularly, DSME won the bid against competitors from France, Germany, Russia, etc, the countries which traditionally dominate the market for diesel submarines, which proves that DSME has competitive edge in overall aspects such as price, quality, education/training, logistics support, technical support in shipbuilding, etc.

Moreover, this new contract is hailed as a major success in beating off the competition from the shipbuilders of the countries that have dominated the world's submarine sector, based on concerted efforts of the nation's private-sector, public-sector, and government organizations, including Ministry of National Defense, Ministry of Knowledge Economy (MKE), Ministry of Foreign Affairs and Trade, Defense Acquisition Program Administration, Korea Defence Industry Trade Support Center, Navy, and DSME.

Nam Sang-tae, President & CEO of DSME, said, "This contract attests to the fact that Korea has joined the ranks of countries, such as Germany, France, Russia and other, which have the cutting-edge submarine technologies. Additional orders are anticipated as we secured important bridgehead to advance into the markets for submarines in the South East Asia."

Meanwhile, DAME is reportedly discussing with respective governments of Central/Latin America and South East Asian countries on the submarine and surface ship export deals.

This contract brings the DSME's total orders for submarines to 14 units, including both domestic and overseas orders. DSME has the nation's most impressive track record of carrying out the upgrade and depot maintenance of 15 domestic submarines and 2 overseas submarines which require the similar level of technology necessary for building submarines, and has emerged as a powerful competitor in the global market for submarines.

Honeywell to enable remote operation of Statoil's Valemon field

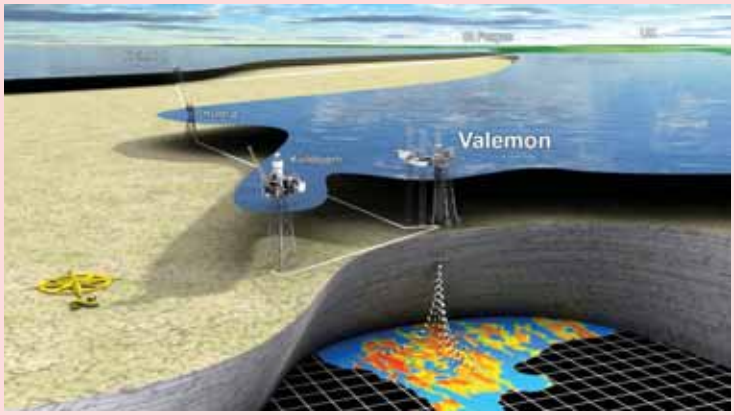
Honeywell announced on October 10 that it was selected by Statoil, the international energy company headquartered in Norway, to deploy its Experion Process Knowledge System (PKS) and Honeywell Distributed System Architecture (DSA) at Statoil's Valemon platform in the North Sea. The DSA will allow Honeywell to integrate Experion with Statoil's existing Kvitebj©™rn platform to enable remote command of the facility, aiming to reduce overall costs and lowering the risks associated with resource recovery.

The Valemon field is located 160 km west of the Norwegian coast and is one of Statoil's largest development projects. The site contains recoverable reserves of 26 billion cubic metres of gas and five million m^3 of condensate, which equates to over 1 percent of Norway's gas reserves.

Honeywell's Integrated Control and Safety System (ICSS) means work can be continuously controlled and the safety of subsea and topside operations monitored without the need for personnel on site. The entire operation can be operated remotely from the existing Kvitebjørn platform. Honeywell's technology reduces the investments needed to achieve the goal of an unmanned platform as minor additional equipment and minimum engineering is required. The DSA will minimize production costs and increase safety for Statoil personnel, as well as reduce the risk of otherwise duplicated ICSS databases becoming inconsistent over time.

Guantak Park, purchasing manager, Samsung Heavy Industries, said, "We selected Honeywell because of the ability of their Process Knowledge System to seamlessly integrate with existing technology. The proven robustness and functionality of Experion PKS gives us the ability to source solutions to maximise productivity safely and at lowcost, and will positively impact our competitive position."

Orhan Genis, vice president, sales, Honeywell Process Solutions, EMEA, commented, "The use of Honeywell DSA and PKS technologies



The Valemon field is located 160 km west of the Norwegian coast and is one of Statoil's largest development projects.

at Valemon demonstrates the industry's recent step forward in resource recovery. The ability to work remotely is opening up the possibility of extracting large untapped reserves in locations, such as the deep North Sea, that were previously too difficult, distant or dangerous to reach, while also helping to drive down costs and increase efficiency."

With production planned to begin in 2014, the gas extracted from the Valemon field will be sent via existing pipelines to supply European gas consumers. Samsung Heavy Industries is acting as the Engineering, Procurement and Construction (EPC) contractor for the project.

Meanwhile, Honeywell DSA allows multiple Experion PKS to operate as one within a single facility, unit, and site or across the enterprise.

Previously, this level of integration could only be implemented within a single, central system. DSA enables seamless global access to points, alarms, interactive operator control messages, and history across constellations of systems, eliminating costly, error-prone performance and functionality, and database duplication or gateways.

DSA dynamically adjusts to changing user and application demands for information. Point data, alarms, and operator messages are delivered only to current subscribers, and then, only when there is a change in status. There is no inter-system polling in the DSA architecture, no transmission of data to systems that aren't currently subscribing, and no transmission of redundant unchanged data to systems that are subscribing.

SHI signed LOA to build the world's largest offshore gas processing facility

Samsung Heavy Industries (SHI) will build the world's largest offshore gas processing facility.

SHI announced that it signed a letter of agreement (LOA) on January 16 with INPEX, the oil and gas exploration and production company based in Japan, to build CPF (Central Processing Facility).

CPF, a type of offshore floating production facility, will produce and process the natural gas from the gas field.

This CPF will measure 110m in both length and width with a weight of 100,000 tons, the largest worldwide. The value of this contract is KRW 2.6 trillion, the highest amount for the offshore plants of same kind.

An official for SHI said, "This contract would be worth KRW 3 trillion if the additional equipments to be confirmed at the formal signing are included." That is equal to the amount generated from the export of 100,000 medium-sized vehicles priced at KRW 30 million each and 3 million units of latest smartphones.

Meanwhile, this CPF to be built by SHI will be listed in the Guinness Book of World Records as the largest offshore plant.

Particularly, SHI was contracted to provide the engineering, procurement and construction (EPC) services covering the design, purchase, production, transport, etc, in recognition of its unmatched ability to carry out off-

shore facility projects, and will be better positioned to dominate the market for ultra large offshore plants.

SHI will sign the contract with INPEX in February and commence the construction of the facility in 2013 and delivery it by the 4th quarter of 2015.

INPEX formed a partnership with French Total (76% owned by Inpex and 24% owned by Total) and is currently developing the Ichthys gas field in the Browse Basin located 200km offshore on Australia's North West Shelf to produce liquefied natural gas.

INPEX awarded CFP, FPSO (Floating, Production, Storage and Offloading), and LNG plant projects at the same time. CPF project was awarded to SHI, while the onshore LNG processing plant will be undertaken by JKC JV (a Japan-based company). Meanwhile, the contractor for FPSO has yet to be decided. Approximately USD 34 billion will be invested in the Ichthys gas field development project.

The gas produced and processed by CPF will be transported via the 885km-long subsea pipelines to the onshore LNG processing plant (located in Darwin, Australia).

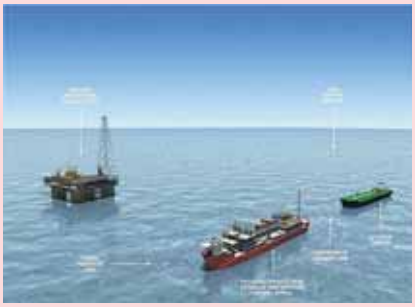
INPEX's Ichthy project will produce 100,000 barrels of condensate per day, 8 million tons of natural gas and 1.6 million tons of LPG per annum, which will be exported to Japan, Taiwan, etc.

The industry expects that gas field developments will gather further momentum worldwide, spurred by the rising demand for LNG which has emerged as eco-friendly source of energy in the wake of Japan's nuclear crisis last year and the high oil prices that can be sent even higher by the U.S. blockade of the Strait of Hormuz.

SHI expects that the offshore plants will contribute approximately 70% of its new order target of USD 12.5 billion for 2012, and is turning itself into a leader in the shipbuilding and offshore plant sectors.

Roh In-sik, President & CEO of SHI, said, "SHI started construction of the world's 1st LNG-FPSO last year and will build the world's largest CPF, writing a new chapter in the history of offshore gas plants. SHI will continue to accumulate the world's best technology and lead the global market."

Bird's eye view of CPF to be built by SHI



Bird's eye view of the Ichthys gas field development project

ABB won cable order from Statoil for world's largest offshore gas platform

ABB announced that it won an order worth around USD 25 million on January 10 from Statoil to supply AC subsea power cables to the world's largest offshore gas platform, Troll A, about 70km off the west coast of Norway.

The order was booked in the fourth quarter of 2011. ABB's scope of supply includes 69km of 3-core cable with integrated fiber optics, accessories and joints. The cables will provide a clean and energy efficient source of power for operating and safety systems on the platform. The project is scheduled for completion in 2014.

ABB is one of the world's leading high-voltage cable manufacturers, with extensive knowledge and experience across a range of applications including offshore wind farm

connections, oil and gas platform power links and subsea interconnections.
This announcement follows a USD 270 million order announced in October last year to supply and install compressor drive systems, HVDC converters and DC cables for the same platform. The Troll A concrete deep water structure is the tallest structure ever to be moved by mankind.
"Expanding oil and gas activities continue to provide ABB with interesting challenges and opportunities. We are delighted that Statoil has decided to partner with us once again for this cable contract," said Martin Gross, head of the Grid Systems business, a part of ABB's Power Systems division. "We have significant experience with both AC and DC submarine cables for applications such as offshore wind farm connections, floating oil and gas platforms and cross border interconnectors."

DSME held a signing-ceremony for a semi-submersible rig

Daewoo Shipbuilding & Marine Engineering (DSME) was recently awarded a contract for 1 semi-submersible rig.
Nam Sang-tae, President & CEO of DSME, signed a contract with Simen Lieungh, President of Odfjell, the offshore drilling rigs operator, in Norway in the evening on January 18 (local time) to build 1 semi-submersible rig.
DSME won this contract in December last year and held a signing ceremony on January after detailed fine-tuning. This semi-submersible rig is priced at approximately USD 620 million. This vessel will be built at DSME's Okpo shipyard and delivered to the ship owner by mid 2014.
This semi-submersible rig measures 119m in length and 97m in width with a deadweight of approximately 33,000 tons. Equipped with the latest drilling system, it has a drilling capacity of up to 10,000m in water depths up to 3,000m.
In addition, this semi-submersible rig is fitted with cutting-edge dynamic positioning system that consists of GPS system, 8 thrusters, computer-controlled propulsion system, etc, enabling the vessel to maintain its position in open waters against strong wind such as typhoon and high waves. Furthermore, it incorporates the winterization technology to ensure stable drilling operations in the rough and cold North Sea.
Meanwhile, Odfjell - which has placed orders with DSME for a total of 3 semi-submersible rigs including this order - selected DSME as its long-term partner. Particularly, the 1st and 2nd semi-submersible rigs, delivered in 2008 and 2010, respectively, have proven to provide high operability and stability and are considered to have unsurpassed capabilities among the drillships being operated by Statoil and BP, the charterers. Odfjell awarded this contract to DSME in recognition of its excellence in the construction of drillship. Additional orders are expected to be placed with DSME which has the unmatched capability in producing semi-submersible rigs.
An official from DSME said, "DSME won orders for 24 semi-submersible rigs and delivered 18 so far, strengthening its leading position in the field of semi-submersible rigs. To ensure continued growth in order intake, we will further increase our sales capability and proceed with strategies tailored to the needs of customers based on strong relationship with ship owners."

Nam Sang-tae (right), President & CEO of DSME, is shaking hands with Simen Lieungh (left), President of Odfjell, after signing a contract in Norway on January 18 (local time) to build a semi-submersible rig.

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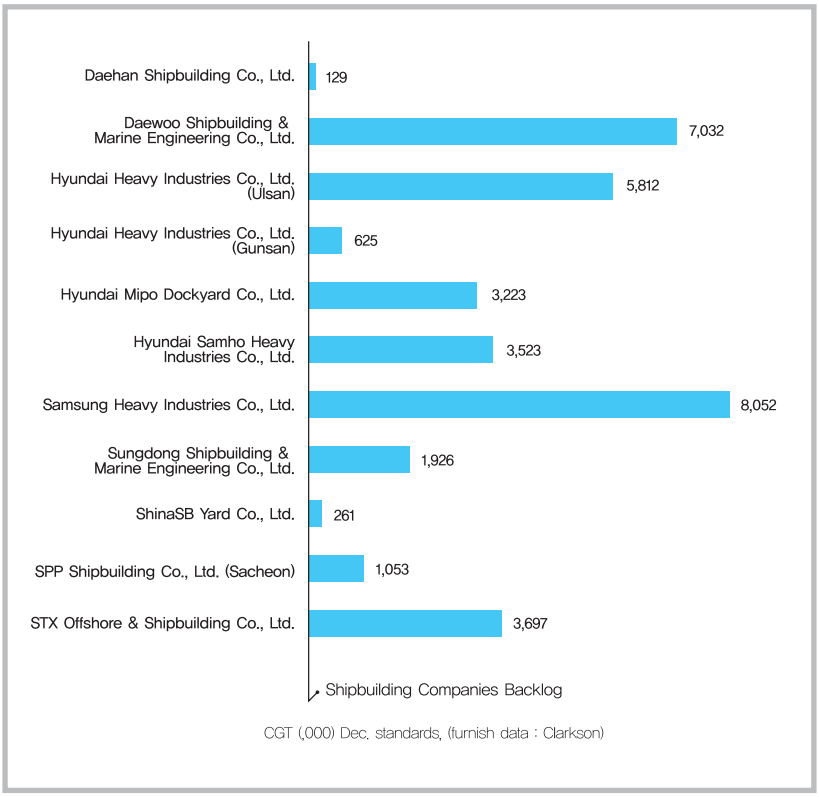
Korean shipyards reclaimed the top spot in the global shipbuilding orders/order amount in 2011 after being overtaken by China in 2010 by a slight margin in terms of new orders, shipbuilding volumes and order backlog as the world's largest shipbuilder.

Domestic shipyards are expected to show strong performance, dominating the market for high value-added vessels, such as containership and LNG carrier, or offshore plants, although the growth may slow down amid sluggish global economy.

According to the Clarkson data published recently, many domestic shipyards still register high order inflow and maintain leading position in the global shipbuilding market.



Here, we take a close look at the performance of Korea's major shipyards, the world's leading players with strong growth in new orders as shown currently in the Clarkson data, such as Hyundai Heavy Industries (HHI), Daewoo Shipbuilding & Marine Engineering (DSME), Samsung Heavy Industries (SHI), STX Offshore & Shipbuilding (STXOS), and others based on the order backlog data.

Photo: SPP Shipbuilding Co., Ltd.

Offshore plant orders awarded to domestic shipyards in 2011-2012

Date		Type	Number of vessel	Amount	Ship owner
2011	January	Drillship	1 vessel (including 1 optional vessel)	KRW 590 billion	Diamond Offshore Drilling Limited, U.S.A
		Offshore Plant	-	USD 900 million	RasGas, Qatar
		Drillship	2 vessels (including 2 optional vessels)	KRW 1 trillion 140 billion	Noble Drilling, U.S.A
		Deepwater drillship	1 vessel	-	Atwood Oceanics, U.S.A
	February	Offshore facility carrier	1 vessel	KRW 265 billion	Dockwise, Netherlands
		FPSO for the North Sea	-	USD 1.2 billion	BP (British Petroleum), U.K
		Platform Supply Vessel	1 vessel	-	-
		Fisheries Research Vessel	1 vessel	EUR 35 million	Ministry of Fisheries and Marine Resources, Republic of Namibia
	March	Offshore Platform (North Sea Drilling & Production platform, Quarters & Utilities platform)	1 unit each	USD 600 million	BP (British Petroleum), U.K
		Deepwater drillship	2 vessel (including 2 optional vessels)	KRW 1 trillion 200 billion	Aker Drilling, Norway
		Drillship	2 vessels	USD 1.1 billion	Ship owner, U.S.A
		Platform Supply Vessel	1 vessel	-	Norsea Group AS, Norway
		Platform Supply Vessel	1 vessel	-	-
	April	Drillship	1 (including 1 optional vessel)	-	Fred Olsen Energy, Norway
		Drillship	2 vessels	USD 1.12 billion	Maersk, Denmark
		Drillship	1 vessel	USD 680 million	Ocean Rig, Greece
		Shuttle Tanker	2 (including 2 optional vessels)	USD 200 million	European Navigation, Greece
	May	Drillship	2 (including 1 optional vessel)	USD 1.12 billion	Rowan, U.S.A
		Deepwater drillship	1 (including 1 optional vessel)	-	Vantage Drilling, U.S.A
		Offshore Platform (Top side of offshore platform)	-	USD 414 million	Statoil, Norway
		FPSO	1 vessel	USD 636 million	Teekay Petrojarl, Norway
		Platform Supply Vessel	2 vessels	Around KRW 120 billion	Farstad Shipping, Norway
		FSO	1 unit	-	PTSC, Vietnam
		LNG-FPSO	1 unit	USD 3.026 billion	Royal Dutch Shell, U.S.A
	June	Platform Supply Vessel	2 vessels	Around KRW 150 billion	Island Offshore, Norway
		LNG-FSRU	2 units (including 2 optional vessels)	USD 500 million	Höegh LNG, Norway
		Multifunctional Deep Water Anchor Handling, Offshore Service Vessels	2 vessels	KRW 240 billion	Farstad Shipping, Norway
		Drillship	1 vessel	USD 680 million	Ocean Rig, Greece
	July	Drillship	2 vessels	USD 1.1225 billion	Maersk, Denmark
	August	LNG-FSRU (Floating Storage and Regasification Unit)	1 vessel	USD 280 million	Excelerate Energy, U.S.A
	September	Semi-submersible Rig	2 units	USD 1.1 billion	Songa Offshore, Norway
		Well Intervention Vessel	2 vessels	USD 420 million	Eide Marine Services AS, Norway
		Drillship	1 unit (optional vessel awarded on January 19)	Approximately KRW 600 billion	Noble Drilling, U.S.A
	October	Fixed Offshore Platform		USD 1.4 billion	Chevron, U.S.A
		Drillship	1 unit	Approximately USD 550 million	Offshore drilling company, Americas
		Platform Supply Vessel	1 unit		Troms Offshore Supply AS, Norway
		Offshore Plant Module	2 units		
		Platform Supply Vessel	4 units	KRW 2 trillion	Island Offshore, Norway
	November	Pipe Laying Support Vessel	2 units	USD 500 million	Odebrecht, Brazil
	December	Offshore facilities (Gas platform and various facilities)		USD 900 million	Major multinational oil companies

**Note : Based on the press release and public announcements of each shipyards, internal estimation of Monthly KORSHIP (estimation until January 15, 2012)*

Delivery	Shipyard
Mid 2013	Hyundai Heavy Industries
Late 2013	Hyundai Heavy Industries
On a staggered basis until late September 2013	Hyundai Heavy Industries
Second half of 2013	Daewoo Shipbuilding & Marine Engineering
October, 2012	Hyundai Heavy Industries
Early 2015	Hyundai Heavy Industries
2012	STX OSV
Early 2012	STX Finland
Late 2014	Hyundai Heavy Industries
Second half of 2013	Daewoo Shipbuilding & Marine Engineering
-	Samsung Heavy Industries
Jun-12	STX OSV
2012	STX OSV
Aug-13	Hyundai Heavy Industries
-	Samsung Heavy Industries
Oct-13	Samsung Heavy Industries
2013	STX Offshore & Shipbuilding
Second half of 2013	Hyundai Heavy Industries
Late May, 2013	Daewoo Shipbuilding & Marine Engineering
-	Samsung Heavy Industries
Mid 2013	Samsung Heavy Industries
First half of 2013	STX OSV
Early 2013	Sungdong Shipbuilding & Marine Engineering
2016	Samsung Heavy Industries
First quarter, third quarter of 2013	STX OSV
Second half of 2013, first half of 2014	Hyundai Heavy Industries
From the second quarter of 2013	STX OSV
Nov-13	Samsung Heavy Industries
Jul-14	Samsung Heavy Industries
First quarter of 2014	Daewoo Shipbuilding & Marine Engineering
Second hallf of 2014	Daewoo Shipbuilding & Marine Engineering
2013	STX Finland
Second half of 2014	Hyundai Heavy Industries
Second half of 2014	Daewoo Shipbuilding & Marine Engineering
	Daewoo Shipbuilding & Marine Engineering
First half of 2013	STX OSV
First half of 2012	STX Finland
Consecutively from the 3rd quarter of 2013 to the 1st quarter of 2014	STX OSV
August of 2014	Daewoo Shipbuilding & Marine Engineering
2nd half of 2014	Hyundai Heavy Industries

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Ships of the Year in 2011

U.K.-based magazines Naval Architect and Fairplay Solution, U.S.-based magazines Marine Log and Maritime Reporter, etc, are world-renowned magazines dedicated to the shipbuilding and shipping industries, and recognize the Ships of the Year at the end of each year.
Many ships built at domestic shipyards, such as Hyundai Heavy Industries (HHI), Daewoo Shipbuilding & Marine Engineering (DSME), Samsung Heavy Industries (SHI), etc, have been recognized as the Ships of the Year. Over 9 ships built by DSME have been selected as the Ships of the Year for consecutive 5 years until 2011.

■ Hyundai Heavy Industries (HHI)

'SIFA', a 317,000-ton very large crude carrier (VLCC) (ship owner: Oman-based OSC)

'Tugela', a 7,900-unit Large Car and Truck Carrier (LCTC) (ship owner: Norway-based Willhelmsen)

■ Daewoo Shipbuilding & Marine Engineering (DSME)

'Maersk Lima', a 7,450TEU containership

'Amali', a 147K CBM LNG carrier

'Mega Caravan', a 16.5K DWT Heavy Lift Carrier (HLC)

'Norbe VIII', a drillship

1. 'Sonangol Sambizanga', a 160.5K CBM LNG carrier
2. 'Bicentenario', a semi-submersible drilling rig
3. 'Seeb', a 318K DWT VLCC

'Victoria Mathias', a wind turbine installation vessel

■ Hyundai Samho Heavy Industries (HSHI)

'SAMCO AMAZON', a product carrier (ship owner: Saudi Arabia-based SAMCO)

■ Hyundai Mipo Dockyard (HMD)

'Halki', a 37,000-ton bulk carrier (ship owner: Korea-based JK Maritime)

'Desert Calm', a 58,000-ton bulk carrier (ship owner: Greece-based Atlantic Bulk Carriers Management)

'Iver Balance', a 6,050DWT asphalt carrier (ship owner: Netherland-based VROON)

'Acamar', a 37,000-ton PC carrier (ship owner: France-based Socatra)

SPP Shipbuilding

'ASTIR LADY', a 50K product carrier (ship owner: Greece-based BYZANTINE)

'LEDA C', a 82K bulk carrier (ship owner: Grece-based Target Marine)

New Product

Industrial scale

OHAUS Korea

Valor 1000

OHAUS Corporation is a leading manufacturer of balances for industrial, laboratory, education and specialty markets worldwide. OHAUS recently unveiled 'Valor 1000', an industrial precision scale, and 'Defender 3000', a bench scale.

Valor 1000

OHAUS Corporation added the new Valor 1000 Compact Precision Scale Series to its line of weight measurement products. The Valor 1000 Series of digital portable scales is ideal for food service, lab and industrial applications.

The Valor 1000 Series allows users to compare the weight of a sample against a reference weight using the included checkweighing software. This allows for quick portioning and checking of multiple sample weights against a target, as well as quickly preparing multiple samples of the same size. The Series is constructed with an ergonomic and user-friendly design, and is an economical choice for professional weighing needs.

The Valor 1000 Scales are simple yet rugged, and are ideal for general weighing and simple counting applications. The scale's software offers check weighing and accumulation of weights, as well as multiple units of measure (pounds, ounces, kilograms and grams). The Valor 1000 also features a large stainless steel pan that is removable for easy cleaning, and a bright, easy-to-read backlit LCD screen. The new scales come standard with a long-lasting internal rechargeable lead acid battery, which has up to 100 hours of life on a single charge for ultimate portability and convenience.

Defender 3000

OHAUS Corporation also added all-stainless steel, full washdown models to its new Defender 3000 Series line of bench scales. The Defender 3000 Series Bench Scales have been designed as reliable and affordable scales for use in areas requiring full protection from water.

The new Defender 3000 Washdown Scales represent further expansion of the new line of OHAUS Defender 3000 bench scale products for industrial and laboratory use. The Defender 3000 Washdown Scales are simple, yet rugged, bench scales that are ideal for general weighing and simple counting applications in locations requiring resistance to water. For instance, packaging and warehouse operations can use the scales to get quick, accurate weights of boxes before shipping.

The new Defender 3000 Washdown Scales have four capacity models available - 60, 150, 300 and 600 lb - with three rectangular base sizes. For increased resistance to water, the scale is manu-

Defender 3000

factured from stainless steel, providing NEMA 4×/IP65 protection. For added durability, the Washdown models feature stainless steel loadcells and sealed membrane keypads.

As with the dry-use versions of the Defender 3000 scales, the new Washdown models have several key features, including multiple weighing units (lb, oz, lb:oz, kg or g), brilliant backlit LCD screen, four input keys, counting software with selectable sample sizes (5-10-20-50-100), retention of last sample size/average piece weight in memory, and an RS232 port for data connectivity.

The Defender 3000 Series is powered by an internal rechargeable sealed lead acid battery with 80 hours of life. Each Defender 3000 Series Scale comes equipped with a removable stainless steel weighing pan and stainless steel welded tubular frame. Non-slip rubber leveling feet with locking nuts and down-stops for overload protection work to make the Defender 3000 Washdown Scales both highly functional and accurate.

-TEL: +82-1688-6388
-http://www.ohaus.co.kr

New Product

FireLockEZ Style 009H rigid coupling

Victaulic

Victaulic, a leading global producer of mechanical pipe joining and fire protection systems, introduced the FireLockEZ Style 009H rigid coupling. The improved design affords faster, more consistent installation with or without power tools, is easy to use and estimate and is designed to avoid rework.

"We are pleased to expand the Victaulic installation-ready product line with the introduction of the Style 009H rigid coupling," said Kim Sam, regional manager, Victaulic Korea. "Victaulic listened to contractors looking for a fast, simple coupling solution that is safe to install, even with hand tools, and delivers solid performance. The FireLockEZ rigid coupling has no loose parts to drop or cause injury, ships to the jobsite ready to install and offers the fastest installation - period."

The new coupling utilizes the same proven groove as other Victaulic couplings, while the improved design makes it easy to install using a hand-tool. This minimizes the need for powered impact wrenches, which are a strong concern for cost and jobsite efficiency. However, if an impact wrench is preferred, the battery consumption will be much less due to reduced installation efforts needed with the Style 009H as compared to other rigid fire protection couplings.

The Style 009H is part of Victaulic's installation-ready product line and platform and has all the same time-saving benefits of the Style 009, plus more.

-Installs in three easy steps: push, join and tighten
-No need to disassemble the coupling prior to assembly, which saves time and increases productivity
-No loose components to drop or lose, increasing productivity, reducing labor hours and increasing efficiency and safety
-Installation times more consistent from one installer to another, providing more accurate labor estimates
-Reduces installation effort by aiding overhead assembly, providing a third hand during installation

FireLockEZ Style 009H rigid coupling

The Style 009H Rigid Coupling is available in 1 1/4″ - 4″ sizes and FM Approved and cULus Listed for fire protection services up to 365 psi/25 bar.

-TEL: +82-2-521-7235
-http://www.victaulic.com

Laser distance measure

Bosch Power Tool

'GLM 50'

Bosch Power Tool's 'GLM 50' is a new laser distance measurer for professionals who want to measure the height and distance of building or the work space fast and accurately.
GLM 50 works in the simple way. Just touch it. GLM 50 can measure distances up to 50m with an accuracy of ± 1.5mm, much faster and more accurate than conventional measuring devices such as the tape measure. Besides, it can measure the area and volume very easy and thus speeds up and simplifies the calculation of material and prices.
Further advantages include the measurement of continuous distance and indirect height. Therefore, GLM 50 provides reliable results even at the place where proper measurements cannot be obtained with a tape measure. Continuous measurement is useful for calculating total length of material. For example, actual distance can be calculated when installing the ventilation duct inside building or fitting the plaster panel to the interior wall of building. The indirect measurement by Pythagorean theorem comes into use simply by pointing the device at two spots.
GLM 50 is the size of cigarette pack and weighs only 140g. It can even be put in jacket or pants pockets and thus highly portable and convenient to carry in job site.
In addition, GLM 50 is easy to operate as it has 7 special function button display marked with symbols keys.

The measurement level setting is available in 3 types - from the front edge of the device or the rear edge of the device or on the tripod - and the measurement results are easy to read out on the bright and large LCD display. The LCD display activated by an integrated light sensor automatically controls the brightness depending on the amount of sunlight outside.
GLM 50 is operated with 2 units of 1.5V AAA batteries which enable up to 10,000 individual measurements. GLM 50 is a IP54 certified device. It is very robust, dust and splash-proof. In addition, it has rubberized edge and remain fully operational even after a fall from a 1m height.
Major specification of GLM 50 is as follows:

-Measurement range : 0.05-50m
-Measurement accuracy: ± 1.5mm
-Battery: AAA battery x 2 units
-Battery life (individual measurement): 10,000 measurements
-Measuring time: 2.5 hours
-Laser type: 635 nm, < 1mW, class 2
-Safety grade: IP54
-Dimension (length x width x height): 114 x 53 x 31 mm
-Weight: 140g

-TEL: +82-80-955-0909
-http://www.bosch-pt.co.kr

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homepage add : www.bycontrols.com
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JONGHAP MACHINERY CO., LTD.
head office : Yangsan Gyeongnam
homepage add : www.jonghap.biz
main products : sewage treatment plant, welding positioning equipment sys. parts former
TEL : +82 55-383-2300

JS CABLE LTD.
head office : Cheonan Chungnam
homepage add : www.jscable.co.kr
main products : offshore & marine cable, power cable, speciality cable, nuclear cable
TEL : +82 41-559-4800

KANGRIM HEAVY INDUSTRIES CO., LTD.
head office : Changwon Gyeongnam
homepage add : www.kangrim.com
main products : boilers, marine & industrial, inert gas system(i.g.s.), i.g.g. & n2generator
TEL : +82 55-269-7701

KANGRIM INSULATION CO., LTD.
head office : Saha-Gu, Busan
homepage add : www.kangrim.com
main products : lng & lpg carriers tank & pipe cryogenic insulation, lng receiving terminal tank & pipe cryogenic insulation
TEL : +82 51-220-6001

KUNSUL CHEMICAL IND. CO., LTD.
head office : Jin-Gu Busan
homepage add : www.jebi.co.kr
main products : marine & heavy duty, protective coatings
TEL : +82 51-892-4221/7

KYUNG EUN CERAMICS CO., LTD.
head office : Gimhae Gyeongnam
homepage add : www.ke-ceramics.com
main products : ceramic back-up tape
TEL : +82 55-345-7761

KUKDONG ELECTRIC WIRE CO., LTD.
head office : Jincheon Chungbuk
homepage add : www.cablekukdong.co.kr
main products : shipboard cable, lan utp cable, power cable, rubber cable, pvc cable
TEL : +82 43-530-2000/1, +82 2-2140-3061

KUMKANG PRECISION CO., LTD.
head office : Saha-Gu, Busan
homepage add : www.kkmarine.co.kr
main products : marine valve, valve for engine, air reservoir tank
TEL : +82 51-262-4890

KUMOH MACH. & ELEC. CO., LTD.
head office : Gijang Busan
homepage add : www.komeco.net
main products : eng. & t/c tacho system, vibration measuring system, d/g engine control panel
TEL : +82 51-724-5070

KEYSUNG METAL CO., LTD.
head office :
homepage add : www.keysungmetal.com
main products : valves for marine & offshore plant, cryogenic vlaves, strainer
TEL : +82 51-831-3391

K. C. LTD.
head office :
homepage add : www.iccp-mgps.com
main products : I.C.C.P. System, Anti-fouling System(M.G.P.S.), Shaft Earthing Device
TEL : +82 51-831-7720

KSP CO., LTD.
head office :
homepage add : www.kspvalve.com
main products : Engine Valve, Flange
TEL : +82 51-831-6270/7

KTE CO., LTD.
head office :
homepage add : www.kte.co.kr
main products : Marine Switchboard(high, low), Marine Control Console, Alarm Monitoring System, Thruster
TEL : +82 51-265-0255

KOKACO CO., LTD.
head office :
homepage add :
main products : Exhaust Valve & Valve Seat Grinding Machine, Nozzle Lapping Machine
TEL : +82 51-403-4114/6

KONGSBERG MARITIME KOREA LTD.
head office :
homepage add : www.km.kongsberg.com
main products : IAS, DP, K-Chief 500, Auto Chief c20, K-Gauge, K-Bridge, MIP, MBB
TEL : +82 51-749-8600

KEYSTONE VALVE(KOREA) LTD.
head office : Anseong Gyeonggi
homepage add : www.tycovalves.com
main products : Butterfly Valve, Ball Valve, Safe Valve
TEL : +82 31-670-2500

KEON CHANG IND. CO., LTD.
head office :
homepage add : www.keonchang.co.kr
main products : marine equipment, ladle turret, roll stand assy, side trimmer & chopper, bloom c c, screw conveyor, etc.
TEL : +82 51-203-0161

KWANG SAN CO., LTD.
head office :
homepage add : www.kwangsan.com
main products : heating coil, sus spool, air vent head, expansion joint
TEL : +82 51-974-6301

KEUMYONG MACHINERY CO., LTD.
head office : Buk-gu, Daegu
homepage add : www.keumyong.com
main products : exhaust valve complete with valve spindle, axial vibration damper
TEL : +82 53-608-8110/6

KWANG SUNG CO., LTD.
head office :
homepage add : ikwangsung.com
main products : t-girder, panel, stair, handrail, inclined ladder,
TEL : +82 55-338-9973

KUK DONG ELECOM CO., LTD.
head office : Saha-Gu, Busan
homepage add : www.kukdongelecom.com
main products : marine & offshore light fixtures, explosion-proof lights, flood & search lights, mgf packing system
TEL : +82 51-266-0050

KYUNGSUNG INDUSTRY CO., LTD.
head office : Gangseo Busan
homepage add : www.e-clamp.com
main products : clamp, sus corner, anchor strip
TEL : +82 51-831-4960

LS CABLE LTD.
head office :
homepage add : www.lscable.co.kr
main products : marine shipboard & offshore cable, bare conductor wire, (pvc/pe/xlpe/rubber) power & control cable
TEL : +82 2-2189-9114

LEE YOUNG INDUSTRIAL MACHINERY CO., LTD.
head office : Ulju Ulsan
homepage add : www.leeyoung.co.kr
main products : engine casing, corr. bhd, upper deck, built-up longitudinal, chain locker, lashing bridge
TEL : +82 52-231-5800

MIN SUNG CO., LTD.
head office : Sasang Busan
homepage add : www.minth.co.kr
main products : cable tray, hatch, electric cable box
TEL : +82 51-305-8862

Mt.H CONTROL VALVES CO., LTD.
head office :
homepage add : www.mth.co.kr
main products : crankcase relief valve, main starting valve, pneumatic control valve, safety relief valve
TEL : +82 51-974-8800

MSL COMPRESSOR CO., LTD.
head office : Pocheon Giyeonggi
homepage add : www.mslcomp.com
main products : breathing air compressor, h.p air compressor, n2 gas booster
TEL : +82 31-853-7000

MYCOM KOREA CO., LTD.
head office :
homepage add : www.mycomkorea.com
main products : screw compressor unt, reciprocating compressor unit condensing unit, brine chiling unit
TEL : +82 55-294-8678

MYCOM KOREA CO., LTD.
head office :
homepage add : www.mycomkorea.com
main products : screw compressor unt, reciprocating compressor unit, condensing unit, brine chiling unit
TEL : +82 55-294-8678

Myung Sung Engineering Co., Ltd.
head office : Mokpo Jeonnam
homepage add :
main products :rudder & rudder stock, rudder horn, stern roller
TEL : +82 61-276-7650

Marine Radio Co., Ltd.
head office :
homepage add : www.mrckorea.com
main products : public address system, auto tel. exchanger sys. communal aerial sys. marine clock system
TEL : +82 51-414-7891

NK CO., LTD.
head office :
homepage add : www.nkcf.com
main products : ballast water system, co2system, deck foam system, dry power system
TEL : +82 51-204-2211/3

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head office :
homepage add : www.opco.co.kr
main products : deck house, funnel & engine room casing, life boat davit, engine room crane
TEL : +82 51-202-0101

OSCG CO., LTD.
head office : Sasang Busan
homepage add : www.oscg.net
main products : cable gland(eexd & e), adapter / reducer, flexible connectors
TEL : +82 51-305-3910

PANASIA CO., LTD.
head office : Gangseo Busan
homepage add : www.pan-asia.co.kr
main products : cargo monitoring sys. tank level gauge sys. high & overfill alarm sys.
TEL : +82 51-831-1010

SARACOM CO., LTD.
head office : Yeongdo Busan
homepage add : www.saracom.net
main products : gmdss, ship sound signal appliances, navigation equipment, fire detection system
TEL : +82 51-600-9000

SAMGONG Co., Ltd
head office :
homepage add : www.sam-gong.co.kr
main products : oil purifiers, ships accommodation ladders, ships windows
TEL : +82 51-200-3040/1

SAMYOUNG MACHINERY CO., LTD.
head office : Daedeok Daegeon
homepage add : www.sym.co.kr
main products : cylinder head, cylinder liner, piston
TEL : +82 42-625-4064

SAMYUNG ENC CO., LTD.
head office :
homepage add : www.samyungenc.com
main products : ais(si-30)-auto. identification sys. dsc vhf radio telephone(str 6000a)-gmdss equipment
TEL : +82 51-601-6601

SUH HAN INDUSTRY CO., LTD.
head office :
homepage add : www.suhhani.co.kr
main products : cable tray others-steel, galvanized steel, stainless steel, aluminium
TEL : +82 51-204-1920

SMS CO., LTD.
head office : Saha Gu Busan
homepage add : www.sms-marinesystem.com
main products : hatch-pontoon type, folding type, side rolling type, etc. lashing equipment-2/3tier
TEL : +82 51-290-1000

SUNBO INDUSTRIES CO., LTD.
head office :
homepage add : www.sunboind.co.kr
main products : tank top unit, engine room unit, package unit
TEL : +82 51-261-3454

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head office :
homepage add : www.skbend.com
main products : pipe fittings-butt. welding / socket welding / thread type/ flange
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SUNG MI CO., LTD.
head office :
homepage add : www.sung-mi.co.kr
main products : fire retarding doors, fire retarding wall, ceiling panel
TEL : +82 55-329-1117

SUNGSIN INDUSTRIES CO., LTD.
head office :
homepage add : sungsin.koreasme.com
main products : hatch coaming, t-bhk block, fore mast & port, water separator
TEL : +82 54-776-6441

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main products : pipe spool fabrication, induction pipe bending, marine engine pipe
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main products : welding consumable, welding equipments
TEL : +82 55-289-8111

SEUN ELECTRIC CO., LTD.
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homepage add : www.seunelectric.co.kr
main products : battery charger and dist. board. full auto. charging sys. .lcd display monitor
TEL : +82 51-208-4641

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head office :
homepage add : www.sewon-ind.com
main products : high velocity p/v valve, gas free vent cover, flame screen
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SAEJIN INTECH CO., LTD.
head office :

homepage add : www.sjhind.com
main products : emergency towing system, telescopic radar post, deck fittings(mooring fitting), industrial m/c & etc.
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TEL : +82 55-239-4700

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homepage add : www.specs.co.kr
main products : system division-oil mist detector, portable level temp/oil
TEL : +82 31-706-5211

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homepage add : www.shindong.com
main products : satellite tv sets-satellite communication equipments, draft buoy(1m, 1.6m, 2.4m discus buoy)-ocean information technology division
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main products : propeller(f.p.p.), c.p. propeller blade & hub, propeller shaft, inter shaft
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homepage add :
main products : air & electric winch-0.2ton ~ 10ton, air motor-1p ~ 25p, davit (all)-0.2ton ~ 5ton
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homepage add : nozzle.koreasme.org
main products : for marine engine-nozzle, plunger assy, delivery valve assy
TEL : +82 51-264-8829, 262-8869

SHIN SHIN MACHINERY CO., LTD.
head office :
homepage add : www.sspump.com
main products : centrifugal pumps, gear pumps, screw pumps, submersible pumps
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main products : white metal bearings-marine metal bearing, automotive metals
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main products : oil & gas system, hydraulic system
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main products : cam & camshaft, valve spindle & seat ring, piston pin
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head office :
homepage add : www.samartkr.com
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homepage add : www.stxengine.co.kr
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homepage add : www.simulationtech.co.kr
main products : Emergency Shutdown System, Grease Extractor/de-Oiler, Operator Training Simulator
TEL : +82 2-3281-0960

SHINHAN MACHINERY CO., LTD.
head office :
homepage add : www.shinerpia.com
main products : deck house, engine casing & funnel, fore/after-end block & others
rudder, living quarters
TEL : +82 52-231-3525

SAMGONG INDUSTRIAL CO., LTD.
head office : Pyonghaek Gyeonggi
homepage add : www.samgong.com
main products : inflatable rubber products
TEL : +82 31-654-4805/6

SIN YOUNG ENTERPRISE CO., LTD.
head office : Gimhae Gyeongnam
homepage add : www.sy-ind.com
main products : main hole, access hatch, bollad
TEL : +82 55-346-0034

SUNG JIN GEOTEC CO., LTD.
head office : Namgu Ulsan
homepage add : sgtkor.co.kr
main products : bulbous bow, stern block, hull block, module, lng/lpg tank
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STACO CO., LTD.
head office : Gangseo Busan
homepage add : www.staco.co.kr
main products : Wall Panel, Ceiling Panel, Unit Toilet, Cabin Door, Furniture,
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homepage add : www.stxenpaco.co.kr
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homepage add :
main products : piston, piston liner, piston skirt
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homepage add : www.suropump.co.kr
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TEL : +82 51-415-0444

SHIN-A ENTERPRISE CO., LTD.
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homepage add : www.shina-ent.com
main products : navigation equipment, communication equipment, monitoring system equipment
TEL : +82 51-204-6221/5

TK CORPORATION
head office :
homepage add : www.tkbend.co.kr
main products : Elbow, Reducer, Tee, Cap
TEL : +82 51-831-6550

TAE YOUNG TRADING LTD.
head office : Junggu Seoul
homepage add : www.marine-material.com
main products : Receptacles & Wire Accessaries, Floodlight, Deck Light, Reflected Lamps
TEL : +82 2-2272-1960

TANKTECH Co., Ltd.
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homepage add : www.tanktech.co.kr
main products : High Velocity P/V Valve, Local Fire Fighting Sys. Tank Cleaning Machine
TEL : +82 51-979-1600

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head office :
homepage add : www.techmarine.net
main products : Loading Computer System
TEL : +82 51-467-7003

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main products : cable tray, heating coil, strainer
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homepage add : www.tmc-cable.com
main products : marine cable, optical fiber cable
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homepage add : www.whayoung.co.kr
main products : Supply Unit Assy, Collector Block Assy, Fuel & Exh. Movement, Fuel Pump Assy
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head office :
homepage add : www.wwckorea.com
main products : i.c.c.p system, m.g.p.s, s.g.d
TEL : +82 51-831-0131

YOUNG KWANG MACHINE CO., LTD.
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homepage add : www.ykme.co.kr
main products : package unit, group unit, module unit for industrial plant
TEL : +82 54-776-5456/9

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homepage add : www.yoowonind.com
main products : steering gear, auto filter, deck machinery
TEL : +82 51-205-8541

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homepage add : www.youjeon steel.co.kr
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Published on Feb. 5. 2012

Publisher Yoseob Choi

Editorial Director Wooseung Cha

Editor-in-Chief Chunghoon Lee

Senior Editor Myungeui Jo

Designer Jaeyong Park

Marketing Manager Kijong Seo
Jongki Hong

Printed by Dae Han Mi Sul

Printed (CTP) by Myungjin

Published by PROCON

Adress : Rm 708 ACE Techno Tower #55-7, Mullae-dong 3 ga, Youngdungpo-ku, Seoul, Korea

Tel : +82-2-2168-8899

Fax : +82-2-2168-8895

International : +82-10-9402-7978 (Mr. Park)

www.korship.co.kr www.procon.co.kr

E-mail : korshipeditor@gmail.com

Price per Copy : ₩10,000

Annual Subscription Fee : ₩100,000

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Kiup Bank	083-038571-04-013
Kook Min Bank	757-21-0285-181
Shin Han Bank	284-05-012954
Woo Ri Bank	182-07-168838
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