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# KORSHIP

Korea monthly shipbuilding magazine

Shipbuilding · Marine · Offshore · Offshore wind

2013. 7

Kormarine  
Official  
Magazine



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SSC (Ship Section Carrier)

Capacity : 50 ton ~ 1,000 ton  
For combination of up to 10,000 ton

- High flexibility while operated with several steering programs
- High accuracy steering system (steering error at all positioning within 1°)
- Ring gear steering system (steering angle ±165°)



RTP (Rail Transporter)

Capacity : 50 ton ~ 1,500 ton  
For combination of up to 90,000 ton

- One operator controls the whole system via radio remote controller
- Hydraulic coupling for drive system and electric coupling cables not required.
- Reduce coupling time



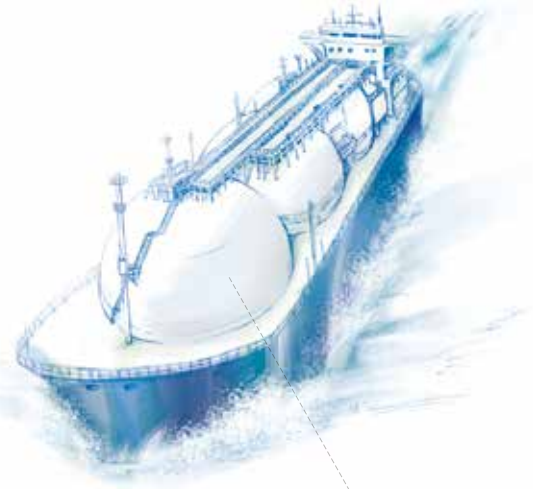
MTP (Module Transporter)

Capacity : 60 ton ~ 1,000 ton  
For combination of up to 20,000 ton

- Ring gear steering system (steering angle ±165°)
- Flexible positioning under the load
- Center of Gravity Systems allows exact positioning under loads

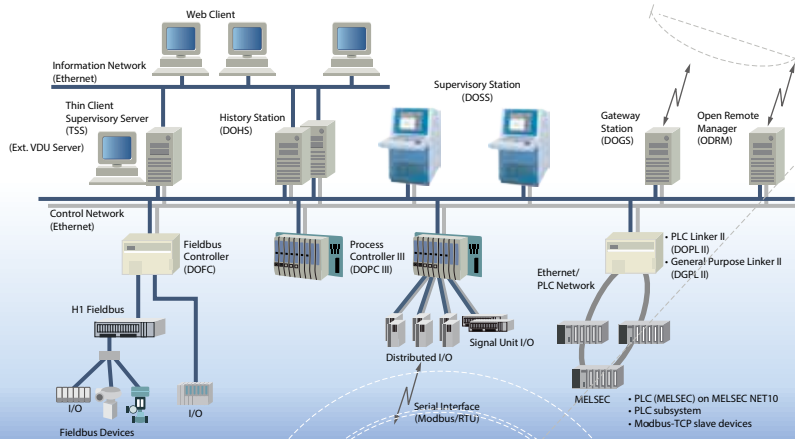


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# KORMARINE 2013

International Marine, Shipbuilding & Offshore Exhibition

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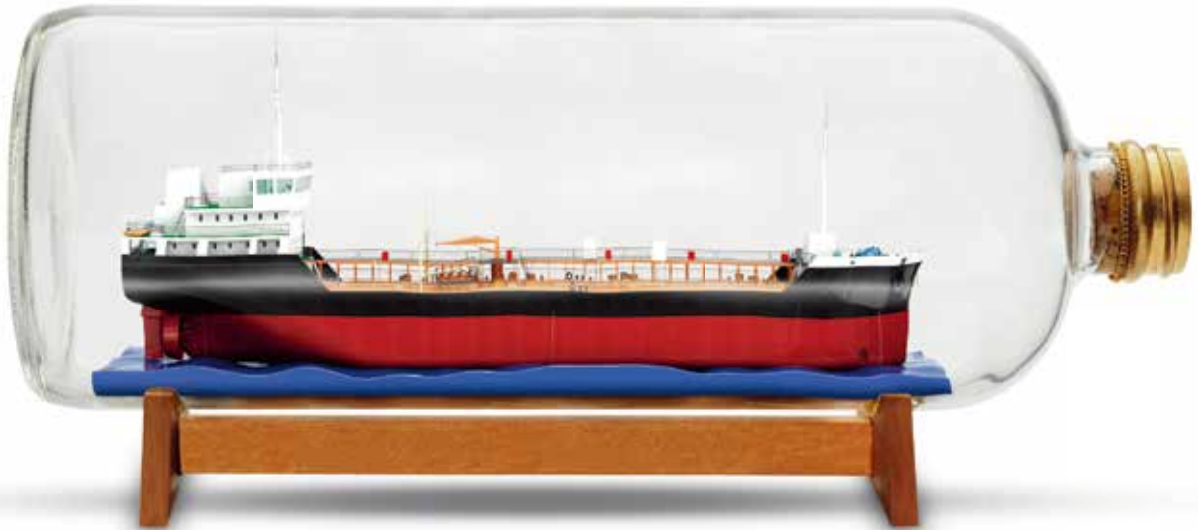


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# HIGEN MOTORS means Reliability and Quality for Shipbuilding Industry.

## Explosion Proof Motors (Ex d)



71M ~ 250M



280M ~ 315M



355L

Fr. Size	Class	Poles and Rated Output			
		2P	4P	6P	8P
71M ~ 250M	IIB, IIC	0.4 ~ 90kW	0.2 ~ 90kW	0.4 ~ 75kW	0.4 ~ 45kW
280M ~ 315M	IIB	110 ~ 132kW	110 ~ 160kW	110 ~ 132kW	75 ~ 90kW
355L	IIB	—	260kW	220kW	—

\* In all above frames, HIGEN is the only Korean manufacturer that acquired certificates such as ATEX.

## High Voltage Motors



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# Hammelmann High pressure systems in the Marine, Oil & Gas industry

High pressure pumps – Cleaning systems - Process pumps

Founded in 1949 Hammelmann has decades of experience in the development and manufacture of high pressure systems for all branches of industry.

## Cleaning with high pressure pumps and applications systems up to 3500 bar

- Removal of marine growths from the hull, rudder and propellers
- Spot blasting
- Hull underside cleaning
- Surface preparation for re-coating the hull above and below the water line
- Rust removal and surface preparation in ballast tanks in dock or at sea
- Cleaning and surface preparation works on superstructure, deck machinery, winches, gangways and anchor chains
- Removing burnt primer from weld seams
- Washing primed new build sections
- Cold cutting
- General clean up operations on dock floors and walls
- Heat exchanger cleaning: rigid and flexible flushing lances, tube cleaning nozzles, internal and external heat exchanger cleaning systems
- Tank cleaning: tank cleaning heads, internal cleaning systems for autoclaves
- Pipe and sewer cleaning: standard and reversible sewer cleaning nozzles, powered hose reels



## High pressure pumps

Hammelmann pumps produce maximum performance from a minimal footprint which is the result of combining a compact integral speed reduction gear end with the concept of a vertical configuration.

Power ratings up to 1100 kW  
Flow rates up to 2987 l/min  
Pressures up to 4000 bar



## Process pumps

Hammelmann Triplex and Quintuplex pumps provide the highest standards of safety and reliability.

Power ratings up to 650 kW  
Flow rates up to 2000 l/min  
Pressures up to 3000 bar



## Typical fluids

- Diesel oil
- Glycol
- LDHI
- Methanol
- Process water
- Salt water
- Scale Squeeze
- Inhibitors:
  - Asphaltene
  - Paraffin
  - Corrosion
  - Scale





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**NEW**



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# Think Innovation

T&S was established on Sept 1st, 2001 based on the concept of providing sophisticated technology and services to customers. At this present, T&S are dealing with almost all of shipbuilding companies in Korea such as HHI, DSME, SHI, STX as a local agent of Greenlee Textron of American Textron Group, Klauke Textron(Germany), Hellermann Tyton(Multinational), FireSeal(Sweden), BIS Lambda(Norway), NEK Cable(Norway), etc.

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# Mission Statement

Korship helps not only to share informations and technologies of shipbuilding & offshore industry between users and potential suppliers but also introduce subscribers up-to-date shipbuilding & offshore related technologies and informations to become a shipbuilding & offshore industry technical journal.

Korship puts advertising domestic companies in touch with abroad buyers and tries to contribute development and growth of domestic shipbuilding & offshore industries by introducing world's new technologies, news, companies and products to superintendents, engineers, Korea branch of abroad companies, domestic shipbuilding & offshore companies and all related companies.

## Technology

World's up-to-date indispensable informations of shipbuilding & offshore companies, products and system technology described to help people who engage in the industry.

## Special Focus

Provide articles deeply focusing on latest shipbuilding & offshore industry technologies, logistics and port etc.

## Company & Comments

Introduce latest tendency and related news of industry through company interview.

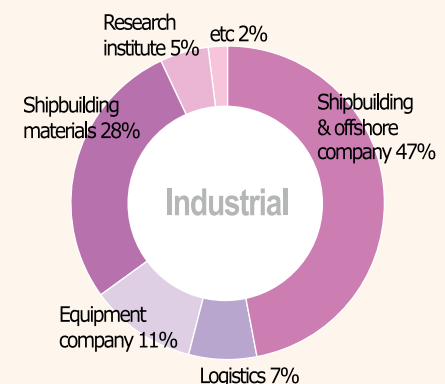
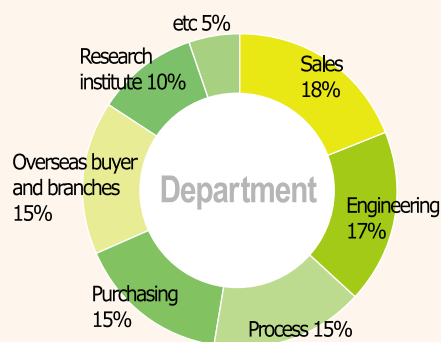
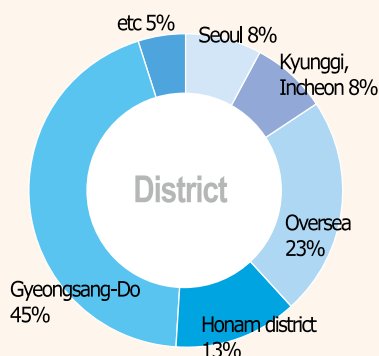
## Product

New shipbuilding & offshore industry products overview

## Business News

Issues and news articles from global shipbuilding & offshore companies and organizations

## Detailed area breakdown





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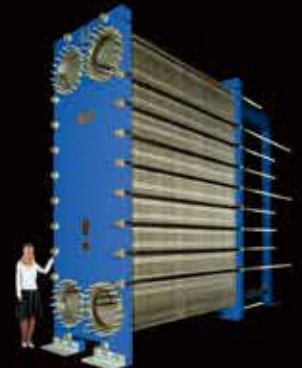
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## The world's largest containership built by DSME was unveiled

Daewoo Shipbuilding & Marine Engineering (DSME) held a naming ceremony for the world's largest containership, which was ordered from the world's largest container shipping operator Maersk in 2011, at Okpo shipyard in Geoje on June 14.

The naming ceremony was attended by major officials of both companies and guests, including Goh Jae-ho, President of DSME, Michael Pram Rasmussen, Chairman of Maersk Group, Soren Skou, President of Maersk Line, H.E. Peter Lysholt Hansen, Danish Ambassador to Korea.

Maersk MC-Kinney Moller, named by Ane Maersk Mc-Kinney Uggla, the Vice-Chairman of Maersk Group, is the first vessel out of the 20 units of 18,270TEU containership series currently being built by DSME. This vessel measures 399m length, 59m in width, and has a carrying capacity of 18,270 containers, which is the largest container-

ship worldwide. The total value for all those 20 vessels amounts to approximately KRW 4 trillion with each unit priced at about KRW 200 billion.

This is the largest single contract in the commercial vessel sector. For that reason, Maersk MC-Kinney Moller, the Chairman of Maersk Group at the time of the contract signing in 2011, had a great attachment to this vessel. Maersk and DSME named the vessel after Maersk MC-Kinney Moller to honor the deceased. Goh Jae-ho, President of DSME, said, "Maersk MC-Kinney Moller is a vessel opening new horizon in the history of



Officials of both companies are posing for photo with the world's largest containership behind after the naming ceremony at DSME's Okpo shipyard on June 14.

DSME, Maersk, and shipbuilding industry. I hope that both companies would keep maintaining strong partnership." Including this contract, Maersk has placed orders for 43 vessels at DSEM, and DSME has delivered 23 vessels thus far.

### 대우조선해양이 만든 세계 최대 컨테이너선, 세상에 첫 선 보인다

대우조선해양은 세계 최대 컨테이너 선사인 머스크(Maersk)사로부터 지난 2011년 수주한 세계 최대 컨테이너선의 명명식을 지난 6월 14일 거제 옥포 조선소에서 가졌다.

이날 명명식에는 대우조선해양 고재호 사장, 미카엘 프람 라스무센(Michael Pram Rasmussen) 머스크 그룹 이사회 의장, 소렌 스카우(Soren Skou) 머스크 라인 사장을 비롯해 피터 뤼스홀트 한센(H.E. Peter Lysholt Hansen) 주한 덴마크 대사 등 양사 주요 관

계자 및 외부 인사들이 참석해 자리를 빛냈다. 아네 머스크 맥키니 우글라(Ane Maersk Mc-Kinney Uggla) 머스크 그룹 이사회 부의장이 선명을 부여한 '머스크 맥키니 몰리호'는 대우조선해양이 건조하는 18,270 TEU 컨테이너선 시리즈 20척의 첫 번째 호선이다. 이 선박은 길이 399m, 폭 59m 규모로 18,270개의 컨테이너를 적재할 수 있는 현존하는 컨테이너선 중 가장 큰 규모를 자랑한다.

선가는 척당 약 2,000억원(KRW)으로, 전체 20척의 총 수주액은 약 4조원(KRW)에 달한다. 이는 상선 분야 단일 계약으로는 역대 최대 기록이다. 이러한 이

유 때문에 2011년 계약 당시 머스크 그룹을 이끌던 머스크 맥키니 몰리 회장은 해당 선박에 큰 애착을 가졌었다. 머스크사와 대우조선해양은 고인을 기리기 위해 그의 이름을 첫 호선명으로 결정했다. 대우조선해양 고재호 사장은 "머스크 맥키니 몰리 호는 대우조선해양과 머스크사 그리고 조선 역사에 새 지평을 연 선박"이라며 "양사가 앞으로도 굳건한 파트너십을 구축하길 바란다"고 말했다. 머스크사는 이번 계약을 포함해 총 43척의 선박을 대우조선해양에 발주했으며, 현재까지 대우조선해양은 그 중 23척을 성공적으로 인도했다.

## STX makes all-out effort for business normalization with adherence to the holding company structure

STX Group Chairman Gang Deok-soo announced on June 2 that STX Group would maintain the holding company structure to bring the business back to normal. He said, "The holding company structure, STX's current governance structure, is absolutely necessary for rapid normaliza-

tion of business and efficient restructuring. We will stick to the holding company structure to bring the business back to normal." He added that all decisions on matters related to the management of Group would be made in close consultation with creditors, and the Group would respond to the

demand of creditors in good faith. STX Group Chairman Gang Deok-soo also mentioned, "If SXT fails to be put back on track, the adverse effects on the local economy will be enormous, such as the rising number of jobless people and bankruptcy of vendors. I will lay down all vested rights,

including the management rights, and put every ounce of my energy to bring the business back to normal at the earliest.”

As STX's major affiliates recently applied for autonomous agreement amid the worsening credit crunch, STX plans to secure the liquidity through the disposal of non-shipbuilding affiliates, such as STX Pan Ocean and STX Energy, etc., pushing forward the

reorganization with a focus on the shipbuilding industry

STX Co.,Ltd., the holding company of STX Group, holds the equity stake in its major affiliates such as STX Offshore & Shipbuilding (STXOS), STX Pan Ocean, STX Engine, STX Energy, etc., and has the opportunity to raise new funds by disposing of its management rights and equity stake.

The industry sources indicate that keeping the holding company structure intact will put STX Group in better position to push ahead with the full-scale reorganization more consistently, such as the disposal of affiliates or restructuring. According to them, it is not late to start discussing the existence of the holding company after the disposal of subsidiaries, major assets, etc., is completed.

### STX, 지주회사 체제 통한 경영 정상화 위해 발벗고 나섰다

강덕수 STX그룹 회장은 지주회사 체제 유지를 통한 경영정상화를 위해 최선을 다하겠다고 지난 6월 2일 밝혔다.

강덕수 회장은 “STX의 현 지배구조인 지주회사 체제는 향후 신속한 경영정상화는 물론 효율적인 구조조정을 위해서도 반드시 필요하다”며 “지주회사 체제 유지를 통한 경영정상화를 위해 최선을 다하겠다”고 밝혔다.

또한 그룹 경영과 관련된 모든 일들에 대해 채권단과의 긴밀한 협의를 거쳐 의사결정하고 있다며, 앞으로

도 채권단의 요구에 성실히 응할 것이라고 말했다.

강 회장은 “STX그룹이 회생하지 못하면 수많은 실직자가 생겨나고 협력업체들의 도산이 예상되는 등 지역경제에 미치는 악영향이 너무 크다”며 “경영권을 포함한 기득권은 모두 내려놓은 채 백의중군의 자세로 조기 경영정상화에 혼신의 힘을 기울이겠다”고 말했다.

STX는 최근 유동성 악화에 따라 주요계열사가 자율 협약을 신청하게 되면서 STX팬오션, STX에너지 등 비조선 부문 계열사 매각을 통한 유동성 확보로 향후 조선사업 중심의 사업구조로 재편하겠다는 방침을 세운바 있다.

STX그룹의 지주회사인 (주)STX는 현재 그룹 주요계열사인 STX조선해양, STX팬오션, STX엔진, STX에너지 등 주요계열사의 지분을 보유하고 있다. 자회사 경영권 및 지분 매각을 통한 신규자금을 창출할 수 있는 기회가 있다.

업계에서는 일단 지주회사 체제를 유지하는 것이 구심점을 갖고 계열사 매각이나 구조조정 등 대대적인 조직 재편 작업을 보다 일관성 있게 추진할 수 있다고 분석하고 있다. 자회사 및 주요자산 매각 등의 작업이 모두 이루어진 후 지주회사의 존속 문제를 논의해도 늦지 않다는 견해다.



## The global MODU market to be worth USD 54.8 billion in 2013

Visiongain, a business information company, recently published a report providing an insight into the Mobile Offshore Drilling Unit(MODU) market for the period spanning from 2013 to 2023. According to Visiongain, the MODU market is expected to reach USD 54.8 billion in 2013.

The MODU market plays an important role in oil and gas industry worldwide. The hydrocarbon resources of the seabed is

expected to become one of the most important energy sources in the global oil and gas sectors for some years in the period ahead.

According to this report, the MODU market is at a critical turning point and witnessing a rapid expansion and change. As the latest technology enables the drilling of oil and gas from the water depth of over 3,000m below the sea surface, the operation

costs(day rate) have been rising and this market is experiencing the short supply.

In particular, the MODU market has already overcome the negative impact of oil spill in the Gulf of Mexico and the financial crisis, and is in the reconstruction cycle that will last for the next 3 decades. The global offshore drilling boom is expected to spur the demand for MODU for the next several years.

### 이동식 해저자원 시추선, 전세계 시장 2013년 548억 달러 전망

비즈니스 정보업체인 비전게인(Visiongain)은 최근 “이동식 해저자원 시추선 시장(The Mobile Offshore Drilling Unit (MODU) Market 2013-2023)”에 관한 보고서를 발표했다. Visiongain에 따르면 세계의 이동식 해저자원 시추선(MODU, Mobile Offshore Drilling Unit) 시장은 2013년 548억 달러에 달할 전망이다.

MODU 시장은 세계 석유 및 가스 산업 내에서 중요한 역할을 하고 있다. 해저의 탄화수소 자원은 앞으로 수년간 세계 석유 및 가스 부문에 있어서 가장 중요한 에너지원 중 하나가 될 것으로 예견되고 있다. 이 보고서에 따르면, 현재 MODU 시장은 큰 전환기에 접어들고 있으며, 현재 급속한 확대와 변화가 이루어지고 있다. 해저 3,000m 이상의 석유와 가스 시추를 가능하게 하는 최신 기술이 개발되면서 작

업 비용(Day Rate)이 상승했고, 이 시장은 공급 부족 상태에 빠져 있다고 설명했다.

특히 MODU 시장은 이미 멕시코만 원유 유출 사고와 금융위기라는 부정적 영향을 극복했고, 현재 향후 30년간 지속될 것으로 보이는 재구조 사이클의 한 가운데에 있다. 급성장을 지속하는 전세계의 해양 시추 붐은 향후 수년간 MODU 수요를 끌어올릴 것으로 전망했다.

## Korea Eximbank and GIEK signed MOU to jointly support the shipbuilding and offshore plant sectors

The Export-Import Bank of Korea(Korea Eximbank) embarked on full-fledged sales activities targeting major European shipping companies in a bid to help domestic shipyards tide over the difficulties amid global economic slump. Korea Eximbank participated in Nor-Shipping, a shipbuilding trade fair held in Oslo for 4 days from June 4, launching an aggressive marketing drive to help domestic shipyards win new orders.

Kim Yong-hwan, President of Korea Eximbank, met separately with the Presidents of 8 major shipping companies, including Lief Hoegh, Chairman of Norway-based LNG shipping company Hoegh, during the Nor-Shipping, requesting the purchase of Korean vessels, and pledged active financial support.

Meanwhile, Korea Eximbank also participated in the Marine Money Seminar held in parallel with the Nor-Shipping. In this seminar which drew about 100 major shipping companies and ship financing institutes from all over the world, Korea Eximbank made a theme presentation highlighting its support policy for shipbuilding/offshore sectors and its new commodities such as bond guarantee, etc., to play a supporting role in the trade of large-scale offshore plants.

Particularly, Kim Yong-hwan, President of

Korea Eximbank, met with Oyvind Ajer, Vice-President of Norwegian Guarantee Institute for Export Credits(GIEK), in Oslo, and signed MOU to promote cooperation in shipbuilding/offshore plant sectors. Both companies will continue the exchange of information related to shipbuilding/offshore plant projects, jointly expand financial support for shipbuilding/offshore plant sectors, and increase the exchange of manpower.

Korea Eximbank has provided financial support for 10 domestic/overseas offshore plant export deals to date since it teamed up with GIEK for the joint funding of drillship export in 2005.

Kim Yong-hwan, President of Korea Eximbank, said, "Shipping companies rely increasingly on the bond market to fund their business as the commercial banks are facing liquidity crunch and reduced large-scale and long-term ship finance in the



A signing ceremony of the Memorandum of Understanding(MOU) to increase the cooperation in shipbuilding and offshore plant sectors. The photo shows Oyvind Ajer, Vice-President of GIEK, and Kim Yong-hwan, President of Korea Eximbank, from the left.

aftermath of global financial crisis. Particularly, Korea Eximbank visited major shipping companies which are expected to place large-scale orders at Korean shipyards, and introduced the advanced financial technique combining the direct finance and bond guarantee, attracting favorable reaction from the market."

This year, Korea Eximbank plans to offer USD 3 billion funding to overseas shipping companies in the form of direct loan to help finance the purchase of high value-added vessels such as LNG carrier, drillship, etc.

### 수출입은행, GIEK과 조선·해양플랜트 공동지원 MOU 체결

한국수출입은행이 글로벌 경기 침체로 어려움에 빠진 국내 조선사들을 돕기 위해 유럽 주요선사들을 상대로 본격적인 세일즈에 나섰다. 수은은 지난 6월 4일부터 나흘간 노르웨이 오슬로에서 개최된 조선 박람회 노르쉬핑(Nor-Shipping)에 참가해 국내 조선사의 수출 지원을 위한 전방위 마케팅을 펼쳤다. 노르쉬핑에 참석한 김용환 한국수출입은행 행장은 노르웨이 LNG 선사인 호그(Hoegh)사의 라이프 호그(Lief Hoegh) 회장 등 8개 주요 선사 대표들을 따로 만나 한국 조선사의 선박 구매를 요청하면서 적극적인 금융지원을 약속했다.

한편 한국수출입은행은 노르쉬핑과 함께 개최된 머

린 머니 세미나(Marine Money Seminar)에도 참여했다. 전 세계 100여개 세계 주요선사 및 선박금융 기관들이 참가한 이번 세미나에서 한국수출입은행은 주제발표를 통해 대규모 해양플랜트 거래 지원을 위한 '조선·해양금융 지원정책 및 채권보증' 등 신상품을 소개해 참가자들의 이목을 집중시켰다.

특히 김용환 행장은 오슬로에서 어빈 아예(Oyvind Ajer) 노르웨이 수출보증공사(GIEK) 부사장을 만나 '조선 및 해양플랜트 부문 협력증진을 위한 업무협약(MOU)'을 체결했다. 양 기관은 앞으로 조선·해양플랜트 프로젝트 정보 교환, 조선·해양플랜트 공동 금융지원 확대, 상호 인력교류 등을 추진해 나갈 예정이다.

한국수출입은행은 GIEK과 2005년 최초로 드릴십

수출을 공동 지원한 이래 현재까지 10개의 국내조선소 해양플랜트 수출거래에 대해 금융지원을 제공했다.

김용환 행장은 서명식 직후 "글로벌 금융위기 이후 상업은행들의 유동성 위축으로 대규모·장기 선박 금융지원 여력이 대폭 축소됨에 따라 많은 해운사들이 채권시장을 통한 자금조달에 힘쓰고 있는 상황이다"면서 "특히 국내 조선사에 대규모 발주가 기대되는 주요 해운사들을 대상으로 이번 방문을 통해 직접금융과 채권보증을 결합한 선진금융기법을 선보여 시장의 좋은 반응을 이끌어냈다"고 말했다. 한국수출입은행은 올해 LNG선, 시추선 등 고부가가치 선박 위주로 해외선사에게 총 30억 달러를 직접 대출 방식으로 지원할 계획이다.



## MOF, KSA, and NFFC join forces to provide loans to small and medium-sized shipping companies

The Ministry of Oceans and Fisheries(MOF) and Korea Shipowners Association(KSA) announced on June 4 that they entered into an agreement with the National Federation of Fisheries Cooperatives(NFFC) to assist the operational funding of domestic shipping companies.

Under this agreement, NFFC will offer up to KRW 30 billion in loans to the qualified shipping companies recommended by the KSA based on the credit guarantee that the Korea Credit Guarantee Fund issues.

NFFC will support a maximum of 0.5% of the guarantee commission incurred in the

issuance of the guarantee. On the supposition that KRW 1 billion is guaranteed at an average guarantee commission rate of 1.3% equal to KRW 13 million, the shipping company has to pay only 8 million in commission with the remaining 5 million being assisted by the NFFC. This agreement is valid for 3 years from June 4, 2013 to June 3, 2016.

Private-sector banks have increased the risk premiums on shipping loan and reduced the credit loans amid the persistent slump in the shipping market since 2008. As a result, small and medium-sized

shipping companies have found it difficult to obtain new loans and extend the term of the loan. The prevailing opinion in the industry is that the financial institutes need to provide assistance to resolve the liquidity problem plaguing those shipping companies.

Meanwhile, MOF considers that this year is very important for laying a firm ground for the survival of domestic shipping companies and building up competitiveness of the shipping sector based on the opinion of most market analysts that the shipping market would start rebounding after 2014.

### 해양수산부·선주협회, 수협과 증권·중소선사 대출 지원

해양수산부와 한국선주협회는 국내 선사들의 운영 자금 확보를 지원하기 위하여 수협은행과 업무협약을 체결했다고 지난 6월 4일 밝혔다.

이번 협약은 한국선주협회 회원사 중 신용도가 양호한 적격업체를 선주협회에서 추천하면 신용보증기금에서 발급하는 신용보증서를 담보로 하여 수협은행에서 해운기업별로 최대 30억원까지 운영자금을 대출해주는 내용이다.

수협은행이 신용보증기금의 보증서 발급시 발생하는 보증수수료 중 최대 0.5%를 지원해 주게 되므로, 평균 보증수수료율 1.3%로 10억원을 보증받는 경우를 가정할 경우 수수료 1,300만원 중 500만원을 수협에서 지원하고 선사들은 800만원만 부담하게 된다. 이번 협약 내용은 2013년 6월 4일부터 2016년 6월 3일까지 3년간 유효하다.

지난 2008년 이후 해운시장 불황이 지속됨에 따라 민간은행들이 해운분야의 대출리스크를 높게 보고 여신규모를 축소하고 있어 특히 증권·중소선사들

의 경우 신규 운영자금 대출은 물론 기존 대출의 만기 연장도 어려운 상황이다. 따라서 이들 업체가 당면한 유동성 문제를 해소하기 위한 금융권의 지원이 무엇보다 절실하다는 것이 업계의 중론이다.

한편 해양수산부는 2014년 이후 해운시황이 회복될 것이라는 대다수 시황분석 전문가들의 전망을 토대로, 올해가 국적선사의 생존과 불황 이후 해운시장을 주도할 경쟁력 제고를 위해 매우 중요한 시기라고 판단하고 있다.



## KR and Dongkuk Steel signed strategic MOU for technical exchange

Korean Register of Shipping(KR) entered into a strategic alliance to expand cooperation with the Central Technical Research Center of Dongkuk Steel at its Busan headquarters on June 11.

This MOU signifies the recognition of the need for mutual cooperation in the development and testing of the steel used in ships and offshore structures.

Both organization reached an agreement on the co-participation and cooperation in new domestic projects such as natural gas carriers, sharing of information on technology trends such as new international treaties, cooperation for joint research and various

approval process related to the development of new steel, KR's involvement in the third party inspection of the steel manufactured by Dongkuk Steel, and exchange of information related to users of steel such as domestic and overseas shipyards.

The signing ceremony was attended by Kim Chang-wook, General Manager supervising the Technical



Support Division of KR, Kang Gi-bong, Director of Central Technical Research



Center of Dongkuk Steel, Park Myeong-soo, team leader of the Central Technical Research Center, etc., who promised mutual cooperation for the exchange of information and technology related to the steel, and establishment of Technical

Committee, etc.

Kim Chang-wook, General Manager supervising the Technical Support Division of KR, said, "The signing of this MOU is expected to lead to stronger relationship with Dongkuk Steel and create significant syner-

gistic effects through the Technical Committee. I hope that both organizations will achieve good results based on mutual cooperation in domestic and overseas new steel markets."

## 한국선급-동국제강, 기술교류를 위한 전략적 MOU 체결

한국선급은 지난 6월 11일 부산 본사에서 동국제강 중앙기술연구소와 협력 관계를 확대 발전하기 위한 전략적 업무제휴를 체결했다.

이번 MOU는 선박과 해양구조물용 강재의 개발 및 검사와 관련해 상호협력의 필요성 인식에 따른 것이다. 양 측은 천연가스운반선 등 신규 국내 프로젝트 공동 참여 및 협력, 새로운 국제협약 등 기술동

향에 대한 정보 공유 및 공동 대응, 국내외 조선소 등 강재 수요처에 대한 정보교환 등 상호 협력, 새로운 강재 개발시 공동연구 및 제반 승인에 대한 상호 협력, 동국제강 강재 제 3자 검사 물량에 대한 한국선급 참여에 대한 협력 등에 합의했다.

이 날 협약식에는 한국선급 김창욱 기술지원본부장을 비롯하여 동국제강 중앙기술연구소 강기봉 소장, 박명수 팀장 등이 참석하여 강재 관련 기술을 기본으로 하는 기술 및 정보 교류와 기술협의회 구축 등

구체적인 상호협력을 약속했다.

한국선급 김창욱 본부장은 "이번 MOU 체결을 통해 동국제강과의 상호 관계를 더욱 견고히 하고, 기술 협의회를 통해 양쪽 모두에 큰 시너지를 창출할 것으로 기대한다"며 "국내외 신강재시장에서도 양측이 협력을 통해 좋은 결실을 맺기를 바란다"고 소감을 밝혔다.



## MOF unveiled its new symbol

The Ministry of Oceans and Fisheries(MOF) unveiled its symbol(Ministry Identity, M.I.) during the 18th Marine Day ceremony held at Taean, South Chungcheong Province, on May 31.

The new symbol has three major meanings. First, the "Taegeuk" form expressed the strong intention of MOF to further strengthen maritime sovereignty and highlight the feature of the integrated administrative body. The dynamic "Wave" form implies infinite possibilities of the sea which MOF transforms into the value of future, the value of people's lives, and the value of global community. The "soaring" form symbolizes

the new growth engine of economy for Korea, improvement of national well-being index, and the leap towards becoming an ocean power.

The symbol used the dark blue color that represents the value of infinite potential of the sea, cool blue color that embodies the smart MOF with enterprising spirit, and light blue color that symbolize the hopes and dreams of Korea.

An official from MOF said, "The new symbol expressed the strong intention of the Ministry of Oceans and Fisheries to achieve creative economy and realize infinite value through the sea. Particularly, it helps project



an image of the organization bringing together all members and making the concerted effort for the public."

## 해양수산부의 의지 표현한 새로운 심벌 공개

해양수산부는 지난 5월 31일 충남 태안에서 개최된 제18회 바다의 날 기념식에서 새롭게 마련한 해양수산부 심벌(Ministry Identity, M.I.)을 공개했다.

새로운 심벌은 크게 세 가지 의미를 담고 있다. 먼저 '태극' 조형은 통합해양 행정기관으로서의 대표성과 함께 해양 주권을 더욱 강화하겠다는 해양수산부의 의지를 표현했고, 역동적인 파도의 조형은 해

양수산부가 바다의 무한한 가능성을 미래의 가치로, 국민 생활의 가치로, 세계 속의 가치로 구현하는 모습을 나타낸 것이다. 또한, 비상의 모습은 해양수산부가 창출하는 대한민국 경제의 신성장 동력, 국민 행복 지수의 상승, 해양 강국으로의 도약을 상징한 것이다.

심벌은 바다에 잠재된 무한한 가치를 나타내는 질푸른 파란색, 해양수산부의 진취성과 스마트함을 의

미하는 시원한 파란색, 그리고 대한민국의 꿈과 희망을 상징하는 맑은 하늘색으로 색상을 배치했다.

해양수산부 관계자는 새로운 M.I. 제작을 통해 창조경제를 실현하고, 바다를 통한 무한한 가치 구현하겠다는 해양수산부의 의지를 표현한 것이라고 전했다. 특히, 흩어져 있던 조직원들의 단합을 도모하고, 하나 된 모습으로 국민께 다가가고자 한다며 M.I. 발표 소감을 밝혔다.



## ABB names Ulrich Spiesshofer as CEO

The Board of ABB has unanimously appointed Ulrich Spiesshofer, the head of its Discrete Automation and Motion(DM) division, as Chief Executive Officer. He will succeed Joe Hogan in this role in an orderly transition on September 15, 2013.

Spiesshofer joined ABB's Executive Committee in 2005 and was named responsible for DM in 2009. He has led a doubling of the division's revenues by organic and inorganic means, and the integration of Baldor-ABB's largest ever acquisition.

"ABB has developed a strong bench of talent: I am extremely pleased that the new CEO comes from within the company, and brings a solid track record and deep knowledge of the portfolio," said ABB Chairman Hubertus von Grünberg. "Ulrich has been a key force in shaping and implementing ABB's strategy, and the integration of Baldor stands out as a benchmark for successful large acquisitions."

Spiesshofer also initiated other business expansion activities in DM based on organic growth and acquisitions. These have helped DM to grow faster than the market and to expand into new business areas such as

e-mobility and uninterruptible power supplies(UPS), as well as to better balance the business geographically. The planned acquisition of Power-One would make ABB a leading global supplier of solar inverters.

Prior to taking over DM, Spiesshofer was responsible for Corporate Development, leading strategy development and implementation across the power and automation businesses, in very close collaboration with all of ABB's teams. This included ABB's roadmap for mergers and acquisitions and the formation of ABB's technology venture arm. In this role, he strengthened ABB's operational excellence and procurement processes, laying the groundwork for the cost savings program which has been executed over the past few years of global economic crisis.

"I am excited about the opportunity to lead ABB and serving our customers building on Joe's success," said Spiesshofer. "I am looking forward to keep working with all my colleagues in the Executive Committee and the entire ABB team. Together, we will continue to drive profitable growth and relentless execution for the company."



Before joining ABB, Spiesshofer spent three years at Roland Berger Strategy Consultants and 11 years at A.T. Kearney management consultants, where he built successful consulting businesses in industries including oil and gas, utilities, telecoms and automotive, in Europe, Asia and the Americas. He has a master's degree in Business Administration and Engineering, and a PhD in Economics, both from the University of Stuttgart, Germany.

### ABB CEO로 올리히 스피어스호퍼(Ulrich Spiesshofer) 임명

ABB 이사회는 만장일치로 산업자동화 사업부(이하 'DM')를 책임지고 있는 올리히 스피어스호퍼(Ulrich Spiesshofer)를 최고경영자(CEO)로 임명했다고 지난 6월 17일 발표했다. 그는 조 호건의 뒤를 이어 9월 15일부터 CEO를 역임하게 된다.

스피어스호퍼는 2005년 ABB 경영진에 합류했고, 2009년 산업자동화 사업본부 총괄로 임명되었다. 그는 ABB의 사상최대 인수였던 발도르(Baldor) 통합을 이끌었으며, 사업본부 매출을 2배로 성장시켰다. ABB 회장 후버투스 폰 그뤼네르크(Hubertus von Grünberg)는 "ABB는 역량있는 인재를 개발해왔다. 새로운 CEO가 내부인사에서 임명된 점을 매우 기쁘게 생각하며, 신임 CEO는 포트폴리오에 대한 깊은 지식과 견고한 실적을 보일 것으로 기대한다."고 말했다. "올리히는 ABB 전략 구축과 실행에 있어 핵

심적인 역할을 맡아왔고, 성공적인 대형 인수로 벤치마크 되는 발도르 통합에서 핵심 멤버였다."고 덧붙였다.

또한 스피어스호퍼는 DM내에서 다른 사업확장에 착수했다. 이러한 활동은 시장보다 산업자동화 사업본부(DM)가 더 빠르게 성장하고, 지역적으로 비즈니스 균형을 이루는 것과 더불어 e-모빌리티와 무정전 전원 공급장치(UPS)와 같은 새로운 사업으로 확장하는데 기여했다. 계획된 Power One사의 인수를 통해 ABB는 태양광 인버터 부문에서 선도적인 글로벌 공급자로 부상했다.

산업자동화 사업본부 총괄 이전에, 스피어스호퍼는 ABB의 모든 부서와 긴밀하게 활동하는 전력 및 자동화 사업에 걸친 전략개발 및 실행을 이끄는 사업개발(Corporate Development)의 책임자였다. 여기에는 인수 합병과 기술 벤처 형성을 위한 ABB 로드맵이 포함되어 있으며, ABB 운영 효율 및 조달 프로세

스를 강화하고 글로벌 경제위기의 지난 수년에 걸쳐 진행된 비용절감 프로그램의 기초를 세웠다.

"조 호건이 쌓아온 성공 속에, ABB를 이끌고 고객에게 기여할 수 있는 기회가 허락되어 흥분되고 기쁘게 생각한다."라며 "동료 경영진 및 모든 전체 ABB 임직원 팀과 함께 일하기를 고대하고 있다. 우리가 함께 내실있는 성장과 회사의 끊임없는 변화를 주도할 것"이라고 스피어스호퍼는 소감을 밝혔다.

ABB에 합류하기 전, 스피어스호퍼는 롤란드 베르거 전략 컨설턴트에서 3년, AT 커니 경영 컨설턴트에서 11년간 근무하며 세계적인 전략 컨설팅사에서 유럽, 아시아 및 미국의 오일 및 가스, 텔레콤 및 자동차를 포함한 산업의 성공적인 사업 컨설팅을 구축했다. 그는 독일의 슈투트가르트 대학에서 경영학 석사와 공학 석사 학위와 경제학 박사를 취득했다.

## Korea Eximbank injected additional KRW 500 billion into the ship production financing

The Export-Import Bank of Korea (Korea Eximbank) announced on June 13 that it would inject the funds totaling KRW 4 trillion in the ship production financing this year, which is KRW 500 billion more than the original plan, to support the struggling domestic shipyards amid the downturn in global shipbuilding market.

Overseas ship owners have a preference for heavy tail payment method, by which a considerable percentage of the payment is made at the time close to delivery, due to the global economic slump. As a result, domestic shipyards have no choice but to find funding from their own resources or are forced to turn to the ship finance institutes while the vessels are being built.

In addition, domestic shipyards are under

great strain at the moment to fend off the fierce competition from Chinese shipyards that have received financial assistance on the basis of China's huge foreign exchange reserves and the Japanese shipyards capitalizing on weaker yen that increases Japan's price competitiveness. In light of such difficulties facing the domestic shipyards, Korea Eximbank drastically expanded the ship production financing this time.

Korea Eximbank will provide KRW 500 billion to domestic shipping companies plagued by chronic financial problems arising from global economic downturn. Particularly, Korea Eximbank introduced the 'ocean-going vessel operation fund' in April, besides the ocean-going vessel purchase fund, pre-owned vessel purchase fund,

and comprehensive export fund. The ocean-going vessel operation fund is designed to assist in funding the operating expenses in exchange for a pledge of the future revenue – from the operation of ships under the long-term operation contract between domestic shipping company and charterer – as collateral.

An official from the Korea Eximbank said, "Domestic shipyards with leading technologies are focusing on winning the orders for high value-added vessels, but are closely trailed by Chinese and Japanese shipyards. Under those circumstances, we significantly increased the financial assistance to help domestic shipyards secure orders without worrying about financing the ship production."

### 수출입은행, 5000억 선박제작금융 추가 지원

한국수출입은행은 세계 조선 시장 악화로 어려움을 겪고 있는 국내 조선사들을 돕기 위해 당초 계획보다 5000억원 늘어난 총 4조원의 선박제작금융을 올해 지원한다고 지난 6월 13일 밝혔다.

최근 세계 경기 불황으로 해외선주들은 선박 건조 대금을 가급적 나중에 지불하는 이른바 '헤비 테일(Heavy Tail)' 방식을 선호하는 추세다. 이 때문에 국내 조선사들은 배를 건조하는 기간 동안 제작에 들어가는 자금을 자비로 부담하거나 선박금융기관에서 조달할 수밖에 없다.

아울러 막대한 외환보유고를 바탕으로 금융지원을 받고 있는 중국 조선업체들의 수주공세와 엔저효과로 가격경쟁력을 내세우고 있는 일본 조선업체들과의 경쟁도 국내 조선업체들로서 큰 부담으로 작용하고 있다. 이런 국내 조선업계 사정을 감안해 한국수출입은행이 이번에 선박제작금융을 크게 확대한 것이다.

세계경기 침체로 만성적인 자금난에 빠진 국내 해운사들에 대해서 유동성 공급을 위해 5000억원의 금융이 제공된다. 한국수출입은행은 지난 4월 기존 외항선박구매자금, 중고선박구매자금, 포괄수출금

용 외에 '외항선박운항자금'을 도입한 바 있다.

외항선박운항자금이란 국내 해운사가 용선주와 장기간의 운항계약을 맺고 배를 운항할 때 생길 미래의 운송료 수익을 담보로 운항자금을 지원하는 것을 말한다.

한국수출입은행의 관계자는 "국내 조선업체들이 앞선 기술력으로 고부가가치 선박 수주에 힘쓰고 있으나, 중국과 일본의 조선업체들의 추격이 만만치 않은 상황이다"면서 "이럴 때일수록 우리 조선업체들이 선박 제작에 필요한 자금 걱정 없이 수주 활동에 나설 수 있도록 제작금융 지원액을 크게 늘렸다"고 밝혔다.

## Lloyd's Register approves HMS LNG carrier training facility in Busan

Lloyd's Register has awarded Approved Training Provider(ATP) Certification to Hae Young Maritime Services Co. Ltd.(HMS), a subsidiary of Hyundai Merchant Marine Co. Ltd.(HMM), one of Korea's largest shipping companies.

The HMS Training Center at Busan, Korea trains seafarers under The Society of International Gas Tanker and Terminal Operators(SIGTTO) training standards. It is equipped with the newest sophisticated sim-

ulation training facilities identical to LNG carrier cargo handling systems and steam turbine plant. The specialised training is led by highly experienced qualified trainers with LNG carrier on-board management experience.

Taeg Gyu Lee, President of HMS(also Managing Director of HMM), was presented with the ATP Certificate and Plaque at HMS's office in Busan, by Lloyd's Register's Chief Representative in Korea, Soo-Young Lee.

HMM took delivery of its first LNG carrier S/S Hyundai Utopia from Hyundai Heavy Industries(HHI), in Ulsan, Korea in 1994 and entered the LNG carriage business. Lloyd's Register's Marine Consulting arm was recently contracted to provide a Longevity Study to develop an approach for a life extension regime of the ship, read more here. The company has substantial LNG carrier expertise with experienced and

qualified on-shore staff and seafarers – and now manages eight LNG carriers for Korean owners, and a 150,000m<sup>3</sup> mem-

brane LNG carrier for a Greek owner. “By gaining accreditation to the Lloyd’s Register Approved Training Provider

Scheme, HMS is further deepening their co-operation and business with Lloyd’s Register,” said Soo-Young Lee.



## DSME and KSP signed MOU on the floating coal-fired power plant projects

Korea Southern Power(KSP) and Daewoo Shipbuilding & Marine Engineering(DSME) signed the MOU(memorandum of understanding) at the headquarters of DSME on May 31 for cooperation in the construction of the floating coal-fired power plants(Barge Mounted Power Plant, “BMPP”) abroad.

BMPP is a new-concept combined cycle power plant installed on a barge. The plant is built at shipyards where the production, construction and management are relatively easier, and then towed to the power plant site for the installation and commissioning.

BMPP has the advantage of being able to improve quality and delivery compared to oversea onshore power plant projects that are often carried out under the constraints on the supply of materials and skilled manpower. Furthermore, BMPP, which is towed away upon completion, can be operated with flexibility in urban regions such as South East Asia, etc., where the connection to the power grid connection is difficult.

An official from DSME said, “BMPP represents a new-concept model that can be built on the product competitiveness and

technological capabilities which DSME has accumulated in shipbuilding industry. Huge synergic effects are expected to result from the combination of DSME’s know-how in shipbuilding/offshore sectors and Korea Southern Power’s expertise in power plant operation and maintenance.”

Korea Southern Power, which specializes in the combined-cycle power plant, has the largest installed capacity among domestic thermal power companies and has built the track records in successfully operating various models. It has achieved the combined-cycle thermal efficiency of 53% and the facility utilization rate exceeding 80%, which are comparable to those of global power generation companies.

An official from Korea Southern Power said, “We have achieved the leading technology in



KSP President Lee Sang-ho(fifth from the right) and DSME President Goh Jae-ho(fourth from the right) are posing for photo with the officials from both companies after signing the MOU for the floating power plant project.

the combined cycle power plant sector though active involvement in commissioning, operations and maintenance(O&M) projects for the combined cycle power plants in foreign countries such as Jordan and Qatar. With the introduction of the BMPP, a new-concept power plant, Korea Southern Power will make further strides in global markets.”

Both companies embarked on the practical process such as overseas power plant project bid and project development, and will accelerate the momentum created by the MOU.

### 대우조선해양-한국남부발전, 부유식 화력 발전소 사업 위한 양해각서 체결

한국남부발전과 대우조선해양은 지난 5월 31일 대우조선해양 본사에서 해외 부유식 화력 발전소(Barge Mounted Power Plant, 이하 BMPP) 구축 사업을 위한 공동협력 양해각서를 체결했다.

BMPP는 복합화력발전소를 바지선 위에 제작하는 신개념 플랜트다. 생산 및 건설관리가 상대적으로 용이한 조선소에서 플랜트 제작을 끝낸 후, 이를 발전소 부지로 해상 운송해 설치 및 현장 시운전을 거치게 된다. BMPP는 건설기자재 및 고급 현장 건설인력 수급이 어려운 해외 육상발전소 건설에 비해 품질 및 납기

를 개선할 수 있는 장점이 있으며, 플랜트 제작이 완료된 상태에서 운송되기 때문에 전력망 연결이 어려운 동남아 등과 같은 도서 지역에서의 탄력적 운용이 가능하다.

대우조선해양 관계자는 “BMPP 컨셉은 대우조선해양이 조선업에서 쌓아온 기술력과 제품 경쟁력을 활용할 수 있는 신개념 발전 모델이라며, “대우조선해양의 조선·해양부문 노하우와 한국남부발전의 발전소 운영 및 유지보수 능력이 결합된다면 큰 시너지를 발휘할 수 있을 것”이라고 말했다.

남부발전은 국내 화력발전소 중 최대설비용량을 보유하고 있는 복합화력 전문기업으로, 다양한 기종을

운영한 경험을 보유하고 있다. 복합 화력 열효율 53% 설비 이용률 80% 이상으로, 세계적 발전사와 견주어도 뒤지지 않는 발전운영 능력을 자랑한다.

남부발전 관계자는 “요르단과 카타르 등 해외 복합 발전소에서의 시운전 및O&M 사업으로 다져진 세계적 수준의 복합부분 운영기술을 보유한 남부발전이 신개념 발전소인 BMPP를 도입함으로써, 해외사업 영역을 더욱 폭 넓게 개척할 수 있을 것으로 기대한다”고 말했다.

양사는 해외 발전사업 입찰 및 사업개발을 위한 실무 작업에 착수했으며, 양해각서 체결을 계기로 업무추진에 더욱 박차를 가할 계획이다.



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# Trade volume growth, good or bad for the shipbuilding market?

- The top priority is the reduction of overcapacity



Approximately 80% of world trade volume is transported by ship. Thus, the trade volume is an important indicator for predicting the outlook of shipbuilding industry. Currently, the global trade volume is increasing steadily. However, the overcapacity has overshadowed the shipping market, prolonging the recession.

Fortunately, shipbuilding industry is finding the silver lining in the cloud amid the significant increase in new orders from major European ship owners for large containerships this year. However, the prevailing opinion in the industry is that the situation does not justify complete optimism from the long-term perspective because the shipbuilding and shipping industries are the forward industries closely related to each other.

This year, the Baltic Dry Index(BDI) of bulk carriers has remained below 1,000 point, suggesting that the worst recession is persistent. Thus, the overcapacity has reached a serious level and the shipbuilding industry sources predict that it might take at least 3 years for the market to be back on track.



### Trade volume growth

Due to the prolonged glut of ships in the market, the shipping industry also had a very hard time in 2012. Particularly, the freight rates(annual average rate based on BDI, the lowest since 1978) have fallen sharply since it hit the historic low in the bulk carrier sector in February, and furthermore, the freight rates remain flat in the tanker sector if the seasonal rebound is excluded.

In the containership sector, the freight rates had continued the downward spiral since the fourth quarter of 2010, but started rebounding after reaching a trough in February 2012, thus creating a condition favorable sales condition. However, the freight rates fell again after the third quarter due to the decline in trade volume.

As the supply of vessels in most sectors is expected to exceed the growth rate of trade volume in 2003, the balance between supply and demand seems unlikely to improve. The containership sector is expected to cope with the off-seasonal lows which are indeed higher compared to 2012, bolstered by the practical control of capacity and active involvement of shipping companies in the drive to pull the freight rates upward. Despite the cooperation among the shipping companies, the



decline in the trade volume is expected to continue for the time being, casting shadow over the outlook for any drastic improvement in market conditions.

As a result, the shipping market is unlikely to experience an upturn in 2013 due to the glut of vessels in the market, slow growth of trade volume amid the uncertainty over the global economy, etc., albeit difference in the extent, depending on the type of vessels. The industry predicts that the oversupply of vessels in the shipping industry will begin to vanish only after 2014.

### Slight decline in trade volume compared to the previous year

The container traffic of the world's top 10 ports increased 3% year-on-year to 47.02 million TEU in the first half of this year. Particularly, the trade volume along the container traffic route between Asia and Europe increased 0.4% year-on-year in February. According to Korea Shipowners Association, CTS(Container Trades Statistics) recently published a report that the container traffic on the route between Asia and Europe increased rose 0.4% year-on-year to 915,000TEU in February, 2013.

That represents the highest figure which has been recorded since 2011, but is a decrease compared to 1.3 million TEU registered in January. The CTS Price index, which provides an insight into maritime freight rates, reached 82p, an increase by 18p compared to the corresponding period. The global container traffic, which had grown more than by 10% in 2000s except for 2009, has slowed down since 2011. The decline in global container traffic is said to be attributed to the slowdown in Chinese economy, although the Eurozone

crisis that began in 2011 is one of the major reasons.

The containership sector which experienced a decline in traffic volume in 2009 for the first time showed a recovery to a relatively high level in 2010(12.8%) and 2011(7.2%). However, the container traffic growth has fallen far below the pre-financial crisis long-term average(8.7% of annual average growth between 1996 and 2008) in 2012 due to the European financial crisis and slowdown of Chinese economy. Particularly, the container traffic on the route between Asia and Europe is considered to have been slightly diminished compared to corresponding period of the previous year as a consequence of the contraction of European consumer market.

(Unit: 1 million TEU)

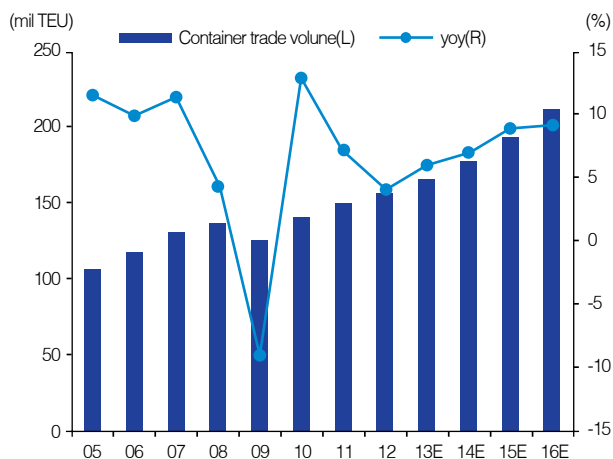
Type	2008	2009	2010	2011	2012(E)	2013(F)
Transpacific	20.5	18.4	20.3	20.7	21.1	22.3
Far East-Europe	16.8	17.3	19.5	20.4	20.2	21
Transatlantic	6.3	5.3	5.9	6.2	6.2	6.5
Non-mainlane East-West <sup>1</sup>	14.3	14.6	16.9	18.4	19.7	21.2
North-South	22	20.3	23.5	25.8	26.9	28.8
Other <sup>2</sup>	56.7	48.8	54.6	59.2	62.8	67.5
<b>Total</b>	<b>136.6</b>	<b>124.7</b>	<b>140.7</b>	<b>150.7</b>	<b>156.9</b>	<b>167.3</b>
% growth	4.3%	-9.0%	12.8%	7.2%	4.1%	6.6%

1: between N.America/Eur./Far East and M.East/ISC  
2: Intra-regional and south-south trade)

**Table 1. Trends and outlook of global container traffic volume(Source: Clarkson, Container Intelligence Monthly)**

The ongoing delivery of vessels which are part of existing orderbooks has led the vessel supply to be made at a rate exceeding the growth rate of trade volume recorded in 2012, although the increase in the number of waste vessels, delay in delivery, etc., have been the contributors to the slowdown in vessel supply.

Consequently, the balance between supply and demand has not shown an improvement since the outbreak of global financial crisis. (Trade volume/capacity stood at 11.2 in 2008 and fell to 9.5 in 2012.) In 2013, any turnaround in the imbalance between supply and demand is expected to be unlikely due to the global economic slump and ongoing delivery of large vessels.



**Figure 1. Trends and outlook of annual global container trade volume (Source: Clarkson)**



Figure 2. Trends of containership freight rates and charterage (Source: Shanghai Shipping Exchange)

(Unit: 1 million TEU)

Type	2008	2009	2010	2011	2012(E)	2013(F)
Post-Panamax (>5,000TEU)	4.5	5	5.9	7.0	8.2	9.5
Panamax (3,000~5,000TEU)	3.4	3.6	3.9	4.0	4.0	4.0
Sub-P'max (2~2,999TEU)	1.8	1.8	1.8	1.8	1.7	1.7
Handy (1~1,999TEU)	1.8	1.8	1.8	1.8	1.8	1.8
Feeders (~999TEU)	0.7	0.7	0.7	0.7	0.7	0.7
<b>Total</b>	<b>12.2</b>	<b>12.9</b>	<b>14.2</b>	<b>15.3</b>	<b>16.4</b>	<b>17.7</b>
% growth	13.0%	5.7%	9.6%	8.1%	6.6%	7.8%

Table 2. Trends and outlook of global containership capacity (Source: Clarkson, World Shipyard Monitor)

The shipping companies experienced massive losses amid the overheated competition to win larger slice of share in the market in 2011. In 2012, the shipping companies refrained from such competition and managed to control real operation capacity through layup, slow-steaming, operation routes reduction, etc., thereby reducing the strains resulting from oversupply.

In addition, shipping companies are expected to keep striving to control the real operation capacity in 2013 as the freight rates bottomed out in the third quarter of 2012, leading to the fast spread of layup

Maersk, the subsidiary of the world's largest shipping company A.P Moller Maersk, had the competitive edge in freight rates based on aggressive strategy to expand its market

share, reduction of layup, and deployment of large vessels. The decline in freight rates, which began in the fourth quarter of 2010, continued into February 2012. Specifically, the sharpest decline in freight rates was witnessed in the route between Asia and Europe where many very large containership of 10,000TEU or higher were put into service.

In 2011, major shipping companies which experienced massive losses in 2011 strengthened cooperation and were actively involved in the effort to raise the freight rates, and resultantly, the freight rates quickly recovered to its previous level after reaching a trough in February 2012. However, global economic recession put a strain on the growth of trade volume while an increasing number of vessels were put into service to meet the rising demand during the peak season, which led to a downward pressure on the freight rates.

### About 6,000 vessels currently in service

The number of vessels currently in service stands at approximately 6,000 as of 2013, and the shipping capacity was projected to be 16.875 million TEU. By size, the vessels with a capacity ranging from 4,000 to 5,999TEU reached the shipping capacity of 3.358 million TEU, accounting for the largest percentage. And the vessels with a capacity ranging from 5,100 to 7,499TEU reached the shipping capacity of 2.943 million TEU, comprising the second largest proportion. Meanwhile, the vessels with a capacity equal to or greater than 10,000TEU, which fall under the category of VLCS(Very Large Container Ships)/ULCS(Ultra Large Container Ships) and are the type of vessels recently thrust into limelight, reached 2.08 million TEU(163 units) in shipping capacity.

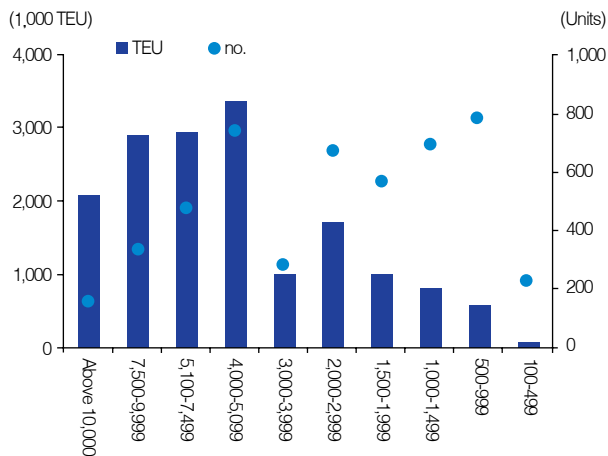


Figure 3. Capacity by size of vessel & number of vessel  
(Source: Alphaliner, E-Trade Korea)

In the route between Asia and Europe, the shipping capacity reaches 16.41 million TEU, the highest worldwide. This route accounted for 22.7% of all shipping capacities in March 2013, the highest, followed by the Intra-Asian route with 16.4%, Latin American route with 12.9%, and Asia-North America route with 11.1%. The shipping capacity in the route between Asia and Europe is expected to increase gradually, considering that VLCS(Very Large Container Ship) or ULCS(Ultra Large Container Ship) are expected to be deployed in the Asia-Europe route.

### Trade volume increasing by 6.3%

As the shipping market still remains sluggish in 2013, the major issue is expected to be the ultra large vessels and recovery of freight rates. However, the increased fluctuations in the market have made the market outlook even more unclear, and the global economic recovery has emerged as an important variable.

Korea Maritime Institute(KMI) predicts a 6.3% increase of trade volume in the containership market in 2013 and about 7.5% increase in the supply of containership. However, such figures are very small compared to the levels recorded in the boom period, and are not sufficient to induce the shipping companies to improve their performance.

The freight rate increase is expected to continue in the next year. Overseas shipping companies, such as Maersk, MOL, APL, etc., have recently raised their freight rates. Experts predict a slight overall increase in freight rates, although the

extent of increase may vary, depending on the strategies of shipping companies.

Meanwhile, Korea Maritime Institute predicts that the total trade volume of bulk carrier market would stand at approximately 4.093 billion tons in 2013. Particularly, it forecast that about 625 million tons of bunker coal would be supplied to the market amid the rising demand for bunker coal. Besides, the trade volume of iron ore imported from China is expected to increase.

According to the sources from the shipping industry, an 8% increase in the number of vessels is expected, along with a 14% increase in the number of Panamax-class vessels in the wake of the Panama Canal expansion. However, the number vessels dismantled amid the worsening market conditions is expected to keep rising in the next year.

### Recovery in new orders for containership and tanker

As the global shipbuilding market is mired in a prolonged recession, overall weak demand has led the delivery volume of commercial vessels to fall below the expected levels, and furthermore, there is a growing number vessels being dismantled. Meanwhile, the shipping market bottomed out last year and has seen an increase in new order placement for bulk carriers, albeit slowly.

Maersk has the highest capacity as of March 2013. It owns a total of 2.59 million TEU(595 vessels) which accounts for 15.4% of the whole shipping capacity around the globe. In Korea, Hanjin Shipping has the shipping capacity of 582,000TEU(111 vessels) which comprises 3.4%, the world's 8th largest, while Hyundai Merchant Marine has the shipping capacity of 342,000TEU(58 vessels) which accounts for 2.0%, the world's 16th largest.

Maersk had placed an order for 20 units(including 10 optional vessels) of 18,000TEU very large containerships, the type of vessel which it ordered to Daewoo Shipbuilding & Marine Engineering(DSME) in February 2011, and recently held a naming ceremony for the first batch of those 20 vessels. The shipping industry is keeping a close eye on how the global shipping market would be affected when all those 20 very large containerships are put into service in the market.

Approximately 50 very large containerships with a capacity of over 10,000 TEU – the type of vessel ordered by Maersk – are expected to be delivered this year. The number reaches about 110 if large containerships with a capacity of 7,500 to

9,999TEU are also factored in. That is only about 2% of all vessels currently operational, but due to their sheer size, is expected to affect the capacity growth.

Meanwhile, there has been a noticeable increase in new orders for tankers, such as the carriers and production facilities, amid the increased drilling activities of major oil & gas developers. By the type of vessel, the energy-related products dominate the new orders, followed by containerships, pure car truck carrier, heightening the expectation for the market recovery.



Figure 4. 13,100TEU very large containership which Hyundai Heavy Industries(HHI) delivered to the Germany-based Maersk

### Old vessels with low fuel efficiency being pulled out of market

The volume of vessels dismantled hit the record high last year, raising the expectation that it would be a prelude to the recovery in the sluggish commercial vessel market. The increase in the dismantled volume would create a room for new demand amid current glut in the market. According to Clarkson, the dismantled volume stood at 5750DWT (Deadweight Tonnage) last year. That represents an increase by as much as 25% from 4270 DWT, the previous record high. The dismantled volume amounted to only 3340DWT even in 2009, the year when the industry was reeling under the aftermath of global financial crisis. The shipping industry pundits say that the old vessels with poor fuel efficiency are being pulled out of the market earlier than expected amid high oil prices. In fact, the average sustainable life of commercial vessels has been 15 years over the last 5 years,

which is 10 years shorter than before.

In particular, the bunker C oil, the primary fuel for commercial vessel has been maintained in a range of USD 800 per ton recently. That represents almost ten-fold increase from 1990s. The vessel dismantling has been also spurred by the glut of vessels in the market as the shipyards have been springing up across China and elsewhere since 2008. In addition, the proportion of the vessels younger than 20 years has increased from 1.8% in 2011 to 9.2% last year among the total number of vessels being dismantled as the fuel efficiency is taking on an added importance. With the IMO's Energy Efficiency Design Index (EEDI) making it mandatory to limit the CO<sub>2</sub> emissions from this year, shipping companies are increasingly showing little interest in vessels with low fuel efficiency.

According to the securities industry, the 20-year old pre-owned Capesize-bulk carrier was priced at USD 8.0 million last year, lower than USD 8.8 million charged for the dismantled vessel. Moreover, the price of pre-owned very large crude carrier(VLCC) is also plunging, which in turn narrows the price gap with the dismantled vessels.

### Maersk Shipping expanding the investment

Although newbuilding orders have been placed steadily amid the rising demand for high fuel efficiency and green ship, the investment in large containership is expected to be fueled by the lack of large vessels in ship owners' fleets. According to the shipbuilding industry, about 1 million TEU is expected to be ordered in the period ahead if the large containerships comprise 18 to 25% of the shipping companies' fleets. That is equivalent to approximately 90 containerships with a capacity of 13,000TEU.

A.P Moller Maersk also announced its intention to make investment in the shipping sector contrary to the expectations of the shipping industry at the outset. Early this year, A.P Moller Maersk indicated that it would inject USD 6 to 8 billion in the shipping sector over the next 5 years. The investment is expected to be made to ensure the balance of growth in various sectors based on profitability. That is considered to be the strategy to cement its leading position in the shipping market.

This strong intention of Moller Maersk has a positive impact on other shipping companies even in the midst of difficulties. Thus, ship owners are expected to increase their investment in new build vessels gradually over time. Particularly, the

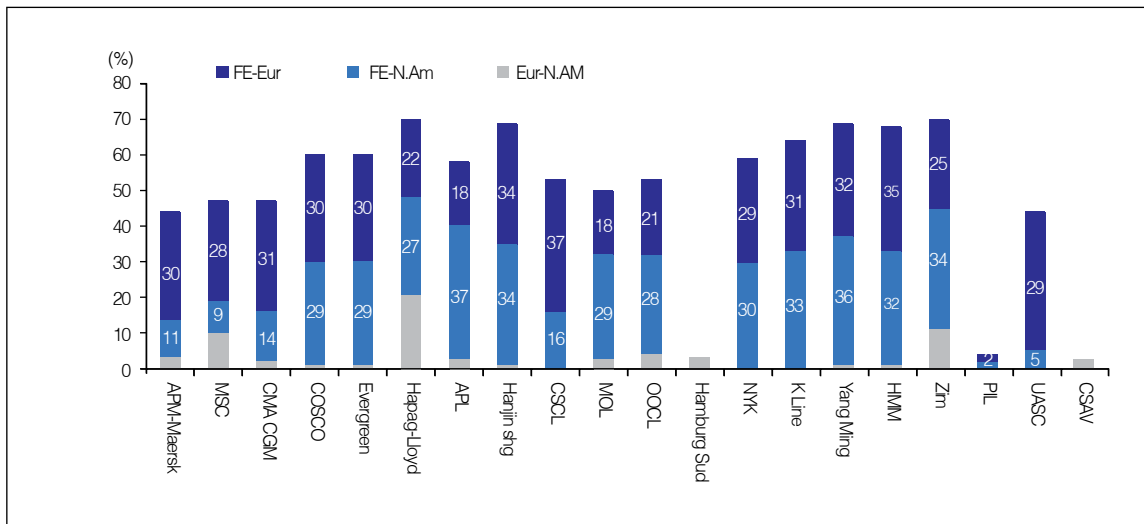


Figure 5. Share of major routes among major global shipping companies

shipbuilding industry predicts an expansion of investment in eco-ship.

### Changing paradigm in shipping

The recent move of Maersk indicates that it is moving ahead with the strategy to strengthen its market power by achieving the economy of scale. Maersk has expanded its fleet size through the M&A with Sea-Land, Safmarine, and P&O Nedllyd in a bid to secure competitive advantage in terms of shipping capacity in a short period of time. In addition, Maersk has built independent global network by steadily securing very large containerships and the dedicated terminals in an attempt to further strengthen its global market power.


The Daily Maersk, which is the shipping company's new service on Asia-North Europe trade lines, is the brainchild based on such business strategy. Maersk is pursuing the strategy to expand its market share fast by realizing the economy of scale based on adequate shipping capacity and designated terminal.

Furthermore, Maersk is likely to leverage the economy of scale to expand its market power. Maersk is strategically moving to provide the Maersk-based 'integrated SCM service' in the shipping market. Maersk Group includes the logistics and transportation company called 'Damco', in addition to the feeder operators such as MCC Transport, Safmarine, Seago, and terminal operator such as APM

Terminals. Thus, Maersk can provide logistics service in conjunction with those companies. In other words, Maersk is expanding its business with an aim to provide total services by carrying out entire processes of cargo transportation based on the link with affiliates.

### Heated competition over freight rates

The trade volume may be the key to the success of Maersk's strategy. The growth rate of container traffic volume is expected to be little more than 6%. Maersk is likely to refuel the competition over freight rates as part of effort to secure the traffic volume above a certain proper level.

Thus, the drive to carve out larger share of the market is likely to be accelerated to spur the utilization of very large containership, in which the company has invested heavily, when there is any sign of market recovery based on some balance between supply and demand. Fiercer competition to garner larger market share will lead to the competition over freight rates. Maersk may start the competition over freight rates to secure the trade volume after gaining some experience with the operation of Tripe-E after its delivery. Particularly, the competition over freight rates for securing the trade volumes is expected to be unavoidable, given that the hub-and-spoke system, the foundation of Maersk's strategy, will have greater efficiency in proportion to the trade volume. 

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# World's first ultra low-temperature resistant cable withstanding the temperatures of up to -65°C

TMC, a leader in the ship/offshore plant cable markets, developed the ultra low-temperature resistant cable, expanding its reach into high value-added markets. TMC has achieved an amazing annual growth rate of 28.2% since 2000, making strides in ship/marine cable markets.

TMC, the manufacturer of ship/marine cables and indoor optical cable, announced that it developed the ship/marine cable which can be used in ultra low-temperature environment of -65°C for the first time in the world. Previous ultra low-temperature resistant cables could be used at temperatures up to -50°C. With the development of this cable, TMC is gaining the reputation for its world's best technology in ship/marine cables used at ultra low-temperatures.

As the Arctic glaciers are melting fast, the global resource developing companies and countries bordering the North Pole are competing fiercely over the Arctic shipping routes and resource development.

Particularly, the successful development of this ultra low-temperature resistant cable that can withstand the temperatures of up to -70°C is expected to further build up the competitiveness of domestic shipyards which have been sweeping new orders in high value-added vessel and offshore plant markets.

This ultra low-temperature resistant ship/marine cable has proven the safety in the cold bending and cold impact

tests at -65°C which were performed in accordance with CSA 22.2 Std test method. According to TMC, this cable ensures stable flow of electricity and is not split or broken by physical force or bending. Furthermore, it is an eco-friendly product that has low toxicity and emits low level of smoke.

Moreover, this cable has excellent safety. Specifically, it has the fire-resistance

properties to ensure stable flow of electricity even when the fire-extinguishing liquid is sprinkled to put out the fire or when the physical force is exerted due to the collapse of the building in case of fire with the temperature reaching 1,000°C. Therefore, this cable enables normal operation of the emergency lights, sprinkler, ventilation system, etc., even during a fire.

Besides, this cable, which is to be installed in offshore plant, has high resistance to mud oil and UV to ensure stable performance in harsh external environment and also has strong physical properties to withstand vibration



Ultra low-temperature resistant cable developed by TMC

and physical shock from the plant.

Shin Min-cheol, Director of the research institute of TMC, said, "The successful development of this cable proves the unrivalled technical prowess of Korea in the electrical cable sector, and we will keep moving ahead with the R&D to further sharpen the nation's competitiveness in the ship and offshore plant sectors. In addition, we will expand the application of this ultra low-temperature technology to the photovoltaic power cable, wind power cable, etc., as part of effort evolve into the world's best company in the ultra low-temperature resistant cable sector." 

# Emerson's control technologies help maintain stability

Designed to transport megastructures to remote, offshore locations, the Dockwise Vanguard relies on Emerson technologies for ballast control and tank gauging system.

Dockwise, a global leader in the transport and offshore installation of extremely large and heavy structures, has selected Emerson Process Management, a business of Emerson, to supply the control systems that help maintain stability and structural integrity for Dockwise's semi-submersible heavy transport vessel, the largest of its kind in the world.

Named Dockwise Vanguard, the new vessel is designed for heavy marine transport and offshore dry docking, enabling oil and gas operators to design and build larger and heavier offshore structures such as Floating Production Storage and Offloading (FPSO) vessels. Because of the Dockwise Vanguard's loading capacity of up to 110,000 metric tons and its bowless design, it is now possible to fabricate these megastructures and load and transport them intact to remote offshore wells or production sites. This helps cut costs, lower risks, improve schedule flexibility and reduce offshore man-hours required to get these megastructures into operation.


Emerson supplies a comprehensive ballast control system, which is responsible for helping the Dockwise Vanguard submerge and rise with stability and integrity. It relies on tank gauging systems that provide highly accurate level measurements for load



calculations as well as high level and overflow alarms. The Dockwise Vanguard also uses Emerson's Smart Wireless technology to measure and transmit tank level data to the wheelhouse.

"Emerson's reliable and highly sophisticated ballast control technologies are an important factor in allowing us to provide this first-of-its-kind carrying capacity, as well as provide a dry dock capability at offshore production sites for repair and retrofit, which saves significant time and money," said Eugène van Dodeweerd, Manager, Fleet Supervision of Dockwise. "Conditions in the offshore environment require ballast control that is also easy to oper-

ate and maintain and Emerson has proven the reliability of its marine tank management systems on a number of other Dockwise vessels."

"The design and execution of the Dockwise Vanguard fits in perfectly with Emerson's 'Never Been Done Before' goals. This vessel redefines the entire Heavy Marine Transport industry," said Steve Sonnenberg, president of Emerson Process Management. "We are proud of our contribution to the ballast systems of this innovative vessel." 



# First foray into the market for high value-added large-scale jack-up rigs

**Samsung Heavy Industries(SHI) secured an order for the world's largest jack-up rig, successfully making inroad into the market for large-scale jack-up rigs which have emerged as new growth engine for shipbuilding industry.**

SHI won an order worth approximately USD 1.3 billion from the Norway-based Statoil for 2 large jack-up rigs that will be deployed in the North Sea. This contract includes 2 optional units, raising an expectation for additional order. The jack-up rig refers a drilling facility used primarily for the oil field development in continental shelves. The jack-up leg installed in the hull is lowered into the sea floor and fixed to the sea bed, keeping the hull afloat to carry out the drilling operation. The jack-up rig can operate without being affected by the tide and wave, and therefore is mainly deployed in shallow sea with rough waves.

Most current Jack-up rigs are small and medium-sized facility capable of operation only in water depths of 100m or less. The market for small and medium-sized jack-up rigs has been dominated by the Chinese and Singaporean shipyards which have price competitiveness and experience accumulated by many years of shipbuilding works.

By contrast, the jack-up rig to be built by SHI this time is a large facility capable of drilling up to 10km from the surface at a maximum water depth of 150m. Additionally, this facility will be built to a high specification to enable the operations under severely cold conditions and harsh marine environ-



The bird's eye view of the large-scale jack-up rig ordered to SHI

ment in the Norwegian North Sea where the temperatures drop to -20°C. This large-scale jack-up rig, ordered to SHI this time, is priced at USD 650 billion per unit which is 3 times more costly than the small-and medium-sized jack-up rig that has the price tag of USD 200 million. Meanwhile, it is the first time that SHI received an order for jack-up rig and this is the world's largest.

An official from SHI said, "SHI won high scores during the bidding process for its extensive experience in the construction of various offshore facilities and vessels deployable in the North Sea, as well as its unrivalled competi-

tiveness in drillship, the most typical oil prospecting vessel."

The large-scale jack-up rig sector which has recently witnessed a rising demand represents the high value-added market where domestic shipyards can have competitive edge. SHI predicted that about 2 to 3 large-scale jack-up rigs would be ordered yearly until 2020. Using the order awarded to it this time as the stepping stone, SHI is moving to make all-out effort to carve out larger slice of the share in the market for large-scale jack-up rig. 

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ENGINEERING YOUR SUCCESS.

# HHI successfully developed an essential equipment used in gas plant

Hyundai Heavy Industries(HHI) successfully made the centrifugal gas compressor, the essential equipment of gas plant, for the first time nationwide. The centrifugal gas compressor is core equipment necessary for long-distance and high volume transportation of natural gas.

The centrifugal gas compressor, a core equipment of plant, has been successfully developed in Korea for the first time, heralding a promising outlook for the shipbuilding industry that has been reeling under recession. HHI recently announced that it successfully completed the trial operation and performance test of its No. 1 centrifugal gas compressor at its gas compressor test site of Ulsan headquarters.

The centrifugal gas compressor is a equipment for compressing the gas by utilizing the centrifugal force generated by high-speed rotation of impeller(rotor blade) and installed primarily in onshore and offshore gas plants that need to transport large amount of gas stably. Specifically, centrifugal gas compressor generates less noise and is smaller than ordinary gas compressors and capable of continuous operation for a long time.

This centrifugal gas compressor, developed by HHI, measures 2.8m in length, 2.6m in width, 1.8m in height, and can pressurize natural gas up to 69 bars and deliver 11,000 tons of natural gas per hour. The rotation axis and impeller were supplied from Mitsubishi Heavy Industries. HHI directly made the rest and completed the assembly and commissioning.



HHI's centrifugal gas compressor of HHI under trial operation

The centrifugal gas compressor incorporates the cutting-edge technology and is a high value-added product priced at over KRW 4 billion. So far, the centrifugal gas compressor market worth USD 4 billion yearly has been dominated by a handful of companies in Europe, United States, Japan, etc.

HHI entered into a technical tie-up with Japan's Mitsubishi Heavy Industries in 2011 in a bid to make a foray into the gas compressor sector. Last year, HHI built a gas compressor performance test site at its Ulsan headquarters with an injection of approximately KRW 6 billion as part of effort to make inroad into the related

market.

HHI, which successfully made the centrifugal gas compressor for the first time nationwide, plans to expand its product line with an aim to increase its annual sales to over USD 200 million from this sector. Additionally, HHI plans to produce the rotation axis and impeller with its own technology.

This centrifugal gas compressor, developed by HHI, is well-received in the market. According to the industry, this centrifugal gas compressor will be delivered to the gas pressurization site of Korea Gas Corporation in June and put into operation from December after the installation period of about 5 months. 



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# The world's first eco-friendly LNG-powered containership

Daewoo Shipbuilding & Marine Engineering(DSME) has put the finishing touch on the eco-friendly LNG-powered vessel dramatically reducing the fuel costs and emissions of contaminants.

The world's first LNG-powered containership will be fitted with the HP-FGSS(High Pressure Fuel Gas Supply System) which DSME developed independently. DSME announced on June 20 that its natural gas fuel supply system would be installed in the 3,100TEU containership to be built at the U.S.-based NASSCO(National Steel and Shipbuilding Company) shipyard. DSME developed HP-FGSS running on LNG as fuel jointly with MAN Diesel & Turbo, the world's leading marine engine maker, which comes after the development of HP-FGS in 2011, and held a large-scale demonstration session in Copenhagen, Denmark.

HP-FGSS uses LNG, not the bunker C oil, as primary fuel and therefore can reduce the emissions of carbon dioxide (CO<sub>2</sub>) by 23%, nitrogen oxides(NO<sub>x</sub>) by 80%, and sulfur oxides(SO<sub>x</sub>) by 95% compared to existing diesel engines of same output.

LNG has been considered to be both eco-friendly and cost-effective, compared to other fuel oils, and the LNG-powered engines are expected to open a new era of ship propulsion in the period ahead. Additionally, LNG-powered large vessel is a prelude to the changes in the shipbuilding industry amid rigorous enforcement of environmental regu-




HP-FGSS developed independently by DSME

lations worldwide under the Framework Convention on Climate Change.

## The world's first LNG-powered vessel

This containership was ordered to NASSCO shipyard by the U.S.-based shipping company TOTE(Totem Ocean Trailer Express) late last year and will become the world's first vessel fitted with ME-GI(MAN Electronic Gas-Injection Engine), the LNG-powered engine developed by MAN Diesel & Turbo. LNG-powered vessel is expected to be one of the greatest transformations that can change the paradigm of shipbuilding industry in the future, considering that the shift to the clean energy is required in all

industries to combat the global warming under the Framework Convention on Climate Change requires. DSME predicted the need for the concerned technology earlier and moved forward with the development of technology. For that reason, DSME is expected to become a leader in the related market if the LNG-powered vessels are fully commercialized.

In relation to that, Jeong Bang-eon, Vice-President supervising the technology affairs at DSME, said, "Our goal is to hasten a shift to the LNG, the clean energy, as the fuel for large vessels around the world while making the technical capabilities of DSME recognized worldwide." 

# Structural Health Monitoring System

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# TRIS, a new leader in the offshore plant equipment sector

-Targeting the shipbuilding and offshore markets with its seamless tube

TRIS has achieved remarkable growth in semiconductor, automotive, petroleum/chemical, boilers, and medical equipment sectors, etc., with a single-minded focus on its business over the last two decades since it began the production of stainless tubes for boiler and medical applications in 1998. In particular, TRIS has been the certified manufacturer and supplier of seamless tube used in petroleum/chemical plant facilities since 2009 and has also been supplying domestic automotive parts companies with its stainless seamless tube, the component of automobile engine fuel injection system, since 2010. This year, TRIS has put the primary focus of its growth strategy on the offshore plant sector which has recently witnessed rapid growth. TRIS is pursuing the strategy to establish itself as a leading tube manufacturer by leveraging on the technological capability which it has built up from petroleum/chemical plant facility sector.

*TRIS Tube Co., Ltd.*

- 2012. 09 Company name changed to 'TRIS'
- 2012. 06 New plant expanded (15,485m<sup>2</sup>)
- 2011. 12 Awarded prize for export of five million USD
- 2010. 01 Certified as a producer of tubes for oil and gas industries by S-oil and Hyundai Oil Bank
- 2009. 12 Start mass production of seamless roll tubing
- 2008. 05 Registered company R&D institute
- 2005. 09 Certified as promising small and medium company in Kyunggi-do
- 2004. 08 Registered as a promising small and medium company for export
- 2004. 03 Exported precision seamless tube for high purity gas industries (USA)
- 2002. 12 Certified as INNO-BIZ company by SMBA
- 2002. 01 ISO 9001.2000 certificate
- 2001. 10 Registered company R&D department
- 1998. 08 Developed and exported precision tubing for medical usage (USA)
- 1992. 04 Established SaeHan Precision Tube in Seoul



## MISSION

*Being a global leading company as an attractive provider of stainless steel precision tube.*

TRIS is recognized to have the world's best technology in high-purity seamless tubes. Particularly, TRIS started the supply of seamless tube for the gas lines of semiconductor facilities of Samsung, Intel, etc., in 2004 and successfully localized the equipment. At that time, the nation had a heavy reliance on the imported stainless precision tubes that had the applications in semiconductor, medical, food and precision machinery industries due to the low availability of indigenous precision tubes. Thus, TRIS has achieved unrivalled competitiveness with its stainless precision tube and seamless tube. Specifically, TRIS is the only domestic precision tube manufacturer which gained reputation in overseas markets for seamless tubes. With the development and production of seamless coil tube, the essential component of petroleum/chemical plant facilities, and the tube for automotive GDI, TRIS has diversified its business portfolio and is on a stable growth path.

TRIS had its ground-breaking ceremony (approximately 16,000m<sup>2</sup>) in December 2011 and commenced the construction in a bid to ensure improvement in productivity and stable delivery and take another giant step forward while expanding its reach in the market.

The new manufacturing plant was completed in September 2012, which is about 10 months after the construction began. It is operating to full capacity in two shifts a day, and currently, TRIS has the monthly production capacity of 100~110 tons, which is two times greater than that of competitors, and raised its monthly production capacity of seamless tube to 350,000~370,000m.

Jin Song, CEO of TRIS, said, "With the successful localization of seamless tube used in the semiconductor production facilities, TRIS has entered a new phase of growth. Particularly, TRIS has been actively coping with the challenges in various sectors such as offshore plant, petroleum/chemical sectors which have a rising demand for the seamless tubes, while expanding our reach into semiconductor, automotive, medical sectors, etc. I think that we will see tangible results from around next year."



Jin Song, CEO of TRIS

## Smart solutions for customers

Upon completion of its new plant in September 2012, TRIS changed its CI as part of effort to strengthen its corporate brand power and competitiveness in global market. The new CI symbolizes the three S' which means 'Saehan' providing Smart Solutions all the time.

Jin Song, CEO of TRIS, said, "The product reliability is the key to the production of seamless tube, our mainstay product. Usually, the mother tube undergoes a series of processes until the finished products are completed, including the pilger, straight drawing, degreasing, thermal treatment (bright annealing), etc. At this time, various errors or problems may occur in respective production processes. Our competitive is the result of the close examination into those problems. It is crucial to identify the root cause. Providing the smart solution is our promise to customers, and we are making utmost effort to make good on our promise."

The offshore plant industry is expected to continue high annual average growth of 6.7% until 2030, and likely to be a new momentum of growth for domestic shipyards. Thus, high growth is expected in the fitting industry which is considered to be the core of plant industry.





### VISION

*Supplying the best solution for stainless steel precision tube, aiming better success with customers, making sustainable company on all member's happiness.*

TRIS is making inroads into the offshore plant market by leveraging its technology amassed through many years of work in the petroleum/chemical plant facilities. In addition, TRIS Predicts an upturn in the demand for stainless seamless tubes due to a shift away from the low-profit carbon steels used mainly in petrochemical plants, and is focusing on expanding its marketing drive for offshore plant equipment manufacturers and domestic/overseas equipment manufacturers which heavily use the tubes.

Meanwhile, the fitting collectively refers to the tube connector joint, and serves the functions of changing the direction/diameter of pipe, branch-out, extension, fluid flow control, etc.

Fitting is divided into various types: Elbow to change the direction of the pipe (∟-shaped), Tee(T-shaped) to branch out the pipe, Reducer to connect the small pipe and large pipe, Flange to linearly extend/connect the same pipe, Cap to finish the pipelines, valve for opening/closing and controlling the fluid flow, and Regular to maintain fluid pressure.

The stainless seamless coil is one of the mainstay products of TRIS in offshore equipment sector. TRIS developed the product with a weight of 100kg per coil for the first time worldwide, exceeding the 90kg per coil which was known to be the longest and heaviest previously.

Jin Song, CEO of TRIS, said, "TRIS began full-scale production of seamless coil tube with the world's heaviest weight and longest length from January this year, along with the expansion of seamless tube. We will take up the challenge to achieve remarkable results in global petrochemical and offshore plant sectors."

The high-purity seamless tube products currently produced by TRIS require high technology and advanced production facilities. TRIS already has the proven technology comparable to that of global manufacturers, and makes relentless effort to supply the products of best quality and price with stable delivery.



Figure 1. Semi-Conductor Use Seamless Tube



Figure 2. Oil & Gas Use Seamless Tube

### Product lineup for offshore plants

The stainless seamless coil is the mainstay products of TRIS. This product is used generally in the Pre-Insulated Tube(PIT) sector. This stainless seamless coil is used as the process tube at the center of PIT product, and its exterior surface is wrapped by the non-hygroscopic fiber glass material. After the aluminum foiling, the finish is made by using the PVC. The finished PIT products are used for the cold and thermal insulation of steam, high-temperature or low-temperature fluid, gas, etc.

According to TRIS, the world's longest coil currently in production has the advantages of significantly reducing the costs of ancillary fittings in various piping works. Therefore, TRIS has stepped up its marketing drive targeting the equipment manu-

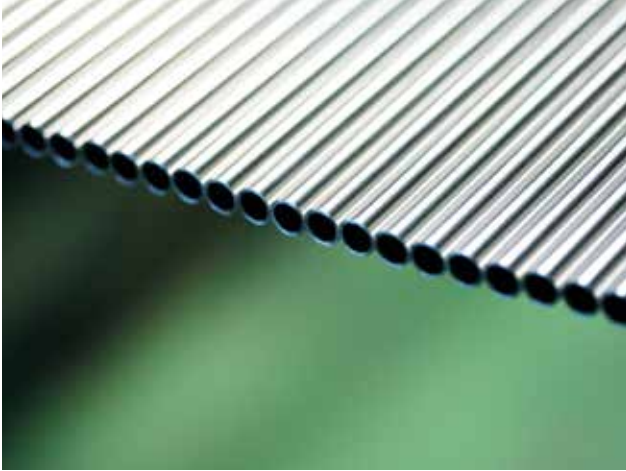


Figure 3. High Precision Welded Tube

factors making the Pre-Insulation tube or fittings.

• **Product Line**

1. Oil & Gas use Seamless Coil Tube
2. Semi-conductor use Seamless Straight Tube
3. Petro chemical use Seamless Straight Tube
4. Offshore plant use Seamless Straight/Coil Tube
5. Automotive GDI fuel rail use Seamless Straight Tube
6. High Precision Welded Tube

TRIS began the production of industrial grade BA tubes for the users who cannot use the high quality seamless & welded grade tubes which cost more than the AP(Annealed & Pickling) grade tube used commonly in general industries. This product lineup offers the users the BA grade product at affordable prices which has relatively higher quality compared to AP grade product, thus increasing the satisfaction with quality.

Offshore plant sector: The industries closely related to the sea, such as offshore facilities, ship and petrochemical industries, need to use the processed product or the type of steel suitable for various tubes & pipes that have prolonged exposure to chlorine atmosphere. TRIS-BA product with excellent surface(chrome carbide layer formation) has excellent corrosion-resistance in chlorine environment compared to the AP product.

- **Shipbuilding & offshore sectors:** It is used in hydraulic control lines, jacket tube, multi core tube & submarine cables, and TRIS tube provides the stability and cost-



Figure 4. Automotive GDI Fuel Rail use Seamless Tube

effectiveness for the plant facilities of vast scale.

- **Petrochemical sector:** It is used as pre-insulation tube and steam tracing tube.
- **Heat exchangers:** TRIS tube can solve or reduce for heat exchanger equipment pollution and corrosion problem.
- **Nuclear industry:** Smooth surface tissue of TRIS tube can simplify the equipment and tools removing of radioactive pollution.
- **TRIS coil tube:** TRIS supplies the seamless & welded tube as coil type on purpose. TRIS seamless tube can save the welding or lok-fitting installation cost by reducing the connection part as per user's designing.
- **Vacuum applications:** Vacuum tube is to be the best solution for stable vacuum condition, by reducing the



Figure 5. Constant Research to improve the facility



connection accessory, for which can achieve the required vacuum level.

- **Gas distribution systems:** Instrument Air, Nitrogen & Oxygen gas and central gas stations minimizes the pollution piping connection, and can keep the gas purity, also reduce the installation cost.

### Ceaseless effort for R&D

TRIS is making relentless efforts for R&D through its own research arm. This focus on R&D has been the key driver for TRIS' leadership in technology. This in-house research institute has performed to develop the working process of welding tube manufacturing, and for use of semi-conductor, automobile, petro-chemical, by complying customer's requirement for best cold drawing and heat treating procedure.

TRIS keeps trying for R&D to be placed with leading company, expanding the field for pharmaceutical, umbilical tubing to make high benefits, through the knowledge-power accumulated for stainless steel tube manufacturing process. Currently, TRIS is proceeding with various R&D related to the SMLS steel tube and welded steel tube.

- Coiled seamless tube for steam tracer
- Coiled seamless tube for umbilical
- Seamless tube for nuclear fuel out-jacket
- Welded & Drawn tube for semi-conductor grade
- GDI welded tube for automobile
- Welded & Drawn thin-wall tube for pharmaceutical



Figure 6. Degreasing Facility for Coiled Tube

TRIS is proceeding with the development to ensure the best prototype, along with the review of standard and specification, through the customer support program in case that the specification required by the customers is not secured in detail. Besides, TRIS has adopted its own quality control system to monitor the whole processes as specified by the method and standards that reflect the requirements of customers before delivery to customers, thereby rigorously inspecting the conformity of quality based on product and purpose. Moreover, TRIS is making constant improvement through the definition, analysis, improvement and standardization according to the troubleshooting procedures in case of quality problem in order to maintain stable quality level. ⚓





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# Turnkey NOR installations on board Arctia Offshore's MSV Nordica and MSV Fennica

The MSV Fennica and Nordica can operate sustainably in the Arctic Ocean - now and in the future. Wärtsilä technology is enabling Arctia Offshore's icebreakers to undergo sustainable heavy machinery operations in this sensitive environment.

## *Wärtsilä Corporation*

*Aslak Suopanki, Senior Technical Manager, Environmental Solutions*

*Tuomas Helin, Project Manager, Environmental Solutions*



Figure 1. NOR (NOx Reducer) installed on board the MSV Nordica.

Arctia Offshore contacted Wärtsilä in 2011 to investigate the possibilities of installing emission reduction systems on board their MSV Fennica and MSV Nordica multipurpose icebreakers. Both vessels have two 16-cylinder Wärtsilä Vasa 32 (6000 kW each) + two 12-cylinder Wärtsilä Vasa 32 (4500 kW each) diesel electric main engines, are Finnish flagged and have been

classified by Det Norske Veritas (DNV).

The vessels had been hired to operate in the Arctic Ocean's Chukchi and Beaufort Seas to assist in oil exploration missions. Due to the sensitive location of the exploration projects, a regular Selective Catalytic Reduction (SCR) system, such as the Wärtsilä NOx Reducer (NOR system), would not suffice since an oxidation catalyst would need to be combined with it in order to comply with the particulate matter (PM) regulations.

In addition, a closed crankcase ventilation system was also required at the operating area to prevent volatile organic compound (VOC) emissions into the atmosphere. Finally, the exhaust gas system setup was designed so that it would subsequently enable a straightforward addition of a continuous emission monitoring system (CEMS). Alternatively, the emissions from each engine could be manually measured by a certified surveyor.

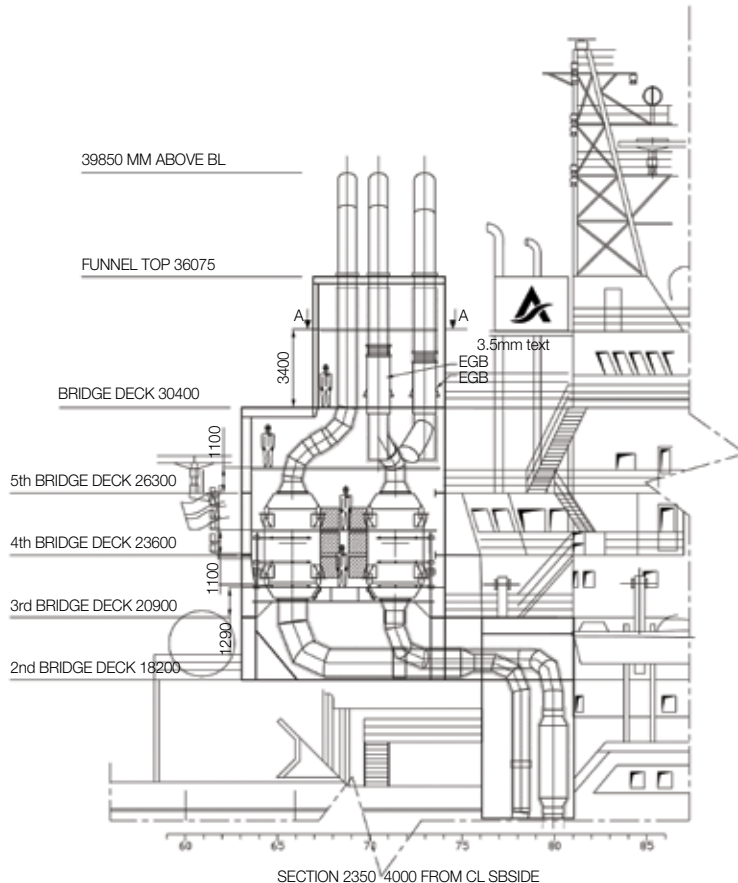


Figure 2. NOR installation layout.

### A first ever retrofit project

After a thorough examination of the known engine emissions, targeted emission values and environmental conditions, Wärtsilä suggested a NOR system having two NOR catalyst layers with an integrated oxidation catalyst layer in the reactor for each main engine. Due to the integrated oxidation catalyst layer, it was considered a “tailor-made system” and hence, required some extra design work. Nevertheless, integration of the oxidation catalyst layer enabled utmost importance in marine applications where the available space is limited.

When operating in the Arctic Ocean, the vessels would be using ultra

low sulphur diesel (ULSD), which means a maximum of 15 ppm (parts per million) sulphur content and a maximum 0.01 weight-% ash content. This meant that every fuel oil tank and the fuel oil system piping from both vessels would need to be washed to get rid of sulphur residues. This fuel quality also enables trouble free operation of the oxidation catalyst, which is prone to sulphur poisoning with the fuel qualities normally used in marine applications. However, when operating outside of the Arctic Ocean, higher sulphur content fuel oils can be used. In that case, the catalytic elements are removed from the reactor. A turnkey, or EPC (Engineering, Procurement and Construction), contract was signed between Wärtsilä and Arctia Offshore in early September 2011, with an ambitious delivery schedule as both vessels were scheduled to enter dry-dock less than 2½ months after the contract signing. The project was then officially transferred from the sales team to a dedicated project team. Even though Wärtsilä Services had earlier successfully completed several turnkey SCR projects for marine applications, this project marked the beginning of a new era as it was to be the very



Figure 3. The new funnel casing structure ready to be lifted on board.

first time that a turnkey retrofit of a Wärtsilä NOR had been undertaken.

The project itself was divided into two parts. The first stage was completed for both the Nordica and Fennica in early 2012, and the second stage for Nordica was completed at the end of April 2012. In Fennica's case, the time schedule was accelerated and the vessel set sail to the USA in mid March 2012. Throughout the project Arctia Offshore's personnel showed strong professionalism and a commitment to making things happen. This was important because the accelerated Fennica schedule meant that a number of fast response decisions were needed. It could, therefore, be said that the joint decision making enabled the schedule to be maintained, with both parties having a mutual understanding and vision about the project's progress.

### The first installation stage

The first stage included installation of the main large components of the system, i.e., new exhaust gas stacks, the NOR reactors, new exhaust gas boilers (EGB), compressed air equipment, urea dosing and pumping equipment, the crankcase ventilation separators, the deck extension, new funnel casing, and the urea solution tanks, as well as the relocation of certain equipment.

All installation work was carried out at the Arctech Helsinki shipyard. The Nordica and Fennica came into dock at the same time in early December 2011. As there was not enough space for the new equipment in the existing funnel casing, a deck extension of some 80 m<sup>2</sup> on the second bridge and a new funnel casing had to be constructed. The new casing structure was pre-fabricated on site and lifted onto the newly constructed deck extension. The funnel was designed so as to take as much advantage as possible of the warm engine room air to heat the space around the NOR reactors and the exhaust gas outlet.

The deck extension and new casing structure also necessitated some relocation of the existing



Figure 4. The deck extension installed.



Figure 5. The new funnel casing installed on the deck extension.

equipment. For instance, the life saving appliances, radar and navigation equipment, storage drums, LT-water header tanks, and aft navigation/signal lights needed to be relocated. All the old and now obsolete exhaust pipes, as well as other remaining equipment having a significant weight effect, were discarded as were all unnecessary cables. The old casing was almost completely reconstructed. In order to meet the strict

delivery schedule, those parts and materials having the longest delivery times had already been ordered prior to the actual signing of the agreement. A total of four stainless steel urea tanks were installed per vessel, two on the portside and two on the starboard side, within a void space on two levels.

The urea solution filling connections were installed in the vessel's bunker stations, and all urea tanks and filling lines were insulated and equipped with heating systems. The total volume of the tanks is 110 m<sup>3</sup>, which corresponds to approximately two weeks of autonomous operation when using a 40 wt-% technical grade urea-water solution, and with all four engines running at full load 24 hours a day. This, however, is not a typical operational profile for the vessel during exploration missions and hence, the real life autonomy will be considerably longer. The two existing exhaust gas boilers in the old funnel were dismantled and replaced with new ones. This was done in order to shorten the lead time for outfitting the new casing as the new exhaust gas boilers were installed in the newly built funnel and, because of the NOR heat requirements, were located after the NOR reactors. In order to meet EPA regulations, most of the fuel oil tanks were washed to rid them of sulphur residues. Furthermore, so as to avoid HFO being accidentally bunkered into those cleaned tanks during routine icebreaking duties prior to heading for the Arctic Ocean, the tanks were sealed by blocking them with flanges.

### The second installation stage

The second stage consisted of installing the catalyst elements within the reactor, as well as the pressurised air system and urea piping for the

NOR, the fuel oil cooling systems including all piping works, plus commissioning and performance testing the installed system.

A fuel oil cooling system was required because of the use of ULSD, since without the cooling system the viscosity of the ULSD fuel would be too low for safe and reliable operation of the fuel oil pumps. Each main engine was equipped with its own cooling unit. In order to get the HFO originated residual sulphur out of the fuel oil system, an extensive washing of the fuel oil system was performed. Similarly, flushing of the lubrication oil system and lube oil change over was carried out because of the recommended use of a lower total base number (TBN) lube oil with the ULSD fuel oil. The modification work also included preparing the system for a possible CEMS addition later on. Hence, flanged ports were installed on both the new, as well as the existing, exhaust stacks. In addition, the necessary service platforms for the same were installed as well.

### Performance tests and commissioning

Some performance tests were conducted already in Helsinki during and immediately after

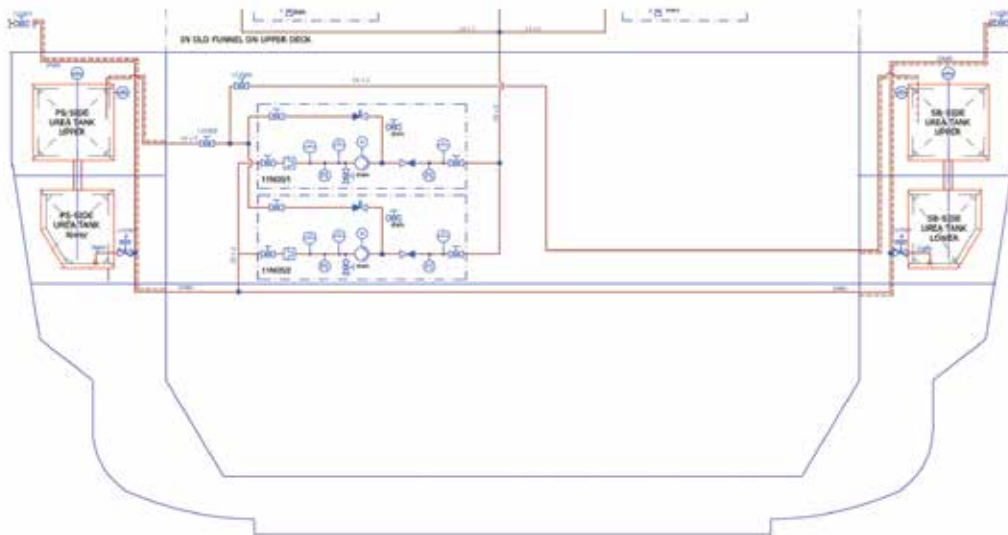


Figure 6. Schematic view of new urea tank arrangement and piping system.



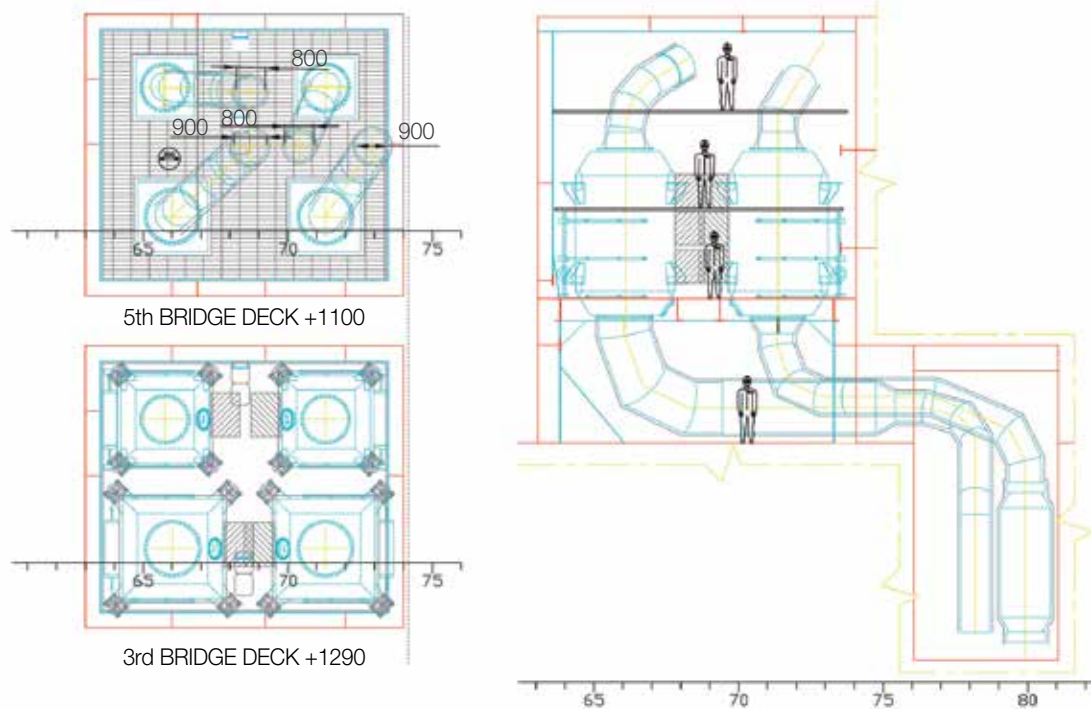


Figure 7. Arrangement of new SCR reactors with exhaust gas piping.

the installation work. For instance, inclining tests were performed during the first installation stage. However, the final emission tests and commissioning were performed later on when the vessels were sailing towards their final destination. The emission tests were performed by an accredited third party assigned by the customer. According to the tests, the emissions were clearly below the required level. It should be noted, for example, that the NOx emission requirements for the vessels were clearly far more stringent than what will be required in the IMO Tier III regulations coming into force for new buildings in 2016.

### Reliable operations in environmentally sensitive areas

Oil exploration operations in the Arctic Ocean place demands on the vessel's machinery, both from the technological and environmental points of view. Systems have to be "bullet-proof" and robust in order to withstand the extreme conditions and long intervals between port calls. At the

same time, the very strict environmental regulations that exceed even the IMO Tier III NOx requirements must be complied with. These are an absolute prerequisite to obtaining exploration permits from the authorities. All modifications on board the vessels were carried out so that none of the excellent capabilities of the multipurpose icebreakers were sacrificed in any way. Thanks to the modification work performed, both the MSV Fennica and Nordica are now ready for demanding oil exploration work in the Arctic Ocean, and can operate sustainably - now and in the future. ⚓



Figure 8. The closed crankcase ventilation units.

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# Azipod<sup>®</sup> CZ for drilling vessels High-efficiency thruster solution for drill ships and rigs

Azipod<sup>®</sup> CZ presents a significant advancement in thruster technology for drilling vessels with station keeping capabilities. A highly simplified structural design with few moving parts combined with high efficiency and minimal thrust loss enables Azipod<sup>®</sup> CZ to provide great operational and economical advantages to the vessel throughout its lifecycle.

ABB

## New generation thruster technology for deepwater drilling vessels

Azipod<sup>®</sup> CZ is a unique underwater (de)mountable thruster solution that stands out from other thrusters due to its built-in high-efficiency electric motor. A fixed pitch propeller is mounted directly to the motor shaft, thus eliminating unnecessary mechanics such as gears, shaft lines and bearings, which makes the thruster unit extremely resilient to mechanical stress and wear. The thruster motor is cooled directly by the surrounding seawater, so no other cooling is needed. Propulsion speed is controlled by a low voltage frequency converter and the Azipod<sup>®</sup> CZ is connected externally by cabling only – no shafts are necessary. This ensures a simple, cost-effective installation at the yard and easy accessibility for ongoing maintenance.

### • Designed for demanding service

The design concept for Azipod<sup>®</sup> CZ originated in the 1990's, when the Azipod<sup>®</sup> propulsion system was first introduced to the shipping industry. Due to its simplified construction concept and high durability, Azipod<sup>®</sup> was originally intended for heavy duty icebreaking operations. Capitalizing on its proven performance in this market, Azipod<sup>®</sup> has grown steadily in several vessel segments and is today the leading edge propulsion technology. The system is especially suited for segments where high maneuverability, reliability and robustness are critical.

Based on the success of Azipod<sup>®</sup> propulsion, Azipod<sup>®</sup> CZ was launched in the early 2000's to cover the market in the under 5 MW class. Azipod<sup>®</sup> CZ is now available in two versions/applications; a main propulsion version for ships and a thruster version for drilling vessels.

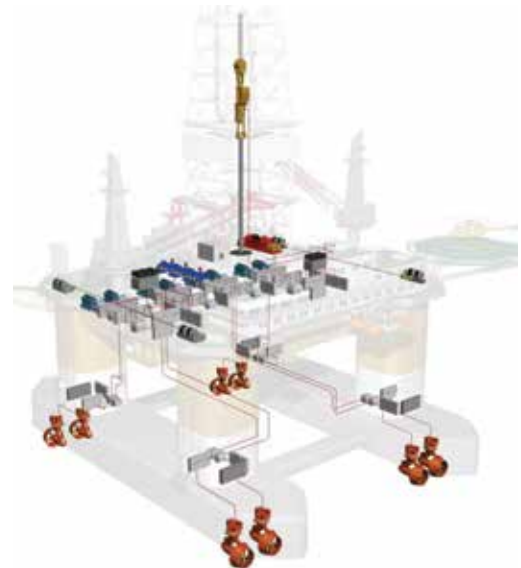


Figure 1. The Azipod<sup>®</sup> CZ thruster system complements ABB's total solutions for semisubmersible drilling rigs.

### • Main Azipod<sup>®</sup> CZ advantages

Azipod<sup>®</sup> CZ is a unique thruster system with unique benefits, such as:

- Modern technology can provide long operational life and low maintenance requirements due to simple mechanics and an "all in one" system approach
- Higher efficiency and less thrust loss means lower power demand, less fuel consumption and a more environmental drilling vessel
- Simplified vessel construction due to easy-to-mount, modular thruster design with podded motor

### • A single source provider

ABB is the leading supplier of total solutions to deepwater drilling vessels and over half of the world's drilling fleet is equipped with an ABB electric power solution. A total ABB solution typically encompasses systems for electric power generation and distribution, and drilling and thruster drive systems. With Azipod® CZ, ABB's scope of supply for the drilling market is expanded and our position as a single source provider is further strengthened.



Figure 2. Azipod® CZ presents a significant advancement in thruster technology for drilling vessels with station keeping capabilities.

### Azipod® CZ - construction principles

Azipod® CZ is highly standardized and modular, comprised of plug-and-play modules for fast and simple installation. The Propulsion Module consists of the motor, the strut and the propeller with nozzle. The Propulsion Module is attached to the steering mechanics at the factory prior to delivery. At the shipyard, the Propulsion Module with steering mechanics is attached to the mounting block by bolted connections.

The Propulsion Module incorporates a high-efficiency per-

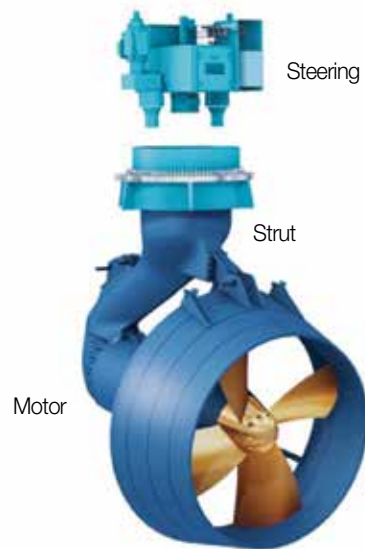


Figure 3. Shown above is the Azipod® CZ Propulsion Module with the Steering System. The Steering System and Steering Converters are the only components inside the vessel, ensuring simple and fast installation.

manentmagnet synchronous motor, enabling many unique benefits. The design allows the motor to be cooled directly by the surrounding seawater without the need for additional cooling media. The outer diameter of the motor can thus be decreased for obtaining improved hydrodynamic efficiency. The over-pressure in the motor prevents seawater from seeping into the motor.

The strut is the connective element in the Azipod® CZ structure. Control cables, piping and power supply cables for the propulsion motors are located inside the single piece cast strut.

### High efficiency - minimum thrust loss

A 3.3 MW Azipod® CZ thruster unit is comparable in performance to a 3.8 MW mechanical thruster. The reason for this is that Azipod® CZ has far better internal and hydrodynamic efficiency.

The difference in internal efficiency is due to the high-efficiency permanent-magnet synchronous motor and the power transmission. Azipod® CZ has an electric power transmission and no mechanical gearing between motor and propeller. The difference in thrust loss lies in the unique possibility Azipod® CZ provides for tilting and thrust optimization.

	Traditional Mechanical Thruster	Azipod® CZ
Mechanical	6 shaft bearing units	2 shaft bearing units
	gear wheels	no gear wheels
	oil filters, pumps and cooling circulation units	no oil filters, no pumps and no cooling circuits
	approximately 4,000 - 6,000 liters of lube oil	approximately 100 liters of lube oil
	hydraulic steering (requires oil circuit, filters, etc.)	electrical steering (low noise, clean, etc.)
	precise shaft alignment required	no shaft alignment required
	single shaft sealing system (oil lubricated)	double shaft sealing system (water + grease)
	3 rotating shafts	1 rotating shaft
Operational	gear loss (around 3%)	no gear loss
	electric motor losses to be cooled inside vessel	electric motor losses directly to sea water
	limited reverse torque	full reverse torque
	sequence start-up	immediate full power
	hydraulic steering efficiency (around 60-70%)	electrical steering efficiency (around 80-90%)
	main electrical motor efficiency (around 95-96%)	main electrical motor efficiency (around 97-98%)

Table 1. The table below shows typical Mechanical and Operational characteristics of Traditional Mechanical Thrusters vs. Azipod® CZ.

### • Tilting and thrust optimization

A semisubmersible drilling rig has several sources of thrust loss, including:

- Friction between propeller slipstream and pontoon bottom
- Coanda effect
- Thruster-to-thruster interaction

It is possible to reduce these losses significantly by directing the jet from the thrusters downward. In traditional mechanical thrusters this can be accomplished by tilting the propeller nozzle. However, tilting the propeller nozzle provides only limited effect as the propeller/nozzle efficiency is reduced and the tilting angle is limited.

Rated power (kW)	Effective thrust (tons)	Max transit speed (knots)
3300	63	9
3800	73	9
3800 - 4500	72 - 84	14

Table 2. Model sizes in the Azipod® CZ range

With Azipod® CZ it is possible to optimize the thrust because the complete motor with nozzle and propeller is tilted. By locating the optimized tilt angle large gains are achieved and water jet interactions with the hull/pontoon are practically eliminated. Compared with traditional thrusters without tilting, a gain of around 20-30% can be achieved. A

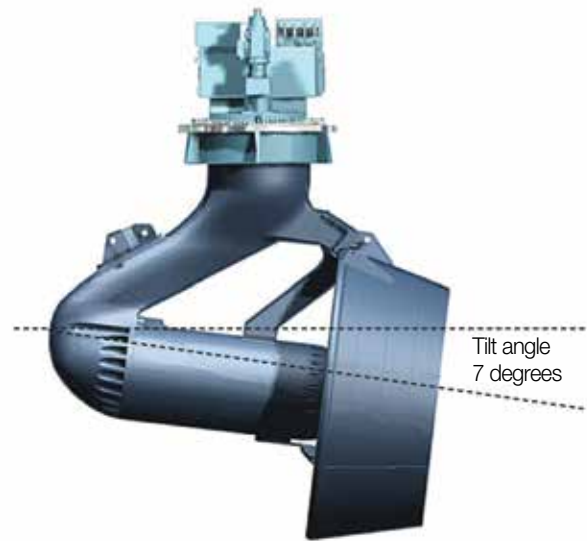


Figure 4. The Azipod® CZ motor with nozzle and propeller is tilted relative to the horizontal position to obtain optimal thrust.

gain of 4–6% is achieved in comparison to traditional thrusters with tilted nozzles.

### • Less installed power

Considering the combined value of both efficiency rewards and thrust loss, Azipod® CZ requires up to 13% less installed power than a mechanical thruster with tilted nozzle. When compared to a mechanical thruster without tilted nozzle, installed power can be reduced by 20-30%. For the

drilling rig this means smaller engines and electrical equipment - cost savings, more space and less weight.

### **Comprehensive services and support for the life of the vessel**

ABB offers project management, design and installation support as well as a full range of specialized after-sales services to provide our customers the resources they need to ensure optimal performance from their Azipod® CZ thruster systems.

ABB works closely with our customers throughout all project phases. From an early design phase we can contribute with expertise in critical hydrodynamic areas. Our professional project management services and highly developed project execution models help assure that all specifications and requirements are implemented accurately, economically and in a timely manner.

#### **• Testing and installation**

For simple, safe installation and start-up at the yard, Azipod® CZ is delivered as a complete, fully tested unit. Before leaving the factory the motor is heat run tested in a water tank.

The Azipod® CZ is a self-contained unit that requires far less work to install than mechanical thrusters. With Azipod® CZ, much installation work is eliminated, such as installation and connection of equipment for cooling, hydraulics and lubrication oil, construction of the motor foundation and precise mechanical alignment and adjustment.

The structural interface for the Azipod® CZ thruster is the mounting block. The mounting block is supplied by the



Figure 5. The photo above shows the grand opening in December 2008 of the new ABB Marine Service Center in Houston, which provides specialized Azipod® CZ competence and equipment for our customers operating in the Gulf of Mexico.



Figure 6. Development Driller I (shown above) and Development Driller II from Transocean (originally built for Global Santa Fe) are both equipped with Azipod® CZ thruster systems.

shipyard and ABB specifies the interfaces to the Azipod® equipment. The structure is straightforward, allowing fast mounting of the Azipod® CZ unit with no further adjustments required. A thorough procedure has been developed for easy underwater thruster installation and de-mounting.

#### **• Lifetime support**

Lifecycle services are an integral part of each delivery and we offer a full range of after-sales services including 24/7 On-call, Planned Repairs, Preventive Maintenance, Training and Spare Parts Management programs to thoroughly address the individual requirements of each vessel.

We continually strive to tailor our service offerings towards specific vessel segments. A good example of this is found in our newly opened Marine Service Center in Houston, Texas. These new facilities have fast and direct access to the Houston ship channel to effectively support our customers. The new workshop is also specially equipped to meet the service needs of offshore rigs and vessels operating in the Gulf of Mexico. ⚓

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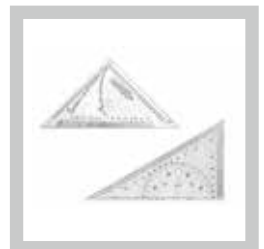
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# Shipping Industry Goes Full Swing in the Installation of Ballast Water Treatment Systems

**FARO® Laser Scanner Focus<sup>3D</sup> Improves Efficiency of Measuring Process Significantly**

*FARO Technologies Inc.*

Environmental problems such as marine and air pollution are usually caused by industrial wastewater, smoke and soot. A lesser known, innocuous cause of contamination, however, is the water discharged by ships.

Large ships take in fresh or seawater into tanks and cargo holds to help stabilize and balance a ship. Known as 'ballast water', this is what a ship draws in at its port of call, either before loading cargo or after unloading cargo. As the ballast water travels with the ship, it can be taken from one region to another that is thousands of kilometers away.

This is a problem because seawater contains sediments, plankton and a variety of small organisms. When ships discharge its ballast water at the port of call, the transfer of harmful aquatic organisms may occur, causing a huge impact to the balance of marine life. In fact, the problem of ballast water transfer has been gaining greater prominence in countries such as America, Australia and many others in recent times.

In response to this growing concern, the International Maritime Organization (IMO) has adopted the "BWM Convention", which will require all international ocean-going ships to install ballast water treatment systems onboard. This translates to more than 30,000 existing ships that will be fitted with ballast water treatment systems in the next few years.

## **A Joint Study Supported by ClassNK**

Motivated by the shipping industry's need, a joint study group named "The Effective Use of 3D Laser Scanner" was founded, and the study explored the use of a three-dimensional (3D) laser scanner to design the ballast water treatment system. The eight-member group of the study



Bird's eye view of Sanwa Dock in Onomichi, Hiroshima prefecture, Japan

included ClassNK, Nippon Yusen Kabushiki Kaisha (NYK Line), Mitsui O.S.K. Lines (MOL), Kawasaki Kisen Kaisha, Ltd. ("K" Line), Monohakobi Technology Institute (MTI), Sasebo Heavy Industries Co., Ltd., Sanwa Dock Co., Ltd., The University of Tokyo and S.E.A. Systems, Inc., and the study was supported by ClassNK as part of the Society's "Joint R&D with industry" scheme.

This time, FARO had the chance to speak to Sanwa Dock (a ship repair company based in Onomichi, Hiroshima prefecture, Japan) about the application of FARO Laser Scanner Focus<sup>3D</sup>. The FARO device was used in an early stage of preparation for the installation of ballast water treatment systems.

## **Design: A Painstaking and Laborious Process**

Typically, the ballast water treatment system goes into the engine room or pump room of a ship. The installation of a new and large system to a functioning ship involves a great



Scanning the Engine Room onboard a ship with the Focus<sup>3D</sup>

deal of time and effort because of the complicated piping systems and machinery already present.

The traditional method of creating detailed drawings requires manual measurements to replicate the actual site layout. Any remodeling to accommodate the new system will have to be done based on these manually-produced drawings. This entails numerous on-site inspections of the ship, and enormous amounts of design time. In addition, limitations that come with manual measurements mean that a slight error on paper could amplify to become a much larger design fault during execution.

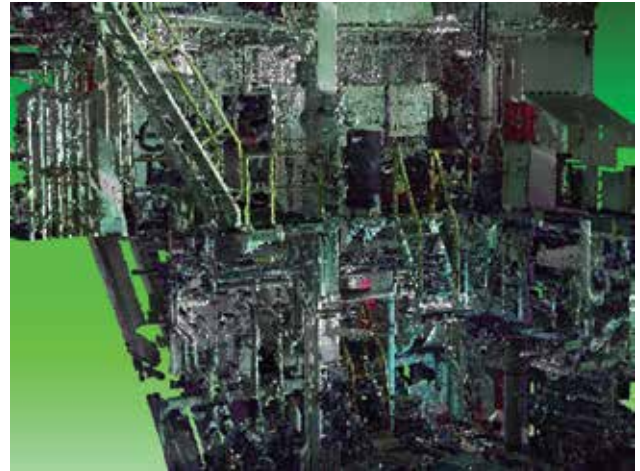
### Measuring Effectively with Focus<sup>3D</sup>

Instead of going with the traditional method, Sanwa Dock invested in Focus<sup>3D</sup> to measure the engine room. The Focus<sup>3D</sup> is a lightweight, compact 3D laser scanner that weighs in at 5kg and measures 24cm x 20cm x 10cm. Capable of scanning 976,000 measurement points per second, the device creates accurate, high-fidelity digital images rapidly.

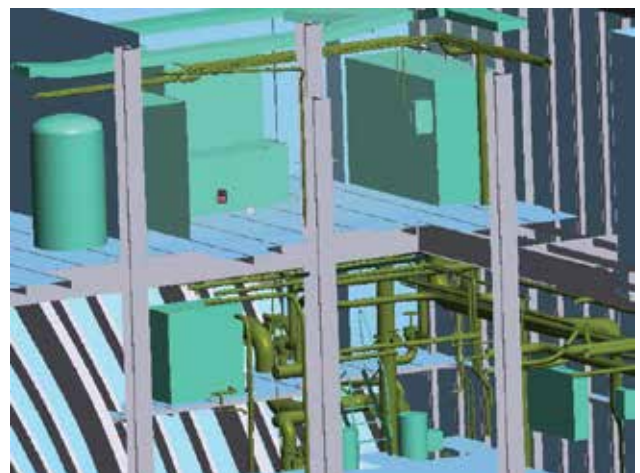
The use of Focus<sup>3D</sup> dramatically reduced the amount of on-site measuring time for Sanwa Dock. The technicians used to take days to measure existing piping and facilities manually, but with the Focus<sup>3D</sup>, it only took them a few hours to a day to complete the task. In addition, the measurement points collected can be converted into 3D CAD data, making it possible to create 3D design drawings directly from the CAD data.

The integrated color camera offered photo-realistic 3D scans, which helped in easy identification of the complex piping routing of an engine room at a glance. Impressed by

the portability of the Focus<sup>3D</sup>, a design engineer of Sanwa Dock commented, "Since the Focus<sup>3D</sup> is compact and light, it can easily be setup anywhere in small engine rooms onboard any ship. This is especially so if the area is very tightly packed, such that technicians can't even set foot into the room to take measurements. The Focus<sup>3D</sup> is also extremely user friendly."



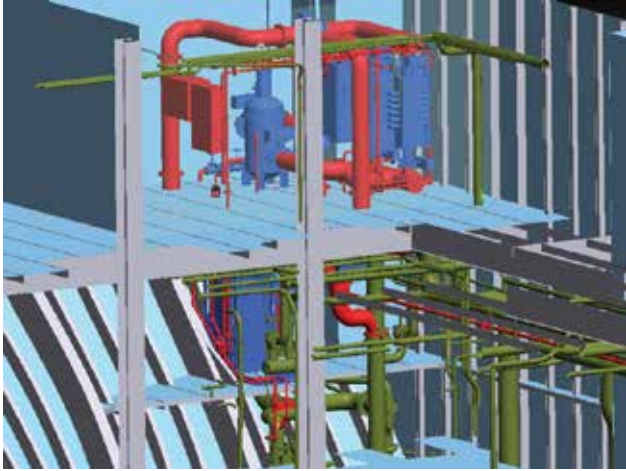
Data points of machine room captured by the Laser Scanner Focus<sup>3D</sup>



3D CAD model of machine room constructed based on the collection of data points

### Enhanced Efficiency with 3D CAD Data

Once the Focus<sup>3D</sup> captures the data points of the target area, the accompanying software processes and constructs complete 3D models with the data. The new ballast water treatment system and its piping route can then be planned and integrated seamlessly with existing structures.



Proposed design of ballast water treatment system based on accurate 3D scans of existing structures in the engine room

The ability to plan in advance, based on accurate 3D models, allows optimum design to be created and factors in preparation time for crucial items, such as detailed structural designs, production materials and engineering drawings. In addition, it is easier to get an idea of the overall layout after the installation of the ballast water treatment system and to identify the potential problems. This would be difficult to address using the traditional 2D model.

Due to the time-savings accorded by the Focus<sup>3D</sup>, project durations are significantly shortened. The time and effort can be put towards the installation of the system itself instead. Design, production, and installation of fixtures can be better managed, allowing each project to be completed in good time.

As the BWM Convention is expected to come into force in the near future, the demand for installations of ballast water treatment systems will surge. It is a real possibility that the shipping industry may struggle to meet strong demand.

Some large shipping companies are already planning ahead and considering the installation of treatment systems ahead of the BWM Convention. In order to meet high demand in a short period of time, it is imperative for shipping companies to look for ways that cut man hours, while ensuring error-free installation. To that end, laser scanning technology is the most effective means to capture a large volume of data within a short period of time for the construction of accurate 3D models. This may prove to be the most efficient and promising solution for the impending challenge of producing countless water ballast treatment

systems, in order to meet the shipping industry's needs over the next few years.

### About SANWA DOCK CO., LTD

Sanwa Dock is a leading ship repair company in Japan that provides repair facilities capable of servicing and modifying all types of vessels. The company specializes in repairs of small and medium sized vessels, but is also well-equipped with technical capabilities to handle a wide range of repairs and modifications from normal cargo ships to special vessels. Taking on the challenge of installing ballast water treatment systems to protect the marine environment, Sanwa Dock continues to play a leading role in the Japanese Shipping Industry, well-known for its technical capabilities in the global arena.

### About FARO

FARO is a global technology company that develops and markets computer-aided coordinate measurement devices and software. Portable equipment from FARO permits high-precision 3D measurement and comparison of parts and compound structures within production and quality assurance processes. The devices are used for inspecting components and assemblies, production planning, inventory documentation, as well as for investigation and reconstruction of accident sites or crime scenes. They are also employed to generate digital scans of historic sites.

With FARO, 3D measurement and documentation needs can be fulfilled confidently. As a pioneer and market leader in portable computer-aided measurement, FARO consistently applies the latest advances in technology to make its industry-leading product offerings more accurate, reliable, and easy to use. The focus is on simplifying workflow with tools that empower customers, thereby dramatically reducing the on-site measuring time and lowering overall costs.

Worldwide, approximately 15,000 customers are operating more than 30,000 installations of FARO's systems. The company's global headquarters are located in Lake Mary, Florida, with its European head office in Stuttgart, Germany and its Asia-Pacific head office in Singapore. FARO has branch locations in Japan, China, India, South Korea, Thailand, Malaysia, Vietnam, Canada, Mexico, United Kingdom, France, Spain, Italy, Poland, and The Netherlands. (For more information, please visit [www.faroasia.com](http://www.faroasia.com)) 



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# SHI penned a contract to build the world's largest FPSO

Samsung Heavy Industries(SHI) clinched an order for an ultra large-scale FPSO(Floating, Production, Storage, and Offloading) in Nigeria. This FPSO worth USD 3 billion is the world's largest among the FPSOs which have been ordered thus far.

SHI announced that Samsung Heavy Industries Nigeria, its local subsidiary in Nigeria, won an order worth USD 3 billion for the construction of FPSO on June 7, and also signed a construction contract with Samsung Heavy Industries Nigeria. Samsung Heavy Industries Nigeria entered into a contract as principal contractor with the owner to build the FPSO, and signed the subcontract with SHI. As the subcontractor, SHI will establish the production base in collaboration with Samsung Heavy Industries Nigeria and build a considerable portion of the top side of FPSO at the local site.

Measuring 330m in length, 61m in width, and 34m in height, this FPSO is an ultra large-scale offshore facility with the topside alone weighing 36,000 tons and has a storage capacity of 2.3 million barrels. The total production cost amounts to approximately 3 billion, which is the most expensive among the FPSOs ordered thus far.

SHI will build this FPSO on a turnkey basis, carrying out the entire processes ranging from the design through the procurement/production/transportation to the commissioning. This facility will start the oil production at sea off the coast of Nigeria from the second half of 2017. SHI won the order for this FPSO, the world's largest and most expensive, after fierce bidding competition. The five-year bidding process began with the pre-qualification in 2009 and was wrapped up when this order was awarded to SHI.

SHI won this order in recognition of its excellent localization strategy to fulfill the local contents requirement by establishing the local production base in Nigeria, as well as its excellent technological expertise which it accumulated in the offshore plant sector thus far.

SHI plans to use this facility as local production base to make headway into the offshore facility market in Nigeria which is expected to witness multibillion-dollar offshore facility orders.

Park Dae-yeong, President of SHI, said, "After signing a USD 2.7 billion contract with the Australia's INPEX last year to build an ultra large-scale offshore facility, we won this ultra large-scale turnkey project, proving our excellent technology for the construction of offshore plants. We will cement our leading position in the offshore plant market by fully leveraging the best technology that we have."

SHI won the orders worth approximately USD 4.8 billion for 1 drillship, 2 jackup rigs, 1 FPSO, etc., this month alone. This order brings the value of orders placed at SHI to approximately USD 7.8 billion, accounting for 60% of its annual new order target of USD 13 billion.



Large-scale FPSO with a storage capacity of 2 million barrels, built by SHI

## 세계 최대 규모 FPSO 수주

삼성중공업이 나이지리아에서 초대형 FPSO(Floating Production Storage and Offloading)를 수주하는 데 성공했다. 이 FPSO는 총 30억 달러로 현재까지 발주된 FPSO 가운데 최대 규모이다.

삼성중공업은 나이지리아 현지 법인인 Samsung Heavy Industries Nigeria가 지난 6월 7일 30억 달러 규모의 FPSO를 수주했으며, 이에 따라 나이지리아 현지 법인과 본사 간에도 건조 계약을 체결했다고 발표했다.

나이지리아 현지 법인이 FPSO 제작의 원청 회사로서 발주처와 계약을 맺은 뒤, 삼성중공업 본사와 하청계약을 체결하는 방식으로 공사가 진행된다. 삼성중공업은 나이지리아 업체와 합작으로 생산 거점을 신설, FPSO 상부구조의 상당 부분을 현지에서 제작할 계획이다.

이번에 수주한 FPSO는 길이 330m, 폭 61m, 높이 34m 크기로 저장용량 230만 배럴에 상부구조(Topside) 중량만 3만 6000톤에 달하는 초대형 해양설비이다. 총 제작비는 약 30억 달러로 현재까지 발주된 FPSO 가운데 가장 비싼 금액이다.

삼성중공업은 설계 및 구매, 제작, 운송, 시운전 등을 총괄하는 턴키방식으로 FPSO를 건조하게 된다. 이 설비는 2017년 하반기부터 나이지리아 해상에서 원유 생산을 개시할 예정이다. 이번에 수주한 FPSO는 세계 최대 규모와 사상 최고가 기록 만큼이나 치열한 수주전이 전개됐다. 2009년 사전 자격심사를 시작으로 입찰 기간만 해수호 5년에 달한다.

삼성중공업은 해양플랜트 분야에서 그 동안 쌓아 온 기술력 뿐 아니라, 나이지리아 현지에서 생산 거점을 신설해 로컬 컨

텐츠(Local Contents, 현지생산규정)를 충족시키기로 한 현지화 전략이 좋은 평가를 받아 수주에 성공한 것으로 분석하고 있다.

나이지리아에서 향후 수백억 달러 규모의 해양설비가 지속적으로 발주될 것으로 전망됨에 따라 이 시설을 현지 생산 거점으로 활용, 나이지리아 해양설비 시장에서 차별적 교두보로 활용할 전략이다.

삼성중공업 박대영 사장은 "지난해 호주 INPEX사로부터 27억 달러 규모의 초대형 해양설비를 턴키로 수주한 데 이어, 또 다시 초대형 프로젝트의 턴키 공사를 진행

하게 됨으로써 해양플랜트 공사 수행능력을 다시 한 번 세계적으로 인정받게 됐다"면서 "최고의 기술력을 바탕으로 해양플랜트 시장을 주도해 나가겠다"고 말했다.

한편, 삼성중공업은 이 달 들어서만 드릴십 1척과 잭업리프 2기, FPSO 1척 등 약 48억 달러를 수주하는 데 성공했다. 현재까지 수주 실적은 약 78억 달러로 연간 수주목표 130억 달러의 60%에 달한다.

## SSME signed a contract to build 4 purse seiners

Sungdong Shipbuilding & Marine Engineering(SSME) signed a contract to build 4 purse seiners worth KRW 100 billion on June 17, and was successfully issued the refund guarantee(RG). These purse seiners are the same kind of vessels as the 80m-class purse seiners which have been ordered to SSME thus far, and will be delivered on a staggered basis from late 2014.

The ship owner is said to have placed the order at SSME in recognition of SSME's track records of successfully building and delivering the purse seiners with excellent performance. Particularly, SSME explains that the signing of this contract marks the culmination of cooperative effort between the SSME and the creditors.

SSME has successfully made an entry into the market for offshore plants such as shuttle tanker, FSO, etc., as well as commercial vessels, its mainstay products, based on ceaseless research into ship models and technology development. Particularly, SSME is strategically targeting the niche market amid the aging of deep-sea fishing vessels worldwide, thus resuming the construction of deep-sea fishing vessel which has not been built over the last 2 decades nationwide.

The state-of-art purse seiner, which SSME delivered to Saju Group, is furnished with the fish finder, radar, satellite communication equipment, etc., while the 'Sajo Columbia' was selected as one of 'Significant Small Ships 2012' by the U.K.'s Royal Institution of Naval Architects.

An industry source said, "SSME has won the orders for many purse seiners from domestic shipping companies, and this contract paves the way for SSME to expand its sales reach and cement its leading position in the construction of deep-sea fishing vessel."

### 성동조선해양, 참치선망선 4척 수주 계약 체결

성동조선해양은 지난 6월 17일 총 1000억 원 상당의 참치선망선 4척의 수주 계약을 체결하고 선수금환급보증(RG)을 성공적으로 발급받았다. 이 참치선망선은 그동안 성동조선해양이 수주해 온 80m급 참치선망선과 동일한 선종으로 오는 2014년 말부터 순차적으로 인도될 예정이다.



한편 이번 수주 계약은 성동조선해양이 건조해 인도한 참치선망선들의 실적과 성능을 전해 듣고 선사 측에서 먼저 건조를 의뢰해 온 것으로 알려졌다. 특히 계약이 체결되기까지 회사와 채권단의 긴밀한 협조를 통해 성공적인 결실을 거둘 수 있었다는 것이 성동조선해양 측의 설명이다.

성동조선해양은 끊임없는 선형 연구와 기술 개발로 강점인 상선뿐만 아니라 셔틀탱커, FSO 등 해양플랜트 시장에도 성공적인 첫 발을 내디뎠다. 특히 세계적인 원양어선의 선령 노후화로 형성된 니치(niche) 마켓을 전략적으로 공략함으로써, 지난 20여 년간 국내에서 건조 실적이 없었던 원양어선 건조를 재개하게 됐다.

성동조선해양이 사조그룹에 인도한 최첨단 참치선망선은 어군탐지기, 레이더, 위성통신장비 등의 장비를 탑재했으며, '사조 콜롬비아'호는 영국왕립 학회지인 '네이벌 아키텍트(Naval Architect)'의 '2012 올해의 선박(Significant Small Ships)'으로 선정된 바 있다.

관련업계 관계자는 "그 동안 국내선사의 참치선망선을 다수 수주해 온 성동조선해양이 이번 계약을 통해 영업 반경을 더욱 확대해 나가고, 원양어선 건조 선두기업의 입지를 더 탄탄히 하는 계기가 될 것"이라고 말했다.

## ABB breakthrough for enhanced reliability drillship

ABB has secured a landmark offshore marine industry contract covering electrical power and propulsion systems onboard a DP class 3 Drill Ship to be conferred with 'Enhanced Reliability' and DYNPOS AUTRO notation from Det Norske Veritas(DNV).

The contract covers installations onboard a 'BT-UDS' dynamic positioned ultra-deep water drill ship ordered by Sigma Drilling, the joint venture between Norway's Skeie Technology and Houston-based Vantage Drilling, from STX Offshore & Shipbuilding. The vessel, to be built at South Korea's STX Jinhae yard, is scheduled for delivery in the second half of 2015.

The new DYNPOS ER class notation for Enhanced Reliability from DNV recognizes advances made in flexibility, redundancy and fuel-efficiency in the structuring of DP systems. The notation covers connected power systems with standby start-up capabilities in specific conditions and the seamless and redundant change-over of generators and thrusters, via closed bus ties.

To meet DYNPOS ER and the DYNPOS AUTRO with closed ring requirements, the Sigma Drilling ship will feature ABB's most advanced protection devices; fast bus communications based on IEC 61850 standards and integrated blackout prevention functions. DYNPOS ER has specific requirements for operational flexibility and the safe operation of the power and thruster plant onboard.

ABB is supplying a comprehensive package of power & propulsion plant and preventive maintenance systems onboard, including generator sets,



switchboards, thruster motors, thruster drives, the drilling drive systems, Diesel Generator Monitoring System (DGMS) and Remote Diagnostic System (RDS).

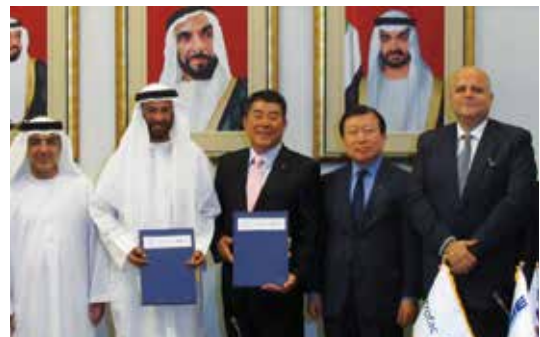
The BT-UDS is a new design of drillship which has been developed by Basso Technology. Capable of drilling wells down to 40,000ft (12,190m) in water depths of up to 12,000ft (3650m), the 232m long, 38m wide vessel will have a payload capacity of 25,000 tonnes. Six azimuthing thrusters combined with the Basso-developed hull form will provide a transit speed up to 16 knots.

## DSME-Petrofac Emirates consortium won an oil field development project in UAE

DSME(Daewoo Shipbuilding & Marine Engineering)-Petrofac Emirates consortium announced on May 27 that it was awarded a package project from Arab Emirate(UAE)-based ZADCO(Zakum Development Company) to increase the oil production from Upper Zakum field.

ZADCO, the state-run oil company of Abu Dhabi, is currently driving a project forward to develop the Upper Zakum field located about 80km offshore northwest from Abu Dhabi. This project is worth USDS 3.7 billion, the largest single plant project in the Middle East, and aims to increase daily oil production up to 750,000 barrels from around 550,000 barrels by installing 4 artificial islands and erecting the oil production facilities thereon.

DSME-Petrofac Emirates consortium will carry out the entire EPIC(Engineering, Procurement, Installation and Commissioning) pro-



cesses based on the turnkey basis, ranging from the design through the procurement/production/

transportation to the installation at the site, and plans to deliver this project by mid 2017.

DSME will undertake the procurement, design and production of 22 modules for production facilities weighing 33,000 tons, which consist of the wellhead control, oil processing facility, etc. Those modules comprise 40% of total module weight(88,340 tons), and the construction costs amount to approximately USD 800 million.

Meanwhile, Petrofac Emirates, the partner of DSME, will undertake the design, procurement and production of the remaining modules in parallel with the whole construction process on the artificial islands at the local site. Petrofac Emirates is the local joint venture formed between Petrofac, the plant design company of U.K., and Mubadala Petroleum, the state-run investment company of UAE.

Goh Jae-ho, President of DSME, said, "I anticipate a great synergic effect resulting from the combination of DSME's production know-how in offshore sector and Petrofac's design ability. This project will help DSME position itself better in the plant market of Middle East."

Including this contract, DSME has won the orders for 13 ordinary commercial vessels, offshore facilities, etc., worth USD 4.2 billion so far this year.

### 대우조선해양-페트로팍 컨소시엄, UAE 유전 개발 프로젝트 수주

대우조선해양과 페트로팍 에미라츠(Petrofac Emirates) 컨소시엄은 아랍에미레이트(UAE) 자드코(ZADCO: Zakum Development Company)사로부터 어퍼 자쿰(Upper Zakum) 유전 증산을 위한 패키지 프로젝트를 수주했다고 지난 5월 27일 밝혔다. 발주사인 자드코사는 아부다비 국영 석유회사의 자회사로 아부다비 북서쪽 약 80km

해역에 위치한 어퍼-자쿰 유전 개발 사업을 진행 중이다. 이 사업은 4개의 인공섬을 설치한 후 그 위에 원유생산설비를 설치해, 현재 약 55만 배럴 수준의 일일 원유생산량을 최대 75만 배럴까지 늘리기 위한 것으로 총 규모가 37억 달러에 달하는 중동 지역 최대 단일 플랜트 프로젝트다.

대우조선해양과 페트로팍 에미라츠 컨소시엄은 설계부터 조달, 제작, 운송 및 현지 설치까지 EPC 전 과정을 포함한 턴키 방식으로 프로젝트를 수행해 2017년 중순까지 인도 완료할 계획이다. 그 중 대우조선해양은 유전 제어(Wellhead control) 및 원유처리시설 등으로 구성된 총 3만 3000톤 규모의 22개 생산설비 모듈(Module)의 구매, 설계 및 제작을 담당한다. 이는 전체 모듈 중량(총 88,340톤)의 40% 수준으로, 공사 금액은 약 8억 달러에 달한다.

나머지 모듈들의 설계, 구매 및 제작과 현지 인공섬에서의 모든 공사는 파트너인 페트로팍 에미라츠사가 담당한다. 페트로팍 에미라츠는 영국의 플랜트 설계 전문업체인 페트로팍과 UAE 국영투자회사인 무바달라(Mubadala Petroleum)사의 현지 합작기업(joint venture)이다.

고재호 사장은 "대우조선해양의 해양 부문 제작 노하우와 페트로팍의 전문 설계 역량을 결합한다면 큰 시너지 효과를 낼 수 있을 것"이라며 "이번 프로젝트를 통해 대우조선해양이 중동지역 플랜트 시장에서 유리한 위치를 선점할 수 있을 것으로 본다"고 평가했다.

한편 대우조선해양은 이번 계약을 포함해 올해 들어서 총 13척, 약 42억 달러 상당의 일반상선과 해양구조물 등을 수주했다.

## HMD clinched orders from 4 shipping companies for 10 eco-friendly vessels

Hyundai Mipo Dockyard(HMD), the world's top leader in the medium-sized vessel sector, signed a series of contract to build eco-friendly vessels(worth approximately USD 300 million). HMD entered into a contract with D'Amico to build 2 units of 50,000DWT product & chemical tankers in Rome, Italy, on May 15. Moreover, HMD inked the contacts with various European ship owners to build 4 units of 38,000DWT product & chemical tankers, 1 unit of 50,000DWT product & chemical tanker, and 3 units of 57,000DWT bulk carriers.

There has been a surge in the demand for eco-friendly vessels amid the steep rise in oil prices and mandatory implementation of Energy Efficiency Design Index(EEDI). HMD expects that it can carve out even larger share in the market for eco-friendly vessels that will replace the existing vessels.



D'Amico has placed orders at HMD for 16 product & chemical tankers so far, and a European shipping



company placed an additional order for the type of vessel which was delivered in July last year for the first time in the industry and improved the fuel efficiency by about 30% compared to the existing vessels. Besides, a Greek shipping company awarded an order for 3 units of 57,000DWT bulk carriers after it received the delivery of 8 bulk carriers from HMD. And a Greek shipping company placed an additional order for 1 unit of 50,000DWT product & chemical tanker and 3 units of the medium-sized PCs this year after ordering 1 unit last year.

HMD won orders for 64 vessels, including 49 medium-sized PCs, worth approximately USD 2.1 billion so far this year, making a smooth progress towards achieving its annual new order target of USD 3.2 billion.

## 현대미포, 4개 선사로부터 친환경 선박 10척 수주

중형선박 부문 세계 1위인 현대미포조선이 최근 친환경 선박 10척(약 3억 달러)을 잇달아 수주했다.

현대미포조선은 지난 5월 15일 이탈리아 로마에서 다미코(d'Amico)사와 5만DWT급 석유화학제품운반선 2척에 대한 건조계약을 체결했다. 이외에도 유럽 유수의 선사들과 3

만8000 DWT급 석유화학제품운반선 4척, 5만DWT급 석유화학제품운반선 1척, 5만7000 DWT급 벌크선 3척을 각각 수주했다. 최근 유가 급등 및 선박제조연비지수(EEDI) 의무화에 따른 친환경 선박에 대한 수요가 늘고 있는 가운데, 예코십 선박 교체 수요가 본격화될 경우 시장 점유율을 더욱 높일 수 있을 것으로 한껏 기대를 모으고 있다.

다미코사는 지금까지 총 16척의 석유화학제품운반선을 현대미포조선에 발주했으며, 이번에 계약한 유럽의 한 선사는 지난해 7월 업계 최초로 인도받은 선박을 운항한 결과 기존 선박대비 30% 가량의 연비 향상효과를 거두자 추가 발주한 것으로 알려졌다.

또한 5만7000 DWT급 벌크선 3척을 발주한 한 그리스 선사는 과거 8척의 벌크선을 인도해 간 선사이며, 5만 DWT급 석유화학제품운반선 1척을 발주한 그리스 선사는 작년 1척에 이어 올해도 중형 PC선 3척을 추가로 발주한 것이다.

한편 현대미포조선은 올해 들어 중형 PC선 49척 등 64척의 선박을 약 2억 달러에 수주함으로써 연간 수주 목표(32억 달러) 달성이 무난할 것으로 보인다.

## SPP secured an order for 2 AHTS

SPP Shipbuilding announced on May 29 that it signed a contract with an European ship owner to build 2 units of AHTS(Anchor Handling Tug Supply Vessel), a type of OSV(Offshore Supply Vessel). This contract is valued at approximately USD 60 million, including the optional vessel.

This marks the first time that SPP was awarded a contract to build the Offshore Supply Vessel(OSV), a high value-added vessel. These vessels are large-scale AHTS measuring 90m in length and fitted with DP2, the automatic position control system, and have fire prevention capability, providing various support to offshore oilfield platforms including the drillship. AHTS refers to the vessel that tows the oil platform to the targeted location at sea, install or remove the anchor of platform. SPP Shipbuilding expects a steady upturn in new orders for AHTS, a high value-added vessel, driven by the growth of offshore oilfield development industry.

Gwak Han-jeong, President of SPP Shipbuilding, said, "This contract attests to the excellent technology of SPP Shipbuilding in the construction of Offshore Supply Vessel, a technology-intensive sector. We will speed up making inroads into this market amid the surge in the demand for OSV."

## SPP조선, 해양예인지원선 2척 수주

SPP조선은 유럽 선주로부터 해양작업지원선(OSV-Offshore Supply Vessel)의 일종인 해양예인지원선(AHTS, Anchor Handling Tug Supply Vessel) 2척을 수주했다고 지난 5월29일 밝혔다. 수주 가격은 옵션을 포함해 적당 약 6000만 달러 수준이다.



해양작업 지원선은 고부가가치 선종으로, SPP가 이 선종을 수주한 것은 이번이 처음이다. 이번에 수주한 선박은 길이 90m의 대형 AHTS로, 자동 위치제어시스템인 DP2를 장착하고 소방 방제 기능을 탑재해 석유시추선을 포함한 해양 유전 플랫폼에 각종 지원을 수행한다.

AHTS는 석유 시추 플랫폼을 바다의 목표 지점까지 예인하고 플랫폼의 닻을 설치하거나 철수하는 역할을 하는 선박이다. 플랫폼에 필요한 물자 공급도 지원해 해상유전 개발 산업이 성장하면 지속적인 발주가 기대되는 고부가가치 선박이라고 SPP조선은 설명했다.

곽한정 SPP조선 사장은 "이번 수주는 기술집약산업인 해양작업지원선 분야에서도 SPP조선의 기술력을 인정받은 대표적인 사례"라며 "앞으로 해양작업지원선 수요가 늘 것으로 예상돼 SPP조선의 이 시장 참여에도 가속도가 붙을 것"이라고 말했다.

# HHI clinched an order worth USD 750 million for a semi-submersible drilling rig

Hyundai Heavy Industries(HHI) secured an order for a semi-submersible drilling rig, a high value-added facility. HHI announced on May 30 that it won an order worth USD 750 million from Diamond Offshore, the U.S.-based drilling company, for the construction of 1 unit of semi-submersible drilling rig. Under this turnkey contract, HHI will undertake entire processes ranging from the design to the commissioning.

HHI will immediately start the designing process and deliver the semi-submersible drilling rig by November, 2015. BP, the operator, plans to deploy this drilling rig to the deepwater area of the Great Australia Bight in South Australia

This drilling rig is capable of operating at water depths up to 3,000m and has the drilling capacity of up to 12,200m from the sea level. Measuring 123m long and 96m wide, this drilling rig is the same class as the world's largest semi-submersible drilling rig ordered by Norway-based Fred Olsen Energy to HHI last year.

Semi-submersible drilling rig has the advantage of high stability due to the small surface area of hull that directly comes into contact with the water and therefore is not affected very much by external environmental factors, such as wave, although it has less mobility compared to the drillship.

HHI swept the orders for 4 ultra deepwater drillships which have been ordered by Diamond Offshore so far, and was awarded the order this time in recognition of its excellent technology for the design and construction.

An official from HHI said, "The drilling and production facilities for deepwater operations require the advanced technology to ensure high quality because the safety is taken as top priority. We will make ceaselessly effort in R&D to sharpen our competitiveness, fully meeting the expectations of ship owners for high quality facilities."

Currently, HHI is building 14 drilling facilities, i.e., 12 drillships and 2 semi-submersible drilling rigs(1 unit being built by Hyundai Samho Heavy Industries). This year, HHI has won orders for 5 units worth USD 6 billion in the deepwater drilling & production facility sector alone, starting with the order from the Norway-based Statoil for a gas production platform in January.

## 현대중공업, 반잠수식 시추선 7.5억 달러 수주

현대중공업이 고부가가치 설비인 반잠수식 시추선 1기를 수주하는데 성공했다. 현대중공업은 미국의 시추전문회사인 다이아몬드 오프쇼어(DIAMOND OFFSHORE) 사로부터 1기, 7.5억 달러 규모의 반잠수식 시추선 프로젝트를 수주했다고 지난 5월 30일 밝혔다. 이번 수주 계약은 설계부터 시운전까지 모든 과정을 책임지는 일괄수주계약 방식으로 체결됐다.

현대중공업은 곧바로 설계작업에 착수해 오는 2015년 11월 선주사에 인도할 예정이며,



'Deepwater Nautilus', a semi-submersible drilling rig which HHI delivered to the U.S.-based Transocean in 1999

운용사인 BP사는 이 시추선을 호주 남쪽 그레이트 오스트레일리아만(Great Australia Bight)의 심해지역에 투입할 계획이다.

이 시추선은 최대 수심 3,000m 해상에서 작업할 수 있으며, 해수면에서 최대 12,200m까지 시추가 가능하다. 길이와 폭은 각각 123m, 96m로 현대중공업이 지난해 노르웨이 프레드 올센(Fred Olsen Energy)사로부터 수주해 건조 중에 있는 세계 최대 규모의 반잠수식 시추선과 동급이다.

반잠수식 시추선은 드릴십에 비해 이동성이 떨어지지만 물에 직접 닿는 선체 면적이 작아 파도와 같은 외부 환경 요인의 변화를 적게 받는 특징을 갖고 있어 안정성이 높다는 것이 가장 큰 장점이다.

현대중공업은 지금까지 다이아몬드사가 발주한 극심해용(Ultra deepwater) 드릴십 4척을 모두 수주했으며, 이번 수주 역시도 현대중공업의 뛰어난 설계 및 건조에 있어 뛰어난 기술력을 인정받았기 때문이다.

현대중공업 관계자는 "심해 지역에서 운용되는 시추 및 생산 설비는 안전이 중요한 만큼 고품질의 설비를 제작할 수 있는 기술력이 필요하다"며 "고품질의 설비를 건조, 인도함으로써 선주사들로부터 좋은 평가를 받고 있는 만큼, 끊임없는 연구개발로 수주 경쟁력을 한층 더 높여가겠다"고 말했다.

현대중공업은 현재 드릴십 12기, 반잠수식 시추선 2기(1기는 현대심해중공업 건조) 등 총 14기의 시추설비를 건조 중에 있으며, 지난 1월 노르웨이 스타타일사로부터 수주한 가스생산 플랫폼 1기를 시작으로 올 들어 심해 시추 및 생산설비 부문에서만 총 5기, 60억 달러의 수주 실적을 기록하고 있다.

## Enesco ordered its 8<sup>th</sup> ultra-deepwater drillship to SHI

Enesco has ordered an additional advanced-capability DP3 ultra-deepwater drillship based on the Samsung GF12000 hull design. The vessel, ENSCO DS-10, will be the eighth Samsung DP3 drillship in the Enesco fleet, further extending the benefits of Enesco's fleet standardization strategy. It will be built at the Samsung Heavy Industries (SHI) shipyard in South Korea, with delivery scheduled for the third quarter of 2015. The agreement includes an option for an additional drillship of the same design.

ENSCO DS-8 and ENSCO DS-9, also based on the GF12000 hull design, are scheduled for delivery in 2014. Enesco is currently the only drilling contractor offering the advanced features of the GF12000 hull design.

Enesco Chairman, President and CEO Dan Rabun said, "We continue to see very strong demand for rigs in existing deepwater markets, along with growing demand from emerging exploration areas. Operators are also showing high interest in this iteration of the Samsung DP3 drillship, due to its advanced design and capabilities that improve drilling productivity and fuel efficiency – two key factors that affect the operator's project costs."

"We have a track record of providing rigs that allow our customers to improve performance and operate efficiently, and the advances on these most recent drillship orders are again all about helping our customers succeed," Rabun added. "Our strategy of fleet standardization further benefits our customers by providing consistency in systems and operational excellence."

Measuring 755 feet in length and 125 feet in width, ENSCO DS-10 will offer a 1,250-ton hoisting system with enhanced offline capability. Like ENSCO DS-8 and ENSCO DS-9, the new unit will have advanced capabilities to meet the demands of ultra-deepwater drilling in water depths of up to 12,000 feet and a total vertical drilling depth of 40,000 feet. It will be initially outfitted to work in water depths up to 10,000 feet.

Enesco's four active DP3 drillships are currently working in the U.S. Gulf of Mexico, Brazil and West Africa. Three are contracted into 2016 and the fourth is contracted into 2018. A fifth drillship, ENSCO DS-7, scheduled for delivery later in 2013, is contracted to Total into 2016.

### 엔스코(Enesco), 삼성중공업에 8번째 극심해용 드릴십 발주

엔스코(Enesco)는 삼성 GF12000 선체 디자인에 기초한 고성능 선박 DP3 극심해용 드릴십을 발주했다. ENSCO DS-10으로 알려진 이 선박은 엔스코 선대에 합류될 여덟 번째의 삼성 DP3 드릴십이며 엔스코의 선대 표준화 전략에 긍정적인 영향을 줄 것으로 기대된다.



Ultra-deepwater drillship built by SHI

이 드릴십은 삼성중공업의 조선소에서 건조되어 2015년 3분기에 인도될 예정이다. 계약에는 동일 선형의 옵션이 포함되어 있다. GF12000 선체 디자인에 기초한 ENSCO DS-8 및 ENSCO DS-9은 2014년에 인도될 예정이다.

엔스코의 회장 겸 CEO인 단 라본(Dan Rabun)은 "탐사 지역으로부터 수요가 증가하고 있을 뿐만 아니라 기존 극심해 시추시장에서 시추선에 대한 수요가 급증하고 있다. 운영사의 프로젝트 비용에 영향을 주는 두 가지 요소, 즉 시추 생산성 및 연비를 개선하는 고급 디자인과 고성능을 특징으로 하는 삼성중공업의 DP3 드릴십이 운영사들로부터 각광을 받고 있다"고 말했다.

그는 "당사는 시추선을 성공적으로 제공하여 고객의 실적향상과 작업효율 개선에 기여해왔다. 최근의 드릴십 발주도 고객의 성공을 목표로 한다. 또한, 당사의 선대 표준화 전략은 시스템 일관성과 운영 개선을 가능하게 함으로써 고객에게 이익이 될 것이다"라고 덧붙였다.

이번에 수주한 ENSCO DS-10은 길이 755피트, 폭 125피트이며 향상된 오프라인 능력과 1,250톤의 호이스팅 시스템을 특징으로 한다. ENSCO DS-8 및 ENSCO DS-9와 마찬가지로, 이 새로운 드릴십은 최대 수심 12,000피트의 극심해에서 최대 40,000피트까지 시추 작업이 가능하다.

현재 엔스코는 4척의 DP3 드릴십을 미국 멕시코만, 브라질, 서아프리카에서 운영하고 있다. 세 번째 드릴십은 2016년까지 운영되고 네 번째 드릴십은 2018년까지 운영될 것이다. 다섯 번째 드릴십인 ENSCO DS-7은 2013년 말까지 운영될 예정이며, 옵션계약에 따라 2016년까지 토탈에 임대된다.

# DSEC was awarded a contract for the material supply and design of ECO MR tanker

DSEC signed a contract to build the MR ECO tanker that provides the world's highest energy efficiency. This vessel is the model developed by DSEC, the subsidiary of DSME, and will be built at the National Steel and Shipbuilding Company(NASSCO) shipyard. DSEC signed an agreement with APT(American Petroleum Tankers), the U.S.-based ship owner, to undertake the design and supply the material package for the 4 vessels(including 4 optional vessels) on June 12.

NASSCO shipyard successfully delivered the 5 MR tankers to the same ship owner in 2006 with the support of DSEC, and those vessels were selected as the U.S. ships of year in 2008. In addition, DSEC entered into a contract with NASSCO last December for the design of the world's first LNG-powered large containership and the supply of materials, and has embarked upon the design process.

This ECO MR tanker is fitted with MAN B&W 'G-type Slow-speed' engine of MDT, and is the optimized ship model that increased energy efficiency. Moreover, this vessel incorporates the advanced design features based on 'LNG-Ready' concept which allows the vessel to be easily converted to operate on LNG as fuel, depending on the market conditions.

Lee Yeong-mahn, President of DSEC, said, "This ECO MR tanker fulfills the demand of market and has the advantage of being easily converted to run on LNG, depending on the market conditions. I am convinced that this ECO MR tanker will bring new changes to the shipbuilding market and meet the demand for eco-friendliness and cost-effectiveness at the same time."

DSEC has provided the material and design to DMHI of Romania, ODC shipyard of Oman, SASEBO shipyard of Japan, etc., as well as NASSCO shipyard, and is on track to unveil the new LR1-class tanker that applies the dual fuel and dramatically improves the fuel efficiency. DSEC anticipates a soaring demand for LNG fuel in the energy-intensive power generation market, as well as the ship market, and is developing the eco-friendly offshore floating LNG power plant(FLPPTM). Currently, DSEC has completed the development of 200MW-class model and aims to finalize the development of 400MW-class and 800MW-class models by the second half of this year.

## 디섹(DSEC), ECO MR 탱커 설계 및 자재 공급 수주

세계 최고의 에너지 효율을 자랑하는 MR ECO Tanker의 계약이 성사됐다. 해당 선박은 대우조선해양의 자회사인 디섹이 개발한 선형으로, 건조는 미국의 NASSCO 조선소(National Steel and Shipbuilding Company)에서 수행될 예정이다. 디섹은 지난 6월 12일 미국 선주사인 APT(American Petroleum Tankers)사로부터 4척(옵션 4



척)에 대한 설계 및 자재 패키지 공급 계약을 체결했다. NASSCO 조선소는 디섹의 지원 아래 지난 2006년 MR 탱커 5척을 동 선주에게 성공적으로 인도했으며, 이 선박은 2008년 미국 올해의 선박으로 선정된 바 있다. 또한 디섹은 지난해 12월 세계 최초 LNG 추진 대형 Container 운반선 설계 및 자재 공급 계약을 NASSCO사와 체결해 현재 설계 중이다. 이번에 개발된 ECO MR 탱커는 MDT사의 MAN B&W 'G-type Slow-speed' 엔진이 탑재되며, 최적의 선형으로 에너지 효율성이 높다. 뿐만 아니라 'LNG-Ready' 개념의 첨단 설계로 시장 상황에 따라 향후 LNG 추진 선박으로 쉽게 개조가 가능하도록 설계될 예정이다.

디섹 이영만 대표이사는 "시장의 요구에 부응할 뿐만 아니라, 향후 시장 환경에 따라서 손쉽게 LNG 추진 선박으로 개조할 수 있도록 설계된 이번 ECO MR 탱커가 조선 시장에 새로운 변화를 이끌고, 친환경 및 경제성을 동시에 추구하는 좋은 해결책이 될 것으로 확신한다."고 수주 소감을 밝혔다. 디섹은 NASSCO 조선소뿐 아니라 루마니아의 DMHI, 오만의 ODC 조선소, 일본의 SASEBO 조선소 등에 설계 및 자재를 공급해 왔으며, 또한 고객의 요구에 부응하여 혁신적 연료 효율 개선 및 이중 연료를 적용한 신형 LR1급 탱커도 곧 시장에 선보일 예정이다.

디섹은 향후 LNG 연료가 선박과 함께 대표적인 에너지집약 산업인 발전시장에서도 수요가 클 것으로 내다보고, 친환경 해상 부유식 LNG 발전소(FLPPTM, Floating LNG Power Plant)를 개발 진행 중이다. FLPPTM은 현재 200MW급 모델이 개발 완료된 상태이며, 금년 하반기까지 400MW급과 800MW급까지 개발하는 것을 목표로 하고 있다.

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The newbuild bulker market is showing strong performance this year despite the prolonged sluggishness in shipbuilding industry. Recently, major overseas ship owners are placing the orders for large-scale capesize bulkers in a row, and the new order placement for small and medium-sized bulkers is also increasing except for the panamax class bulkers.

According to the data published by Clarkson, new orders for capesize bulkers this year exceeded 29 units which were recorded last year.

Amid the upturn in new orders for capesize bulkers, there has been a sign of upswing in new orders from the handysize and handymax bulker sector which remained sluggish for a while. However, new orders for panamax bulkers still remain flat, and it will take more time until the overcapacity of panamax bulker is resolved compared to other vessel types.

Domestic shipyards have received new orders for various kinds of vessels such as bulker/tanker, LNG carrier and very large containership based on their strength in eco-friendly and high fuel-efficient vessels. Particularly, domestic shipyards have seen their new order intake increase 22.5% year-on-year to 2.56 million CGT in the first quarter of this year alone, accounting for 39% of all new orders placed worldwide.

Here, we take a close look at the performance of South Korean 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. 

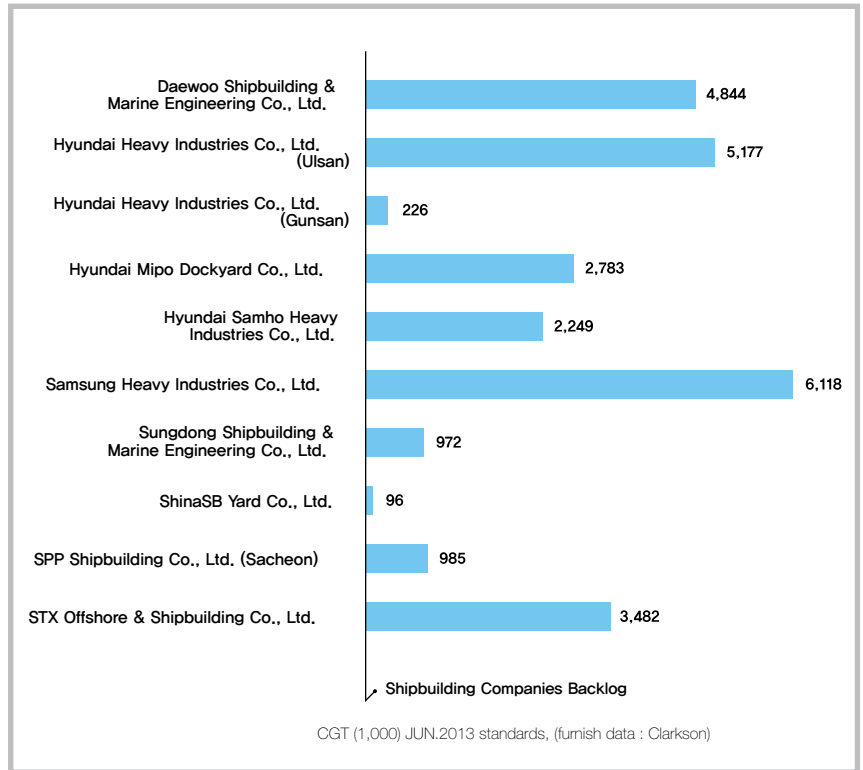


Photo: STX Offshore & Shipbuilding Co., Ltd.

## Offshore plant orders awarded to domestic shipyards in 2011-2012

Date	Type	Number of vessel	Amount	Ship owner	Delivery	Shipyard
January	Drillship	1 vessel	KRW 500 billion	Diamond Offshore Drilling Limited, U.S.A	Mid 2013	Hyundai Heavy Industries
	Offshore Plant	-	USD 900 million	RasGas, Qatar	Late 2013	Hyundai Heavy Industries
February	Drillship	2 vessels	KRW 1 trillion	Noble Drilling, U.S.A	On a staggered basis until Sep 2013	Hyundai Heavy Industries
	Deepwater drillship	1 vessel	-	Atwood Oceanics, U.S.A	Second half of 2013	Daewoo Shipbuilding & Marine Engineering
	Offshore facility carrier	1 vessel	KRW 265 billion	Dockwise, Netherlands	October 2012	Hyundai Heavy Industries
	FPSO for the North Sea	1 vessel	USD 1.2 billion	BP (British Petroleum), U.K	Early 2015	Hyundai Heavy Industries
	Platform Supply Vessel	1 vessel	-	-	2012	STX OSV
March	Fisheries Research Vessel	1 vessel	EUR 35 million	Ministry of Fisheries and Marine Resources, Republic of Namibia	Early 2012	STX Finland
	Offshore Platform (North Sea Drilling & Production platform, Quarters & Utilities platform)	1 unit each	USD 600 million	BP (British Petroleum), U.K	Late 2014	Hyundai Heavy Industries
	Deepwater drillship	2 vessels	KRW 1.2 trillion	Aker Drilling, Norway	Second half of 2013	Daewoo Shipbuilding & Marine Engineering
	Drillship	2 vessels	USD 1.1 billion	Ship owner, U.S.A	-	Samsung Heavy Industries
	Platform Supply Vessel	1 vessel	-	Norsea Group AS, Norway	June 2012	STX OSV
	Platform Supply Vessel	1 vessel	-	-	2012	STX OSV
	Drillship	1 vessel	-	Fred Olsen Energy, Norway	August 2013	Hyundai Heavy Industries
	Drillship	2 vessels	USD 1.12 billion	Maersk, Denmark	-	Samsung Heavy Industries
	Drillship	1 vessel	USD 680 million	Ocean Rig, Greece	October 2013	Samsung Heavy Industries
	Shuttle Tanker	2 vessels	USD 200 million	European Navigation, Greece	2013	STX Offshore & Shipbuilding
2011	Drillship	2 vessels	USD 1.12 billion	Rowan, U.S.A	Second half of 2013	Hyundai Heavy Industries
	Deepwater drillship	1 vessel	-	Vantage Drilling, U.S.A	Late May, 2013	Daewoo Shipbuilding & Marine Engineering
	Offshore Platform (Top side)	-	USD 414 million	Statoil, Norway	-	Samsung Heavy Industries
	FPSO	1 vessel	USD 636 million	Teekay Petrojarl, Norway	Mid 2013	Samsung Heavy Industries
	Platform Supply Vessel	2 vessels	KRW 120 billion	Farstad Shipping, Norway	First half of 2013	STX OSV
	FSO	1 unit	-	PTSC, Vietnam	Early 2013	Sungbong Shipbuilding & Marine Engineering
	LNG-FPSO	1 unit	USD 3.026 billion	Royal Dutch Shell, U.S.A	2016	Samsung Heavy Industries
	Platform Supply Vessel	2 vessels	KRW 150 billion	Island Offshore, Norway	First quarter, third quarter of 2013	STX OSV
	LNG-FSRU	2 units	USD 500 million	Høegh LNG, Norway	Second half of 2013, first half of 2014	Hyundai Heavy Industries
	June	Multifunctional Deep Water Anchor Handling, Offshore Service Vessels	2 vessels	KRW 240 billion	Farstad Shipping, Norway	From the second quarter of 2013
Drillship		1 vessel	USD 680 million	Ocean Rig, Greece	November 2013	Samsung Heavy Industries
July	Drillship	2 vessels	USD 1.1225 billion	Maersk, Denmark	July 2014	Samsung Heavy Industries
	LNG-FSRU	1 vessel	USD 280 million	Excellerate Energy, U.S.A	First quarter of 2014	Daewoo Shipbuilding & Marine Engineering
August	Semi-submersible Rig	2 units	USD 1.1 billion	Songa Offshore, Norway	Second half of 2014	Daewoo Shipbuilding & Marine Engineering
	Well Intervention Vessel	2 vessels	USD 420 million	Eide Marine Services AS, Norway	2013	STX Finland
September	Drillship	1 vessel	KRW 600 billion	Noble Drilling, U.S.A	Second half of 2014	Hyundai Heavy Industries
	Fixed Offshore Platform	-	USD 1.4 billion	Chevron, U.S.A	Second half of 2014	Daewoo Shipbuilding & Marine Engineering
October	Drillship	1 unit	USD 550 million	Offshore drilling company, Americas	-	Daewoo Shipbuilding & Marine Engineering
	Platform Supply Vessel	1 unit	-	Troms Offshore Supply AS, Norway	First half of 2013	STX OSV
	Offshore Plant Module	2 units	-	-	First half of 2012	STX Finland
	Platform Supply Vessel	4 units	KRW 2 trillion	Island Offshore, Norway	Consecutively from the 3rd quarter of 2013 to the 1st quarter of 2014	of 2013 to the 1st quarter of 2014

Month	Project Name	Quantity	Value	Client	Completion Date	Company
November	Pipe Laying Support Vessel	2 units	USD 500 million	Odebrecht, Brazil	August of 2014	Daewoo Shipbuilding & Marine Engineering
December	Offshore facilities (Gas platform and various facilities)	-	USD 900 million	Major multinational oil companies	2nd half of 2014	Hyundai Heavy Industries
January	CPF (Central Processing Facility)	-	KRW 2.6 trillion	Australia / INPEX	4th quarter of 2015	Samsung Heavy Industries
February	Semi-submersible rig	1 unit	USD 620 million	Norway/ Odfjell	by mid 2014	Daewoo Shipbuilding & Marine Engineering
	LNG-FSRU	-	-	Norway / Høegh	-	Hyundai Heavy Industries
March	Offshore Platform	1 unit	USD 560 million	Danish / DONG E&P A/S	April 2015	Daewoo Shipbuilding & Marine Engineering
	FPSO	1 unit	USD 2.0 billion	INPEX / Australia	April 2016	Daewoo Shipbuilding & Marine Engineering
April	Drillship	1 vessel	USD 645 million	Enasco plc	Third quarter 2014	Samsung Heavy Industries
	Semi-submersible Drilling Rig	2 units	USD 1.1 billion	Songra Offshore, Norway	Mid 2015	Daewoo Shipbuilding & Marine Engineering
May	Drillship	1 vessel	USD 600 million	Seadrill, Norway	Second half of 2014	Samsung Heavy Industries
	Drillship	1 vessel	USD 655 million	Diamond Offshore Drilling Limited, U.S.A	4th quarter of 2014	Hyundai Heavy Industries
	Semi-submersible drilling rig	1 unit	USD 700 million	Fred Olsen Energy, Norway	March 2015	Hyundai Heavy Industries
June	LNG-FPSO	1 unit	-	Petrolim Nasional Berhad, Malaysia	June 2015	Daewoo Shipbuilding & Marine Engineering
July	Drillship	1 vessel	USD 645 million	Enasco plc	-	Samsung Heavy Industries
	Gas Compression Platform	1 unit	USD 420 million	(Letter of Award)	Second half of 2015	Hyundai Heavy Industries
Aug	LNG-FSRU	8 vessels	-	Excelerate, U.S.A	Between early 2015~2017	Daewoo Shipbuilding & Marine Engineering
Sep	Drillship	1 vessel	USD 620 million	Rowan, U.S.A	First half of 2015	Hyundai Heavy Industries
	Drillship	1 vessel	USD 623 million	-	-	Samsung Heavy Industries
	Drillship	4 vessels	USD 2.06 billion	Transocean, U.S.A	One-by-one from mid 2015	Daewoo Shipbuilding & Marine Engineering
Oct	Drillship	1 vessel	USD 560 million	Alwood Oceanics, U.S.A	-	Daewoo Shipbuilding & Marine Engineering
	LNG-FSRU	1 vessel	USD 270 million	Høegh LNG, Norway	First half of 2015	Hyundai Heavy Industries
Nov	Drillship	1 vessel	USD 700 million	-	2nd half of 2015	STX Offshore & Shipbuilding
Dec	offshore platform (Top side)	1 unit	USD 1.77 billion	Statoil, Norway	The end of 2016	Daewoo Shipbuilding & Marine Engineering
Jan	Gas Production Platform (topside)	1 unit	USD 1.1 billion	Statoil, Norway	Mar 2016	Hyundai Heavy Industries
	LNG-FSRU	1 vessel	-	BW Maritime, Singapore	2015	Samsung Heavy Industries
Mar	Floating Production Unit (FPU)	1 unit	USD 1.3 billion	Total, France	First half of 2016	Hyundai Heavy Industries
	Tension Leg Platform (TLP)	1 unit	USD 700 million	Total, France	First half of 2015	Hyundai Heavy Industries
Apr	FPSO	1 unit	USD 1.9 billion	Chevron, U.S.A	-	Hyundai Heavy Industries
May	Semi-Submersible Drilling Rig	1 unit	USD 750 million	Diamond Offshore, U.S.A	Nov. 2015	Hyundai Heavy Industries
	Ultra-deepwater Drillship	1 unit	USD 515 million	Enasco, United Kingdom	Third quarter of 2015	Samsung Heavy Industries
Jun	FPSO	1 unit	USD 3.0 billion	Nigeria	Second half of 2017	Samsung Heavy Industries
	Jack-up Rig	2 unit	USD 1.3 billion	Statoil, Norway	-	Samsung Heavy Industries

\*Note : Based on the press release and public announcements of each shipyards, internal estimation of Monthly KORSHIP (estimation until Jun 15, 2013)





# ‘Passenger Ship’ transporting the people

Cruise ship is one of the passenger ships in a broad sense. Clearly, the cruise ship may be the centerpiece of passenger ship, but there are many different types of passenger ships.

Passenger ship refers to the vessel operating for the profit-making purposes such as the transportation of cargo or passengers. The International Convention for the Safety of Life at Sea (SOLAS) defines that the passenger ship is a ship which carries more than twelve passengers.

The Ship Safety Act defines the passenger ship as the vessel devoting over 70% of full space to the passenger accommodation.

Based on those definitions set forth by law, the shipping industry is seriously considering whether the vessel is a passenger ship or not. The biggest reason is that different regulations are applied to the vessel depending on whether it is a passenger ship or not. As passenger ship is boarded by many people, far stricter regulations are applied to ensure the safety of human life. 🚢



‘Voyager of the Seas’ of Royal Caribbean Cruise





Bird's eye view of the cruise ship which TUI Cruises ordered to STX Europe



'Oasis of the seas' built by STX

■ 'MSC Splendida' of MSC Cruise



'Club Harmony' of Harmony Cruise, Korea's first cruise ship operator. Unfortunately, this cruise ship has halted the operation since late January, one year after delivery, due to sluggish sales performance.



'Night Car Ferry', a luxury ferry built by Daewoo Shipbuilding & Marine Engineering(DSME)





# Rotary and Linear Valve Position Monitors

YTEC Co., Ltd.



Established in 1984, Westlock Controls has a global reputation providing innovative solutions for networking, monitoring, and controlling process valves. Our focus on technology and supplying reliable products manufactured to the highest industry standards, makes us a preferred choice with the world's leading process companies and a trusted partner developing even better solutions for the future.

Westlock's commitment to leading edge technology remains second only to its dedication to producing products of quality. By anticipating the changing needs of the process industry, Westlock's development team is focused on implementing technological advancement of valve monitoring, control and diagnostic systems which satisfy the latest international standards and a wide array of process conditions.

Designed around a unique self-locking spring-loaded TouchSet cam mechanism attached to a stainless steel shaft and housed in a weatherproof rated aluminium, stainless steel or engineered resin enclosure, the Accutrak utilized bushings at both ends to assure concentric turning of the cams.

For digital signaling to lights, motors, micro processors or peripheral equipment, two position sensors are standardly housed within the enclosure. The requirement for tools to adjust cam settings is unnecessary. The self-locking TouchSet cam mechanism allows for a quick and simple hand operation in the setting of both sensors. Additionally, the Accutrak is specifically designed for ease of wiring by the incorporation of abundant working space and a direct wire-feed terminal block. All that is necessary to make the unit operational is the bringing in of electrical leads to a single juncture.

-TEL: +82-31-777-8200  
-http://www.ytec.net

New  
Product

# Allen-Bradley SMC-50 Smart Motor Controller

*Rockwell Automation Korea*

Rockwell Automation Launched the latest generation of 'Allen-Bradley SMC-50' solid-state motor controllers. This released includes a newly designed three-phase, fully solid-state, silicon-controlled rectifier (SCR) power structure.

The new SMC-50 controller addresses the motor control needs of OEMs and end users seeking a more economical alternative to drives and more advanced control than across-the-line starters. Designed for customer flexibility, the SMC-50 controller combines advanced monitoring and protection features, multiple start and stop options, and expandable control inputs and outputs. These features help users increase efficiency, reduce downtime and improve control.

Rated at 200V-690V AC and with software from 90 to 520 amps, the SMC-50 controller is ideal for controlling motor speed and torque in a range of normal-duty applications, including pumps, compressors and short conveyors, as well as in heavy-duty applications, such as rock crushers, wood chippers, centrifugal fans and long conveyors.

The SMC-50 smart motor controller's design improves voltage output to maximize efficiency of motor starts and stops. For application scalability, it features nine standard starting modes, six stopping modes and several slow-speed functions. In traditional starting mode, for example, if the SMC-50 controller senses that the motor has reached full speed before completing the selected ramp time, it will automatically switch to providing full voltage to the motor. The patented linear-acceleration starting mode offers the lowest starting current profile per start, consistent acceleration time, and



enhanced control over both torque and speed. Regardless of the starting mode chosen, the SMC-50 controller stores the actual motor start time and peak current value to assist in setup and process optimization.

Depending on the application, controlling voltage during motor stopping is equally critical to controlling voltage during motor starts. To further protect motor assets and decrease downtime, the SMC-50 controller utilizes advanced power monitoring and diagnostics. The SMC-50 controller also boasts innovative features, such as energy saver, motor winding heater, and the snapshot and event log features, which capture fault, alarm and operational history.

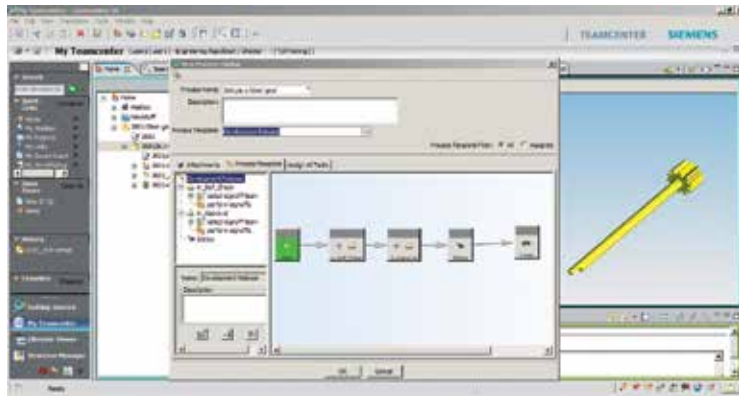
-TEL: +82-2-2188-4400

-<http://www.rockwellautomation.co.kr>



# Rapid Start Speeds Product Data Management Deployment

Siemens PLM Software



Siemens introduced the next generation of easy to deploy product data management (PDM) based on Teamcenter® software and designed to streamline the product development process by enabling businesses to quickly find, share and re-use product data.

The Teamcenter Rapid Start configuration delivers Teamcenter, the world's most widely used digital lifecycle management system, with a preconfigured PDM deployment. Teamcenter Rapid Start is the next step in the evolution of Siemens' Teamcenter Express software. It provides companies a quick, low risk method to realize the benefits of PDM today, while protecting their technology investment. Teamcenter Rapid Start uses the same software code as Teamcenter, so it provides a simple growth path to full PLM implementation.

Teamcenter Rapid Start provides multi-CAD data management capabilities that enable manufacturers to effectively and efficiently manage, control and share mechanical computer-aided design (CAD) data across the entire design and supply chain. Supporting most popular CAD solutions, Teamcenter Rapid Start provides a single view of product data. This combined with its visualization capabilities help enhance collaboration, enabling businesses to make smarter decisions that result in better products.

Teamcenter Rapid Start also manages everyday tasks and processes with preconfigured best practice workflows for engineering change and product release. These processes enhance efficiency to meet design and schedule targets.

Teamcenter Express customers can exchange their current licenses for equivalent Teamcenter Rapid Start licenses and after a straightforward upgrade will benefit from both the preconfigured PDM capabilities of Teamcenter Rapid Start and easy access to the full PLM capabilities of Teamcenter.

-TEL: +82-2-3016-2079  
-http://www.siemens.com/plm

A large red ship is docked at a pier. The ship is viewed from a low angle, looking down the length of the pier. The pier has yellow lines on the deck. In the background, there are large blue cranes. The sky is clear and blue.

# **Monthly Korship, Korea's only Offshore & Shipbuilding monthly magazine in English**

Monthly Korship keeps readers up to date with the latest news on Offshore & Shipbuilding industry and various companies swiftly. Korea, a small country on the planet, is leading the world's Offshore & Shipbuilding industry, powered by its economic growth.

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# KOMEA (Korea Marine Equipment Association)

## Member List

### AMS CO., LTD.

head office : SAHA-GU, BUSAN  
 homepage add : www.albatros.co.kr  
 main products : universal machine  
 TEL : +82 51-293-8641

### BUMHAN INDUSTRIES CO., LTD.

head office : Changwon Gyeongnam  
 homepage add : www.bumhan.com  
 main products : air compressor, high pressure air compressor,  
 high pressure air dryer & reducing stations  
 TEL : +82 55-251-6070

### BOYANG HARDWARE CO., LTD.

head office : Gimhae Gyeongnam  
 homepage add : www.byhd.co.kr  
 main products : stairway body, ladder, handrail & stormrail, other  
 outfitings, sanitary & furniture hardware  
 TEL : +82 55-345-1951/3

### BY CONTROLS INC.

head office : Gimhae Gyeongnam  
 homepage add : www.bycontrols.com  
 main products : control valves, hydraulic & pneumatic actuator,  
 valve remote control sys  
 TEL : +82 55-345-6110

### BC TAECHANG IND. CORP.

head office :  
 homepage add : www.bcinternational.co.kr  
 main products : water jet power pump, marine tape, petro tape,  
 corrosion shield bt  
 TEL : +82 55-333-1985

### CHK CO., LTD.

head office : Gangseo Busan  
 homepage add : www.chk.co.kr  
 main products : fire damper, junction box, steel furniture, pilot  
 chair, cable box  
 TEL : +82 51-831-9500

### CMR KOREA CO., LTD.

head office : Geumjeong Busan  
 homepage add : www.cmrkorea.com  
 main products : Marine Telephone, Marine CCTV, Anemometer,  
 TEL : +82 51-521-2883

### CAPE INDUSTRIES LTD.

head office : Yangsan Gyeongnam  
 homepage add : www.capeind.com  
 main products : cylinder liner-man b&w, sulzer(wartsila)  
 TEL : +82 55-370-1234

### Emerson Process Management Marine Solutions Korea Co., Ltd.

head office : Saha-Gu, Busan  
 homepage add : www.emersonprocess.com/marine  
 main products : Valve Remote Control Systems, Tank Level  
 Gauge Systems, Marine Tank Management Systems  
 TEL : +82 51-602-5555

### DAEYANG INSTRUMENT CO., LTD.

head office : Saha-Gu, Busan  
 homepage add : www.daeyang.co.kr  
 main products : precision instrument-anemometer rudder angle  
 indicator, engine monitoring system, temperature sensor  
 TEL : +82 51-200-5303

### DAE JIN IND. CO., LTD.

head office : Gangseo Busan  
 homepage add : www.daejinqc.co.kr  
 main products : aluminium/steel/wooden furniture, catering  
 furniture, fire & gas damper a60  
 TEL : +82 51-831-4551

### DAE JIN DAMPHA CO., LTD.

head office : Ulsan  
 homepage add :

main products : ceiling panel, wall panel  
 TEL : +82 52-225-2361

### DAECHUN INDUSTRIAL CO., LTD.

head office : Gimhae Gyeongnam  
 homepage add : www.daechun.co.kr  
 main products : multi core tube, stainless steel tube  
 TEL : +82 55-345-2288

### DAIHAN ANCHOR CHAIN MFG. CO., LTD.

head office : Nam-Gu Incheon  
 homepage add : www.dhac.co.kr  
 main products : anchor chain grade 2, anchor chain grade 3,  
 mooring chain r3, (stud & studless)  
 TEL : +82 32-862-0091/4

### DONG KANG M-TECH CO., LTD.

head office : Kangnam-Gu, Seoul  
 homepage add : www.dkmtech.com  
 main products : water jet, (hj212, hj292, hj322, hm461, hm817),  
 night navigator(nn-9000, nn-3000)  
 TEL : +82 2-553-0181

### DONG WOO MACHINERY & ENGINEERING CO., LTD.

head office : Changwon Gyeongnam  
 homepage add : www.hanyang-p.co.kr  
 main products : provision crane, hose handling crane, cargo m/r  
 room, center frame  
 TEL : +82 55-295-3261

### DONG-I INDUSTRIAL CO., LTD.

head office : Chin-ju Gyeongnam  
 homepage add : www.e-dongi.com  
 main products : marine gear box, hyd. steering system, power  
 take off  
 TEL : +82 55-755-9928

### DONGHWA ENTEC

head office : Gangseo Busan  
 homepage add : www.dh.co.kr  
 main products : e/r heater & cooler, plate cooler, fresh water  
 generator, charged air cooler, lng cargo handling system,  
 TEL : +82 51-970-1000

### DOOSAN ENGINE CO., LTD.

head office : Changwon Gyeongnam  
 homepage add : www.doosanengine.com  
 main products : marine diesel engine, diesel power plant  
 TEL : +82 55-260-6000

### DONGNAM MARINE CRANE CO., LTD.

head office : Gimhae Gyeongnam  
 homepage add : www.dmcrae.co.kr  
 main products : hose handling crane, hose handling crane,  
 provision crane, engine room crane, offshore crane  
 TEL : +82 55-720-3001

### DAEMMSTOFF INDUSTRIE KOREA LTD.

head office : Saha-Gu, Busan  
 homepage add : www.daemmstoff.com  
 main products : KVM Sealing Compound, Mangana Retaining  
 Compound, Durasin Chocking Compound, Panda-90  
 TEL : +82 51-261-7073

### DAEYANG ELECTRIC CO., LTD.

head office :  
 homepage add : www.daeyang.co.kr  
 main products : lighting fixture, main switch board, fan, precision  
 instrument,  
 TEL : +82 51-200-5303

### DAE HEUNG COOLER CO., LTD.

head office : Pocheon Gyeonggi  
 homepage add : www.cooler.co.kr  
 main products : heat exchanger, gas cooler, oil cooler, air cooler,  
 water chiller  
 TEL : +82 31-532-9667/9

### DONG-A VALVE IND. CO.

head office :  
 homepage add :  
 main products : gate valves, globe valves, check valves(swing,  
 dual, single), strainer(basket, y-type)  
 TEL : +82 51-831-1500

### DK TECH CORPORATION

head office :  
 homepage add : www.dklok.com  
 main products : Instrumentation Fitting & Valve-Compression  
 Tubing Fitting, Pipe & Weld Fitting, Needle, Check, Ball, Plug  
 TEL : +82 55-338-0032

### DAE HEUNG MARINE CORP. LTD.

head office :  
 homepage add :  
 main products : rudder, block, bolster  
 TEL : +82 55-346-3663

### DONGJIN M.P. TECH CO., LTD.

head office :  
 homepage add : www.epmp.net  
 main products : parts for marine engine, shaft systems for ship,  
 power generation facility, industrial machines  
 TEL : +82 55-346-0303

### DAECHANG METAL CO., LTD.

head office : Saha-Gu, Busan  
 homepage add : www.dcm.co.kr  
 main products : chain wheel, main bearing support, ucc center  
 piece, piston crown  
 TEL : +82 51-264-0831/5

### DONGSUNGFINETEC CORPORATION

head office : Ansong, Gyeonggi  
 homepage add : www.dsfinetec.co.kr  
 main product : lng & lpg carriers tank & pipe cryogenic insulation,  
 lng receiving terminal tank & pipe cryogenic insulation  
 TEL +82 2-2185-7000

### GENERAL MARINE BUSINESS INC.

head office :  
 homepage add : www.gmbmarine.com  
 main products : ship shore communication sys. emergency  
 shutdown sys. trim/list indicator  
 TEL : +82 52-254-5215

### G.S HIGH TECHER CO., LTD.

head office : Gangseo-Gu, Busan  
 homepage add : gshightecher.koreasme.com  
 main products : Air vent heads, Auto air vent heads, Pipe  
 coupling, Expansion joint  
 TEL : +82 51-832-0456

### GS-HYDRO KOREA LTD.

head office : Gangseo-Gu, Busan  
 homepage add : www.gshydro.com  
 main products : Hydraulic Pipe, High Pressure Pipe, Steering  
 Gear Hydr. Pipe  
 TEL : +82 51-266-8221/5

### HY-LOK CORPORATION

head office :  
 homepage add : www.hy-lok.com  
 main products : HY-Lok Tube Fittings, Bite Type (DIN 2353, JIS  
 b2351) Fittings, 37°Flared Type(SAE J514) Fittings  
 TEL : +82 51-9700-800

### HANKUK MIBOO CO., LTD.

head office :  
 homepage add : www.hankookmiboo.co.kr  
 main products : Spiral Duct, Cold Chamber, Deck Covering  
 TEL : +82 51-263-3621

### HI AIR KOREA Co., Ltd.

head office :  
 homepage add : www.hi-airkorea.co.kr

main products : Air Conditioning System, Refrigeration Plant, Package A/C, Ventilation Fan  
TEL : +82 55-340-5000

#### **HAN KOOK FLEXIBLE CO.**

head office :  
homepage add : www.hkflex.com  
main products : Flexible, Expansion Joint, Rubber Compensator  
TEL : +82 51-508-6291/3

#### **HANLA LEVEL CO., LTD.**

head office :  
homepage add : www.hanlalevel.co.kr  
main products : Cargo Tank Monitoring Sys. Tank Remote Sounding Sys. High Level Alarm Sys.  
TEL : +82 51-605-3000

#### **HALLA INDUSTRIAL CO., LTD.**

head office :  
homepage add : www.hallaiq.co.kr  
main products : Refrigeration Pumps (NH<sub>3</sub>, R22, NHO<sub>3</sub>, CO<sub>2</sub>), Volute Pumps, Turbine Pumps  
TEL : +82 51-264-2201/5

#### **HANSHIN ELECTRONICS CO., LTD.**

head office :  
homepage add : www.ehanshin.com  
main products : Public Address System (hpa-9600, hpa-9200, hpa-7300), Marine Telephone  
TEL : +82 51-412-5551

#### **HAN JO CO., LTD.**

head office : Yeongdo Busan  
homepage add : www.hanjoms.co.kr  
main products : expansion joint. Fuel Injection Pipe. Air Filter  
TEL : +82 51-414-1201

#### **HAEAN MACHINERY IND. CO., LTD.**

head office :  
homepage add : www.haeon21.com  
main products : Marine Crane, Deck Machinery(Outfitting), Special Equipment  
TEL : +82 55-345-2024

#### **HYUNDAI LIFEBOATS CO., LTD.**

head office :  
homepage add : www.hdboat.com  
main products : Life Boat & Rescue Boat  
TEL : +82 52-237-4850/4

#### **HYUNDAI MARINE MACHINERY CO., LTD.**

head office :  
homepage add : www.hmmco.co.kr  
main products : Hyundai-Atlas Incinerator. Hyundai-Jowa 15ppm Bilge Separator, Auxiliary Blower, Ventilation Fan  
TEL : +82 32-583-0671

#### **HYUNDAI ELEVATOR CO., LTD.**

head office :  
homepage add : www.hyundailevator.co.kr  
main products : Elevator, Escalator, Auto. Parking System  
TEL : +82 31-644-5114

#### **HYUNDAI WELDING CO., LTD.**

head office :  
homepage add : www.hdweld.co.kr  
main products : Covered Electrode ARC Welding Consumables, Sub-Merged ARC Welding Flux & Wire  
TEL : +82 2-6230-6010/2

#### **HYUN DAE FITTING CO., LTD.**

head office :  
homepage add : www.hdfco.co.kr  
main products : Flange, Stainless Steel, Duplex Stainless Steel, Forged Carbon Steel  
TEL : +82 51-831-0891

#### **HYUN JIN CO., LTD.**

head office :  
homepage add : www.hyunjinn.co.kr  
main products : Control Console, Light Signal, Column, Control Panel  
TEL : +82 51-263-9841

#### **HYUNJIN MATERIALS CO., LTD.**

head office : Gangseo Busan  
homepage add : www.hjmco.co.kr  
main products : Marine Engine Uses-Camshaft & C/Flange, Connecting Rod, Cross Head  
TEL : +82 51-602-7700

#### **HOSEUNG ENTERPRISE CO., LTD.**

head office : Gangseo Busan  
homepage add : hoseung.koreasme.com  
main products : Package Unit for Engine Room, Portable Tank, Ventilator, Cable Box  
TEL : +82 51-831-2233/4

#### **HOCHANG MACHINERY INDUSTRIES CO., LTD.**

head office :  
homepage add : www.hoc21.com  
main products : Deck Machinery, Hose Handling Crane, Provision Crane, Cell Guide  
TEL : +82 52-255-2000

#### **HAE WON INDUSTRY CO.**

head office :  
homepage add : haiwon1.koreasme.com  
main products : marine diesel engine parts(water seal, inflatable ring, mating ring, compact seal, cr-liner)  
TEL : +82 51-831-4600

#### **HODU INDUSTRIAL CO.**

head office :  
homepage add :  
main products : ups & rectifier sys. hull stress monitoring sys. waste compactor  
TEL : +82 51-291-9512

#### **I.M.E. CORPORATION**

head office :  
homepage add : www.promarine21.com  
main products : engine valve & seat, all type engine  
TEL : +82 55-346-1127

#### **IL SEUNG CO., LTD.**

head office : Gimhae Gyeongnam  
homepage add : www.ilseung.co.kr  
main products : Sewage treatment plant. Biological type, Frash water generator. Plate. tubular type,  
TEL : +82 55-345-4114

#### **IL-SUNG IND. CO.**

head office :  
homepage add :  
main products : Hot water calorifier, Silencer(for m/e, g/e, fan), Mist eliminator, Washable air filter  
TEL : +82 51-312-4056

#### **JUNG GONG IND. CO., LTD.**

head office :  
homepage add : www.jung-gong.com  
main products : Ordinary window & side scuttle, Heated window, Fire resistant window & side scuttle, Window for passenger ship, Window box, Roller blind  
TEL : +82 51-261-2911

#### **JUNG-A MARINE CO., LTD.**

head office :  
homepage add : www.jung-a.co.kr  
main products : Accommodation ladder, Wharf ladder, Window wiper  
TEL : +82 51-831-4147

#### **DONGHWA PNEUMATIC TECHNOLOGY CO., LTD.**

head office :  
homepage add : www.jptec.co.kr  
main products : marine reciprocating air compressor, industrial air compressor, screw type air compressor  
TEL : +82 51-831-3227

#### **JUNGSAN ENTERPRISE CO., LTD.**

head office :  
homepage add : www.jungsan.com  
main products : Bolt & Nut (Exhaust valve, Cylinder cover, Connecting-rod, Main bearing & etc.)  
TEL : +82 52-254-3290

#### **JHK INC.**

head office : Gimhae Gyeongnam  
homepage add :  
main products : Container Fixed Fitting, Car Lashing Equipment  
TEL : +82 55-346-2225

#### **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.jsable.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. & n<sub>2</sub>generator  
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 valves, 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 : Uiju 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 unit, reciprocating compressor unit, condensing unit, brine chilling unit  
 TEL : +82 55-294-8678

**MYCOM KOREA CO., LTD.**

head office :  
 homepage add : www.mycomkorea.com  
 main products : screw compressor unit, reciprocating compressor unit, condensing unit, brine chilling 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

**ORIENTAL PRECISION & ENGINEERING CO., LTD.**

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 & overflow 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 Daegwon  
 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

**SUNG KWANG BEND CO., LTD.**

head office :  
 homepage add : www.skbend.com  
 main products : pipe fittings-butt. welding / socket welding / thread type/ flange  
 TEL : +82 51-3300-200

**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

**SUNG IL CO., LTD. (SIM)**

head office :  
 homepage add : www.sungilsim.com  
 main products : pipe spool fabrication, induction pipe bending, marine engine pipe  
 TEL : +82 51-831-8800

**ESAB SeAH CORP**

head office :  
 homepage add : www.esab.co.kr  
 main products : welding consumable, welding equipments  
 TEL : +82 55-289-8111

**SEUN ELECTRIC CO., LTD.**

head office :  
 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

**SE-WON INDUSTRIES CO., LTD.**

head office :  
 homepage add : www.sewon-ind.com  
 main products : high velocity p/v valve, gas free vent cover, flame screen  
 TEL : +82 51-728-4191

**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.  
TEL : +82 55-328-1770

#### **SE JIN IND. CO., LTD.**

head office : 61-68 Ungnam-dong, Changwon-si,  
Gyeongsangnam-do.  
homepage add : www.sejin89.co.kr  
main products : piping, h.f.o supply unit, purifier module each kind  
TEL : +82 55-239-4700

#### **SPECS CORPORATION**

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

#### **SHIN DONG DIGITECH CO., LTD.**

head office :  
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  
TEL : +82 51-467-5001

#### **SIL LA METAL CO., LTD.**

head office :  
homepage add :  
main products : propeller(f.p.p.), c.p. propeller blade & hub,  
propeller shaft, inter shaft  
TEL : +82 51-831-5991/8

#### **SHINMYUNG TECH CO., LTD.**

head office :  
homepage add :  
main products : air & electric winch-0.2ton ~ 10ton, air motor-1p  
~ 25p, davit (all)-0.2ton ~ 5ton  
TEL : +82 55-363-7091

#### **SHINSUNG DIESEL KIKI CO.**

head office :  
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  
TEL : +82 51-727-5300

#### **SHINA METALTECH CO., LTD.**

head office :  
homepage add : www.shinametal.com  
main products : white metal bearings-marine metal bearing,  
automotive metals  
TEL : +82 52-298-2100/4

#### **SHIN YOUNG HEAVY INDUSTRIES CO.,LTD**

head office :  
homepage add : www.syhico.com  
main products : oil & gas system, hydraulic system  
TEL : +82 61-800-3700

#### **S & W CORPORATION**

head office :  
homepage add :  
main products : cam & camshaft, valve spindle & seat ring, piston  
pin  
TEL : +82 51-205-7411

#### **S.A. MART CO., LTD.**

head office :  
homepage add : www.samartkr.com  
main products : control lever, control cable, hydraulic steering  
system, auto pilot system, stern drive system  
TEL : +82 32-815-6314

#### **STX ENGINE CO., LTD.**

head office :  
homepage add : www.stxengine.co.kr

main products : marine diesel engine, military diesel engine, gas  
engine, gas turbine  
TEL : +82 55-280-0114

#### **SIMULATION TECH INC.**

head office : Geumcheon Seoul  
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, bollard  
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  
TEL : +82 52-228-5801

#### **STACO CO., LTD.**

head office : Gangseo Busan  
homepage add : www.staco.co.kr  
main products : Wall Panel, Ceiling Panel, Unit Toilet, Cabin Door,  
Furniture,  
TEL : +82 51-831-7000

#### **STX ENPACO CO., LTD.**

head office :  
homepage add : www.stxenpaco.com  
main products : turbocharger, diesel engine parts, marine equip.  
TEL : +82 55-282-1131

#### **SEOUL ELECTRIC CABLE CO., LTD.**

head office : Eum-seong Chungbuk  
homepage add : www.seoulcable.com  
main products : offshore & shipboard cables, travelling cables,  
high voltage power cables  
TEL : +82 43-879-7200

#### **SMECO**

head office :  
homepage add :  
main products : piston, piston liner, piston skirt  
TEL : +82 41-864-3030

#### **SURO PROPELLER & MACHINERY CO**

head office : Yeongdo Busan  
homepage add : www.suropump.co.kr  
main products : Propeller(d : 2500mm), Shaft (l : 6m), Pump  
TEL : +82 51-415-0444

#### **SHIN-A ENTERPRISE CO., LTD.**

head office : Saha Busan  
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 Accessories, Floodlight,  
Deck Light, Reflected Lamps  
TEL : +82 2-2272-1960

#### **TANKTECH Co., Ltd.**

head office :  
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

#### **TECHMARINE SW CO., LTD.**

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

#### **FRIEND CO., LTD.**

head office : Gangseo Busan  
homepage add : www.tsdream.co.kr  
main products : cable tray, heating coil, strainer  
TEL : +82 51-974-7900

#### **TMC CO., LTD.**

head office : Cheonan Chungnam  
homepage add : www.tmc-cable.com  
main products : marine cable, optical fiber cable  
TEL : +82 2-771-3434

#### **WARTSILA ACCOMMODATION SYSTEMS KOREA, INC.**

head office : Goseong Gyeongnam  
homepage add : www.waskorea.co.kr  
main products : unit toilet, unit cabin, wall panel, ceiling panel,  
door  
TEL : +82 55-673-7315

#### **WOCHANG IND. CO., LTD.**

head office :  
homepage add :  
main products : steel door, ventilator, mooring fitting, h/c fitting,  
hand rail  
TEL : +82 55-331-1651

#### **WHA YOUNG CO., LTD.**

head office : Miryang Gyeongnam  
homepage add : www.whayoung.co.kr  
main products : Supply Unit Assy, Collector Block Assy, Fuel &  
Exh. Movement, Fuel Pump Assy  
TEL : +82 55-359-1100

#### **WILSON WALTON CORRPRO KOREA**

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.**

head office :  
homepage add : www.ykme.co.kr  
main products : package unit, group unit, module unit for  
industrial plant  
TEL : +82 54-776-5456/9

#### **YOOWON INDUSTRIES LTD.**

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

#### **YOUJEON STEEL CO., LTD.**

head office : Changwon Gyeongnam  
homepage add : www.youjeon steel.co.kr  
main products : Marine Engine Parts-Engine Bed  
TEL : +82 55-297-2121

### HYUNDAI HEAVY INDUSTRIES CO., LTD. (HHI)

- Address : 1, Jeonha-dong, Dong-gu, Ulsan, Korea • Tel : +82-52-202-2114 • Fax : +82-52-202-3470 • <http://www.hhi.co.kr>
- Products : Bulk Carriers, Containerships, Tankers, VLCCs, Product Carriers, Multi-purpose Cargo Ships, OBO Carriers, Pure Car Carriers, LPG Carriers, Ro-Ro Ships, Chemical Tankers, Offshore Rigs/Barges, LNG Carriers, Passenger Ships, Drill Ships, Special & Naval Ships, FPSO, FSO, Semi-submersible Drilling Rig, Other Vessels

### DAEWOO SHIPBUILDING & MARINE ENGINEERING CO., LTD. (DSME)

- Address : 85, Da-dong, Jung-gu, Seoul, Korea • Tel : +82-2-2129-0114 • Fax : +82-2-2129-0077~8 • <http://www.dsme.co.kr>
- Products : LNG Carriers, LNG-RVs, LNG-FPSOs/FSRUs, LPG Carriers, LPG-FPSOs, ULCCs, VLCCs, Suezmax/Aframax/Panamax Tankers, Shuttle/Chemical Tankers, Product Carriers, Containerships, Capesize/ Kamsarmax/ Supramax Bulk Carriers, Ore Carriers, VLOCs, Ro-Ro Ships, PCTCs, Passenger Car Ferries, FPSOs, FSOs, FPU, Drill Ships, Semi-Submersible Drilling Rigs, Fixed Platforms, Submarines, Submarine Rescue Vessels AUVs, Destroyers, Battle Ships

### SAMSUNG HEAVY INDUSTRIES CO., LTD. (SHI)

- Address : 1321-15, Seocho-Dong, Seocho-Gu, Seoul, Korea • Tel : +82-2-3458-7312 • Fax : +82-2-3458-7319
- <http://www.shi.samsung.co.kr>
- Products : Arctic Shuttle Tankers, VCLLs, Crude Oil Tankers, Container Vessels, LNG/LPG Carriers, FPSO, FSO, Drillships, etc., LNG FPSO, Offshore Platforms, TLP, SEMI, Cruise Ships & Ferries, Steel Structures, Bridges & Building, Cargo & Material Handling Equipment

### HYUNDAI SAMHO HEAVY INDUSTRIES CO., LTD. (HSHI)

- Address : 1700, Yongdong-ri, Samho-eup, Yeongam-gun, Jeollanam-do, Korea • Tel : +82-61-460-2114 • Fax : +82-61-460-3701
- <http://www.hshi.co.kr>
- Products : Tankers, VLCCs, Product Carriers, Chemical Tankers, Containerships, LNG Carriers, LPG Carriers, Pure Car Carriers, Bulk Carriers, Other Vessels

### STX OFFSHORE & SHIPBUILDING CO., LTD.

- Address : 100 Wonpo-dong, Jinhae, Gyeongnam, Korea • Tel : +82-55-548-1122 • Fax : +82-55-546-7928 • <http://www.stxship.co.kr>
- Products : Crude Oil Tankers, Product Oil Tankers, Chemical Tankers, Bulk Carriers, Container Ships, LNG/LPG Carriers, Pure Car & Truck Carriers, Ferries & Passenger Ships, Naval Ships, Special Purpose Ships, Offshore and offshore support vessel, Etc

### HYUNDAI MIPO DOCKYARD CO., LTD. (HMD)

- Address : 1381, Bangeo-dong, Dong-gu, Ulsan, 682-712 Korea • Tel : +82-52-250-3031~3040 • Fax : +82-52-250-3056 • <http://www.hmd.co.kr>
- Products : Product/Chemical Tankers, Containerships, Self-Unloading Bulk Carriers, Multipurpose Cargo Carriers, Drillships, Cable Layers, Pipe Layers, FPSOs, Car Ferry & Passenger Ships, LPG Carriers, Pure Car / Truck Carriers, General Cargo Carriers, Ro-Ro Vessels

### HANJIN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

- Address : 29, 5-ga, Bongnae-dong, Yeongdo-gu, Busan, Korea • Tel : +82-51-410-3240 • Fax : +82-51-410-8477 • <http://www.hanjinco.com>
- Products : Container Carriers, Product/Chemical/Crude Oil Tankers, LNG/LPG Carriers, Cable Ships, Supply Boats, Semi-Submersible Drilling Rigs, Dredgers, Naval Ships, Special Purpose Ships, Bulk Carriers

### SHINASB YARD CO., LTD.

- Address : 227, Danam-dong, Tongyeong, Gyeongnam, Korea • Tel : +82-55-640-3300/3302 • Fax : +82-55-649-2114 • <http://www.shinasb.co.kr>
- Products : 43,000DWT Stainless Steel Chemical Tanker, 44,000DWT Chemical Tanker, 45,000DWT Chemical Tanker, 51,000DWT Product/Chemical Tanker, 49,700DWT Product Tanker, 41,000DWT Product/Chemical Tanker, 40,000DWT Product/Chemical Tanker, 58,000DWT Supramax Bulk Carrier

### DAESUN SHIPBUILDING & ENGINEERING CO., LTD.

- Address : 12, 4-ga, Bongrae-dong, Yeongdo-gu, Busan, Korea • Tel : +82-51-419-5090~1 • Fax : +82-51-416-7965 • <http://www.daesunship.co.kr>
- Products : Container Ships, Bulk Carriers, Tankers, MPC & General Cargo Ships, Gas Carriers, Ro/Ro ships, Tug Boats, Fishing Boats/Vessels, Special Purpose Vessels



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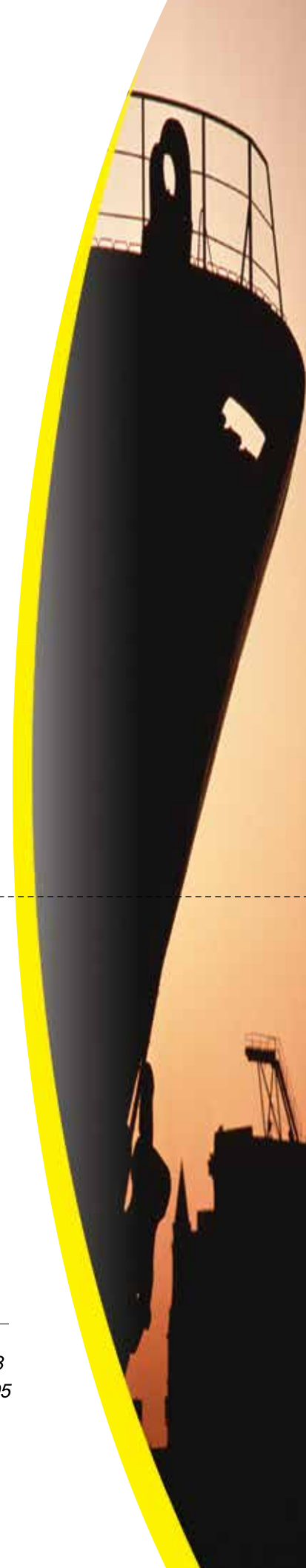
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# Daily News of KORMARINE 2013



(Korea International Shipbuilding and offshore Marine Exhibition)

Monthly KORSHIP, the Korea shipbuilding & Offshore monthly magazine, will launch daily news service to keep your finger on the pulse of the KORMARINE 2013.

KORMARINE 2013 will be open with great eclat at Busan Exhibition & Convention Center (BEXCO) , and Monthly KORSHIP will keep you updated with the latest news swiftly during the show as the official media of KORMARIE 2013 and we appreciate you cooperation in advance.

*KORMARINE 2013 will run from October 22 to October 25 Busan Exhibition Convention Center (BEXCO) .*

*Our daily news will have a circulation of 6,000 every day during the show.*

Contact Monthly KORSHIP or K. Fairs for inquiries or suggestions for the daily news article related to KORMARINE 2013 or advertisement in the print Edition. (Deadline Date: September 25th 2013)

- KORMARINE 2013 참가 업체를 대상으로 무료기사 게재가 가능하오니 많은 관심 부탁드립니다.  
(단, 선착순으로 마감합니다.)
- 광고게제도 접수 중 이오니 많은 참여 부탁드립니다.

Contact : Monthly Korship / K. Fairs

Tel : 02-2168-8898, 02-555-7153

Website : [www.korship.co.kr](http://www.korship.co.kr) / e-mail : [korshipeditor@gmail.com](mailto:korshipeditor@gmail.com)

We promise that we will go hand in hand with the shipbuilding & Offshore industry.