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월간 KORSHIP 발행

2016년 개정판

조선 & 해양 총람 Guide

Offshore & Shipbuilding

조선&해양 총람 '2016년 개정판' 발행

월간 KORSHIP은 지난 2013년 조선해양 관련업계의 관심과 협조에 힘입어 국내 처음으로 '조선&해양 기업총람(Offshore & Shipbuilding Guide)'을 제작해 발행했습니다.

이번에 월간 KORSHIP은 국내 조선업계의 요구에 따라 '2016년 개정판'을 새롭게 발행하게 되었습니다. 2016년 개정판은 기존 2013년 총람 (1,008개 업체)에 비해 50% 이상 업체가 추가되어 총 1,600여 곳의 조선&해양 업체 정보가 수록되어 있습니다.

발 행 사: 프로콘 (Procon) / 월간 KORSHIP
발 행 일: 2016년 7월 20일
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&. 2016년 개정판 조선해양 총람 구매와 관련해 기타 자세한 사항은 전화문의(02-2168-8896) 또는 본사 홈페이지(www.korship.co.kr)를 참조해 주십시오.

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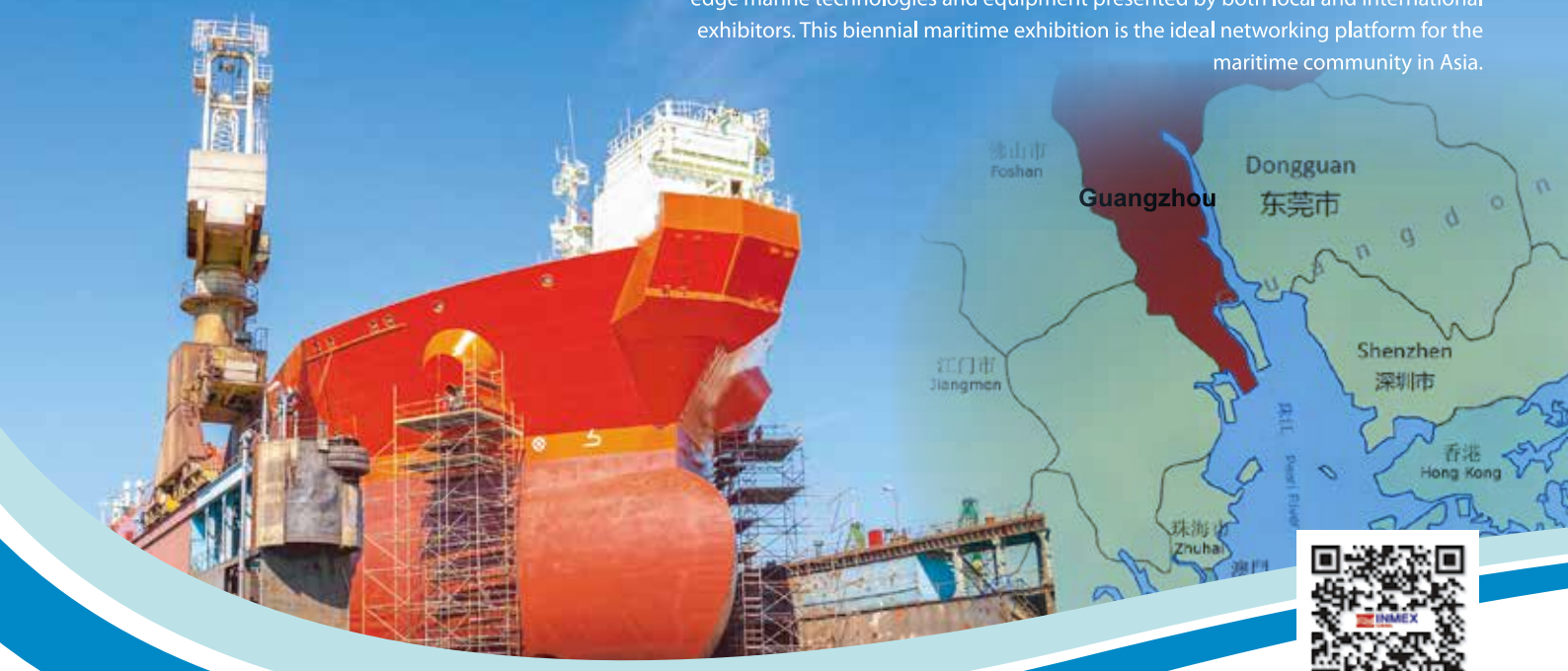


Exhibitor Feedback:

92% of exhibitors stated that the exhibition was an important platform to establish their market presence in the South China Sea region

75% of exhibitors managed to successfully generate new sales leads

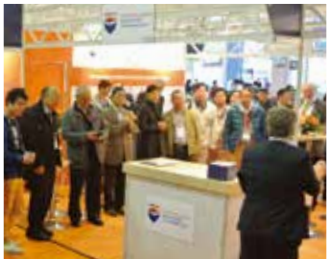
94% of exhibitors stated that the exhibition helped to raise the profile of their company

81% of exhibitors stated that the exhibition was a good platform to penetrate new markets

89% of exhibitors felt that the exhibition was a good opportunity to meet existing clients

8 out of 10 exhibitors were satisfied with the quality of visitors

9 out of 10 exhibitors stated that the exhibition played an important role in their marketing activities within the region



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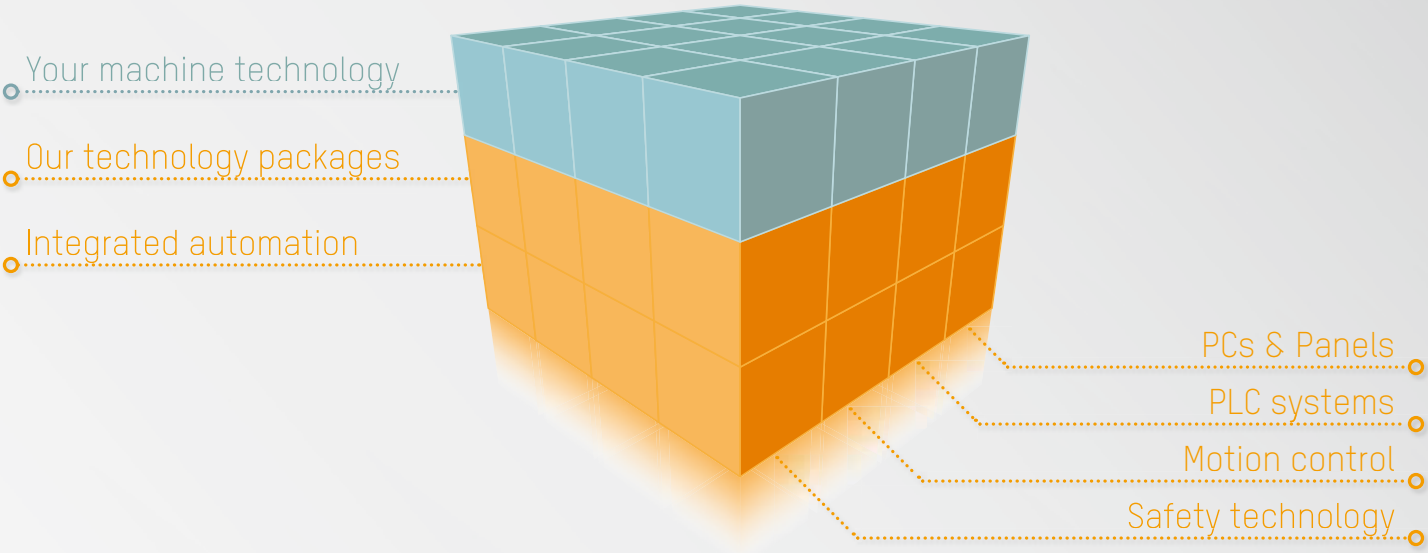

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Net Weight (kg)		555	595	595
Cutting Size (cm)		1~2(W) X 5~15(D)	1~2(W) X 5~15(D)	1~2(W) X 5~15(D)
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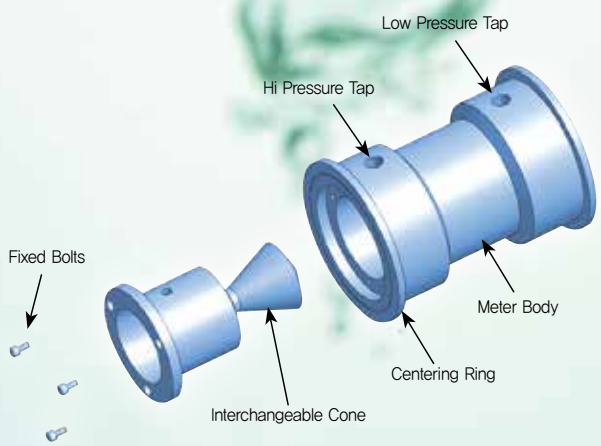

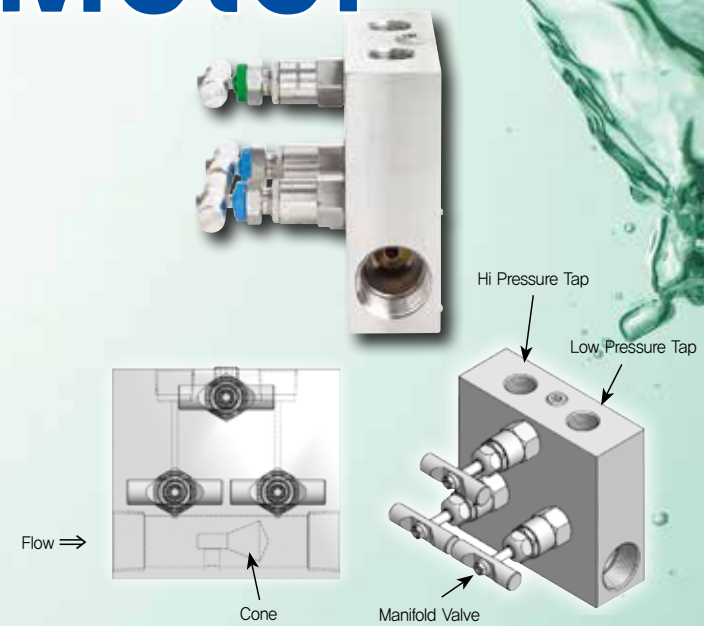

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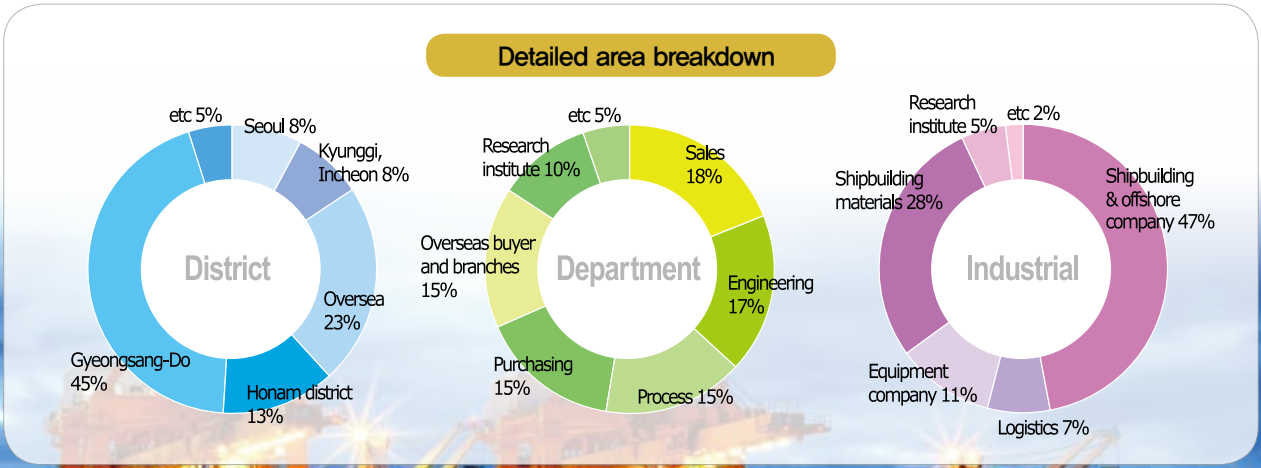

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HHI became world's first shipbuilder that outfitted high flame-retardant insulation material to LPG carrier

Hyundai Heavy Industries (HHI) announced on July 4 that it outfitted a high flame-retardant thermal insulation material, developed jointly with an insulation material manufacturer, to cargo tank of ultra-large LPG carrier with a capacity of 84,000m³. This high flame-retardant thermal insulation material drastically improved weakness of existing materials of its kind used in LPG carriers vulnerable to fire.

Previously, cargo tank of LPG carrier used polyurethane thermal insulation materials with low thermal conductivity to keep liquefied gas at temperatures below – 50°C so as to prevent boil-off loss. However, polyurethane vulnerable to fire increased risks of accidents including fire. The high flame-retardant thermal insulation material, developed recently by HHI, changed chemical structure of polyurethane to increase flame retardance drastically. Therefore, sparks or flames are extinguished naturally within 4 minutes without spreading at all. Moreover, it provides high thermal insulation performance comparable to that of existing products.

An official from HHI said, "Use of high flame-retardant thermal insulation materials will reduce the risk of fire significantly during construction of LPG carriers. We anticipate a surge in the demand for these high flame-retardant thermal insulation materials that have attracted huge attention from ship owners."

Armed with unmatched competitiveness in LPG carrier segment, HHI has won orders for 179 LPG carriers thus far which is the largest globally, out of which 159 units have been built.

현대중공업, LPG선 '고난연성 단열재' 세계 최초로 적용

현대중공업은 단열재 전문회사와 공동 개발한 고난연성 단열재를 84,000m³급 초대형 LPG선의 화물탱크에 처음 시공했다고 지난 7월 4일 밝혔다. 이 고난연성 단열재는 불에 취약한 기존 LPG선 화물탱크용 단열재의 단점을 획기적으로 개선한 제품이다.

LPG운반선의 화물탱크는 액화가스가 기화로 손실되는 것을 막기 위해 영하 50도 이하를 유지해야 하기 때문에 열전도율이 낮은 폴리우레탄 재질의 단열재를 사용해왔다. 하지만 불에 취약한 폴리우레탄은 화재발생 등 안전사고 발생위험이 높다.

현대중공업이 개발한 고난연성 단열재는 폴리우레탄의 화학적 구조를 변경해 난연성을 크게 향상시켰기 때문에 불꽃이 튀어도 불이 전혀 번지지 않고 4분 이내 자연적으로 꺼지는 특성이 있다. 단열 성능 또한 기존 제품에 비해 손색이 없다.

현대중공업 관계자는 "고난연성 단열재 사용이 확대되면 LPG선 건조 중 화재 위험이 크게 낮아질 것"이라며 "선주들의 관심도 높아 앞으로 수요가 크게 늘어날 것으로 예상된다"고 말했다.

한편, 현대중공업은 LPG운반선 분야에서 뛰어난 경쟁력으로 지금까지 전 세계에서 가장 많은 179척의 LPG운반선을 수주해 159척을 건조했다.

Co-existence Council on Shipbuilding & Shipping Industries is slated for launch

Co-existence Council is scheduled for launch this month to help shipbuilding and shipping industries overcome current adversities. The Ministry of Oceans & Fisheries (MOF) convened a meeting with relevant organizations which revolved around the theme "Coexistence and cooperation between shipbuilding and shipping industries" at Haeun building, Yeouido, the largest island of Seoul, on July 7. In the meeting, the MOF announced that it would organize the Co-existence Council jointly with KSA (Korea Shipowners' Association) and KOSHIPA (Korea Offshore & Shipbuilding Association).

The meeting was attended by delegates from the MOF, MOI (Ministry of Industry), FSC (Financial Supervisory Commission), KSA, KOSHIPA, Korea Eximbank (Export-Import Bank of Korea), KMI (Korea Maritime Institute), KIET (Korea Institute for Industrial Economics & Trade), etc. Organizations that attended this meeting will evaluate cost competitiveness of fleets with national flags and look into grievances occurring at the site when national shipping companies place shipbuilding orders. Along with that, the meeting addressed the issue of giving priority to national shipping lines for transportation of major raw materials such as

coals, gas, etc., so as to promote placement of newbuilding orders.
The KSA and KOSHIPA will play a leading role in operations of the Co-existence Council. Specifically, issues, such as government support and institutional improvement, etc., will be addressed at the Council in the period ahead. Moreover, matters discussed in this Council will be referred to the second meeting of relevant government ministries for review.
An official from the MOF remarked, "An upturn in order placement by national shipping lines will ultimately bring much-needed respite back to national shipping lines currently reeling from order drought. We will provide full support for operations of the Co-existence Council to help ensure that shipbuilding and shipping industries can benefit practically from the measures discussed at the Council meeting, and at the same time, will examine measures for institutional improvement in close cooperation with relevant organizations including the MOI (Ministry of Industry)."

해운 · 조선 상생 협의체 구성

해운 · 조선 동반 위기 극복을 위한 상생 협의체가 이르면 이번 달 중 구성될 예정이다. 해양수산부는 지난 7월 7일 여의도 해운빌딩에서 '해운 · 조선 상생 협력을 위한 관계기관 회의'를 개최하고, 선주협회와 조선해양플랜트협회 공동 주관으로 상생 협의체 구성을 추진할 계획이라고 밝혔다.
이번 회의에는 해수부, 산업부, 금융위, 선주협회, 조선해양플랜트협회, 수출입은행, 한국해양수산개발원, 산업연구원 등이 참석했다. 참석한 기관들은 국적 선대의 원가 경쟁력을 진단하고, 국적 선사가 선박 발주 시 현장에서 겪는 애로사항을 함께 점검하게 된다. 이와 함께 석탄, 가스 등 주요 원자재 수송 시 국적 선사 이용 비중을 확대하여 선박을 신규로 발주하는 방안도 검토했다.
이 상생 협의체는 선주협회와 조선해양플랜트협회 주도로 운영될 예정이며, 향후 정부 지원 및 제도 개선 필요 사항 등을 협의하게 된다. 또한, 협의체에서 논의한 사항은 제2차 관계부처 회의에서 함께 검토할 예정이다.
해양수산부 관계자는 "국적 선사의 발주 확대가 수주 절벽에 시달리는 국적 선사에 도움이 될 것으로 기대하고 있다"며, "상생 협의체에서 논의된 내용이 실질적으로 해운 · 조선 산업에 도움이 될 수 있도록 협의체 운영을 적극 지원하고, 산업부 등 관계기관과 함께 제도 개선 방안을 검토해 나갈 예정"이라고 밝혔다.

SSME held a naming ceremony for the last batch of vessels for NAVIG8 of Singapore

Sungdong Shipbuilding & Marine Engineering (SSME) announced that it held a naming ceremony on July 22 for the tenth vessel out of 10 units ordered by Singapore-based NAVIG8 in 2013.
For SSME, construction processes of these vessels have been particularly significant. The first vessel S3078, named 'NAVIG8 SERENITY', was selected as the Ship of Year in 2015 by the Naval Architect of the U.K. and Maritime Reporter of the United States, the world's leading magazines in shipbuilding and shipping industries. Moreover, SSME was proven to have global competiveness in the field of medium-sized vessel construction when it reached a milestone of 200th ship delivery by handing NAVIG8 SWIFT over to ship owner.
In the ceremony, the tenth vessel was named 'NAVIG8 SUPREME' by the wife of the General Manager of NAVIG8 Asia who served the role of godmother. NAVIG8 SUPREME is scheduled for delivery by mid August.

성동조선해양, 싱가폴 나빅8사의 마지막 호선 명명식

성동조선해양은 지난 7월 22일 2013년 싱가폴의 나빅8(NAVIG8)사로부터 수주한 10척의 시리즈 호선 중 마지막 호선의 명명식을 가졌다고 밝혔다.
이번 시리즈 선박들의 건조과정은 성동조선해양에게 있어 그 의미가 남다르다. 첫 호선이었던 S3078, '나빅8 세레니티(NAVIG8 SERENITY)'는 세계 3대 조선 · 해운 전문지인 영국 네이벌 아키텍트(Naval Architect)와 미국 마리타임 리포터(Maritime Reporter)가 선정하는 2015 올해의 최우수 선박에 선정된었다. 또한 성동조선해양의 200번째 인도 선박이었던 '나빅8 스위프트(NAVIG8 SWIFT)'를 통해 명실공히 중형 선박 건조 분야에서 세계적인 경쟁력을 갖춘 조선사임이 입증됐다.
이날 명명식에서는 나빅8 아시아 지부장의 부인이 대모로 나서 선박의 이름을 '나빅8 슈프림(NAVIG8 SUPREME)'으로 명명했으며, 해당 선박은 8월 중순 인도될 예정이다.

KR promotes exports with CE (European Conformity) certification

Korean Register of Shipping (KR) announced that it signed an agreement with Korea Apparel Testing & Research Institute (KATRI) to cooperate in underpinning export growth of domestic PPE (Personal Protective Equipment) manufacturers.

As a result, domestic manufacturers of PPE, including firefighter protective clothing, respiratory protective equipment, etc., can obtain CE Mark certification domestically through product certification and factory audit by KR based on test reports issued by KATRI. In that regard, this agreement is expected to bring benefits, such as cost-savings, prevention of leakage of key technologies and delay in test, compared to when certification is commissioned to overseas certification organizations.

CE marking, a uniform product certification procedure in EU member countries, is required mandatorily for products related to consumer health, safety, and environment to be allowed to move freely across EU without separate test or inspection.

An official from KR said, "We will build collaborative system to ensure successful certifications and joint R&D both at home and abroad by tapping into the testing and research capabilities of KATR based on our CE mark certification and marine equipment certification authorities."

KR set up a CE certification organization known as 'KR Hellas' (its Greek subsidiary) in 2008, and was designated by EU as CE mark certification organization in 2009. Currently, KR is carrying out CE certification works covering 10 fields including PPE (Personal Protective Equipment) field.

한국선급, EU의 CE인증 통해 유럽수출 지원

한국선급(KR)은 국내 개인보호장구 제조업체들의 보다 원활한 유럽 수출을 돕기 위해 한국의류시험연구원(KATRI)과 상호협력 업무협약을 체결했다고 밝혔다.

이번 협약을 통해 소방관용 보호복, 호흡 보호장비 등의 개인보호장구를 제조하는 국내업체들은 한국의류시험연구원이 발급한 시험성적서를 통해 한국선급으로부터 제품인증 및 공장 심사를 받아 국내에서 CE 마크 인증을 획득하는 것이 가능해졌다. 이에 따라 해외 인증단체에 의뢰를 했을 때에 비해 핵심기술 유출 및 시험기간 지연 방지, 비용 절감 등의 편리를 얻을 수 있을 것으로 기대된다.

CE 마크는 EU 국가의 통일된 제품 인증 마크로서 EU 역내에서 유통되는 소비자의 건강, 안전, 환경에 관련된 제품은 CE 마크를 의무적으로 부착해야만 별도의 검사나 시험없이 자유로이 유통될 수 있다.

한국선급 관계자는 "우리가 보유한 CE 마크 인증 및 선박 기자재 인증 권한을 바탕으로 한국의류시험연구원이 수행하는 시험·연구 능력을 더해 국내외 인증 및 공동 연구개발 등의 성공적 수행을 위해 협력체계를 구축 하도록 노력하겠다"고 밝혔다.

한국선급은 지난 2008년, 그리스에 자회사인 'KR Hellas'라는 CE 인증기관을 설립하고 2009년에 EU로부터 CE 마크 인증기관으로 지정되었으며, 현재 개인보호장구(PPE, Personal Protective Equipment)를 포함한 10개 분야의 CE 인증업무를 수행하고 있다.

DSME developed key technology for submarines

Daewoo Shipbuilding & Marine Engineering (DSME) developed DURAN Mark-1 (DSME Underwater RAdiated Noise) providing capability to analyze warship-related information based on underwater noise. It represents a culmination of two and a half years of extensive research by DSME.

Underwater radiated noise refers to transmission of sound from equipment and system, such as propellers, etc., on board warships through the sea. As each warship has different acoustic signatures analogous to fingerprints, analysis of underwater radiated noise can help keep track of installed equipments, current position, etc.

Underwater radiated noise testing and analytical systems represent key technologies determining operation capabilities of naval warships and survivability of crews, given that lower noise level generated from warships, including submarines, reduces the chance of being detected by enemy warships. DURAN Mark-1, an underwater radiated noise analytical system developed by DSME in collaboration with Agency for Defense Development, Seoul National University, Korea Institute of Machinery & Materials, Sonar Tech, etc., from 2013, reaffirms DSME's dedication to building up competitiveness of indigenous submarines.

DURAN Mark-1 has been proven to provide high performance and stability throughout

seal trials and conforms to functional standards of ANSI (American National Standards Institute) and ISO (International Standard Organization) and requirements set forth by Korean Navy. Moreover, DSME has completed patent application for underwater navigation system and a technology enabling tracking of specific noise under the sea to trace the sound to its source.

Having developed this technology, DSME's key technological competitiveness has been taken to the next advanced level in the field of submarines. Besides, DSME has developed analytical program (DURAN_DTF) and early prediction program (DURAN_Ghost) through projects aiming to acquire technologies related to underwater radiated noise from special purpose vessels. DURAN Mark-1 will be applied first to submarines currently under construction at DSME's Okpo shipyard for Indonesian Navy.

An official from DSME said in connection with the research, "DURAN Mark-1 will help optimize underwater radiated noise performance of warships to increase survivability and detect enemy warships with greater effectiveness. Key achievement in the latest research is that we have even sharper competitive edge underpinned by new technology development in the field of special purpose vessels."

대우조선해양, 잠수함 핵심 기술 개발

대우조선해양은 2년 6개월여 간의 연구 끝에 바다 속 소음을 통해 함정 관련 정보를 분석하는 시스템인 '듀란 마크-1(DURAN Mark-1, DSME Underwater RAdiated Noise)'을 개발했다.

수중방사소음은 프로펠러 등 함정에 탑재된 장비나 시스템 등이 일으키는 소리가 수중으로 전달되는 방식을 뜻한다. 사람의 지문처럼 각 함정마다 고유한 소음 패턴을 갖기 때문에 수중방사소음을 분석하면 설치장비나 현재위치 등의 정보를 파악할 수 있다.

잠수함 등 함정에서 발생하는 소음이 작을수록 적함에게 탐지될 가능성도 낮아지기 때문에, 이를 파악하는 수중방사소음 시험 및 분석 시스템은 해군 함정의 작전능력과 승조원의 생존성을 결정하는 핵심 기술로 꼽힌다.

대우조선해양은 국산 잠수함의 경쟁력을 높이기 위해 지난 2013년부터 국방과학연구소, 서울대학교, 한국기계연구원, 소나테크 등 전문기관들과 함께 수중방사소음 분석 시스템 개발에 착수했고 최근 최종 개발을 완료했다.

대우조선해양은 개발 과정에서 듀란 마크-1의 해상 시험을 통해 그 성능과 안정성을 검증받았고, 미국표준협회(ANSI)와 국제표준화기구(ISO)의 성능 기준과 한국 해군의 요구 조건에 부합하는 성능도 확보했다. 아울러, 수중 네비게이션 프로그램과 수중의 특정 소음을 추적해 소리의 발생 원점을 추적할 수 있는 기술에 대해 특허출원을 완료했다.

이번 시스템 개발로 대우조선해양은 잠수함 핵심 기술의 경쟁력을 끌어올리는 데 성공했다. 그 동안 대우조선해양은 특수선 수중방사소음 분야의 기술력을 확보하기 위한 프로젝트를 발족해 해석프로그램(DURAN_DTF)과 초기 예측프로그램(DURAN_Ghost) 등도 함께 개발해왔다. 듀란 마크-1은 현재 대우조선해양 옥포조선소에서 건조 중인 인도네시아 수출 잠수함에 최초 적용될 예정이다.

이번 연구 성과와 관련해 대우조선해양 관계자는 "듀란 마크-1을 이용해 함정의 수중방사소음 성능을 최적화하면 보다 높은 생존성과 적함 탐지 성능을 확보할 수 있다"며, "신기술 개발로 회사가 특수선 분야에서 더 높은 경쟁력을 확보한 점이 이번 연구의 핵심 성과"라고 말했다.

Alfa Laval PureBallast has completed required USCG testing procedures

Alfa Laval remains on track to submit a US Coast Guard (USCG) type approval application for Alfa Laval PureBallast 3.1 in the coming weeks. The company has successfully completed all required land-based tests using the current system design.

Alfa Laval is maintaining its ambitious timetable for USCG type approval in ballast water treatment. As anticipated, the company completed the requisite tests of PureBallast in Q2, which were performed using the USCG-approved CMFDA/FDA (staining) method. All testing was conducted at DHI in Denmark using the same hardware, power consumption and flow as the already market-leading IMO-approved version of the system.

"PureBallast has achieved high-performance results without any change to its components or system design," said Anders Lindmark, General Manager, Business Centre PureBallast. "The tests show that PureBallast provides reliable biological disinfection at full flow, whether by IMO or US Coast Guard standards."

Alfa Laval will now compile its USCG type approval application, including the CMFDA / FDA test results for PureBallast 3.1, for submission to the USCG within the coming weeks.

ARAON on a mission to explore continental shelf of the Arctic East Siberian Sea

ARAON dubbed 'Santa Claus of the Antarctic' will sail for the Arctic Ocean. This marks the seventh departure of ARAON from port since 2010. The Ministry of Oceans and Fisheries (MOF) held a sail-away ceremony to celebrate departure of ARAON, an icebreaking vessel, at Incheon Port on July 20. After sailing off from Incheon Port on July 20, ARAON will carry out a research mission in East Siberian Sea, Bering Sea, Chukchi Sea, etc., for 67 days before its return on September 25.

ARAON will become the first domestic vessel to explore continental shelf of the East Siberian Sea estimated to hold vast reserves of gas hydrate. Specifically, ARAON will collect basic data related to subsea resource environment while investigating large-scale methane gas discharge from gas hydrate being melted. This mission will also include intensive observation of phenomenon associated with thawing in ice-covered area of East Siberian Sea, Bering Sea, Chukchi Sea, etc., in collaboration with Pacific Arctic Group (PAG) member countries such as the United States, China, and Japan as part of effort to shed light on environmental changes in the Arctic Ocean which have been triggered by climate changes. The East Siberian Sea has recently seen the rapidest decline in thawed area, attracting attention globally from researchers.

An official from MOF said, "This year, Arctic Ocean is expected to have the smallest thawed area in history. Investment needs to be made constantly in investigation into environmental changes of the Arctic Ocean and exploration of resources to better cope with Cold Rush in the period ahead."

Korea discovered traces of a gigantic ice sheets from the fourth glacial period in the Arctic East Siberian Sea for the first time worldwide in 2003 and embarked upon Arctic research in full scale with completion of ARAON ice-breaking vessel in 2009.

아라온호, 북극 동시베리아해 대륙붕 탐사

'남극의 산타' 아라온호가 이번에는 북극해로 간다. 2010년 이후 7번째 출항이다. 해양수산부는 지난 7월 20일 인천항에서 쇄빙연구선 아라온호 출항식을 가졌다. 아라온호는 7월 20일 인천항을 출항해 67일 간 동시베리아해, 베링해, 척치해 등에서 북극 연구를 수행한 후 9월 25일 복귀할 예정이다.

이번 탐사에서 아라온호는 국내 최초로 가스하이드레이트 매장량이 상당할 것으로 추정되는 동시베리아해 대륙붕 지역을 탐사한다. 해저자원환경에 대한 기초 자료를 확보하는 한편, 가스하이드레이트가 녹으면서 발생되는 대규모 메탄 가스 방출 현상에 대해 연구할 예정이다.

또한, 미국, 중국, 일본 등 7개 태평양북극그룹(PAG) 회원국들과 공동으로 동시베리아해 결빙 해역과 베링해, 척치해 등에서 해빙과 관련된 현상들을 집중 관측한다. 이를 통하여 기후변화에 따른 북극해의 환경변화를 규명할 계획이다. 참고로 동시베리아해는 최근 가장 급격하게 해빙이 감소해, 세계적으로 주목을 받고 있다.

해양수산부 관계자는 "올해는 북극해의 해빙 면적이 역사상 가장 최소가 될 것으로 예상된다"라며, "향후 극지개척 시대(Cold Rush)에 대비해 북극해 환경 변화와 자원 탐사 등 관련 연구에 대한 지속적인 투자가 필요하다"고 말했다.

언급할 예정이다.

한편, 한국은 지난 2003년 세계 최초로 북극 동시베리아해에서 제4기 거대 빙상의 흔적을 발견했으며, 2009년 쇄빙연구선 '아라온호' 준공해 북극 연구에 본격적으로 착수했다.

Samil PwC Gives Green Light for HHI's 3.5 Trillion Won Management Improvement Plan

Hyundai Heavy Industries (HHI) announced on July 26 it was notified by Samil PwC, a local member of the global accounting firm PwC, that its 3.5 trillion won worth management improvement plan is good enough for HHI to make operating profits and secure liquidity even in the worst case scenario.

The announcement is the result of due diligence that had been conducted by Samil PwC for 10 weeks from May 23 this year at the request of HHI's main creditor banks including the Export-Import Bank of Korea and KEB-Hana Bank.

According to the analysis of Samil PwC, with the faithful execution of the proposed management plan, HHI would be able to make operating profits, secure enough liquidity and cut down considerable amount of debt each year until 2020.

An HHI official said, "The green light from Samil PwC for our management improve-

ment plan today will help us greatly to regain the trust of the market and financial sector."

An official from the Export-Import Bank of Korea who attended the due diligence briefing session held today added, "We see the due diligence result today will help creditor banks of HHI to take a positive stance on RG issuance for new shipbuilding orders HHI expects to win down the road."

현대중공업, 3조 5,000억원 규모 경영개선 계획 충분

삼일회계법인이 현대중공업에 대한 경영진단 결과 "경영개선 계획대로 이행될 경우, 최악의 상황을 가정하더라도 문제가 없다"는 결론을 내렸다.

이번 경영진단은 수출입은행과 KEB하나은행 등 주요 채권은행들의 의뢰로, 지난 5월 23일부터 약 10주간에 걸쳐 잠재부실의 가능성과 향후 손익 및 현금흐름의 안정성을 점검하는 2단계로 진행되어 왔다.

삼일회계법인이 분석한 결과에 따르면 현재 주채권은행에 제출된 경영개선계획을 계획대로 실행하면 영업이익 실현과 유동성 확보에 문제가 없는 것으로 나타났다.

현대중공업 관계자는 "현대중공업이 제출한 3조 5,000억원 규모의 경영개선계획이 충분하다는 진단이 나온 셈"이라며, "이번 진단 결과가 현대중공업에 대한 시장 및 금융권 신뢰회복의 계기가 될 것으로 기대한다"고 밝혔다.

한편 삼일회계법인은 현대중공업과 함께 지난 7월 26일 주채권은행인 KEB하나은행에서 주요 8개 채권은행을 대상으로 경영진단 결과 설명회도 가졌다. 이번 설명회에서는 이번 경영진단 결과를 기초로 그 동안 어려움을 겪어왔던 RG 발급 문제에 대한 지원방안도 논의된 것으로 알려졌다.

이날 설명회에 참석한 수출입은행 관계자는 "실사 결과가 긍정적으로 나옴에 따라, 채권은행들도 RG 발급 등에 있어서 보다 전향적인 자세를 갖게 될 것으로 보인다"고 밝혔다.

Hyundai Merchant Marine expands overseas terminal projects to tide over crisis

Hyundai Merchant Marine is adding fresh momentum into its overseas terminal projects while moving to make its major fleets larger.

Recently, Hyundai Merchant Marine acquired 4 supersized gantry cranes capable of handling ultra-large containership with a capacity of 18,000 TEU through cooperation with Taiwan International Ports. These supersized gantry cranes will be installed on July 12 at a terminal operated by Taiwan International Ports Corporation adjoining Kaohsiung Terminal of Hyundai Merchant Marine. Cooperation with Taiwan International Ports Corporation was vital for Hyundai Merchant Marine to use these cranes. As a result, call and loading/unloading of G6 Alliance-affiliated ultra-large vessels with a capacity of over 10,000 TEU will be able to be handled at Kaohsiung Terminal of Hyundai Merchant Marine previously accessible for vessels with a capacity of up to 8,000 TEU.

Hyundai Merchant Marine expects that annual processing capacity can be increased by about 70% to 700,000 TEU from current 400,000 TEU by attracting large vessels to Kaohsiung Terminal and maximizing the use of berth. Additionally, Hyundai Merchant Marine has proceeded with upgrade of WUT (Washington United Terminals) located at Tacoma, the United States.

Hyundai Merchant Marine began discussion with the NWSA (NorthWest Seaport Alliance), formed last year by the ports of Seattle and Tacoma, the two major ports in the northwestern part of the United States, on upgrade of WUT in early July. Major plans include expansion of terminal land, terminal automation, and deployment of additional equipments such as supersized cranes. Hyundai Merchant Marine plans to complete all roadmaps by the end of this year. That aims to solidify the position of WUT as the largest container terminal in the northwestern part of the United States.

Hyundai Merchant Marine currently has 3 terminals operated directly, such as U.S.-based CUT (California United Terminals), WUT (Washington United Terminals), and Taiwan-based KHT (Kaohsiung Hyundai Terminal), and jointly owns RWG(Rotterdam World Gateway) of the Netherlands.

현대상선, 해외 터미널 사업 강화로 위기 타개

현대상선이 주력 선대 대형화와 함께 해외 터미널 사업 강화에 나섰다.

최근 현대상선은 대만 항만공사와의 협력을 통해 18,000TEU급 초대형 컨테이너선을 처리할 수 있는 초대형 겐트리 크레인 4대를 확보했다. 이번 초대형 겐트리 크레인은 현대상선의 대만 카오슝 터미널 옆, 대만 항만공사가 운영하는 터미널에 7월 12일 설치 완료 예정으로 현대상선은 대만 항만공사와의 협력을 통해 크레인을 사용할 수 있게 되었다. 이로써 기존 8,000TEU 선박까지 처리가 가능했던 현대상선의 카오슝 터미널은 앞으로 G6 얼라이언스 내 1만 TEU 이상 초대형 선박의 기항 및 양하역 작업이 가능해질 전망이다.

현대상선은 카오슝 터미널의 대형선 유치 및 선석 활용을 극대화함으로써 처리 물량이 기존 연간 약 40만 TEU에서 70만 TEU까지 약 70% 확대가 예상된다. 또한, 현대상선은 미국 타코마에 위치한 WUT (Washington United Terminals) 터미널의 최신화 작업에 착수했다.

현대상선은 미주 서북부 양대 항만인 시애틀과 타코마 항만청이 지난해 결성한 '더 노스웨스트 시포트 얼라이언스(NWSA, The NorthWest Seaport Alliance)'

와 WUT 터미널 최신화를 위한 논의를 7월초 시작했다. 주요 추진 사항으로 터미널 부지 확대 및 터미널 자동화, 초대형 크레인 등 추가 장비 투입 등을 논의 중에 있으며, 올해 연말까지 모든 로드맵 수립을 완료한다는 계획이다. 이를 통해 미주 서북부 지역의 최대 컨테이너 터미널로서 입지를 더욱 공고히 한다는 전략이다.

현대상선은 현재 미국의 CUT(California United Terminals), WUT(Washington United Terminals), 대만의 KHT(Kaohsiung Hyundai Terminal) 등 3개의 자영 터미널을 보유하고 있으며, 네덜란드 RWG(Rotterdam World Gateway)를 공동 보유하고 있다.

Nexans drives the transition to higher Voltage wind farm networks

Nexans is launching a new range of cable and power accessories to meet the growing demand for higher capacity windfarms. The new generation of power accessories with F-type outer cone comprising separable T-connectors, coupling connectors and surge arresters has been developed to operate at 72.5 kV.

To transmit the increased power between each individual turbine and collection platforms efficiently, Nexans has created inter-array cable systems able to operate at 72.5 kV instead of the traditional 36 kV. Transformer and switchgear OEMs have upgraded their designs to take into account the higher voltage.

As renewable energy becomes more prevalent, economic power supply becomes more and more important. There is now a new common standard for offshore wind connection systems up to 72.5 kV.

The standardized interface between power accessories and equipment bushings is a first in the field of this voltage class. Unlike traditional connection solutions, separable, compact T-shape connectors offer many advantages. The outer cone standard allows several combinations of cable arrangements such as single connection, double connector arrangement with coupling connector, double connector arrangement with surge arrester.

All of Nexans power accessories up to 72.5 kV are type tested according to IEC 60840. Equipment bushings by EUROMOLD® are additionally type tested according to IEC 60137. Both, separable connectors and bushings are tested according to IEC 60068 successfully (solar radiation IEC 60068-2-5 and salt mist IEC 60068-2-52).

All kits of Nexans connectors, terminations and joints include conductor contacts use patented GPH® mechanical connection technology, which is type tested according IEC 61238-1. GPH® mechanical connectors and cable lugs have been in use for 25 years. They are compatible with aluminum and copper conductors of the most designs. An innovative system of patented shear-off-head bolts ensures easy installation and the stability of electrical connections.

넥상스, 풍력 단지의 전압 효율성 개선에 기여

넥상스는 풍력단지의 용량 증가를 원하는 수요에 맞춰 새로운 케이블과 파워 엑세서리를 출시했다. T-커넥터, 쿠플링 커넥터와 피뢰기로 구성된 F-타입의 신세대 파워 액세서리는 72.5kV에서도 작동 가능하도록 개발됐다.

각 개별 터빈과 다량의 플랫폼 간에 효율적으로 더 높은 전압을 전달하기 위해 넥상스는 일반적인 36kV 전압 대신 72.5kV에서 작동 가능한 인터 어래이 시스템을 개발했다. 변압기와 스위치 기어 제조사들도 더 높은 전압을 고려하여 제품 디자인을 업그레이드했다. 재생 에너지가 더 널리 퍼짐에 따라 경제적인 전력 공급의 중요성은 더 커지고 있다. 현재는 72.5kV까지 해상 풍력 연결 시스템을 위한 새로운 공용 표준이 제정됐다.

파워 액세서리와 부싱 장비 사이의 표준화된 인터페이스는 72.5kV 전압에서는 첫 번째이다. 이전의 전형적인 연결 솔루션과는 차별화하여 분리 가능하고 작은 사이즈의 T 형태의 커넥터는 많은 장점이 있다. 꼬깔 형태의 외경 표준은 싱글 커넥션, 쿠플링 커넥터와 더블 커넥터 방식, 피뢰기와의 더블 커넥터 방식 같은 케이블 방식의 여러 조합을 허용한다. 72.5kV까지 사용 가능한 모든 넥상스 액세서리는 IEC 60840에 따라 타입 테스트를 완료했다. 유로몰드가 제공하는 부싱 장비는 IEC 60137에 따라 추가로 타입 테스트를 완료 했다. 분리 가능한 커넥터와 부싱은 IEC60068에 따라 성공적으로 테스트를 완료했다.

넥상스 커넥터, 터미네이션, 컨텍터 컨택트를 포함하는 조인트는 IEC61238-1에 의해 타입 테스트를 마친 넥상스가 특허를 갖고 있는 GPH® 기계적 연결 기술을 사용했다. GPH® 기계적 커넥터와 케이블 러그는 25년간 사용하고 있다. 이는 거의 대부분의 알루미늄 및 구리 컨덕터와도 호환 가능하다. 또한 특허 받은 shear-off head bolt(볼트 헤드를 잘라낸)를 사용한 혁신적인 시스템은 용이한 설치와 전기 연결시 안정성을 보장한다.

Daehan Shipbuilding delivered 207,000-ton bulk carrier to Daehan Shipping

Daehan Shipbuilding held a naming ceremony for a 207,000 DWT bulk carrier at the second quay wall of Haenam shipyard on July 7. This vessel, named 'SM DRAGON', is an ultra-large bulk carrier measuring 300m in length, 45m in width, and 25m in height, and the third vessel out of 4 bulk carriers ordered by Daehan Shipping in December 2013.

Daehan Shipbuilding delivered 207,000-ton bulk carrier last April after delivery of 180,000-ton bulk carrier in July last year. The fourth vessel is currently undergoing outfitting works at the second quay wall and scheduled for delivery by September this year.

Park Yong-duk, President of Daehan Shipbuilding, said, "I extend my appreciation to SM Group and Daehan Shipping for their unsparing support and cooperation which have been vital for successful construction of the vessels. I think that we can overcome current downturn if we work closely together based on trust that we have shown to one another even in the midst of severe adversities facing shipbuilding and shipping industries."

Woo Oh-hyun, Chairman of SM Group, the ship owner, remarked, "I will remember the hard efforts and enthusiasm of employees at Daehan Shipbuilding who built this vessel excellently. I will continue to help Daehan Shipbuilding make further strides, playing a key part in promoting advancement of steel, shipbuilding and shipping industries, the backbone of Korean economy."

After delivery, 'SM DRAGON' will be deployed to carry iron cores of POSCO, major customer of Daehan Shipping, over the long-term, along with the fourth bulk carrier to be delivered by Daehan Shipbuilding in the period ahead.

대한조선, 207,000톤급 벌크선 대한해운에 인도

대한조선은 지난 7월 7일 해남조선소 제2안벽에서 207,000 DWT 벌크선의 명명식을 가졌다. 이날 에스엠 드래곤(SM DRAGON)으로 명명된 이 선박은 길이 300미터,너비 45미터, 높이 25미터의 초대형 벌크선으로 지난 2013년 12월 대한해운이 발주한 4척의 벌크선 중 세 번째 선박이다. 대한조선은 지난 해 7월 180,000톤급 벌크선을 인도한 데 이어 지난 4월 207,000톤급 벌크선을 인도했다. 2안벽에서 의장 공사를 진행 중인 네 번째 선박은 오는 9월 인도될 예정이다.

대한조선 박용덕 대표이사는 "아낌없는 지원과 협조로 성공적인 건조를 할 수 있도록 도와 준 SM그룹과 대한해운에 감사하다"고 전하고, "조선 및 해운업계가 큰 어려움에 처해 있지만 선박을 건조하면서 서로가 보여준 신뢰를 바탕으로 협력한다면 불황의 파고를 넘을 수 있을 것"이라고 말했다.

선주사인 SM그룹 우오현 회장은 "훌륭하게 선박을 완공해 준 대한조선 임직원의 땀과 열정을 기억하겠다"고 밝히고, "대한해운을 발전시켜 대한민국 산업 원동력인 철강, 조선, 해운 산업 발전에 크게 기여하도록 하겠다"고 말했다.

한편 에스엠 드래곤호는 앞으로 인도 할 네 번째 선박과 함께 대한해운 주 거래처인 포스코의 철광석을 장기 운송하는데 투입될 예정이다.

World's First LNG-Powered Bulker with ME-GI Prime Mover Announced

After a period of negotiation, Korean shipowner, ILSHIN and HMD (Hyundai Mipo Dockyard Co., Ltd.) have signed a shipbuilding contract for a 50,000 DWT bulk carrier.

As a world first for the segment, the vessel will be powered by an MAN B&W 6G50ME-C9.5-GI engine, to be built by HHI-EMD who will also supply the ME-GI and fuel gas supply system.

POSCO, the multinational steel-making company headquartered in Pohang, South Korea, has already agreed to charter the newbuilding upon delivery, and will use the vessel to transport limestone for its operations.

POSCO will deliver the LNG fuel tank, which will be made of high-Mn steel as an alternative material to the currently widely used nickel alloy.

Another industry-first for leading society ClassNK

ClassNK has established ClassNK Archive Center (NKAC), the maritime industry's first onshore digital archive center that fully complies with IMO Goal-based ship construction standards (GBS) and the Industry Standard, which begin to apply from 1 July.

IMO GBS are broad, over-arching safety and environmental standards that ships are required to meet during their operational lifetime. The new SOLAS regulation II-1/3-10 made GBS applicable to bulk carriers and oil tankers of 150m in length and above for which the building contract is placed on or after 1 July 2016.

The new regulation requires that a Ship Construction File (SCF) be provided upon delivery of a new ship and kept on board the ship and/or ashore. The SCF provides ship information related to design and construction that is needed to ensure the safety of the ship throughout its operational lifetime and includes certain documents that are recognized as being highly sensitive intellectual property and permitted to be kept onshore.

Hence, an onshore archive center is necessary to securely store these documents, protecting intellectual property rights whilst enabling regulatory compliance.

The Industry Standard ("The SCF Industry Standard [IS] and SCF Supplementary Guidance [SG]") was developed by a cross-industry group including the Shipbuilders' Association of Japan (SAJ) and other organizations such as CANSI, CESA, KOSHIPA, SCA, ICS, INTERCARGO, INTERTANKO, BIMCO, OCIMF and IACS. It provides industry guidance relevant to new shipbuildings, substantial repairs, conversions and major modifications to the structure of bulk carriers and oil tankers and was noted at the 96th session of the IMO Maritime Safety Committee (MSC 96) held in May 2016.

NKAC is certified according to the Information Security Management Systems (ISMS, ISO/IEC 27001:2013) etc. which are prescribed in the Industry Standard. The secured cloud-based system includes an intrusion prevention system, remote data protection and many other advanced security features. As an essential service for both shipowners and shipbuilders, today's application of IMO GBS is anticipated to spur increased demand.

Busan Metropolitan Government mapped out a comprehensive plan to underpin shipbuilding industry

Busan Metropolitan Government announced that it would map out a comprehensive plan to underpin shipbuilding industry in Busan on July 21 in a bid to address severe financial straits and employment uncertainty rampant in shipbuilding industry and to mitigate recession in local economy.

This comprehensive plan was designed to embrace desperate needs of enterprises by coming to grips with current situation where even blue-chip companies are pushed to the verge of bankruptcy in the aftermath of restructuring at large shipyards, court receivership of STX Shipbuilding & Offshore, and unwillingness of financial institutions to offer loans.

The comprehensive plan consists of 9 strategic tasks over the short-term, mid-term, and long-term, respectively. The policy measures aim to provide guarantee support through special funding for marine equipment manufacturers. Special funding support will be provided to excellent local marine equipment manufacturers - which have been facing difficulty in securing additional loans from financial institutions due to issues of credit loans and overdraft - with blanket guarantee offered by Busan Metropolitan Government irrespective of existing loans and ceiling of guarantee. Financial support will be provided to about 250 companies by the end of this year with loans worth KRW 500 million to existing companies and up to KRW 2 billion to companies that have receivables from STX.

This plan is expected to be of great help to related companies struggling to overcome current adversities and hardship. Moreover, Busan Metropolitan Government will provide support to marine equipment manufacturers seeking to open up export markets by promoting participation in exhibitions, while sending trade delegates to emerging markets such as Iran, India, Kazakhstan, etc., by earmarking KRW 470 million additionally for overseas marketing support.

Furthermore, Busan Metropolitan Government will expedite launch of site job creation support center and employment support center in Busan Chamber of Commerce and Industry and Noksan zone of Gangseo district which is home to many companies related to shipbuilding industry in an attempt to spur re-employment and job stability by facilitating the change of occupation, re-employment, and vocational training, etc., for the jobless.

The plan also includes multi-faceted coun-

termeasure against unemployment, including urgent financial support for families without employed parents (jobless families) that are unable to receive unemployment allowances and expansion of short-term job creation projects such as public works, etc., as part of effort to build social safety network for jobless families, in tandem with special survey of workers hired by 481 enterprises in shipbuilding industry and assignment of officials promoting communication.

An official from Busan Metropolitan Government said, "We will make utmost effort, concentrating all our capabilities to help reinvigorate local economy based on successful restructuring and industrial reform as envisioned by the comprehensive plan recently mapped out to provide special support to shipbuilding industry while providing practical support to local enterprises and workers facing difficulties."

부산시, '조선업 특별지원 종합대책' 마련

부산시는 지난 7월 21일 조선업의 극심한 자금난과 고용불안을 해소하고 지역경제 침체를 완화하기 위하여 부산지역 조선업 특별지원 종합대책을 마련한다고 밝혔다.

이번 종합대책은 대형조선사의 구조조정과 STX조선해양의 법정관리 여파, 금융권의 신규대출 거부 등으로 우량 기업조차도 도산의 위기에 직면할 수 밖에 없는 조선업의 현 실태를 면밀히 파악하고, 실질적으로 기업이 절실히 요구하는 사항을 최대한 반영하여 만들어졌으며, 단기, 중기, 장기 3개의 단계별 9개 전략과제로 이루어져 있다.

주요 지원 대책을 살펴보면, 조선기자재업체 특별자금 보증지원시책의 경우, 신용대출 및 한도초과로 현재 더 이상의 금융권 추가대출이 어려운 지역의 우수 조선기자재 업체를 대상으로 기존 대출과 보증한도와 관계없이 부산시가 전액 보증 지원하는 특단의 자금지원 대책으로, 기존업체는 5억원, STX채권 미회수 업체는 최고 20억원까지 연말까지 총 250여개 업체에 대하여 지원이 가능할 것으로 보고 있으며, 관련 업체들에게 직접적인 수혜이 되어 이 어려운 시기를 넘어가는 데 큰 도움이 될 것으로 기대하고 있다.

아울러, 이번 추경을 통해 4억7,000만원 해외마케팅 자금을 추가로 확보하여 이란, 인도, 카자흐스탄 등 신흥국 시장에 무역 사절단과 행회전시회 참가 등의 지원을 통해 조선기자재업체의 수출판로 개척을 적극 지원하고, 조선업체 밀집지역인 강서구 녹산지역과 부산상공회의소에 '현장일자리지원센터'와 '고용안정 특별지원센터'설치를 조속히 마무리하여 실직자의 전직과 재취업 알선, 직업훈련 등 근로자의 재취업과 일자리 안정을 적극 지원해 나갈 계획이다.

또한, 조선업계 481개사를 대상으로 근로자에 대한 특별 설문조사와 소통관 집중 배치하고, 실직한 가정의 사회안정망 확보를 위해 실업급여를 받지 못하는 취약계층 실직가정을 대상으로 긴급 생계자금을 지원하고 공공근로 등 단기 일자리사업 확대 등 다각적인 실업대책도 함께 담고 있다.

부산시 관계자는 "이번 조선업 특별지원 종합대책이 어려움을 겪고 있는 지역기업과 근로자들에게 실질적인 도움을 주고, 성공적인 구조조정과 산업개혁을 통해서 우리 경제가 다시 일어설 수 있도록 시의 모든 역량을 집중하여 지원에 최선을 다하겠다"고 밝혔다.

Testing & research center launched to build up competitiveness of marine equipment industry

Korea Marine Equipment Research Institute (KOMERI) held a ceremony on June 29 to celebrate launch of Advanced Performance Test & Research Center under its aegis, dedicated to building up competitiveness of shipbuilding and offshore industries.

Currently, shipbuilding and offshore industries are confronted with a challenge to develop futuristic technologies, such as energy-saving technology, contaminant reduction technology, etc., to preserve marine environment and prevent global warming. Particularly, various special complex performances have been increasingly required for marine equipment to accommodate changes in international regulations and industrial environment. The Advanced Performance Test & Research Center is expected to take on a central role in building an integrated support system capable of coping with such changes.

KOMERI established the Advanced Performance Test & Research Center with an investment of KRW 33.3 billion on a land covering a gross area of 17,861m^2 and total floor area of 8,626m^2 within Mieum R&D Hub Complex, Gangseo District, Busan Metropolitan City, which houses 6 test buildings and 1 research building.

The Advanced Performance Test & Research Center will carry out performance evaluation of equipment under simulated polar environment, thermal insulation evaluation of smart cabin, impact resistance and fatigue performance evaluation, etc.

In particular, the Advanced Performance Test & Research Center will provide testing & certification services nationwide to cope with Polar Code (Mandatory Code for ships operating in Polar waters) adopted by IMO (International Maritime Organization) under the umbrella of U.N. and slated to be made mandatory, restriction on underwater radiated noise for protection of marine ecosystem, regulations requiring mitigation of carbon

dioxide (CO_2) emissions from ships, etc.
Once the Advanced Performance Test & Research Center becomes operational in full scale, test cost saving worth KRW 59.8 billion is anticipated by 2018, along with import substitution effect worth KRW 1 trillion and 565 billion for marine equipment over the next 7 years.
An official from KOMERI said, "The Center was launched earlier than scheduled to help overcome crisis facing shipbuilding and offshore industries and reduce certification-related workloads that have piled up. We will speed up operation of equipments to provide one-stop testing and certification services to companies as best as we can."

조선해양 기자재 경쟁력 강화를 위한 시험 연구센터 개소

조선해양기자재산업 경쟁력 강화를 위한 한국조선해양기자재연구원 산하 '성능고도화 시험연구센터' 개소식이 지난 6월 29일 열렸다.
현재 조선해양산업은 해양 환경 보전과 지구온난화 방지를 위한 에너지 및 오염물질 저감 등과 같이 미래 지향적인 기술을 요구하고 있으며, 특히 국제 규제 및 산업 환경 변화로 조선해양기자재에 대한 다양한 특수 복합 성능을 요구하는 선박이 증가하고 있는 추세다. 성능고도화 시험연구센터는 이러한 변화에 대응할 수 있는 통합 지원체계 구축에 있어 구심점 역할을 할 것으로 기대된다.
한국조선해양기자재연구원은 총사업비 333억을 투입해 1만7861㎡의 부지에 연면적 8626㎡, 시험동 6개, 연구동 1개를 부산 강서구 미음 R&D 허브단지 내에 성능고도화 시험연구센터를 구축했다.
성능고도화 시험연구센터는 극지 환경 구현 기자재 성능평가, 스마트 선실 단열평가, 내충격 피로 성능평가 등을 시험한다. 유엔 산하 국제해사기구(IMO)가 강제 시행을 예고하고 있는 극지해역 운항선박 안전기준과 강제화 추진, 해양생태계 보호를 위한 수중 방사소음 규제, 선박의 이산화탄소 배출저감 규제 등에 대응해 국내에서 시험인증서비스를 실시하게 된다.
이 센터가 본격 가동되면 2018년까지 총 598억원의 시험 비용절감 효과 및 7년간 1조 5,650억원의 기자재 수입대체 효과를 가져올 것으로 기대된다.
한국조선해양기자재연구원 관계자는 "어려운 조선해양산업 위기극복과 공인 인증 적체 해소를 위해 당초 계획보다 앞당겨 센터를 조기구축 하였고, 구축된 장비를 조속히 가동하여 원스톱 시험인증 서비스를 기업들에게 제공할 수 있도록 총력을 기울이겠다"고 밝혔다.

KR to provide technical support to shipping companies for cost reduction

Ship owners are mulling over the options of ordering newbuilt vessels of optimal size or retrofitting their existing fleets to accommodate recent changes in market conditions, along with changes in optimal size of vessels that can pass through the newly expanded Panama Canal, and to cope with declining efficiency of vessel currently operational.
Korean Register of Shipping (KR) recently announced that it was proceeding with feasibility study on a project retrofitting 8,600 TEU containership into a 10,000 TEU-class vessel in collaboration with Hyundai Ocean Service.
This feasibility study investigated into traditional methods for increasing ship size based on length extension and recent method for increasing ship width, and based on the two different methods, analyzed operating speed, fuel efficiency, resilience, strength, retrofitting costs and period, anchoring performance, etc.
The results showed that both methods led to a reduction of operation speed by about 4% after retrofitting. Vessels with length extension turned out to be more advantageous by about 1 knot, compare to those with width extension. For fuel efficiency, vessels with length extension were more advantageous by about 5% based on fuel consumption per TEU transported.
For resilience and strength, vessels with width extension increased resilience and did not need additional reinforcement almost at all. By contrast, vessels with length extension needed much reinforcement on deck and bottom due to increased external bending force on hull. Cargo carrying capacity increased by up to 30% in vessels with width extension and by up to 15% in vessels with length extension.
Retrofitting with width extension took more than double the time taken to retrofit with length extension. Costs incurred from retrofitting were similar for both options. No significant difference was observed in steering performance, anchoring performance, etc.
An official from KR said, "Retrofitting a vessel costs only about 15% of the price for a newbuilt vessel. Moreover, retrofitting period is far shorter than newbuilding period, allowing rapid response to changes in international shipping environment. So, retrofitting can be a good alternative for ordering newbuilt vessels. KR will make utmost effort in providing technical support to help beef up competitiveness of shipping companies."

한국선급, 선사의 투자비 절감 노력에 기술 지원 나서다

최근 시장상황 변화 및 파나마운하 확장으로 인해 선박의 최적크기가 변경되고 기존의 운항중인 선박의 운항효율이 저하됨에 따라 선주사들은 최적크기의 선박을 신규로 발주하거나 보유하고 있는 선박을 개조하는 방안을 검토하고 있다.
한국선급(KR)은 최근 현대해양서비스와 공동으로 8,600TEU 컨테이너선을 10,000TEU급으로 개조하는 프로젝트에 대한 타당성 연구를 수행하고 있다고 밝혔다.
이번 연구는 선박의 길이 연장을 통해 크기를 증가하는 전통적인 방법과 폭을 늘리는 최신의 방법, 두 가지 옵션을 토대로 운항 속도, 연비, 복원성 및 강도, 개조 비용 및 기간, 계선성능(Anchoring) 등의 항목을 분석했다.
그 결과 운항 속도의 경우 두 옵션 모두 개조 전후

로 4% 정도 감소한 가운데, 길이연장 개조가 폭을 늘리는 개조에 비해 약 1노트 유리했으며, 연비의 경우 단위 TEU 운송 연료소모량 기준으로 길이연장 개조가 약 5% 유리한 것으로 나타났다.
복원성 및 강도의 경우 폭을 늘리는 개조는 복원성이 향상되었고 추가보강 또한 거의 불필요한 반면, 길이연장 개조는 선체 굽힘 외력이 증가하여 갑판과 선저부에 많은 보강이 필요한 것으로 나타났고, 화물운송능력은 폭을 늘리는 개조가 최대 30%, 길이연장 개조가 최대 15% 증가가 가능했다.
개조기간은 폭을 늘리는 개조가 길이연장에 비해 2배 이상 소요되는 것으로 나타났고, 비용은 두 옵션이 유사했다. 그 외, 조정성능 및 계선성능 등도 큰 차이가 없는 것으로 나타났다.
한국선급 관계자는 "선박 개조공사에 드는 비용은 신조선가의 약 15% 정도에 불과하고, 공사기간 또한 월등히 짧아 급변하는 국제해운 환경에 신속하게 대응할 수 있어서 신조 발주의 좋은 대안이 될 수 있다"며 "한국선급은 앞으로도 선사의 경쟁력 향상을 위한 노력에 도움이 될 수 있도록 기술적인 지원에 최선을 다 하겠다"고 말했다.

HHI Teams up with Partners to Establish Smart Ship Eco System

Hyundai Heavy Industries (HHI) announced on July 6 that is the signing of a Memorandum of Understanding for Creating an Eco System for Smart Ships with SK Shipping, Intel, Microsoft, the Ulsan Center for Creative Economy & Innovation (UCCEI) and the Daejeon Center for Creative Economy & Innovation (DCCEI).
Under the MOU, HHI and its partners will join forces to help domestic small and medium-sized ICT companies to develop "17 Ship Service Software," that meet the needs of shipowners for safe ship operation and improved crew well-being.
The Ship Service Software that is planned to be developed and applied to smart ships by 2019 will enable ballast tank inspection, remote medical treatment services for crews, virtual reality training, automatic voyage information reporting, and maintenance for key equipment. HHI and SK Shipping will provide technological mentoring services and smart ship platforms for the to-be-developed software while UCCEI and DCCEI hold briefing sessions on technology demand for shipbuilders and shipping liners to encourage the participation of the ITC companies.

An HHI official said, "The Korean shipbuilding industry has developed on the back of the advanced manufacturing technology but now is the time for us to shift our focus to differentiated ship service technologies. We see that customized and value-added software will play a role in reviving the industry."
In May this year, HHI and Accenture jointly unveiled OceanLink™, its version of smart ship, for the shipbuilding, shipping, and onshore-logistics sectors. With a network of sensors and analytics software, shipowners can monitor a ship's status and condition in real-time and have at their disposal a wide range of ship operation information including weather, location, and onboard equipment and cargo status data.

현대중공업, 고객 서비스 강화 위해 글로벌 기업들과 협력

현대중공업은 지난 7월 6일 울산대학교 국제관에서 열린 울산창조경제혁신센터 개소 1주년 기념행사에서 SK해운, 인텔(Intel), 한국 마이크로소프트(Microsoft), 울산창조경제혁신센터, 대전창조경제혁신센터 등 5개 기업 및 기관과 '스마트십(Smart Ship) 서비스 생태계 조성 공동 협약(MOU)'을 체결했다.
이번 협약으로 5개 기업 및 기관은 중소ICT(정보통신기술)기업들이 선박 안전 운항과 업무 효율, 선원 복지 등 선주사의 니즈를 반영한 '선박 서비스 소프트웨어'를 개발할 수 있도록 기술 및 컨설팅, 스마트 장비 등을 지원한다.
중소ICT기업들은 원격 선원 진료, 가상현실교육, 선박 주요 장비 유지보수 등 17개 소프트웨어를 개발해 오는 2019년까지 스마트십에 적용할 예정이다.
우선, 현대중공업과 SK해운은 이들 중소ICT기업에 소프트웨어가 구현될 수 있는 스마트십의 플랫폼(Platform)을 제공하고, 기술 멘토링과 실증 설비(Test Bed) 지원 등을 통해 개발 제품의 완성도를 높인다는 계획이다. 인텔과 마이크로소프트사는 개발 소프트웨어에 필요한 각종 스마트 기기를 중소기업에 무상으로 지원하는 한편, 기술 컨설팅도 펼치게 된다.
또 울산창조경제혁신센터와 대전창조경제혁신센터는 더 많은 중소기업들이 스마트십 사업에 참여할 수 있도록, 조선·해운사의 기술 수요 설명회, 아이디어 상담 등의 자리를 마련해 스마트십 생태계 기반 조성에 힘쓸 예정이다.
현대중공업 관계자는 "우리나라 조선업은 지금까지 선진적인 제조 기술을 기반으로 발전했지만 앞으로는 차별화된 선박 서비스 기술을 전략으로 내세울 전망"이라며, "각종 소프트웨어로 선박의 부가가치를 높이면 조선업의 재도약을 이끌어낼 수 있을 것"이라고 말했다.
한편, 현대중공업은 지난 5월 원격으로 선박의 기관 상태와 운항정보를 모니터링하는 차원을 넘어 탑재하는 소프트웨어에 따라 충돌 회피, 최적 운항 등 다양한 기능을 구현할 수 있는 차세대 스마트십인 '오션링크(OceanLink)'를 출시한 바 있다.

KOGAS helps reinvigorate domestic shipbuilding industry

Korea Gas Corporation (KOGAS) opened up the way for domestic shipyards to carry out regular dock repair on board LNG carriers from July. Regular dock repair means onshore inspection and repair performed twice every 5 years on operational vessels.

Previously, KOGAS commissioned regular dock repair of LNG carriers to overseas shipyards. Now, KOGAS plans to allow regular dock repair to be carried out by domestic shipyards in a bid to help domestic shipbuilding industry break out of recession.

Specifically, KOGAS will entrust domestic shipyards with regular dock repair on board 2 LNG carriers out of 21 units this year and will earmark approximately KRW 40 billion for regular dock repair after consultation with ship operators on expansion of applicable vessel categories.

Additionally, KOGAS plans to increase ratio of localized components when placing orders for newbuild LNG carriers in an attempt to add vitality to domestic shipbuilding industry.

한국가스공사, 국내 조선업에 힘 싣는다

한국가스공사는 7월부터 LNG수송선의 정기입거수리를 국내 조선소에서도 수행할 수 있게 했다. 정기입거수리는 운항중인 선박을 5년에 2회 정기적으로 육상에서 검사 및 수리하는 것을 뜻한다.

한국가스공사는 그 동안 수송선 정기입거수리를 해외 조선소에 위탁해왔으나, 최근 국내 조선산업의 불황 탈출을 지원하기 위해 이 업무를 국내에서도 가능하게 할 계획이다.

한국가스공사는 우선 금년 중 LNG수송선 21척 중 2척의 정기입거수리를 국내 수리조선소에서 수행하도록 하고 향후 운영선사와 대상선박 확대를 협의해 약 400억 원의 수리비용을 집행할 예정이다. 또한, 향후 신규 LNG선 발주시 부품 국산화율을 높여 국내 조선산업에 활기를 불어넣을 예정이다.

New Ecofix filler coat reduces the cost of rudder repairs

With an increasing trend for thruster and rudder manufacturers finishing their products with self-cleaning protective hard coatings, Antwerp headquartered Subsea Industries has introduced a filler coating for use with its award-winning Ecoshield hard coat system.

Ecofix, specifically formulated to provide shiprepairers and Original Equipment Manufacturers with a cost-effective solution for the repair of corroded or pitted steel surfaces, returns the thruster or rudder to its original state prior to touching up the repaired area with Ecoshield.

Boud Van Rompay, Executive Director of Subsea Industries, said "We are seeing an increasing number of propulsion and steering equipment suppliers apply tough hard coatings to their equipment for maximum protection against cavitation and abrasion damage, both of which can lead to widespread corrosion if conventional coatings fail."

"When a rudder or other piece of underwater gear has not been properly protected, the surface will become corroded. Cavitation damage can cause severe pitting and the steel needs to be restored to its original shape with a smooth surface prior to recoating,"

Subsea Industries' Ecofix is a cost-effective solution for the repair of corroded or pitted steel surfaces

With extraordinary bonding and hardness properties, Ecofix is an effective alternative to metal facing or very expensive fillers. And because it is part of the Ecospeed/Ecoshield family, it is non-toxic and extremely durable.

Since Ecofix uses the same basic resin as Ecoshield, the coating can be applied just one hour after applying the filler.

"Ecoshield is the only coating known to fully protect rudders and thrusters from all cavitation damage for the remainder of a vessel's service life. Now with the launch of Ecofix, the repair work needed on the underlying steel can be done effectively and economically," said Van Rompay.

Gibdock's growing offshore status underlined by Solstad return

Gibraltar's Gibdock shipyard has completed an extensive package of work on Solstad Shipping's Normand Cutter. The 127m long, 10,979grt construction support vessel (CSV) left the yard on June 29th following a 22-day drydock programme, which included a comprehensive overhaul of its entire propulsion system.

Norway-based Solstad has become a regular Gibdock customer, entrusting the yard with work on a number of high-tech offshore vessels over the past decade. The 2001-built Normand Cutter is in fact a repeat visitor to the yard, having previously docked at Gibdock in April 2011 for its last 5-year special survey.

Gibdock managing director, Richard Beards, said "We are delighted that such a well-respected, quality operator as Solstad has decided to come back to us once again. Their continued support is much valued and appreciated and this project further demonstrates that we have become the 'go to' yard for offshore vessel work in the region."

The scope of work commissioned by Solstad for Normand Cutter included maintenance and repairs to key components of its propulsion system. Its five Brunvoll thrusters were removed and transported to the yard's workshops, where they were stripped down and overhauled before being returned to the ship and reinstalled. Similarly, the vessel's two tailshafts and CPP propeller hubs were withdrawn and overhauled, as were the two rudders. The rudder tiller flaps were removed, machined and refurbished as part of this process. In addition, the two gearboxes, port and starboard, were also overhauled.

Gibdock has secured a number of offshore vessel projects this year, despite the challenging market conditions in the offshore sector. At the time of Normand Cutter's departure, three more offshore vessels were in the yard.

Alfa Laval PureSOx Global prepared to comply with a 0.5% sulphur fuel cap

Alfa Laval is ready to help customers meet a global 0.5% sulphur fuel limit, no matter what the outcome of the MEPC70 meeting. The new Alfa Laval PureSOx Global is part of a major expansion of the PureSOx platform that will be released at SMM in Hamburg.

Alfa Laval launched the original Alfa Laval PureSOx far in advance of today's Emission Control Area (ECA) legislation. In the same way, the company is prepared to guide customers to 0.5% fuel sulphur compliance long before such a limit is implemented. Whether the decision is taken at October's MEPC70 meeting or postponed until 2025, Alfa Laval has a solution in place.

At this year's SMM exhibition, a major expansion of the PureSOx platform will be presented at Alfa Laval's stand (Hall A1, Stand A1.226). PureSOx Global will be introduced for 0.5%S compliance, taking its place beside the existing PureSOx ECA system for 0.1%S compliance. In addition, there will be a PureSOx Flex system offering compliance at both levels.

"Scrubbers are the proven route to compliance, whereas the costs and infrastructure associated with LNG remain uncertain," said René Diks, Manager Marketing & Sales, Exhaust Gas Cleaning. "For owners or operators of a big fleet, now is the time to start investigating options and to consider gaining experience with a first scrubber installation."

The current PureSOx technology – now operating in over 70 proven systems, including the original pilot from 2009 – will continue to be used throughout the expanded PureSOx platform. Likewise, the PureSOx Global, PureSOx Flex and PureSOx ECA versions will all be available in open-loop, closed-loop and hybrid arrangements, with either U-design or

inline I-design scrubbers. All versions are intended to provide payback after a maximum of three years, even considering a smaller difference in price between 0.5% and 0.1% fuels compared to the difference between 0.1% fuel and HFO.

Prospects for global oil & gas markets

- Oil prices on downward trend, sliding to USD 50 per barrel range
- Global companies poised to make forays into Iran in full scale

Oil prices fell to the lowest annual level in the beginning of this year, but since then, have continued their upward trends in the wake of agreement to freeze oil production among oil producing countries and reduction of U.S. oil production. Natural gas prices have also been in downward trends and dipped below USD 2 per mmBtu in mid February which was an all-time low in 16 years. The Energy Information Administration (EIA) predicted that average oil price would slide by USD 14.07 per barrel (p.b.) year-on-year to USS 34.60 p.b. in 2016.

Global oil and gas market has witnessed full-fledged advancement of multinational oil companies into Iran after economic sanctions against the country was lifted. Iran plans to expand oil production and exports with an injection of USD 185 billion into its domestic oil industry by 2020.

As many as 52 onshore and offshore mining sites in Iran have become the arena for fierce competition among countries including France, Russia, China, Japan, etc.

Trends of energy prices

Oil price dipped to the lowest annual level of USD 22.83/bbl (Dubai oil) in January this year. Amid mounting concern about supply glut arising from lifting of economic sanctions against Iran, prices of Dubai oil hit an all-time low to USD 22 per barrel in 13 years during mid January. However, oil prices began to rebound in the midst of growing expectations for reduction of oil production target among OPEC members.

Oil prices recovered to USD 30 per barrel range amid heightening expectations for mitigation of supply glut in the wake of agreement among oil producing countries since last February. The upward trend in oil prices continued in March. However, oil prices slid again as Saudi Arabia was unlikely to join in the proposed production freeze. Fortunately, oil prices recovered to USD 40 per barrel range due to supply disruption in major oil producing countries and constant reduction of oil production in the United States despite recent collapse of talk to freeze oil production among oil producing companies.

Natural gas prices have continued downward trend due to supply glut, weak demand, etc., in the aftermath of sustained low oil prices in the beginning of this year. Natural gas prices slid below USD 2 per mmBtu last February and hit an all-time low in 16 years last March. Prices of other major energy resources have also been in downward trend. Prices of bituminous coal have dipped to USD 50 per ton range due to sluggish global demand, high stock level, etc. Uranium prices have also been sliding since October last year due to weak demand, and dipped below USD 30 per pound range this year.

Outlook for oil and gas prices

The Energy Information Administration (EIA) predicted that average oil price would slide by USD 14.07 per barrel (p.b.) year-on-year to USS 34.60 p.b. in 2016.

The EIA also predicted that global demand for oil would increase by 1.16 million b/d (barrels per day) year-on-year to 94.86 million b/d this year and rise by 1.33 million b/d year-on-year to 96.19 million b/d in 2017, spurred by the upturn in net income as a result of low oil prices. In the oil market, demand for oil is expected to increase by about 1 million b/d year-on-year to 48.37 million b/d in non-OECD (Organization for Economic Cooperation and Development) member countries and to edge up by 160,000 b/d year-on-year to 46.49 million b/d in OECD member countries this year.

Meanwhile, global oil supply is expected to increase by 510,000 b/d year-on-year to 96.27 million b/d in 2016 and to increase by 340,000 b/d year-on-year to 96.61 million b/d in 2017. In OECD member countries, oil production is expected to fall by 500,000 b/d year-on-year to 26.23 million b/d in 2016 amid the decline in production of shale oil in the North America. This year, oil supply by OPEC is expected to increase by 920,000 b/d year-on-year to 39.10 million b/d in light of the failure to reach an agreement among OPEC members on reduction of production targets and policies focusing on maintaining market share.

The EIA scaled backed its forecast of international oil prices for 2016 significantly compared to the previous month, considering persistent supply glut arising from resumption of Iran's crude exports after the lifting of economic sanctions, maintenance of current production level by OPEC members.

(Unit: $/bbl)

Basis oil type	2015	2016				
	Average	1/4	2/4	3/4	4/4	Average
WTI	48.67	33.35	35.00	35.00	35.00	34.60
Brent	52.32	33.89	35.00	35.00	35.00	34.73

Table 1. EIA's forecast of international oil prices (April 2016)

In the meantime, the EIA predicted that the U.S. natural gas prices (Henry Hub) would edge down by USD 0.46 per mmBtu from the previous month to USD 2.25 per mmBtu in 2016. This year, the U.S. natural gas consumption will rise by

970 million cf/d (cubic feet per day) (1.3%) year-in-year to 76.24 billion cf/d, fuelled by the rise in demand for industrial and power generation applications despite decline in demand for home and commercial applications.

Diminishing energy production in the United States

The U.S. oil and gas production is expected to decrease unavoidably this year as large-scale investments are diminishing amid sustained low oil prices. The EIA predicted that the U.S. oil production will slide to 8.7 million b/d in 2016, which represents a decrease by about 7.5% from the previous year's level of 9.40 million b/d, in the aftermath of persistent decline in oil prices. Reduction of oil production is expected to be driven by the decline in large-scale investment amid prolonged fall in oil prices in 2016, although a 10% increase was witnessed last year in oil production fuelled by improvement of production efficiency even in the midst of plunge in the drilling operations.

The U.S. oil production has continued downward trend since May 2015 with oil drilling operations plunging to an all-time low after hitting the trough in December 2009. Particularly, oil production from the Bakken (comprising 12% of all oil produced in the United States), one of the 3 largest shale producers in the United States, has also been falling.

Bakken oil production slid by 75,000 b/d (barrels per day) year-on-year to an all-time low of 1.15 million b/d in December 2015, decreasing by about 20,000 b/d from the previous month. As a result, drilling demand in the United States has plummeted by 70% over the last 1 year amid prolonged decline in oil prices. Industry experts predict that the downward trend of Bakken oil production is likely to continue as the breakthrough point is above current oil price level.

Financial strains in Middle East amid sustained low oil prices

Major oil producing countries of Middle East have seen their credit ratings fall due to worsening fiscal deficits in the aftermath of sustained low oil prices. S&P downgraded the credit rating of Saudi Arabia two notches to A- from A+ out of concern about worsening fiscal deficits and changes in foreign exchange policies. Meanwhile, S&P slashed the credit rating of Oman to BBB-, the lowest level. Despite deteriorating fiscal deficits, major oil producing countries of Middle East are attempting to seize opportunities created by low oil prices, such as lower service fees including lower drilling rates, etc., in order to expand their market shares.

The number of oil drilling rigs operational around the globe stood at 1,270 units in the beginning of this year, which is a decrease by 935 units over the last 1 year. Particularly, North America has seen the number of operational oil drilling rigs plunging by 725 units, the largest decline. Latin America and Asia Pacific region has seen the number of operational oil drilling rigs falling by 103 units and 39 units, respectively. However, the number of oil development drilling rigs rather increased to 402 units in February 2016 from 395 units in February 2015. Kuwait and UAE plans to increase oil production capacity to 1.3 million b/d over the last 5 years with an investment of USD 100 billion each. KPC, a state-run enterprise in Kuwait, signed 3 engineering contracts worth USD 5.7 billion in all to develop Jurassic gas field. Moreover, UAE is also mulling over investment to increase oil production capacity of Adma-Opco site to 900,000 b/d from current 600,000 b/d.

Iran advancing into upstream industry in full scale

Iran is poised to increase both production and exports of oil with an injection of USD 185 billion into its domestic oil industry by 2020. Specifically, Iran has mapped out a plan to invest USD 85 billion in upstream segment, USD 10 billion in downstream segment, USD 80 billion in petrochemical sec-

tor, and over USD 10 billion in natural gas sector. If the plan is realized, oil production is expected to recover to pre-sanction level of 4.3 million b/d in upstream segment within the next 2 to 3 years and to increase to over 5 million b/d within the next 5 to 6 years.

As Iran has maintained oil production cost at a low level, creating profits even at current oil price level, Iran has taken up slightly skeptical stance on negotiations with oil producing countries on reduction of production targets in the face of prolonged fall in oil prices.

Specifically, Iran plans to supply 100,000 b/d to Italy's state-run company Eni, 60,000 b/d to refining company Saras, and 160,000 b/d to French Total. Attention of global oil companies is focused on the 52 onshore and offshore mining sites in Iran which are slated for allocation at the end of 2016. Iran, which holds vast oil reserves and enjoys low production cost, has attracted attention from international oil companies since economic sanction was officially lifted on January 16, 2016, in 37 years after its imposition. Iran's oil production cost remains as lows as USD 5 to 10 per barrel in offshore mining sites and USD 5 in onshore mining sites, suggesting that those mining sites have adequate feasibility for development even when oil prices stay in USD 30-per-barrel range. However, oil production costs are known to be high in the frontier area adjoining the border between Afghanistan and Pakistan, oil exploration site on the Caspian Sea and offshore gas fields.

Japan expands investment in energy

Japan recently unveiled a government support to cope with hikes in energy prices and ensure energy security amid prolonged decline in oil prices. JOGMEC (Japan Oil, Gas and Metals National Corporation) set out a policy to provide support for investment and guarantee necessary to secure mining rights and expand support for exploration projects that involve high risks in a bid to better cope with future hikes in prices of resources. Specifically, JOGMEC will invest up to 3 trillion yen (600 yen annually) to underpin investment and guarantee for overseas resource exploitation projects to be carried out by private-sector over the next 5 years.

Meanwhile, Inpex, a public-private partnership, is participating in major projects for development of oil fields in Abu Dhabi, including Adma-Opco, Zadco, Adco, etc. Moreover, government, financial institutions, and oil companies are making multi-faceted efforts to renew Adma-Opco mining right.

Particularly, Japanese companies backed by government support are also expanding overseas oil production and investment. Japanese companies, such as Inpex, Japex, etc., have also boosted overseas oil production in 2015. Inpex increased overseas oil production by 41% year-on-year to 338,000 b/d, driven by production increase in Middle East and Africa, in the first to third quarter (between April and December) of fiscal year 2015.

The onshore mining right, acquired by Inpex in April 2015 over Adco in UAE, has been instrumental very much in boosting production significantly. As a result, Inpex acquired a 5% stake in the mining equity, thus raising oil production to 80,000 b/d. Moreover, Japex increased overseas oil production by 2.3 times (30,000 b/d) compared to same period of previous year, fuelled by increase in oil production from Gharraf oil field of Iraq. In adition, Inpex plans to proceed with such key projects as Ichthy LNG project in Australia and Abadi LNG project in Indonesia.

China increases investment in overseas assets

Geo-Jade Petroleum, the largest independent oil company of China, acquired Canada-based Banker Petroleum at USD 440 million this year. Geo-Jade Petroleum, established in 1984, made inroads into upstream segment by purchasing the exploration-related assets from Kazakhstan in 2014 and is using the latest acquisition as a springboard to expand into Eastern Europe. Banker Petroleum is currently producing approximately 20,000 b/d of oil from Patos-Marinza and kucova-Arreza oil fields in Albania and also operating Puspokladany exploration mine sites (85%) located in Pannonian Basin of Hungary.

Meanwhile, ENN Ecological Holdings, one of China's largest

LNG suppliers, advanced into LNG production market by acquiring 11.7% stake in Santos of Australia at USD 750 million. ENN Ecological Holdings plans to participate in projects throughout whole processes ranging from production to supply of LNG with an aim to increase operational efficiency and directly introduce the produced LNG to reduce related costs. Santos, the third largest oil company in Australia, is currently participating in LNG projects such as LNG project in Papua New Guinea (13.5%) and Gladstone (30%, holding the operation right) in Australia and producing 2 million tons of LNG annually.

South East Asia became a magnet for investment

Petronas of Malaysia will proceed with investments in upper stream segment for the next 5 years despite a 56% year-on-year decrease in its net income which reached USD 5 billion in 2015 amid prolonged decline in oil prices. Specifically, Petronas of Malaysia put side USD 15 billion for investment this year and plans to invest USD 80 billion in upper stream segment over the next 5 years. In November last year, Petronas invested in key projects including LNG Train 9 project in Malaysia and Pacific NorthWest LNG (PNW LNG) project in Canada.

Meanwhile, Indonesia-based Pertamina increased the ratio of capital investment by 21% year-on-year to USD 5.31 billion for 2016, out of which more than 70% will go to upper stream segment.

Pertamina set a goal to raise oil production by 10% year-on-year to 340,000 b/d in 2016 and achieve production buildup to 560,000 b/d of oil by 2025. Thailand-based PTT has registered USD 870 million in net income in 2016 which represents a 54% decrease year-on-year in the face of sustained low oil prices. Nonetheless, it set side USD 1.4 billion for investment, a 31% increase from the previous year, and plans to invest USD 8.2 billion by 2019.

Reference

The Export-import Bank of Korea

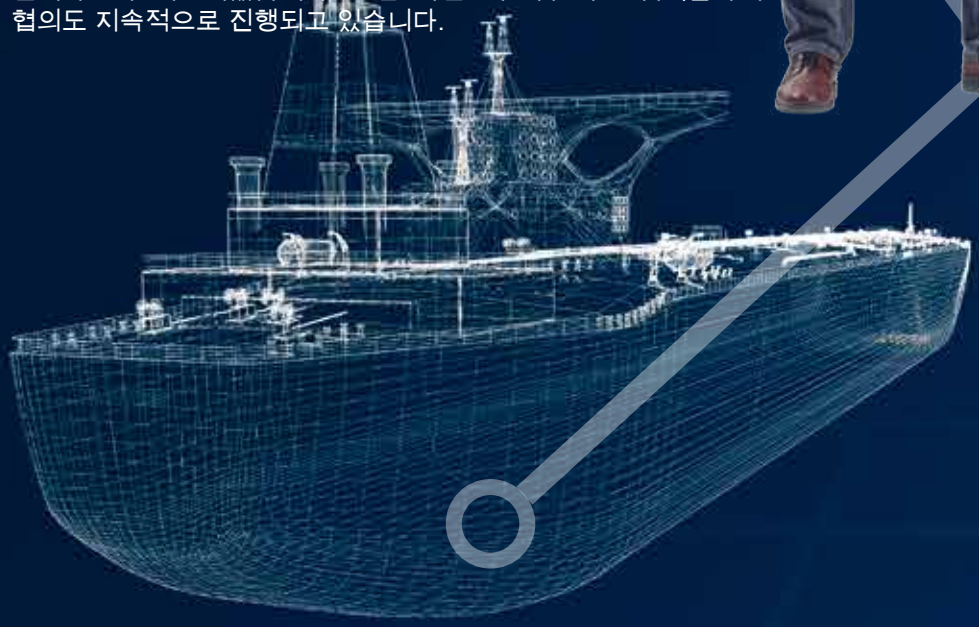
안정적인 공급을 보장합니다

곧, 아마 오래지 않아, IMO(국제해사기구) 평형 수(水)조약 (Ballast Water Convention)이 발효될 것이며 선박 선주들은 평형 수(水) 처리 시스템을 의무적으로 설치 해야만 할 것입니다.

이러한 사실은 조선소로부터 시스템 공급자에 이르기까지 모든 관련자들에게 문제가 될 수 있습니다. 그러나 스웨덴의 파워산업전문글로벌 제조업체인 KraftPowercon사는 평형수 처리 시스템이 중단 없이 생산되어 가동될 수 있도록 하기 위해 공인된 전원 공급 업체로서 고객이 필요로 하는 대규모 예상 수요를 충족시킬 수 있는 생산 설비를 이미 갖추고 있습니다. 회사 자체 생산 및 조립 라인 뿐만 아니라, KraftPowercon사는 부품공급 업체가 공급하는 모든 부품이 안정적으로 공급받기 위해 부품공급업체들과 긴밀한 협조 하에 필요한 모든 조치를 취해 놓았습니다.

스웨덴에 있는 KraftPowercon의 생산 공장은 새로운 생산 라인에 투입될 수 있는 숙련된 직원과 필요한 생산량을 증산하는 데 필요한 모든 공간, 설비 그리고 인력을 충분히 갖추어 놓고 있습니다. 뿐만 아니라, 더욱 증가한 많은 생산이 필요할 경우, 상하이 소재 KraftPowercon사의 ISO 9001 인증 공장으로부터 중국 현지 및 국제 시장 수요를 충족시킬 수 있습니다. “우리는 평형수시스템에 필요한 (ballast) 대량주문을 충족시키기 위해 필요한 모든 것을 갖추고 있습니다” 라고 생산 매니저인 Sefedin Harbas씨는 언급하고 있습니다. “ 현대적인 공장, 훈련된 직원, 절약형의 유연한 생산 및 효과적인 추적 시스템이 그것입니다.”라고 그는 덧붙였습니다.

KraftPowercon사는 2015년에 창립 80주년을 맞이한, 오랜 역사를 지닌 회사입니다. 이러한 오랜 경험과 역사를 바탕으로, KraftPowercon 사는 전기 화학 평형 수 처리 시스템에 없어서는 안 될 필수적이고 신뢰할 만한 양질의 전류를 공급하는 정류기의 FlexKraft계열의 정류기를 개발하였습니다. 이러한 시스템의 전해 조에 일정한 직류 (DC)를 공급하지 못할 경우, 시스템은 제대로 된 살균성분을 생산 할 수가 없게 되며 시스템은 작동하지 않게 됩니다. KraftPowercon 사 정류기의 신뢰성은 다른 산업 분야에서 매우 다양하게 적용되고 있다는 사실로 입증되었으며, 이러한 최고 수준의 명성은 DeNora Water Technologies, ErmaFirst, OceanSaver 및 RWO사와 같은 평형 처리 제조업체들이 그들 시스템에 사용하기 위해 본 정류기를 선택하도록 매료시켰습니다. 또한 다른 시스템 제조 업체들과의 협의도 지속적으로 진행되고 있습니다.



당신은 알고 계시나요?

KraftPowercon 은 최대 **48,000암페어 및 90,000 볼트** 전압까지 사용 가능한 스위치 모드 디자인(SMPS)의 표준 DC 정류기를 공급할 수 있습니다.

당신은 알고 계시나요?

KraftPowercon 은 1935년 이래 **백 만** 대 이상의 정류기/전원 공급 장치를 설치하여 왔습니다.

우리는 당신이 아무것도 할 수 없는 상황에 이르게 놔두지 않을 것입니다

당신이 어디에 있건, FlexKraft 해양 위성 솔루션과 글로벌 서비스 네트워크로 KraftPowercon은 늘 당신 곁에서 서비스할 것입니다.

KraftPowercon Sweden의 평형수시템파워사업 부문 리더인 Lennart Hansson 은 다음과 같이 말하고 있습니다. “선박 업주들은 여러 공급 업체가 제시하는 처리 시스템을 접할 수 있습니다. 하지만 그 핵심 부품들이 신뢰할 만하며 필요 시 손쉽게 구할 수 있는지를 인식하는 것이 필수적입니다.”

FlexKraft 정류기는 기존 시스템 대비 많은 장점을 갖고 있는데, Hansson은 다음과 같이 설명하고 있습니다. “이 제품은 레고 블록처럼 조립됨으로써 완성된 하나의 스텍 및 레벨을 이루어 거의 모든 설치배열에 맞춰질 수 있는, 단일 표준 모듈 중심으로 설계되고 구축된 소형의 모듈 형 시스템입니다.”

이러한 모듈은 형식 승인 기관에서 어떠한 신규 또는 변경 요청이 있을 때 충족시키기 위해서 재구성되거나 추가될 수 있다고 Hansson은 말합니다. 가장 중요한 것은, 개별 모듈에 문제가 발생할 경우, 평형수 처리가 완료될 수 있도록 시스템이 전류를 계속 공급하는 것을 보장해 주는 내장형 독립분할시스템 특성을 갖고 있는 점입니다. 평형 수(水)처리장치에 적용하기 위해 개발된 FlexKraft 모듈은 이미 구축된 신뢰할 만한 시스템의 선박평형수처리장치 만을 위한 버전입니다. 본 모듈이 공급된 평형 처리 시스템의 형식 승인 절차에서, 그리고 독립적으로, FlexKraft 모듈 시스템은 테스트를 거쳤으며 DNV-GL, LR, KR의 해양 기준에 따라 승인되었고, 또한 IACS E10 와IMO G8 요구 조건을 충족시켜 줍니다.

“FlexKraft 시스템의 다른 용도가 많아짐에 따라, KraftPowercon 사는 거점 지역에 자체 서비스 센터를 설립했으며 글로벌 네트워크 파트너를 확대시켜 나가고 있습니다”라고 Hansoon은 말합니다. “ 또한 저희는 항상 서비스와 지원을 위한 모든 준비가 되어 있기는 하나, 본 시스템의 가장 아름다운 특징이라면 개별 모듈을 변경하는 것이 매우 쉽다는 점이며 따라서 선상에 있는 전기 기술자가 단 몇 분만에 해낼 수 있다는 점입니다. 정확히 이 내용을 보여주는 유 튜브 동영상을 갖고 있습니다.” 라고 그는 말합니다.

당신은 알고 계시나요?

1983년도에, KraftPowercon 스웨덴에서는 **세계 최초로** 고 전류 애플리케이션을 위한 새로운 스위치 모드 DC 정류기(SMPS)를 도입했습니다.

Lennart Hansson
lennart.hansson@kraftpowercon.com
+46 706 97 97 29

Eunkee Kim
eunkee.kim@kraftpowercon.com
+82 -10-8792-4052

DSME turns itself into state-of-art smart shipyard

Daewoo Shipbuilding & Marine Engineering (DSME) is adding momentum to its effort for normalization of business with better productivity, timely delivery and better quality, ramping up its competitiveness.

DSME successfully developed IoT (Internet of Things) smart tag enabling supply and management of necessary materials in the right place at the right time.

Usually, much time and manpower are required to spot and deploy various materials/production tools situated at different locations within shipyard. To build a very large crude carrier (VLCC) with a capacity of 300,000 tons, as many as about 100,000 pieces of steel plates are used, along with millions of materials and tools brought into production site of Okpo shipyard covering an area of 4.6 billion ㎡ which is about 1.5 times larger than the area of Yeouido, a large island in the Han River of Seoul, including various outfitting devices (pipes, mechanical equipment, etc) to be installed inside the vessel. As a result, there has been a mounting demand for development of systematic material supply and management systems at shipyards since long before.

To meet such demand, smart tag developed by DSME incorporates wireless internet technology to provide capability for real-time management of data related to logistics and materials. Synchronizable with personal computers and mobile devices, this smart tag allows users to keep track of positions of materials, installation schedules, movement route, surrounding environment even at production site, as well as from office.

IoT Smart Tag, developed by DSME with its proprietary technology, is used to keep track of movement route and position of materials via smart devices in real time at production site.

Smart tag modules installed at production site automatically collect position data of objects and transmit data via wireless communication network. If synchronized with modules and smartphones, smart tag allows operators to spot necessary materials easily in real time wherever they are.

The Central Institute, a research arm of DSME which developed this smart tag, miniaturized the module to 5.5cm in length and 4.4cm in width to increase ease of transport and installation. It adopted portable power supply and photovoltaic power generation systems to ensure semi-permanent power supply. DSME anticipates that the smart tag will serve as catalyst for ushering in smart ship era. Wireless internet technology can help prevent disruptions in information within vast area of shipyard, contributing to improvement of productivity. DSME expects smart tag to help preclude costs arising from loss of materials and delays in supply throughout shipbuilding processes, which is vital for raising cost effectiveness and normalization of business.

An official from DSME said, "This power-free material position management system will help ensure timely delivery of vessels and quality improvement essential for achieving greater satisfaction of global ship owners. We will do more to make company stay ahead of competitors by taking the lead in building smart shipyard harnessing IoT and cutting-edge information technology (IT) such as artificial intelligence technology."

PlantAsset signed a domestic partnership agreement with Aconex

PlantAsset Technology Inc. announced on June 29 that it signed a partnership agreement with Australia-based Aconex Limited, a global leader in the field of cloud-based collaboration platform.

PlantAsset, a venture company providing IT solution and service related to onshore/offshore plant lifecycle, has multiple partners with domestic and oversea companies and develops technology to lead productivity and quality improvement for the domestic construction industry by implementing government R&D with MOTIE (Ministry of trade, Industry and Energy) and MOLIT (Ministry of Land, Infrastructure and Transport) in Korea. Specially, Plant Asset is currently seeking to develop knowledge based engineering system to guarantee qualification at design/engineering stage and higher end-valued solution for handover of data or modeling from engineering to O&M stage.

Aconex, the world leading cloud and mobile collaboration platform for the global construction, infrastructure and energy industries, provides solutions to manage project-wide information and process covering Document, Communication and Process management, BIM, Inspection & Commissioning, Bidding & tenders, Handover and O&M Manual.

Recently, Aconex signed up the enterprise level contracts with Bechtel, Fluor and Exxon Mobil which are the leading construction companies in the world. Additionally, in Korea, some of the largest EPC Contractors such as Samsung C&T, Hyundai E&C and SK E&C have all deployed Aconex on multiple overseas projects. Furthermore there are many references for offshore projects including Helios Oil Terminal in Singapore, Heera RD Phase-II Pipeline & Mid Tapti Gas Field Expansion, both in India and Maari Field FPSO in New Zealand

Plant Asset CEO Cho Siyeon (left) and Matthew Robertson (right), Regional Manager of Aconex in Korea, are posing for a photo after signing a partnership agreement.

Siyeon Cho, CEO of PlantAsset, said "These days, projects become bigger and more complex, joint venture or consortium projects dramatically increase potential risks. In addition, smooth collaboration with multiple stakeholders becomes a very important issue. Therefore, Aconex's collaboration solution will more and more be required for successful project management and delivery"

Also, "According to this partnership agreement, we would like to contribute to the development of the domestic construction industry by making the successful practices of projects constructed by Korean construction companies with Aconex, even though global construction industry is slowdown." Siyeon Cho said.

HHI delivered the world's largest semi-submersible drilling rig

Hyundai Heavy Industries (HHI) is dispelling concerns in the market by delivering a series of offshore facilities even in the face of downturn in offshore plant sector which has been aggravated by sustained low oil prices.

HHI announced that it delivered Ocean Greatwhite, a semi-submersible drilling rig, to U.S.-based Diamond Offshore on July 15. HHI was awarded this contract for this drilling rig in 2013 on a turnkey basis encompassing entire processes ranging from designing to commissioning.

This semi-submersible drilling rig with a price tag of as high as USD 630 million measures 123m in length and 78m in width, the world's largest of its kind. Particularly, this semi-submersible drilling rig can operate at water depths of up to 3,000m and drill into 10,000m or deeper into the seabed. With small hull area coming into direct contact with water, semi-submersible drilling rigs provide advantage of high stability due to their low vulnerability to external environmental changes such as waves despite lower mobility compared to drillships. BP, the operator, plans to deploy this semi-submersible drilling rig in deep sea of the Great Australian Bight off southern Australia from October this year.

Significant, the latest delivery was made successfully even in the face of delay in delivery or cancellation of multiple offshore projects amid persistent decline in oil prices. The cash inflow worth approximately KRW 460 million for delivery will help improve cash flow of HHI significantly which ran into deficits worth billion of won (KRW) last year and has experienced financial strains consequently.

The World's Largest Semi-Submersible Drilling Rig "Ocean Greatwhite" built in HHI

An official from HHI said, "We have successfully delivered the drilling rig which we owe to our close cooperation with ship owner based on relationship rooted in trust even amid unfavorable market conditions. With production processes being stabilized by delivery of large-scale offshore facilities in a row, we anticipate that we will be able to build and deliver other ongoing projects in a timely manner."

HHI has delivered 4 drillships to Diamond Offshore thus far, maintaining strong relationship with the ship owner. When HHI reached a milestone of 2,000th ship delivery in 2015, 'Ocean Blacklion', a drillship built for Diamond Offshore, was the very 2,000th vessel handed over.

HHI delivered 16 drillships and 8 semi-submersible drilling rigs thus far and has successfully delivered many large-scale offshore facilities including Gorgon LNG Plant, Goliath FPSO, Q204 FPSO, etc., since last year.

Continuous R&D yields major size reduction in the PureSOx U-design

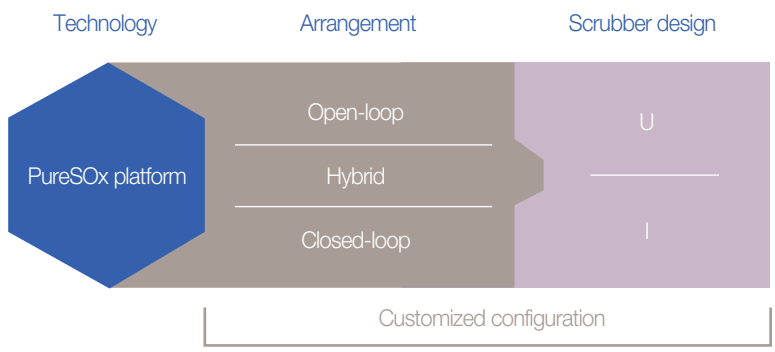
As of 1 May 2016, the Alfa Laval PureSOx scrubber is available in a U-design with greatly reduced dimensions. The improvements, which further increase the U-design's flexibility, were announced around the same time as a date for decision on the 2020 global fuel sulphur cap.

The PureSOx U-design, which is used on the majority of vessels, is a U-shaped configuration where the jet and absorber sections are separated by a natural water trap. In the updated version, available from 1 May, the exhaust gas flow through the scrubber has been heavily optimized. This allows a dramatic reduction in scrubber height – 26% in the jet section and 17% in the absorber section – as well as a reduction in weight.

"We have a strategy of continuous development for the Alfa Laval PureSOx platform," said René Diks, Manager Marketing & Sales, Exhaust Gas Cleaning at Alfa Laval. "We launched our inline I-design in December 2015, and we are pleased to follow it so soon with significant advances in our U-design."

A key factor in achieving the reductions was the minimization of back pressure, which has been done entirely without exhaust gas fans. "Avoiding additional equipment high up in the funnel is advantageous for maintenance and stability," said Diks. "All advances in the PureSOx U-design, including the reduced back pressure, have been made by working with the exhaust gas flow itself."

The reduction in size and weight adds to the advantages of the PureSOx U-design, which include the natural water trap, simple connection to multiple inlets and easy switching between open-loop and closed-loop modes. A smaller scrubber facilitates placement and reduces installation costs, while a lighter scrubber reduces the impact on vessel stability. In some cases, the smaller U-design may also be placed lower in the ship, which will have further stability benefits.



Alfa Laval PureSOx platform offers an exhaust gas cleaning system for any sailing profile and physical constraints of a vessel.

"The improvements make it even clearer that the choice of U-design or inline I-design is not specific to vessel type," said Diks. "A scrubber should be customized for the vessel it serves, and the new U-design makes the PureSOx customization process more flexible."

Coinciding with the arrival of U-design improvements is a renewed sense of urgency surrounding SOx scrubbers. At MEPC 69, which convened in London in late April, it was agreed that the question of a global 0.50% fuel sulphur cap would be resolved at MEPC 70 in October. Whether the cap appears in 2020 or 2025 will hinge on a study by CE Delft, which will report on the availability of low-sulphur fuel. The study, prescribed by MARPOL Annex VI regulation 14.8, is being supervised by a steering committee consisting of member states, non-governmental organizations and one intergovernmental organization.

"It is impossible to speculate on the outcome of the study or of MEPC 70," said Diks. "But scrubber technology will be considered in assessing the adequacy of the fuel supply. PureSOx has shown that SOx limits can be met reliably, even without low-sulphur fuel."

DNV GL And South Korean Yards' Standardization Efforts Deliver First Results

Phase 1 of the JIP has comprised DNV GL, Hyundai Heavy Industries (HHI), Daewoo Shipbuilding and Marine Engineering Company (DSME), Samsung Heavy Industries (SHI), the Korea Offshore and Shipbuilding Association and the Korea Marine Equipment Research Institute.

The RPs provide guidance for meeting requirements in multiple recognized standards applied globally. The RPs also provide guidance and propose new standards in areas where no standards exist. They aim to reduce variations and unique requirements for every project and thereby to reduce the general cost level and delays in offshore oil & gas projects. The RPs are:

- DNVGL-RP-E401 Recommendation for selecting standards for piping components
- DNVGL-RP-E402 Recommendation for selecting standards for electrical and instrumentation components
- DNVGL-RP-B201 Recommendation for selecting standards for structural steel materials
- DNVGL-RP-E403 Recommendation for selecting standards for steel bulk items

"The RPs are the first in a series to reduce cost and increase predictability without compromising quality and safety in international offshore development projects. DNV GL is working closely with oil companies, engineering houses and fabricators to develop the submitted RPs further for global application," said Hans Petter Ellingsen, Group leader for offshore risk advisory, Korea, DNV GL - Oil & Gas.

"We are delighted to further develop the strong relationship and collaboration we have with Korean shipyards. Together we are addressing the challenge of a high cost level by using international standards more widely in offshore oil and gas projects. When we have common challenges, we also have common opportunities. Standardization has potential to significantly reduce cost levels and enables the industry to move forward," said Remi Eriksen, Group President and CEO of DNV GL.

"South Korean shipyards are market leaders for construction of floating and fixed offshore oil and gas installations and HHI has been on the forefront to drive initiatives to reduce the general cost level for the oil and gas industry. A major part of these efforts is to drive efficiencies through greater standardization. Standardization will provide an opportunity to enhance efficiency and competitiveness of whole value chains in the oil and gas industry and induce environmental improvement by minimizing the surplus resources. These RPs are a very positive and radical step forward which will help to reduce inefficiencies in design and construction as well as to increase predictability and quality even further," said Kil Seon Choi, Chairman & CEO of HHI.

The second phase of the JIP is already underway and will deliver extended recommended practices for equipment packages, documentation requirements, and procedures.

Maersk Tankers places volume order for Maersk Fluid Technology

In the second half of 2015, Maersk Fluid Technology introduced a new version of its cylinder oil 'Blending-On-Board' (BOB) system, targeting medium-sized 2-stroke propulsion engines with a cylinder bore between 420 and 680 mm.

Now the first volume order has been placed for retrofit of the SEA-Mate® B1000 system onto 12 tankers delivered to Maersk Tankers between 2005 and 2008-ten vessels equipped with Wärtsilä (WinGD) RTA and RT-Flex engines with a bore between 580 and 620 mm and two vessels with engines designed by MAN Diesel & Turbo.

The order has been placed after careful evaluation of the expected payback time, which was found to be less than 2 years when taking the proven fuel savings, system oil and cylinder oil cost reductions into account.

The ordered BOB systems are simple to retrofit onboard existing vessels and will be installed during 2016 without the need to interrupt vessels schedule. With the systems installed the vessels will be able to blend from 30-140 BN cylinder oil, utilizing the in-use system oil as a base-oil. The system is fully approved for the MAN Diesel & Turbo and Wärtsilä (WinGD) engines in question.

Tommy Thomassen, CTO Maersk Tankers, said "With the flexibility of the B1000 Blending-On-Board (BOB) system from Maersk Fluid Technology, we get the ability to match our cylinder oil lubrication to the fuel sulphur. The BOB system is expected to facilitate up to 40% reduction of current lube-oil consumption, cleaner main engine system oil and fuel savings of at least 0.5% for both MAN Diesel & Turbo and Wärtsilä (WinGD) 2-stroke engines. Investing in BOB allows Maersk Tankers to stay flexible and ready for future lubrication challenges."

Maersk Pearl – one of the vessels to be equipped with B1000 Blending-On-Board system from Maersk Fluid Technology

Sune Lilbaek, Head of Sales and Marketing at Maersk Fluid Technology, said "When switching from traditional lubrication oil to our future-proof blending system, vessels will be able to reduce lubricant supply to the lowest allowed consumption of lubricant as specified by the engine manufacturer. This is possible because cylinder lubricant from the BOB system always will be matching the sulphur content in the fuel. The BOB system also facilitates better engine performance through utilization of the in-use system oil as a base for the cylinder oil. This way, it will be possible to add fresh system oil to the main engine, improving overall cleanliness and viscosity of the system oil."

In addition, three of the 12 vessels will be equipped with the SEA-Mate B4000 analyzer, making it possible for the vessels to closely monitor the iron levels in the cylinder oil scrape-down, facilitating further optimization of the lubrication system for the different engine types in the series of vessels.

Maersk's SEA-Mate Blending-On-Board system

All elements of the system have been verified by the 2-stroke engine designers who have issued official approvals or no-objection letters.

Fast propeller repair in Germany avoids costly drydocking

Recently a team of Hydrex diver/technicians performed a propeller blade cropping on a 190-meter container bulker berthed in Hamburg. Two parts of the tip of one of the four propeller blades were damaged and needed to be cropped to restore the propeller's efficiency.

Having developed different procedures for different kinds of damage, Hydrex teams are equipped and trained to make the best out of a bent or broken propeller. Ideally, the in-house developed cold straightening technique is used. This procedure enables Hydrex technicians to straighten damaged blades in-water, allowing commercial operations to continue without the need to drydock.
In the following example cropping was the only option as the type of damage to the propeller blade did not allow cold straightening. This kind of repair is carried out with the propeller blade cutting equipment developed by the Hydrex research department. In cases like this, where there is an even number of blades an identical piece will be cropped from the opposite blade to restore the hydrodynamic balance of the propeller. By doing so, the best possible efficiency is obtained.
One of the four blades of the bulker had lost two parts of its tip. An on-site solution was needed to restore the propeller's balance and efficiency. A team was therefore mobilized from our headquarters in Antwerp to the ship's location in Germany
After the equipment arrived at the vessel's location the team started the operation with a detailed survey of the affected propeller blade. The team then used the information acquired during the inspection to calculate and determine the correct measurements needed to modify the trailing edges of the propeller blade. Next the divers cropped the blade and ground its edge to give it the correct radius. The opposing blade was modified using the exact same cutting line, to give the propeller back its balance.

Cutting the opposite blade of the damaged blade to keep the balance.

When the cropping was complete, the Hydrex technicians buffed the blades to make sure that any remaining loss of efficiency would be minimal.
Over forty years of experience with propeller repairs have given us the tools and know-how to offer fast repair and modification services to vessels around the world. All types of operations can be carried out fast, fluently and efficiently afloat and underwater.
In this case the repair took less than a day. This prevented any unwelcome delay to the vessel's schedule.

Cropped and buffed propeller blade.

Intellian selected as 'World Class 300' company by Korean Government

Intellian's appointment to Korea's prestigious 'World Class 300' list of the country's most promising technology companies is a distinguished achievement and confirms its commanding lead in the mobile satellite communications terminal sector.

Intellian, the global leader in maritime satellite communication antenna systems is now a fully-fledged member of the exclusive "club" comprising a group of Korean corporates recognized as the best and brightest in creative innovation, outstanding development and future market potential.

Intellian expects to receive multi million dollars in R&D funding from the Korean Government over the next five years as a result of joining the World Class 300 group. This will underpin the company's existing commitment to invest more than $ 100m in game-changing technology developments over the next five years. This, says President and CEO Eric Sung, will enable Intellian to leap-frog competitors and invest in new technologies and new products in both the maritime and aviation satellite antenna sectors.

Intellian already has a strong track record in R&D spending, maintaining a policy of investing just over 10% of top line revenue each year. Over its 12-year life, the company has invested close to $40m in R&D, a key differentiator which Mr. Sung believes has been essential in keeping the company ahead of the game in a sector which is undergoing exponential growth, and development on a daily basis.

"A maritime communications revolution is taking place and we are proud to be a pioneer in this process," said Mr. Sung. "We are committed to a continuing R&D investment program to ensure that we are leaders in game-changing satcoms technology."

Eric Sung, President and CEO of Intellian receives 'World Class 300' certificate

"We are delighted to be selected as a member of the World Class 300. This clearly validates all of our hard work and success so far, our financial strength, market position, and growth potential," Sung continued. "The endorsement from the Korean Government, following analysis of thousands of other companies, technologies and markets, is a major achievement."

"Our leadership in the segments in which we currently engage is well-established and our market share continues to grow. Our service-providing partners and the tens of thousands of end-users likely to become connected over the next five years have already taken notice of this," Sung declared.

About World Class 300

Established in 2010, the World Class 300 Program is managed by the Korea Institute for Advancement of Technology (KIAT) and the Small and Medium Business Administration. Its aim is to nurture 300 small- and mid-sized enterprises (SMEs) with high-growth potential, known as "hidden champions", into competitive global players by 2020. To date, 231 companies have been inducted into the Program. The concept of the World Class 300 Program was adopted by the Korean Government based on a book by German author Hermann Simon, 'Hidden Champions', in which the development of 500 small German enterprises which now hold leading global positions was tracked.

Refrigeration plant optimisation reduces operational costs for LSM Reefers

London Ship Managers (LSM) has made substantial savings across its fleet of 9000gt refrigerated cargo vessels following an extensive refrigerant plant optimisation programme carried out by Oceanic Technical Solutions.

An engineering team from the Asia division of the UK-based refrigeration specialist carried out complete marine refrigeration inspections aboard the Cala Portese, Cala Piana, Cala Pevero and Cala Piccola.

"We found we were spending substantial time and resources looking and checking for gas leaks which were still not being efficiently detected, in order to try and remove any environmental impact our vessels were making. This, along with losses of refrigerant, obviously had a monetary impact, which we also wanted to reduce," said LSM Technical Fleet Manager Mike Seymour.

"We transport bananas and pineapples so maintaining a 13.3°C temperature is crucial to our operations. If we lose refrigerant, not only does it result in unnecessary expenditure, it puts undue stress on the compressors and it could result in cargo loss. Although our vessels operate outside of European F-Gas rules, its good practice to ensure our ships operate in an economically and environmentally-sustainable way."

Taking just three days to inspect the entire plant on each ship, the Oceanic Technical Solutions team carried out a full system evaluation and performance test, finding substantial gas leaks from corroded pipe work in bulkhead penetrations.

Dave Lloyd, Oceanic Technical Solutions' Technical Director, said "Two of the vessels were found to have major refrigerant leaks, but they had proven very difficult to find. You get a lot of moisture building up around insulated pipes and bulkhead penetrations and this can corrode the pipe work, resulting in substantial refrigerant loss."

Cala Piccola are to LSM vessels to have been inspected by Oceanic Technical Solutions.

Once Lloyd's team found the source of the leaks, the plant was shut down and isolated so repairs could take place. Additional isolation valves were fitted and when the plants were running to optimum, shipboard crews were shown how best to carry out routine inspections. "The catalyst for inspection was to reduce the amount of refrigerant being used and to prevent gas escaping to the environment. We achieved that," said Lloyd.

While LSM has made annual savings of about 15% year-on-year with replacement of refrigerant cylinders, frequent refrigeration inspection and optimization prevents compressor wear and tear and increased loads on generators as they compensate for systems with reduced refrigerant.

"With vessel movement and vibration, it is inevitable that refrigerant leaks will occur, with seals breaking down and valves coming loose and so on; but the key is to carry out frequent performance tests and to keep on top of the maintenance. Simple measures, such as regular oil changes, replacing filters and tightening valves and flanges, can make a huge difference," said Robert Chesters, Oceanic Technical Solutions' Managing Director.

"LSM has shown that even though their vessels do not fall under the F-Gas regulations for mandatory inspections they have taken control of refrigerant consumption and the overall impact of operations on the environment. This is responsible ship management."

DSME to build oil production plant project worth KRW 3 trillion

Daewoo Shipbuilding & Marine Engineering (DSME) will embark upon full-scale construction of oil production plant project worth USD 2.7 billion which is the single largest contract ever awarded to it since its establishment.

Final Investment Decision (FID) was reached by multinational oil companies, including Chevron, ExxonMobil, etc., which have large-scale stakes in Tengiz Field in Kazakhstan. As a result, DSME announced that it would embark upon construction of oil production plant project worth approximately 2.7 billion.

Tengizchevroil LLP (TCO) which operates the Tengiz oil field is a consortium comprised of world's leading oil companies such as Chevron (holding 50% stake) and ExxonMobil and (holding 25% stake). Their investors decided to invest USD 36.8 billion in a project to expand the Kazakhstan oil field. DSME was awarded by TCO a construction project valued at roughly USD 2.7 billion to build production facilities, including oil field control, oil processing facilities, etc., in 2014. Aggregate production volume alone reaches about 240,000 tons. That is equivalent to about 3 years of offshore plant production works for DSME and its subcontractors.

About 90 modules that comprise offshore platform will be built at Okpo shipyard and Shin Han Heavy Industries, a subsidiary of DSME, before they are assembled for delivery by 2020. In this project, DSME will undertake only production of modules while other works, such as detail designing, procurement of heavy-duty equipment, local installation works, etc., will be carried out under the responsibility of owner. As the contract amount varies proportionally to construction volume, much lower risk of loss will ensue in comparison to other offshore plant construction projects awarded on turnkey basis.

Significantly, the latest FID reflects deep trust of multinational companies in DSME for its excellence of technologies and production capabilities despite current unprecedented adversities facing DSME. Those multinational companies are said to have given high score to DSME's advanced safety management capabilities, stable labor and management relationship, extensive track records of offshore plant construction and management experience.

The latest FID came amid postponement of investments in the aftermath of sharp decline in oil prices and other unfavorable conditions, thus signifying resumption of investment spurred by recent rebound in oil prices. For DSME grappling with financial woes arising from delay in delivery of offshore plants, the payment of USD 130 million in advance will be of a great help to DSME in mitigating its liquidity crunch. This project, which is a fruit of Korea-Kazakhstan summit in 2014, is also expected to further promote economic cooperation between the two countries and revitalize local economy.

An official from DSME said in connection with TCO project, "The latest FID will bring significant respite to domestic equipment manufacturers and subcontractors facing hardship due to recent decline in offshore construction volumes. With thorough planning and actions, we will dispel concerns about our company in the market and set the tone for rebound."

Once this project is completed, oil production from Tengiz field will almost double from current 500,000 barrels per day (bpd) to 760,000 bpd. TCO and Chevron expect that first oil production upon completion of construction will start from 2022.

에머슨, 엔지니어링 기반 '프로젝트 확실성 (Project Certainty)' 전략 제안

한국 에머슨 프로세스 매니지먼트는 지난 7월 7일 'PWC(Performamce Without Compromise)' 컨퍼런스를 통해 최상의 프로젝트 성과(Top Quartile Project Performance)를 낼 수 있는 솔루션을 제시했다.

에머슨 프로세스 매니지먼트는 이번 세미나에서 산업용 사물인터넷(IIoT)을 활용한 공정 혁신 방안을 제시했다. 특히 주요 기간 산업의 자본재 프로젝트 수행시 변화와 개선을 추구하는 산업의 수요에 따라, 자본 효율성의 향상과 프로젝트 일정의 신뢰성을 위한 혁신적인 기술 및 엔지니어링 기반 접근 방식인 '프로젝트 확실성(Project Certainty)' 전략의 필요성을 강조했다.

석유/가스 탐색 및 생산, 탄화수소 및 가스 처리, 화학, 약학 및 기타 프로세스 산업의 수많은 프로젝트에서 매년 수십억의 달러가 낭비되고 있다. 예를 들어, 10억 달러 이상 규모의 프로젝트 중 65% 이상과 5억 달라 미만 규모의 프로젝트 중 35% 이상이 실패하며, 이들 가운데 25% 이상이 예산을 초과하고, 50% 이상의 프로젝트가 일정 지연을 겪고 있다. 또한, 플랜트 가동이 시작된 다음 해에도 같은 문제들을 겪게 된다. 이와 같이 부진한 성과가 지속되면 새로운 투자를 고려하는 공정 제조 기업들에게는 큰 방해요소가 될 수 있다.

에머슨에 따르면, 산업 내 프로젝트들은 현재 예산과 일정을 맞추지 못하는 임계점에 이르렀으며, 프로젝트의 성과를 결정하기 위해서는 프로젝트 확실성과 같은 혁신적이고 포괄적인 접근법이 필요하다.

프로젝트 확실성은 FEED(Front End Engineering and Design) 초기 단계부터 참여해 더 나은 프로젝트 접근법을 정의하는 것으로 시작된다. 전통적으로, 자동화 전략에 소요되는 투자 비용은 프로젝트에서 약 4%에만 해당하지만, 그 이상으로 프로젝트의 비용과 일정, 복잡성에 영향을 미칠 수 있다. 실예로, 프로젝트 확실성 전략에서는 중앙 집중식 제어 시스템의 요구 사항들을 70~80% 줄이고 일부 어플리케이션 내 배관 설비를 최대 50~60% 제거할 수 있는 설계 기술을 도입한다. 또한, 플랜트 전체의 장비 신뢰성 분석을 통해 수천만 달러의 비용이 드는 예비 부품들을 줄이는 것이 가능하다.

에머슨 관계자는 "프로젝트 확실성 전략은 다수의 공급자들 사이에 의존성과 장애물을 제거하며, 동시에 작업할 수 있게 하여 프로젝트 수행의 복잡성을 제거한다. 즉, 혁신적인 기술로 데이터 및 문서의 복잡성을 다룰 수 있는데, 자동화된 문서뿐 아니라 방대한 프로젝트 데이터를 단일 출처에서 관리하는 것"이라고 설명했다.

프로젝트 확실성에서는 프로젝트의 가장 큰 취약점을 해결하여, 프로젝트 일정 관리를 크게 개선할 수 있다. 전자 마샬링(Electronic Marchalling)과 CHARM(특성화 모듈), 그리고 퍼베이시브 센싱(Pervasive SensingTM) 전략에 근거한 무선 필드 계기화와 같은 혁신적인 기술들을 통해서 프로젝트 팀은 비용과 일정에 미치는 영향을 최소화 하면서 프로젝트 후반에 발생하는 뒤늦은 변경사항들도 수용할 수 있다.

에머슨 관계자는 "최상의 프로젝트 성과를 달성할 수 있는 시기가 다가왔다"며 "오래된 프로젝트 접근법에서 벗어나 기술 및 입증된 방법론으로 업계에 새로운 변화를 불러오기 위해서 많은 협력과 노력이 필요할 것"이라고 말했다.

대우조선해양, 첨단 스마트 조선소 도약

대우조선해양이 생산성 향상을 통해 선박 인도 기일 준수 및 품질향상 등 경쟁력 확보로 경영정상화에 적극 나섰다.

대우조선해양이 적시적소에 필요한 자재를 공급하고 관리할 수 있는 'IoT(사물인터넷, Internet of Things) 스마트 태그(Smart Tag)'를 독자 개발하는데 성공했다.

조선소는 다양한 자재들과 생산지원도구를 사용하는데 그 위치가 분산되어 있을 경우, 필요한 자재를 찾고 이를 생산 현장에 투입하는 과정에서 많은 시간과 인력이 소비된다.

30만 톤급 초대형 원유운반선 한 척을 건조하는데 들어가는 철판 조각만 약 10만개로 선박 내부에 설치되는 각종 의장품(배관, 기계장비 등)까지 합치면 수백만 개에 달하는 자재와 도구가 여의도 1.5배 면적(460만㎡)인 옥포조선소를 오가며 생산 현장에 투입된다.

이 때문에 조선소 현장에서는 오래 전부터 체계적인 자재 공급관리 시스템을 개발해야 한다는 요구가 있었다.

이러한 요구를 충족하기 위해 개발된 대우조선해양의 스마트 태그는 무선 인터넷 기술을 이용해 조선소 내 물류 및 자재 관련 정보를 실시간으로 제공한다. PC 및 모바일 기기와도 연동이 가능해 사무실은 물론 생산 현장에서도 자재 위치, 설치일정, 이동경로, 주변 환경 등의 정보를 확인할 수 있다.

스마트 태그는 생산 현장에 설치된 소형 모듈이 사물의 위치 정보를 자동으로 수집한 뒤 이를 자체 무선통신망을 통해 전송하는 방식으로 구현된다. 현장 작업자가 모듈과 스마트 폰을 연동하면 필요한 자재가 어디에 있는지를 실시간으로 쉽게 알 수 있는 방식이다.

대우조선해양이 자체 개발한 'IoT Smart Tag'를 활용해 생산 현장에서 자재 이동경로와 위치를 스마트기기로 실시간 모니터링하고 있다.

개발을 담당한 대우조선해양 중앙연구원 측은 스마트 태그 모듈의 크기를 길이 5.5cm, 폭 4.4cm로 소형화해 이동과 설치를 용이하게 했고, 휴대용 전원공급 장치와 태양광 발전 방식을 적용해 반영구적 전원 공급이 가능하도록 개발했다.

대우조선해양은 이번 개발이 스마트 조선소(Smart Shipyard) 구현을 위한 촉매제가 될 것으로 예상하고 있다. 무선 인터넷 기술을 활용하면 광활한 조선소 내에서 정보가 단절되는 현상을 극복할 수 있어, 생산성을 높이는 데 도움이 될 것으로 전망된다.

대우조선해양은 스마트 태그가 선박 건조 과정 중 발생하는 자재 분실 및 공급지연 등에 따른 비용손실을 막아 원가경쟁력 향상 및 경영정상화에도 기여할 것으로 기대하고 있다.

대우조선해양 관계자는 "이번 무전원 자재 위치관리 시스템 개발로 선박 납기일 준수는 물론 품질 향상으로 회사를 찾는 글로벌 선주들의 만족도를 높일 수 있게 됐다"며 "사물인터넷(IoT)과 인공지능 기술 등의 첨단 IT 결합을 통한 스마트 조선소 구축에 앞장서 회사 경쟁력 강화에 노력하겠다"고 말했다.

플랜트에셋, Aconex사와 국내 파트너십 계약 체결

플랜트에셋은 클라우드 기반 협업플랫폼 분야 글로벌 선두 주자인 호주의 Aconex사와 국내 파트너십 계약을 체결했다고 지난 6월 29일 밝혔다.

플랜트에셋은 육상/해양 플랜트 분야의 생애주기 관련 IT 솔루션 및 서비스를 제공하는 벤처기업으로 국내외 많은 고객과 파트너를 보유하고 있으며, 산업통상자원부, 국토교통부 등의 국책 R&D과제를 수행하며 국내 건설 산업의 생산성/품질 향상과 소프트웨어 기술 발전에 앞장서고 있는 기업이다.

현재까지 플랜트에셋은 디자인/엔지니어링 단계의 품질을 보증하기 위한 지식기반 설계시스템과, 엔지니어링 단계에서 O&M(운전/유지보수) 단계로 데이터/모델/자료를 핸드오버 하는데 사용되는 고부가가치 솔루션을 개발하는데 주력해왔다.

Aconex사는 글로벌 건설, 인프라, 에너지 산업을 위한 세계 최고의 클라우드와 모바일 협업 플랫폼으로 프로젝트 전반의 정보와 프로세스를 관리할 수 있는 솔루션을 제공하고 있다.(Document, Communication & Process management, BIM, Inspection & Commissioning, Bidding & tenders, Handover, O&M Manual 등)

최근에는 Fluor, Bechtel, Exxon Mobil 등 해외 선진 건설사와 엔터프라이즈 계약을 체결하며 글로벌 무대에서 확고한 자리매김 중이다. 국내에서는 삼성물산, 현대건설, SK건설 등 대형 EPC Contractor의 해외 프로젝트 수행을 위해 Aconex를 적용한 사례들이 있고 싱가포르 Helios Oil Terminal, 인도의 Heera RD Phase-II Pipeline & Mid Tapti Gas Field Expansion, 뉴질랜드 Maari Field FPSO 등 오프쇼어(Offshore) 프로젝트 사례들을 통해 기술 경쟁력을 인정받았다.

조시연(C.E.O Siyeon Cho) 플랜트에셋 사장(좌)과 Aconex 한국지역 책임자 Matthew Robertson(우)는 파트너십 계약을 체결하고 기념촬영을 하고 있다

플랜트에셋의 조시연 대표는 "최근 글로벌 플랜트 경기 침체에도 불구하고, 이번 파트너십 계약을 통해 국내 EPC 및 건설사가 수행하는 프로젝트의 성공 사례를 많이 만들어 건설 산업 발전에 기여하는데 주력하겠다"고 향후 계획을 밝혔다. 또한 그는 "메가 프로젝트의 복잡도 상승으로 조인트벤처, 컨소시움 형태의 계약이 증가하고 외부 협업의 중요성이 대두되는 시점에서 Aconex의 협업 솔루션은 침체된 국내 EPC 및 건설사의 해외 진출과 글로벌 협업에 도움이 되고 성공적인 프로젝트 수행에 기여할 것으로 기대된다"고 말했다.

현대중공업, 세계 최대 반잠수식 시추선 인도

현대중공업이 저유가로 해양플랜트 시황이 어려운 가운데도 해양설비를 잇달아 인도하며 시장의 우려를 불식시켰다.

현대중공업은 지난 7월 15일 반잠수식 시추선 '오션 그레이트화이트(Ocean Great white)'호를 발주처인 미국 다이아몬드 오프쇼어(Diamond Offshore)사에 인도했다고 밝혔다.

현대중공업은 지난 2013년 이 시추선의 설계부터 시운전까지 모든 과정을 책임지는 '일괄수주계약' 방식으로 체결했다. 또한 수주 당시 6.3억 달러를 넘는 고가의 해양설비로서 길이 123m, 폭 78m로 현존하는 세계 최대 규모의 반잠수식 시추선이다.

이 시추선은 최대 수심 3000m 해상에서 작업할 수 있으며, 해수면에서 최대 10,000m 이상 시추가 가능하다. 반수식 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.

운용사인 BP는 오는 10월부터 호주 남쪽 그레이트 오스트레일리아만(the Great Australian Bight)의 심해지역에 이 시추선을 투입할 계획이다.

이번 인도는 최근 저유가 기조로 다수의 해양 프로젝트가 인도 지연 및 취소되는 상황에서 성공적으로 이뤄졌다는 점에서 의미가 있다. 또한 지난해 수 조원대 적자로 자금 압박에 시달렸던 현대중공업은 이번 인도 대금으로 약 4,600억원(KRW)이 들어옴에 따라 현금 흐름에도 크게 기여할 것으로 기대된다.

현대중공업이 성공적으로 인도한 다이아몬드사의 반잠수식 시추선 '오션 그레이트화이트(Ocean Greatwhite)'호

현대중공업 관계자는 "어려운 시황 속에서도 발주처와 신뢰 관계를 바탕으로 긴밀하게 협업해 이번 시추선을 성공적으로 인도할 수 있었다"며 "대규모 해양설비를 잇달아 인도하면서 공정이 안정화된 만큼 현재 진행 중인 다른 프로젝트도 적기에 건조, 인도할 수 있을 것으로 기대하고 있다"고 말했다.

현대중공업은 지금까지 다이아몬드 오프쇼어사에 드릴십 4척을 성공적으로 인도하며 긴밀한 관계를 유지해오고 있다. 지난 2015년 현대중공업이 선박 2,000척 인도라는 기록을 세울 때, 이 회사의 드릴십 '오션 블랙라이언(Ocean Blacklion)'호가 2,000번째 인도선박이 되기도 했다.

한편, 현대중공업은 지금까지 총 16척의 드릴십과 8기의 반잠수식 시추선을 인도했으며, 지난해부터 고르곤 LNG플랜트, 골리앗 FPSO, Q204 FPSO 등 다수의 초대형 해양설비를 성공적으로 인도한 바 있다.

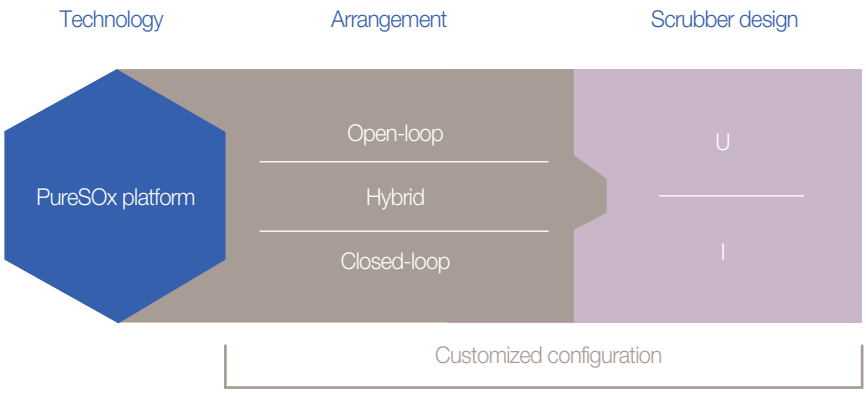
알파라발, 지속적인 연구개발로 PureSOx U-design 소형화 성공

2016년 5월 1일부터 U-design이 적용된 PureSOx 황산화물 저감장치를 이용할 수 있다. 알파라발은 유연성이 향상된 이 소식을 '2020년 Global Cap' 겨냥해 발표했다.

최적화된 flow 및 pressure로 소형화

대다수 선박에서 사용되는 PureSOx U-design은 U자형 구성으로, jet 및 absorber 섹션으로 분리된다. 지난 5월 1일 출시된 새로운 SOx scrubber는 황산화물 저감장치를 통과하는 배기 가스의 배압을 최소화 함으로써 배기가스의 흐름을 최적화시켜 Scrubber 높이와 무게를 대폭 줄였다.

알파라발 르네 딕스(Rene Diks) 배기가스 정화 부문 마케팅 및 영업 담당자는 "Funnel에 높은 장비를 추가로 설치되지 않아 유지관리 및 안정성이 향상됐다. 배기 가스 유동 자체를 연구한 결과, 배압 감소를 포함해 PureSOx U-design 개선을 이끌어 낼 수 있었다" 고 말했다.



알파라발의 PureSOx 플랫폼은 항해 프로필과 선박의 물리적 제약을 위한 배기 가스 정화 시스템을 제공한다.

비용 절감 및 안정성 향상

또한 알파라발은 이번에 크기와 무게를 줄이고, 멀티 인젯, Open 및 Close 루프 모드 간의 간편한 전환 등 많은 장점을 추가시켰다. SOx scrubber의 크기와 무게가 작으면 배치가 용이하고 설치 비용을 절감할 수 있으며, 선박 안정성에 미치는 영향력이 줄어든다. 어떤 경우에는 선박 아래쪽에 배치할 수도 있어 선박의 안정성을 한층 높일 수 있다.

르네 딕스는 "성능이 향상되어 선박유형에 따라 U-design 혹은 Inline I-design을 선택하는데 고민할 이유가 줄었다" 면서, "SOx scrubber는 선박의 특성에 최적화되어야 하며, U-design으로 이를 더욱 효율적으로 진행할 수 있게 됐다" 고 말했다.

글로벌 연료 황 상한선 동향 현재 글로벌 조선시장은 U-디자인 출시와 때를 같이해 SOx 황산화물 저감장치를 둘러싼 논의가 다시금 떠오르고 있다. 지난 4월 말 런던에서 소집된 MEPC 69에서는 Global Cap에 대한 문제를 10월 MEPC 70에서 해결하기로 결정했다. Global cap 적용 시기를 2020년으로 할지 2025년으로 연기할지 여부는 0.5% 저유황 연료의 가용성에 대한 연구를 진행중인 CE Delft의 연구결과에 달려 있다. 회원국, 비정부 기구 및 정부 간 조직으로 구성된 조정 위원회에서 MARPOL(해양오염방지협약) Annex VI 규정 14.8에 따라 이 연구를 감독하고 있다.

르네 딕스는 "해당 연구 또는 MEPC 70의 결과를 추측하는 것은 불가능하다"며 "하지만 연료 공급의 적합성을 평가하는 과정에서 황산화물 저감장치 기술이 고려 선상에 오를 것이다. PureSOx는 저유황 연료 없이도 신뢰할 수 있는 수준으로 SOx 배출 제한을 준수할 수 있다"고 말했다.

DNV GL, 해양설비 표준화 1단계 완료 '실무권장지침' 완성

DNV GL은 해양설비 표준화를 위한 협력 프로젝트(JIP, joint industry project)를 진행 중이다. 그 1단계가 마무리되고 최근, 관련 4개의 실무권장지침(Recommended Practice)를 발표했다. JIP 1단계에는 DNV GL, 현대중공업, 대우조선해양, 삼성중공업을 비롯하여 한국조선해양플랜트협회와 한국조선해양기자재연구원이 참여했다.

이번에 발표된 RP는 다수의 국제 기준에 부합되는 가이드라인을 제공하고 있다. 또한, 이제까지 표준이 없었던 분야에 새로운 표준을 제안했다. 궁극인 목표는 프로젝트마다 각각 다른 요구사항을 줄임으로써 해양 오일·가스 프로젝트 전반의 비용과 시간을 절약하는 데 있다. 이번에 발표된 RP는 다음과 같다:

- DNVGL-RP-E401 – 배관(Piping) 기자재에 대한 표준
- DNVGL-RP-E402 – 전기 및 계측(electrical & instrument) 기자재에 대한 표준
- DNVGL-RP-B201 – 구조 강철 재료(structural steel materials)에 대한 표준
- DNVGL-RP-E403 – 철강 벌크 항목(steel bulk item)에 대한 표준

DNV GL 한국 오일&가스 사업부, 해양 위험요소 자문(Risk advisory) 그룹 리더인 한스 피터 엘링슨(Hans Petter Ellingsen)는 "이 RP는 품질이나 안전성은 그대로 유지하면서 비용을 절감하고 예측 가능성을 높일 수 있는 국제 표준의 첫 단계라고 할 수 있다. DNV GL은 나아가 국제적인 적용을 위한 RP를 개발하기 위해 국제 석유 메이저, 엔지니어링 업계와 제조 업계와도 협력하고 있다"고 말했다.

DNV GL 그룹 대표이사인 레미 에릭센(Remi Eriksen)은 "이번 JIP를 통해 한국 조선소와의 협력관계를 강화할 수 있게 되어 기쁘다. 협력의 결과 국제 표준을 해양 오일&가스 프로젝트에 적용함으로써 비용절감에 도움을 줄 수 있게 되었다. 공통의 도전과제는 공유할 수 있는 기회로 이어질 수 있다고 본다. 표준화 작업은 비용을 현저하게 낮추고 산업계 전반을 한 단계 발전시킬 가능성을 가지고 있다"고 말했다.

현대중공업 최길선 회장은 "한국의 조선소들은 부유식, 고정식 해양 설비 건조의 선두 주자들이다. 현대중공업은 오일&가스 산업에 전반적인 비용을 절감하는 노력을 선도해 왔다. 그 중 하나가 효율성 증대를 위한 이번 표준화 작업이다. 표준화는 효율성 증대는 물론 오일&가스 산업 밸류체인 전체의 경쟁력을 높이고 자원의 낭비를 최소화함으로써 환경적 측면에서도 기여할 것이다. 이번 RP는 설계와 건조 단계에서의 비효율을 줄이고 예측 가능성과 품질을 한층 높여줄 매우 고무적이며 혁신적인 초석이 될 것"이라고 밝혔다.

표준화 제2단계는 이미 진행 중이며 더 광범위한 분야, 즉, 기자재 페키지, 문서화 요구사항, 절차 등에 관한 RP를 발표할 예정이다.

대우조선해양, 3조원 규모 원유생산 플랜트 제작

대우조선해양이 27억 달러에 달하는 원유 생산 플랜트의 본격적인 건조에 들어간다. 이는 계약금액 측면에서 대우조선해양 창사 이래 최대 규모 플랜트 공사다.

카자흐스탄의 텡기즈 유전(Tengiz Field)에 대규모 지분을 보유하고 있는 셰브론, 엑슨모빌 등 다국적 석유회사들은 최근 이 유전에 대한 최종 투자 결정(FID, Final Investment Decision)을 내렸다. 이에 따라 대우조선해양도 약 27억 달러에 수주한 원유생산 플랜트의 본격적인 생산에 들어간다고 밝혔다.

텡기즈 유전을 운영하는 텡기즈셰브로일(Tengizchevroil LLP, 이하 TCO)사는 세계적 석유회사인 셰브론(Chevron, 지분 50% 보유)과 엑슨모빌(ExxonMobil, 지분 25% 보유) 등으로 구성되어 있다. 이 회사의 투자자들은 카자흐스탄 유전 확장 프로젝트에 총 368억 달러를 투자하기로 결정했다.

대우조선해양은 지난 2014년 11월 TCO로부터 유정제어, 원유처리시설 등 생산설비 모듈(Module)을 제작하는 공사를 약 27억 달러에 수주했다. 총 제작 물량만 약 24만톤에 달한다. 이 정도 규모면 대우조선해양과 협력업체의 해양플랜트 생산인력이 약 3년 정도 안정적으로 일할 수 있는 물량이다.

대우조선해양은 이들 물량을 옥포조선소와 자회사인 신한중공업 등에서 90여개의 모듈로 제작하여 2020년까지 인도할 예정이다. 이 프로젝트의 상세설계와 대형장비 구매, 현지 설치공사 등은 주문주 책임 하에 진행되며, 대우조선해양은 모듈의 제작만 담당하게 된다. 계약가도 공사 물량이 증가하면 연동되어 증액하는 방식이어서 기존에 턴키 공사로 수주했던 해양플랜트 공사에 비해 손실 위험이 극히 적은 것으로 알려졌다.

이번 투자 결정은 비록 대우조선해양이 창사 이래 최대의 어려움을 겪고 있지만 그 기술력과 생산능력에 대해서는 세계적인 기업들이 신뢰를 보여줬다는 점에서 큰 의미를 갖는다. 이들 회사들은 대우조선해양의 안전경영 역량, 안정된 노사관계 그리고 해양플랜트 건조 실적 및 매니지먼트 경험을 높게 평가한 것으로 알려졌다.

또한 글로벌 오일 메이저 회사들이 급격한 유가하락 등으로 투자 결정을 미뤄왔던 상황에서 나온 결정으로 석유회사들이 최근 유가 반등에 힘입어 투자를 재개하는 신호탄으로써 의미를 부여할 수 있다.

해양프로젝트 인도지연 등으로 어려움을 겪고 있는 회사입장에서는 이 프로젝트의 1차 선수금으로 입금될 1억3,000만 달러는 유동성 확보에 큰 도움이 될 것으로 보인다. 지난 2014년 한국-카자흐스탄 간 정상회담의 결실이기도 한 이 프로젝트가 정상적으로 추진됨에 따라 양국 간 경제협력뿐만 아니라 지역경제도 활기를 띨 것으로 예상된다.

TCO 프로젝트와 관련해 대우조선해양 관계자는 "이번 투자결정은 최근 해양 공사 물량의 감소로 어려움을 겪고 있는 국내 기자재 업체와 협력사에게도 큰 도움이 될 것"이라며, "철저한 준비와 실행으로 회사에 대한 시장의 우려를 불식시키고 분위기 반등의 기회로 삼겠다"고 밝혔다.

한편 이 프로젝트가 완료되면 텡기즈 유전은 현재 약 50만 배럴 수준인 하루 원유생산량이 76만 배럴로 약 50% 가량 늘어나게 된다. TCO와 셰브론 측은 공사 완료 이후 첫 원유생산(First Oil) 시점을 2022년으로 예상하고 있다.

생산 손실을 막기 위해서는 모든 핵심 설비의 고장 가능성에 대한 사전 경보가 필수입니다. 하지만 실시간 사전 경보 모니터링이 가능한 시설은 전체의 10%에 불과하다는 사실, 알고 계셨나요?

IT'S IMPOSSIBLE

에머슨의 스마트 무선 솔루션은 장비 상태를 실시간으로 파악할 수 있는 심도 깊은 통찰력을 제공합니다. 에머슨의 무선 기술은 비용 효율이 높고, 설치가 용이하며, 수동 검사와 일상적인 모니터링의 필요성을 최소화합니다. 회전기계와 열교환기의 상태를 실시간으로 파악하면 비상 상황에 신속하게 대비할 수 있습니다. 이런 정보를 기반으로 유지보수 및 에너지 비용을 절감하는 동시에 생산 능력은 증가시키는 결정을 내릴 수 있습니다. 문제를 찾아내는 시간이 빨라질수록 예방조치를 취할 수 있는 시간도 늘어납니다.
더 자세한 내용은 **www.emersonprocess.com/EAM**에서 확인할 수 있습니다.

한국 에머슨 프로세스 매니지먼트(株)
대표전화 02-3438-4600 www.emersonprocess.co.kr

EMERSON™
Process Management

EMERSON. CONSIDER IT SOLVED.™

Denka Lowers Steam Costs with Emerson™ Remote Monitoring Services for Steam Traps

Rosemount 708 Wireless Acoustic Transmitters installed on the steam traps

Emerson Process Management

RESULTS

- 7% steam savings with automatic and continuous remote monitoring service
- Traps in bypass reduced to less than 4%
- On system startup, 15% blow-through and 8% cold units identified

APPLICATION

Polystyrene Resins production

CUSTOMER

Denka Singapore, a chemical plant on Singapore's Jurong Island, which manufactures Polystyrene Resins

CHALLENGE

Denka purchases steam from a utility provider used in the process. The plant has hundreds of steam traps. After years of operation, steam traps may fail as cold or blow-through which results in wasting steam, water hammer, erosion, corrosion, and lower heat transfer efficiency.

Due to expensive manpower, location safety, and high capital expenditure, it is challenging for Denka to survey their steam traps frequently. Hence, they engage contractors to inspect them yearly, and forgo the steam loss between inspections.

"The exception reports provided by Emerson become work orders for the maintenance team and have enabled us to reduce steam consumption by 7%."
- Ng Hock Cheong Maintenance Manager, Denka Singapore

SOLUTION

With Emerson's Remote Monitoring Service business model, Denka only pays monthly subscription fees for the necessary services. There is no upfront capital expenditure.

For this Industrial Internet of Things (IIoT) solution, Emerson installed Rosemount™ 708 Wireless Acoustic Transmitters on 148 of Denka's critical steam traps. The transmitters monitor noise and temperature of the steam traps and transfer the data through a 3G mobile network to a Microsoft® AZURE™ cloud virtual server. The analytics software, SteamLogic™, then automatically analyzes the data and generates alerts.

Emerson experts review this information and provide actionable reports to Denka. Then Denka's maintenance staff repairs or replaces the failed steam traps according to the reports using new standard operating procedures (SOPs) and therefore achieves substantial savings, thanks to this digital transformation. Periodic surveys by workers and annual inspections by contractors are no longer required.

에머슨 스팀 트랩 원격 모니터링 서비스로 증기 비용을 절감한 Denka

증기 트랩에 설치된 Rosemount™ 708 무선 어쿠스틱 트랜스미터

에머슨 프로세스 매니지먼트

결과

- 자동화 및 지속적인 원격 모니터링 서비스로 7%의 증기 절약
- 바이패스상의 트랩 4% 미만으로 감소
- 시스템 시작 시 15% 블로우 스루 및 8% 콜드 상태의 유닛 확인

어플리케이션

폴리스티렌 수지 생산

고객

Denka Singapore, 폴리스티렌 수지를 생산하는 싱가포르 주롱섬에 위치한 화학 플랜트

도전과제

Denka는 유틸리티 제공자로부터 프로세스에서 사용되는 증기를 구매한다. 플랜트에는 수 백개의 증기 트랩이 있다. 몇 년간 운영 후, 증기 트랩은 콜드 상태 또는 블로우 스루 상태로 고장날 수 있으며, 이는 증기 낭비, 수격 작용, 침식, 부식 및 낮은 열 전달 효율성으로 이어진다.

비싼 인력과 장소적 안전성, 높은 비용 지출로 인해 Denka가 증기 트랩을 자주 점검하는 것은 힘든 일이었다. 그런 이유로, Denka는 계약자를 통해 매년 점검했고, 점검 받기 전까지는 증기 손실을 포기해야만 했다.

> "에머슨이 제공하는 뛰어난 보고서는 유지보수팀의 지도서가 되었으며, 우리는 증기 소비를 7%나 감소할 수 있었다."
> – NG Hock Cheong, 유지보수 관리자, Denka Singapore

솔루션

에머슨의 무선 모니터링 서비스 비즈니스 모델을 통해 Denka는 필요한 서비스에 대한 월별 사용료만 지불하면 된다. 미리 내야하는 자본 지출이 없다.

이러한 산업용 사물인터넷(IIoT) 솔루션을 위해서 에머슨은 Denka의 148개 주요 증기 트랩에 Rosemount™ 708 무선 어쿠스틱 트랜스미터(Wireless Acoustic Transmitters)를 설치했다. 트랜스미터는 증기 트랩의 소음과 온도를 모니터하고, 3G 모바일 네트워크를 통해 Microsoft® AZURE™ 클라우드 가상 서버로 데이터를 전송한다. 그 후 분석 소프트웨어인 SteamLogic™은 데이터를 자동적으로 분석하여 경보를 생성한다.

에머슨의 전문가들은 이 정보를 검토한 후 Denka에 실행 가능한 보고서를 제공한다. Denka의 유지보수 직원은 보고서를 토대로 새로운 표준 운영 절차(SOP)를 사용해 고장난 증기 트랩을 수리하거나 교체할 수 있다. 이런 디지털 변환을 통해 상당한 비용 절약이 가능했다. 직원의 정기적인 점검이나 계약업자의 연간 점검이 더 이상 필요 없게 된 것이다.

Proposed location of BWMS components on maindeck

Foreship shows owners the way on ballast water

Now convinced that the entry into force of the IMO Ballast Water Convention is imminent, owners have been calling on Foreship to provide an independent assessment of their ballast water management system retrofit options.

Foreship Ltd.

The frequent addition of signatures to the 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments in recent months cannot disguise the fact that this is an IMO measure resisted since conception. The 51 states which had signed up at IMO by June 2016 far exceed the 30 required but represent 'only' 34.87% of the 35% of world tonnage needed to trigger entry into force 12 months after ratification. The legal 'instrument' is closer than

ever, but still not a done deal.

However, in 2016 owners are taking matters into their own hands, in the firm belief that technical answers are urgently needed on optimal BWMS performance for existing ships.

Leading naval architecture and marine engineering consultancy Foreship has recently been providing detailed advice on the retrofit options, with feasibility studies covering single ships. Foreship is assessing different technical solutions and similar technologies from different suppliers for a range of vessel types and ages, and evaluating overall installation work, installation locations, and temporary and permanent structural modifications.

Olli Somerkallio, Foreship Head of Machinery Department, explains that while choosing between systems will certainly be guided by cost, comparisons can be less than straightforward. "We have focused on the technical aspects of the installation, meaning space for equipment, piping connections and electrical compatibility," says Somerkallio. "Expertise in naval architecture, marine engineering and ship behaviour are all needed to yield meaningful results."

Ballast water flow rate requirements are typically below 500m^3/h in the cruise ship sector have led owners to select BWMS technology based on UV, which makes invasive species 'non-viable' rather than killing them. As has been widely reported, however, definitive approval of UV testing criteria has not been forthcoming from the US Coast Guard.

Furthermore, UV installations are not practicable for the larger flow rates required by the main ballast water systems onboard large cargo ships, such as tankers and bulk carriers. Here, electro-chlorination (EC) has emerged as the preferred solution. EC produces chlorine-based disinfectants by running direct electrical current through water to cause a reaction with Sodium Chloride. The resulting free chlorine kills bacteria and other microbes in the ballast tanks. At the deballasting stage, chlorine content is measured and a neutralising agent introduced as necessary.

Owners should be aware that the additional piping, related fittings and valves required by a BWMS, and the BWMS itself, are all sources for pressure losses, Somerkallio advises, which ballast pumps must have enough head pressure to address. Foreship makes pressure loss analysis part of its feasibility study, he says, because upgrades are sometimes needed to the pump impellers or electrical motors. "In the worst case, the entire pumps might have to replaced," he says.

Olli Somerkallio, Foreship Head of Machinery Department

Special consideration must also be given to tankers, says Somerkallio, where ballast water operations occur both fore and aft, and aft ballast tanks are often over three quarters full - and so critical for unobstructed vessel operation. Here, the main ballast system pumps are located in the cargo pump room (hazardous area) and so cannot be used to pump water to the aft peak tank, which is in safe area. The aft pumps cannot be connected directly to the main BWMS.

A typical mid-range tanker could have main ballast system flow rate requirements of 2000m^3/h, split across port and starboard ballast tanks. This could be dealt with by two BWMS each with 1000m^3/h capacity or a single BWMS where both pumps are connected to the same treatment system. Separate aft tank ballast water needs would be handled through the general service pumps, connected to a smaller BWMS with flow rates of 250-300m^3/h (for example).

A recent Foreship feasibility study assessed two EC solutions from competing manufacturers in detail: one features EC in the main stream; in the other, EC occurs in a side stream, with the 'chemical' introduced to the ballast tanks.

Practically speaking, Somerkallio says, the mainstream system is less complex, lighter, smaller, and draws roughly 25% less electrical power than its sidestream counterpart. However, attributes related to installation, performance and safety can be persuasive in favour of a sidestream solution, he adds.

"For example, according to one manufacturer its mainstream EC system can operate in extremely low salinities due to special electrode design and materials, but operation in

Starboard ballast water pump location

practically zero salinity waters such as the Great Lakes is not possible. No such restrictions apply to the sidestream system; if salinity is below 15 PSU, stored seawater can be used."

The sidestream system is also better able to operate in colder water than its mainstream counterpart.

Again, there is no getting around the fact that the sidestream system could be twice the volume of its mainstream counterpart, also weighing 60% more, but Somerkallio points out it is more significant to ask where the additional BWMS is taking up space. He explains that a mainstream system forward requires a larger additional deckhouse for two EC units and two filters, while the smaller sidestream deckhouse solution brings greater positioning freedom for the EC unit and other auxiliaries.

In terms of footprint, a mainstream solution could require two thirds the area needed by a sidestream solution but, if a single sidestream system worked across two pumps, the difference would become almost negligible.

Similarly, the separation of the EC process required by the sidestream system demands twice as much piping as its mainstream counterpart. However, the majority of the extra pipes are of small diameter (DN20, DN40).

Somerkallio says that these variables confirm the need scrutiny at the level of individual ships, although he adds some general observations regarding tanker installations. Whatever the solution needed for the main system, the aft peak tanks need a different arrangement. A separate UV or EC system could be considered aft, but so could a ship-wide EC solution so long pump system separation between the main and aft systems was assured. In the latter case, the 'chemical' produced in the safe area would be distributed separately to the Aft Peak Tank system.

Somerkallio notes that EC systems of all types produce Hydrogen gas as a by-product, adding that here the sidestream option is definitively more risk averse: hydrogen can be extracted from the chlorine buffer tank with forced ventilation to trip the BWMS in case of ventilation failure.

Again, operators prioritising maintenance should consider that, while the main stream system is less complex in principle, implying fewer components, two separate BWMS may be required: overall, the number of components will be higher. Furthermore, Foreship indicates that the mainstream systems it has assessed are in general more prone to deterioration over time than their sidestream counterparts.

Conversely, both systems require periodic filter replacement, but the sidestream's pump and blower need attention after 2500 hours. While much of this work could be done by crew, Somerkallio says that a full assessment of this aspect maintenance is still pending.

As owners face up to the realities of retrofitting the technology, he suggests that Foreship's detailed feasibility studies are revealing that any beauty in BWMS may be very firmly in the eye of the beholder.

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ABB offers extractive continuous emissions monitoring system(CEMS) for measurement of SOx, CO_2 and NOx according to the International Maritime Organization´s requirements. GAA630-M offers a capable solution for engineers and help them carry out a representative sampling and precise analysis. Also, this system can be delivered with easy operation, simplified calibration and outstanding performance of providing necessary information. Learn more about why ABB CEMS is your solution in the ship engine and scrubber. www.abb.com/analytical

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Continuous Emission Monitoring for Marine

ABB's industry proven photometric analyzer modules are covering all the wavelengths for a precision measurement of CO_2, NOx and Sox according to the International Maritime Organization's requirements. Advance Optima gas analyzers are the choice if it comes to emission monitoring and combustion optimization.

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Background

The legislation set out by International Maritime Organization (IMO) is coming into force starting January 2015 for Sox control and starting 2016 for NOx. Ship yards, ship owners and marine scrubber manufactures need to equip vessels with continuous gas analyzers for Continuous Emission Monitoring. Oceangoing ships including:

– *Container ships*
– *Tankers*
– *Rigs*
– *Cruise ships*

are major contributors to increase global air pollution and exhaust gases emitted from their diesel engines. This have been recognized by International Maritime Organization to be a serious health threat.
Marine vessel engines are under observation and recent norms set by IMO clearly calls for monitoring of exhaust emission constituents from Heavy Fuel Oil (HFO):

– *Oxides of nitrogen (NOx)*
– *Sulfur oxides (SOx), along with carbon dioxide (CO_2)*

The IMO has identified rules to ensure SOx control emissions monitoring worldwide; initially (2015-2020) these rules are

planned to apply for ships seagoing in the Environmental Control Areas (ECAs); at a later stage the same rules are extended to all oceans areas. The NOx Technical Code (NTC) 2008 state the conditions and processes for NOx emission control and foresees continuous emission monitoring ("direct measurement") as method for ensuring NOx emissions compliance, starting from January 1st 2016.

Measurement of SOx/CO_2

The continuous gas analyzer AO2000 Uras26 is based on the Non Dispersive IR (NDIR) technology. NDIR is a referenced and recognized for monitoring SO_2/CO_2 ratio for IMO. The NDIR technology allows for selective measurement of SO_2 and CO_2. ABB's Advance Optima series grant advanced capabilities and calculation of SO_2 (ppm)/CO_2(Vol. %) ratio, as specified on the MEPC 184 (59). When burning fuels with sulfur content higher than 0.1 Vol. % in ECAs, ships must abate SO_2 and keep SO_2/CO_2 ratio under control at the ECGS (Exhaust Gas Cleaning System).

Measurement of NOx

The continuous gas analyzer AO2000 Limas11UV can be easily and successfully used for direct measurement of NO and NO_2 at the catalytic reactor or directly at the stack. UV based technology doesn't require ozone generators, nor NO/NO_2 catalytic conversion units and allows for a direct and separate measurement of both nitrogen oxides with high repeatability and stability. The Non Dispersive UV technology has been specifically studied by ABB for NO and NO_2 analysis and offers operators a simplified approach, is easy to be used and requires no auxiliary accessories.

Direct measurement of NOx allows ships to operate engines with the highest flexibility, without any need for time consuming engine re-certifications and with no restrictions on OEM parts.

Measurement of O_2

The continuous gas analyzer AO2000 Magnos206 is specifically designed for monitoring O_2. Magnos206 can be used for example to monitor oxygen in excess at the engine outlet exhaust or before SOx scrubbing. It also helps to find and maintain engine combustion efficiency at the desired setpoint. ABB's Magnos206 is based on paramagnetic effect and is therefore an IMO referenced analytical technique for oxygen measurements.

The modular gas analyzers Advance Optima combine advanced technologies with more than 75 years of experience in process and environmental gas analysis. Advance Optima is the innovative solution for the demands of today and the challenges of tomorrow.

ABB has the right gas analyzers portfolio to allow oceangoing vessels to stay compliant to upcoming legislations and optimize energy and fuel consumptions.

ABB's Advance Optima solution can be integrated in a single cabinet, to be installed close to the measuring point.

In addition all Advance Optima solutions can be interfaced with the latest ABB Marine Advisory Tools such as EMMA and OCTOPUS, for an optimized visualization and a real-time actions.

DSME sealed a contract worth KRW 70 billion to design submarines for Korean Navy

Daewoon Shipbuilding & Marine Engineering (DSME) announced on July 19 that it sealed a contract with Defense Acquisition Program Administration (DAPA) on the 3,000-ton submarine Jangbgo-3 Batch-Ⅱ exploration & development project.

The exploration & development project signed recently aims to carry out basic designing of newbuild submarines in initial designing stage where detailed specifications and materials will be determined. DSME will complete basic designing for Jangbogo-3 submarines by late 2018.

DAPA selected DSME as preferred negotiator for the exploration & development, the initial phase of next-generation submarine construction project, last May. This contract is valued approximately USD 70.5 billion. Jangbogo-3 submarine is the nation's first indigenous version to be designed and built with domestic technology. A new chapter will be written in history of Korean national dense as a medium-to-large submarines that would play a key role in building up nation's naval combat capabilities are to be constructed with domestic technology.

DSME is already building 2 submarines ordered in 2012 under the-Jangbogo-3 Batch-Ⅱ project worth about KRW 1.7 trillion. Having recently won the contract for second project, DSME is solidifying its unmatched competitive advantage in the field of submarine construction.

As this project will integrate highly advanced technologies (related to underwater operation capabilities, detection capabilities, and arming) into project delivery, DSME is expected to be even better positioned to win new orders in the field of submarine construction in upcoming years.

Once basic design is completed, DSME and DAPA will sign a private contract on construction of guide ship. DSME is expected to see better financial conditions amid the looming prospects for large-scale projects.

An official from DSME remarked, "The latest contract for the newest strategic weapon project will help lay cornerstone for our technological advancement and future projects vital for establishing a leading position in submarine segment of national defense market. We will complete the second Jangbogo-3 project successfully in our endeavor to help achieve independent national defense capabilities and build up key naval combat capabilities of the nation."

The latest contract brings total value of vessels ordered to DSME so far this year to approximately USD 810 million, awarded through projects for building 6 ships and 2 special purpose vessels.

대우조선해양, 700억 규모 대한민국 해군 잠수함 설계 사업 본계약 체결

대우조선해양은 방위사업청과 '3천톤급 잠수함 장보고-3 2차사업(Batch-Ⅱ) 탐색개발 사업'의 본 계약을 체결했다고 지난 7월 19일 밝혔다.

이번에 체결된 탐색개발사업은 새로 건조하는 함정의 기본설계를 수행하는 사업으로, 함정의 구체적인 제원이나 재료 등을 결정하는 설계 초기 단계에 속한다. 대우조선해양은 2018년 말까지 장보고-3 잠수함의 기본설계를 진행할 예정이다.

앞선 지난 5월, 방위사업청은 대우조선해양을 차세대 잠수함 건조 프로젝트의 초기 사업인 '탐색개발사업'의 우선협상 대상자로 선정한 바 있다. 이번 계약의 사업 규모는 약 705억원이다.

장보고-3 잠수함은 우리 기술로 독자 설계 및 건조되는 최초의 잠수함이다. 우리나라 해상 전력을 증강하는데 핵심적인 역할을 담당할 중대형 잠수함을 국내 기술로 독자 개발한다는 점에서 국방 역사에 있어 큰 의미가 있다.

2012년 약 1조 7천억 규모의 장보고-3 1차 사업(Batch-Ⅰ)을 수주해 잠수함 두 척을 건조 중인 대우조선해양은 이번 2차 사업까지 따내며 잠수함 분야에서의 압도적 경쟁력을 대내·외에 드러냈다. 특히 이번 2차 사업은 수중 작전능력, 탐지능력, 무장 등에서 크게 앞선 기술이 적용됨에 따라, 향후 대우조선해양의 잠수함 분야 수주경쟁력이 더욱 높아질 것으로 기대된다.

기본설계가 완료되면 대우조선해양과 방위사업청은 선도함(Guide Ship) 건조와 관련된 수의계약도 체결할 예정이다. 계약 규모와 공사물량이 큰 사업의 수주가 예정됨에 따라 회사 경영에도 보탬이 될 것으로 보인다.

이번 계약과 관련해 대우조선해양 관계자는 "최신예 전략무기 사업의 수주로 회사가 향후 잠수함 방산시장을 주도할 수 있는 기술 및 사업 기반을 구축할 수 있게 됐다"며, "장보고-3 2차 사업 역시 성공적으로 완료해 자주국방 구현 및 대한민국 해군의 핵심전력 확보에 기여하겠다"고 말했다.

대우조선해양은 이번 계약 포함, 올 한해 총 6척의 선박과 2건의 특수선 사업을 통해 총 8.1억 달러 상당을 수주하는데 성공했다.

Nexans umbilicals achieve global reach with new project in Australia

OneSubsea has ordered the umbilical and accessories from Nexans to develop the Greater Enfield development off the coast of Exmouth, Western Australia. The project, worth around 20 million euros, will be Nexans' first to be installed in Australia.

Nexans umbilicals achieve global reach with new project in AustraliaThe umbilical will be manufactured at Nexans' plants in Halden and Rognan, and will be delivered in January 2018. It will be installed at a depth down to 915 m. To maximise the cost-effectiveness of the single unit umbilical it will comprise both dynamic and static sections.

Dirk Steinbrink, Senior Executive Vice President High Voltage & Underwater Cable Business Group at Nexans said, "We are excited to expand our reach around the world and our strong relationship with OneSubsea. Nexans has pioneered the development of power umbilicals which are a cost-effective way of supplying power, control and other functions to the sea floor."

The Greater Enfield Project is a joint venture between Woodside Energy Ltd and Mitsui E&P Australia Pty Ltd. The oil field is 60 km from the coast of Exmouth. The oil field will be developed using a 31 km subsea tie-back to the floating production storage and offloading (FPSO) facility. The six subsea production wells and six water injection wells will produce around 69 million barrels of oil equivalent (MMboe). OneSubsea will supply subsea pumps for the project.

Nexans previously worked with OneSubsea on the Julia oil field project in the Gulf of Mexico. Nexans designed, manufactured and supplied an integrated power umbilical solution and termination hardware. Production of the field started earlier this year.

넥상스, 호주에 처음으로 설치될 엄빌리칼 수주

원서브씨는 서 호주에 위치한 엑스마우스 해안의 그레이터 엔필드 유전을 개발하기 위해 넥상스의 엄빌리칼 및 액세서리를 주문했다. 프로젝트는 약 2,000만 유로 상당으로 호주에 설치하는 첫 번째 넥상스 엄빌리칼 케이블이 된다.

엄빌리칼은 넥상스 할덴 및 로그난 공장에서 제조되며, 2018년에 납품된다. 이 케이블은 해저 915m에 설치될 예정이다. 싱글 엄빌리칼의 비용효율성을 극대화하기

위해 동적 및 정적 섹션으로 구성된다.

넥상스 초고압 및 해저 케이블 사업부 총괄부사장 더크 스테인브링크(Dirk Steinbrink)는 "우리는 전세계로 넥상스의 저변을 확대하며, 원서브씨와 긴밀한 파트너십을 맺게 되어 매우 기쁘다. 넥상스는 해상에서 전력, 제어 및 기타 기능을 제공할 수 있는 비용효율적인 전력 엄빌리칼 개발을 선도해오고 있다"고 말했다.

그레이터 엔필드 프로젝트는 우드사이드 에너지와 미쯔이 E&P 호주법인의 조인트 벤처로 이루어진다. 유전은 엑스마운트 해안에서 60km 떨어져있고, 해저 31km에 고정된 부유식 원유생산저장하역설비(FPSO)를 사용해 개발된다. 6개의 해저 생산 유정과 6개의 물투입 유정을 통해 약 6,900만 배럴의 오일을 생산한다.

넥상스는 이전에도 원서비씨와 멕시코 걸프만의 줄리아 유전 프로젝트를 함께 한 경험이 있다. 줄리아 프로젝트에 넥상스는 통합 전력 엄빌리칼 솔루션과 터미네이션 하드웨어를 설계, 제조, 공급했다. 줄리아 유전은 올해 초부터 생산에 들어갔다.

HMD won a contract for 1 bulk carrier applying high manganese steel

Hyundai Mipo Dockyard (HMD) signed a contract with Ilshin Marine Transport, a middle-standing shipping company of Korea, to build 1 bulk carrier with a capacity of 50,000 tons in mid June. This bulk carrier will be built into a high efficiency eco-friendly vessel outfitted with dual fuel engine and LNG fuel tank of the world's first kind made of high manganese steel

In addition to the dual fuel engine which can run on both bunker C oil and LNG, exhaust gas recirculation (EGR) system will be easily mounted on board this bulk carrier to meet the requirements set forth by the IMO(International Maritime Organization) Tier III as deemed necessary by ship owners.

Moreover, LNG tank for this bulk carrier will be made of high manganese steel developed by POSCO for the first time in the world for cryogenic applications, attracting attention from global shipbuilding and steel industries. The IMO International Code of Safety for Ships Using Gases or. Other Low Flashpoint Fuels (IGF Code) allows only 4 materials, such as nickel alloy steel, stainless steel, 9% nickel steel, and aluminum alloy, to be used in LNG fuel tanks and pipes to ensure withstanding of the freezing temperatures of 150°C below zero.

The high manganese steel developed by POSCO for cryogenic applications has the advantage of far greater strength, toughness, and cost-effectiveness than those 4 materials at extremely low temperatures. However, practical application of high manganese steel, a novel material, to LNG fuel tank requires certification by global classification societies for its performance/stability, along with amendment to current regulations set forth by the IMO.

Primary contracts will be executed with Korean Register of Shipping (KR) and U.K.-based Lloyd's Register(LR), respectively, for vessels adopting high manganese steel for the first time globally among those built at shipyard of HMD. There has already been a mounting interest in construction process and actual operational outcomes even before delivery scheduled for late November 2017.

Significantly, the latest contract will set a win-win example for domestic steel, shipping, and shipbuilding industries gripped by persistent recession. Furthermore, the latest contract is all the more meaningful, considering the strong long-term competitiveness of Chinese and Japanese shipyards bolstered by extensive government support and close relationship with their domestic shipping industries.

현대미포조선, '고망간강' 적용된 벌크선 1척 수주

현대미포조선은 지난 6월 중순 한국 중견 선사인 일신해운과 5만톤급 벌크선 1척에 대해 건조계약을 체결한 것으로 알려졌다. 이 벌크선은 '이중 연료 엔진(Dual Fuel Engine)'과 함께 세계 최초로 '고망간강(High Manganese Steel)' 재질의 LNG연료탱크

가 탑재되는 고효율 친환경 선박으로 건조될 예정이다.

무엇보다 이 선박은 벙커C유와 LNG를 모두 사용할 수 있는 '이중 연료 엔진'이 탑재되며, 선주사의 필요에 따라 국제해사기구(IMO)의 대기 오염방지 3차 규제(IMO Tier Ⅲ)를 충족하기 위한 별도의 질소산화물 저감장치(EGR)을 향후 쉽게 추가 장착할 수 있도록 설계된다.

뿐만 아니라 이 선박의 추진연료 중 하나인 LNG를 저장하는 탱크의 경우, POSCO가 세계 최초로 개발한 극저온용 고망간강으로 제작될 것으로 알려져 전 세계 조선업계 및 철강업계 관계자들의 관심을 끌고 있다.

현재 국제해사기구가 규정하고 있는 국제가스추진선박기준(IGF CODE)에 따르면, LNG 연료탱크와 파이프는 영하 150도 이하의 환경에서도 견딜 수 있도록 니켈합금강, 스테인리스강, 9%니켈강, 알루미늄합금 등 4가지 소재만 사용하도록 되어 있다.

POSCO가 개발한 극저온용 고망간강은 초저온 환경에서 이들보다 강도와 인성dl 훨씬 뛰어나고 경제성도 매우 높다. 하지만 신소재인 고망간강을 LNG 연료탱크 등에 적용하기 위해서는 성능 및 안정성에 대해 전세계 선급기관으로부터의 인증과 함께 국제해사기구의 규정 개정이 필요하다.

현대미포조선에서 건조되는 세계 첫 고망간강 적용 선박은 한국선급(KR)과 영국선급(LR) 2곳의 선급에서 이중으로 입급계약이 체결될 계획이며, 2017년 11월말 인도를 앞두고 벌써부터 건조과정과 실제 운용결과에 관심이 모아지고 있다.

아울러 이번 선박 발주는 지속되는 불황으로 인해 함께 위기를 겪고 있는 국내 철강, 해운, 조선업계의 모범적인 산업간 윈-윈(win-win) 사례가 될 것으로 보여 더욱 의미가 깊다. 특히 일본과 중국 조선업계가 자국 해운업계와의 긴밀한 유대관계나 정부의 강력한 제도적 지원에 힘입어 장기적인 글로벌 경기침체에도 경쟁력을 유지하고 있는 지금 상황을 감안하면 이번 사례는 시사하는 바가 크다.

HHI Wins Logistics Support Vessel Order for New Zealand's Maritime Sustainment Capability Project

Hyundai Heavy Industries (HHI) announced on July 25 it won an order to build a 23,000 ton class logistics support vessel for New Zealand Defence Force's Maritime Sustainment Capability (MSC) project. HHI was selected as a preferred bidder in December 2015. HHI will deliver the logistics support vessel to New Zealand by the end of 2019.

Under the MSC project, the Royal New Zealand Navy (RNZN) plans to replace its replenishment tanker HMNZS Endeavour to maintain replenishment capability for the New Zealand Defence Force. HMNZS Endeavor, which has served RNZN for the past 30 years and is still in good condition, was also delivered by HHI in 1987.

The MSC tanker is able to refuel two ships at a time while underway, carry and refuel helicopters, produce and store water, and store and transport bulk goods. The tanker also has ice-strengthening and winterisation features to support Antarctic base during summer season. The vessel has adopted Environship Leadge Bow for improved fuel efficiency, maneuverability and stability. The Electric Replenishment/Fuelling-at-sea systems allow ease of control and quieter operation while CODLAD (combined diesel-electric and diesel) propulsion system reduces emissions and ensures longer engine life. With the main crane located at the center of the vessel weighting 25 tons with a wider-than-average operating range of 23 m, the tanker can load and offload container boxes and bulk goods more effectively.

ROK Defense Acquisition Program Administration (DAPA) and ROK Navy have been supportive of HHI in its efforts to win the order. DAPA and ROK Navy joined due diligence sessions to promote HHI's capabilities showing existing HHI built logistic support vessel, and promised support in building the MSC Tanker.

HHI has built all the logistics support vessels for ROK Navy and has exported two logistics support vessels. Moreover, the company is currently building the next generation AOE-II. Since constructing and delivering the first Korean-built frigate ROKS Ulsan in 1980, HHI has solidified its position as a leading naval shipbuilder by delivering a variety of naval ships including Aegis destroyers, KDX-II destroyers, multi-purpose frigates, submarines, and patrol/salvage ships.

현대중공업, 뉴질랜드로부터 30년 만에 함정 수주

현대중공업은 지난 7월 25일 뉴질랜드 웰링턴에서 김정환 조선 사업대표와 헬렌 퀼터(Helene Quilter) 뉴질랜드 국방부 차관 등이 참석한 가운데 뉴질랜드 해군과 배수량 23,000톤급의 군수지원함 1척에 대한 건조 계약을 체결했다고 밝혔다. 이번에 현대중공업이 수주한 군수지원함은 지난 1987년 뉴질랜드 해군에 인도한 12,000톤급 군수지원함인 '엔데버(Endeavor)'호의 후속 함정이다.

현대중공업은 지난해 6월 입찰에 참여해 독일, 스페인 등의 방산전문 조선소와 경합을 펼친 끝에 지난해 12월 우선협상대상자로 선정됐으며, 이후 약 7개월간의 계약조건 협상 등을 거쳐 최종 계약에 성공했다.

뉴질랜드 해군은 현대중공업이 지난 30여년간 우수한 성능을 발휘한 엔데버호를 건조했을 뿐 아니라, 현재 우리나라 해군이 운용 중인 군수지원함 3척과 차기 군수지원함 1척도 건조하는 등 군수지원함 분야에서 풍부한 경험을 갖춘 데 높은 점수를 준 것으로 알려졌다.

현대중공업이 수주한 군수지원함은 길이 166미터, 최고 속력 17노트(31.4km/h)로, 1만톤의 보급 유류와 20피트(feet) 컨테이너 12개를 적재할 수 있다. 또한 운항속력에 따라 전기추진과 디젤기관 추진을 선택적으로 사용해 추진 효율을 높일 수 있는 하이브리드 추진 체계와 양현에서 동시에 급유가 가능한 전기식 해상 보급 · 연료공급 체계, 25톤 크레인 등이 탑재된다. 특히 이 군수지원함은 남극 해역에서 작전을 수행할 수 있도록 내빙 방한 성능을 갖춘 것이 특징이다. 현대중공업은 오는 2018년 2월 이 함정을 착공해 2019년 12월 뉴질랜드 해군에 인도할 계획이다.

한편, 우리나라 방위사업청과 해군은 현대중공업이 우선협상대상자로 선정된 이후 뉴질랜드 관계자들의 군수지원함 견학을 돕고, 건조 및 시운전 중 지원을 약속하는 등 현대중공업이 함정을 수주할 수 있도록 측면에서 지원했다.

Petronas selects Intellian to connect new state-of-the-art floating LNG production vessel

A triple installation for the next generation Petronas Floating Liquid Natural Gas (PFLNG) vessel emphasizes increased demand for Intellian's 2.4m product line in the Offshore Energy and Enterprise market segments.

Built at Daewoo Shipbuilding & Marine Engineering in South Korea, PFLNG Satu is a game-changer in the global LNG business. PFLNG technology dramatically improves asset mobility, paving the way for efficiency in monetizing gas resources from remote, marginal and stranded fields.

To ensure redundant, seamless connectivity onboard, Petronas selected Intellian for its outstanding performance, intuitive user experience and superior remote Management & Control capability. Two v240 C-band VSAT systems managed by a Dual VSAT Mediator will provide uninterrupted operation of enterprise data applications and crew welfare solutions. Live TV entertainment will also be available via a third 2.4m system providing simultaneous reception of C- and Ku-band anywhere in the world. The t240CK features Intellian's patented WorldView LNB and the company's proprietary Fiber Link optical IFL solution, which delivers near zero loss between above and below deck modules for cables up to 2km in length.

"It's always especially exciting for us to be associated with ground breaking projects like this one," declared Eric Sung, Intellian's President and CEO. "Every system on the PFLNG Satu is the most advanced technology of its kind. Our inclusion validates the continuing dominance of our 2.4m products in the high end maritime segments, such as Cruise and Offshore Energy," he said.

"Market adoption of our 2.4 meter systems is steadily increasing for the

same reasons why our 1-meter VSAT is now the most widely deployed maritime VSAT in the world. Customers value our focus on simplifying this somewhat complex technology while delivering greater performance and a truly outstanding user experience," Sung added.

All of Intellian's 2.4m systems pack in a single shipping container and arrive pre-configured for complete build, installation and commissioning within a single workday, while alternative systems require up to 2+ days for assembly and field calibration. Experienced partners in the Cruise segment have completed up to four full builds and installations in just two days, citing the system's practical packaging design, consistent quality, and overall ease of assembly.

MacGregor continues to win hatch cover contracts for Japanese container ship series

MacGregor has signed a contract for the design and delivery of key components and the fabrication of steel structures for the hatch covers on board five 14,000 TEU container vessels under construction at Japan Marine United's (JMU) Kure shipyard. The order was booked into the second quarter 2016 order intake.

"MacGregor enjoys a long and successful working relationship with JMU," said Hiroshi Goto Area Sales/Marketing Director, Cargo Handling, MacGregor. "The order builds on two similar previous contracts with the shipyard; one in 2015 for six vessels and the other for four vessels in 2014, taking our delivery commitment to 15 ships in the same series."

The 144,285gt vessels will be all for a Japanese owner and they will be deployed for the service between Far East and Europe.

MOL makes fleet-wide migration to Fleet Xpress

Inmarsat has announced that its partner JSAT MOBILE Communications has signed an agreement with Mitsui O.S.K. Lines (MOL), one of the world's largest shipping companies, to introduce the newly-launched Fleet Xpress service across the majority of its car carrier fleet.

Existing Inmarsat customer MOL says migrating its car carriers to always-on, high-speed broadband connectivity will be pivotal in its continuing drive towards 'smarter and greener shipping' operations.

MOL has long been convinced that the environmental performance of its ships offers a competitive advantage. It was the first owner in the world certified under the Ship Energy Efficiency Management Plan (SEEMP) - the International Maritime Organization's emissions scheme to benchmark the impact of technical innovations on ship efficiency.

The roll-out of Fleet Xpress on board the MOL fleet will coincide with planned vessel drydockings, with the owner's car carriers selected for the first installations. Fleet Xpress will effectively and efficiently connect MOL ships to landside offices via VPN.

"Owners have been eagerly awaiting fully integrated connectivity between ship and shore that delivers an unprecedented scale of redundancy and seamless service virtually everywhere on the planet," said Gerbrand Schalkwijk, Chief Sales Officer, Inmarsat Maritime.

"Fleet Xpress is the first global maritime high-speed broadband service from a single network operator. High-speed, ultra-reliable connectivity will transform the maritime industry by putting big data at the heart of operating decisions and cost-controlled connectivity in the hands of seafarers."

Rolls-Royce to deliver ship design and equipment to Hurtigruten's new polar cruise vessels

Rolls-Royce has signed a contract worth about £ 25 million with the ship building company Kleven in Norway for design and ship equipment to two new polar cruise vessels, with an option for two additional vessels. The contract between Kleven and Rolls-Royce follows the conversion of a letter of intent into a firm contract signed between Kleven and Hurtigruten.

Daniel Skjeldam, CEO of Hurtigruten, said "The ships soon about to take shape in the docks of Kleven will be striking. They will attract interest to both the Norwegian ship building industry and to Hurtigruten as a leading player within the field of explorer tourism. To me, this contract is proof of the combined innovation powers of Norway's maritime industry and the country's growing tourism industry. Together we are providing growth along the long and beautiful Norwegian coastline."

Helge Gjerde, Director of Offshore and Merchant Solutions, Rolls-

Royce, said "Hurtigruten and Kleven have agreed to build state-of the art passenger vessels, and

Rolls-Royce will provide some of the most innovate ship technology on the market today. I'm confident that these new polar cruise vessels will bring the proud heritage of the Hurtigruten into a similarly proud future."

In addition to the innovative ship design with a wave piercing bow, Rolls-Royce will supply an integrated package of technology and equipment. Among the deliveries will be the innovative Rolls-Royce Unified Bridge, which represents a complete redesign of the ship bridge environment. Consoles, levers and software interfaces will have a common look and feel, resulting in a more comfortable, clutter-free and ultimately more safe and efficient working environment for the captain and his team on the bridge.

Advanced MacGregor technology serves new polar research ship

MacGregor has won an order to supply MacGregor offshore cranes and a Triplex handling system for a 14,300 gt polar research vessel being built for the Polar Research Institute of China. Designed by Aker Arctic Finland, it will be the first vessel of its type to be built in China; the shipyard has yet to be named.

"Our ability to deliver tailor-made packages of equipment and a reputation for successful low temperature operations were key factors in winning this contract," said William Storvik, Shiptype Group Sales Manager, MacGregor Offshore Deck Machinery. "MacGregor products have a proven track record of performance in extreme environments, which makes them ideal for this type of vessel. Our combined expertise also ensures good value and performance for the customer and smoothes operations by reducing the number of suppliers that the shipyard and the owner have to deal with."

The 122.5m multi-functional icebreaker will be able to handle ice up to 1.5m thick, achieving a continuous icebreaking speed of two to three knots. It will have an endurance of 20,000 nautical miles and with a full 90-person crew, it will be able to cruise for 60 days without re-supply.

It will also be fitted with a MacGregor Triplex six-tonne SWL telescopic/knuckle jib crane with a 17m outreach and a handling system specifically designed for research equipment. The handling system comprises: a 30-tonne SWL stern-mounted A-frame; a five-tonne SWL multi-functional launch-and-recovery overhead crane for conductivity, temperature and depth (CTD) oceanographic instrumentation; and a piston coring system that includes an eight-tonne SWL corer pipe handler, a 23m corer pipe cradle and a 25-tonne SWL side-mounted A-frame.

With the exception of the cranes, all MacGregor equipment will be served by a common central hydraulic system driven by one hydraulic power unit. MacGregor deliveries are scheduled for completion by the end of 2017.

The new polar research vessel will be equipped with MacGregor offshore cranes and Triplex systems specifically designed for handling research equipment in extreme temperature environments.

The Polar Research Institute of China was established in 1989. It is a public welfare institution reporting to China's State Oceanic Administration. The new vessel will join its existing 1993-delivered icebreaker, Xue Long, which operates in research stations in the Arctic and Antarctic.

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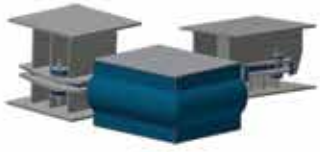

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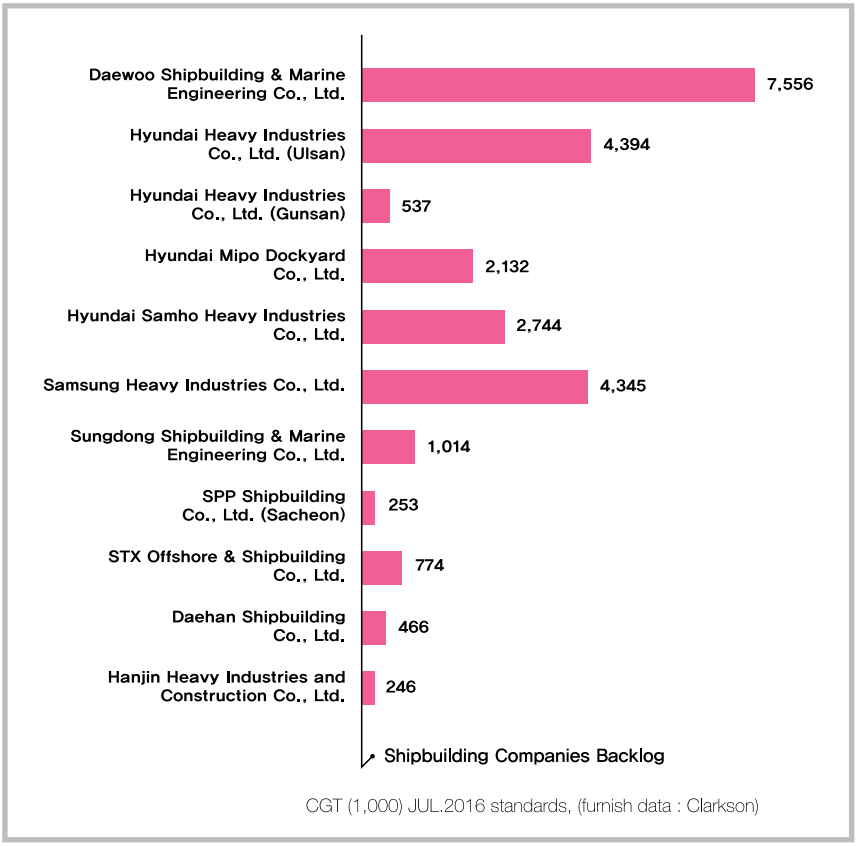
Korea Shipbuiling Orders awarded to domestic shipyards in 2015~2016

Data		Type	Number of vessel	Amount	Ship owner	Delivery	Shipyard
2015	Jan	174,000m³ LNG carriers	2 vessels	USD 400 million	Korea Line Corporation, Korea	The end of 2017	Daewoo Shipbuilding & Marine Engineering
		174,000m³ LNG carriers	2 vessels	USD 400 million	Hyundai LNG Shipping, Korea	The end of 2017	Daewoo Shipbuilding & Marine Engineering
		19,200 TEU container ships	3 vessels	USD 450 million	Scorpio Group, Monaco	-	Samsung Heavy Industries
		LNG carriers	2 vessels	USD 416 million	SK shipping, Korea	The end of 2017	Samsung Heavy Industries
		319,000 DWT VLCCs	2 vessels	USD 198 million	Maran Tankers Management, Greece	-	Daewoo Shipbuilding & Marine Engineering
	Feb	158,000 tons oil tankers	5 units (2 optional vessels)	USD 330 million	-	2017s	Sungdong Shipbuilding & Marine Engineering
		174,000m³ LNG carriers	1 vessel	USD 200 million	-	-	Daewoo Shipbuilding & Marine Engineering
		74,000 DWT oil products carriers	2 units (1 optional vessels)	USD 46 million	Valles Steamship, Hong Kong	-	STX Offshore & Shipbuilding
		300,000 DWT VLCCs	2 vessels	USD 192 million	Metrostar Management, Greece	The end of 2016	Hyundai Heavy Industries
		1,800 TEU container ships	4 units (2 optional vessels)	-	Cosmoship Management S.A, Greece	-	Dae Sun Shipbuilding & Engineering
		180,000m³ LNG carriers	1 vessel	-	Mitsui O.S.K Lines, Japan	2018s	Daewoo Shipbuilding & Marine Engineering
	Mar	38,000m³ liquefied petroleum gas and ammonia carriers	2 vessels	-	Asian ship owner	-	Hanjin Heavy Industries & Construction
		20,100TEU container ships	4 vessels	USD 619.57 million	Mitsui O.S.K Lines, Japan	2017. August	Samsung Heavy Industries
		LR1 tankers	2 vessels	KRW 320 billion	BW, Singapore	2016 ~ 2017	STX Offshore & Shipbuilding
	Apr	319,000 DWT VLCCs	2 vessels	USD 198 million	Maran Tankers Management, Greece	The end of 2016	Daewoo Shipbuilding & Marine Engineering
		20,600 TEU container ships	3 vessels	-	CMA CGM, France	The end of 2017	Hanjin Heavy Industries & Construction (HHIC)-Phil's Subic Shipyard
		21,100 TEU container ships	6 vessels	USD 950 million	OOCL, Hong Kong	The end of 2017	Samsung Heavy Industries
		10,500 TEU container ships	5 vessels	-	Hapag-Lloyd, Germany	-	Hyundai Samho Heavy Industries
		Pure Car/Truck Carriers	2 vessels	USD 130 million	Norwegian Car Carriers, Norway	The end of 2016	Hyundai Samho Heavy Industries
		11,000 TEU container ships	6 vessels	-	Asian and European ship owners	2016 ~ 2017	HHIC-Phil's Subic Shipyard
	May	156,000 tons oil tankers	2 vessels	-	Maran Tankers Management, Greece	-	Daewoo Shipbuilding & Marine Engineering
		5,200 ton training vessel	1 vessel	-	-	-	Hanjin Heavy Industries & Construction
		74,000 tons LR1 tankers	8 units (4 optional vessels)	USD 375 million	Marshall Islands-based ship owners	The end of 2016	STX Offshore & Shipbuilding
	Jun	300,000 DWT VLCCs	10 units (5 optional vessels)	USD 1 billion	The National Shipping Company of Saudi Arabia	2017s	Hyundai Samho Heavy Industries
		19,630 TEU container ships	11 vessels	USD 1.1 billion	Maersk Line A/S, Denmark	2018s	Daewoo Shipbuilding & Marine Engineering
		Tankers	2 vessels	-	Arcadia Shipmanagement, Greece	-	Hyundai Heavy Industries
		300,000 DWT VLCCs	6 units (4 optional vessels)	USD 540 million	John Fredriksen	-	STX Offshore & Shipbuilding
		174,000 CBM LNG carriers	3 units (1 optional vessels)	-	Teekay LNG Partners, Canada	First quarter of 2019	Hyundai Samho Heavy Industries
		155,000 DWT tankers	3 vessels	USD 330 million	-	2018. February	Samsung Heavy Industries
		84,000m³ VLGCs	4 vessels	USD 320 million	China Peace, China	-	Daewoo Shipbuilding & Marine Engineering
	Jul	173,400m³ LNG Carriers	1 vessel	USD 195 million	Chandris, Greece	The end of 2018	Daewoo Shipbuilding & Marine Engineering
		14,000 TEU container ships	9 vessels	USD 1.1 billion	Maersk Line A/S, Denmark	2017	Hyundai Heavy Industries
	Aug	Product Carriers	4 vessels	USD 144 million	Scorpio Tankers, U.S.A	The first of 2017	Hyundai Mipo Dockyard
	Sep	84,000m³ LPG Carriers	2 vessels	-	Asia ship owner	2017s	Daewoo Shipbuilding & Marine Engineering
		74,000 tons LR1 tankers	4 units (2 optional vessels)	-	Greece ship owner	The second half of 2017	STX Offshore & Shipbuilding
	Oct	173,400m³ LNG Carriers	2 vessels	USD 400 million	BW Group, Singapore	The first half of 2019	Daewoo Shipbuilding & Marine Engineering
		84,000m³ LPG carriers	2 vessels	-	Asia ship owner	2017s	Daewoo Shipbuilding & Marine Engineering
	Nov	319,000 tons VLCCs	2 vessels	-	Maran Tankers Management, Greece	2017s	Daewoo Shipbuilding & Marine Engineering
	Dec	114,000 tons products carriers	2 vessels	-	Sea Tankers Group	2017. September	Daehan Shipbuilding
2016	Feb	158,000 DWT oil products carriers	2 vessels	-	Ditas Shipping, Turkey	2018s	Hyundai Heavy Industries
	May	40,000 DWT products carriers	2 vessels	-	Greece ship owner	-	Hyundai Mipo Dockyard
		159,000 DWT oil tankers	2 vessels	-	AMPTC, Kuwait	2018s	Hyundai Heavy Industries
	Jun	75,000 tons product carriers	4 vessels	USD 170 million	Tsakos, Greece	The first of 2018	Sungdong Shipbuilding & Marine Engineering
		180,000m³ LNG carriers	2 vessels	USD 400 million	SK E&S, Korea	The first of 2019	Hyundai Heavy Industries
		50,000 tons bulk carrier	1 vessels	-	Ilshin Marine Transport, Korea	The end of 2017	Hyundai Mipo Dockyard

*Note : Based on the press release and public announcements of each shipyards, internal estimation of Monthly KORSHIP (estimation until Jul 15, 2016)

Global new orders plunged by 71% year-on-year this year. According to Clarkson, cumulative number of vessels ordered until June stood at 224 units. Total value of new orders at Chinese shipyards reached USD 4.057 billion (2,421,561 CGT with 92 vessels), the highest worldwide, which represents 38% share in global market. New orders at Korean shipyards amounted to USD 1.85 billion (826,386 CGT with 27 vessels), while those at Japanese shipyards totaled USD 1.076 billion (52,452 CGT with 28 vessels). Meanwhile, global order backlog stands at 101.91784 million CGT (with 4,318 vessels) as of late June.



As global shipbuilding orders diminish, ship prices fell to an all-time low. Clarkson index hit 127 points in June which is the lowest level since June 2013. Prices for major vessel types have fallen each week by USD 500,000 apiece, including VLCC (Very Large Crude Carrier), Suezmax tanker, Aframax tanker, Capesize bulk carrier, supersized containership with a capacity of 13,000 TEU (1 TEU represents a 20-ft equivalent container).

Here, we take a close look at the performance of major domestic 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) and others based on the order backlog data.

Photo: Hyundai Heavy Industries Co., Ltd.

Offshore plant orders awarded to domestic shipyards in 2011-2016

Data		Type	Number of vessel	Amount	Ship owner	Delivery	Shipyard
2011	Jul	Drillship	2 vessels	USD 1.1225 billion	Maersk, Denmark	July 2014	Samsung Heavy Industries
	Aug	LNG-FSRU	1 vessel	USD 280 million	Excelerate Energy, U.S.A	First quarter of 2014	Daewoo Shipbuilding & Marine Engineering
	Sep	Semi-submersible Rig	2 units	USD 1.1 billion	Songa Offshore, Norway	Second hallf of 2014	Daewoo Shipbuilding & Marine Engineering
		Well Intervention Vessel	2 vessels	USD 420 million	Eide Marine Services AS, Norway	2013	STX Finland
		Drillship	1 vessel	KRW 600 billion	Noble Drilling, U.S.A	Second half of 2014	Hyundai Heavy Industries
	Oct	Fixed Offshore Platform	-	USD 1.4 billion	Chevron, U.S.A	Second half of 2014	Daewoo Shipbuilding & Marine Engineering
		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	-	-	From 2013 to 2014	STX OSV
		Platform Supply Vessel	4 units	KRW 2 trillion	Island Offshore, Norway	Consecutively from the 3rd quarter	of 2013 to the 1st quarter of 2014
	Nov	Pipe Laying Support Vessel	2 units	USD 500 million	Odebrecht, Brazil	August of 2014	Daewoo Shipbuilding & Marine Engineering
	Dec	Offshore facilities (Gas platform and various facilities)	-	USD 900 million	Major multinational oil companies	2nd half of 2014	Hyundai Heavy Industries
2012	Jan	CPF (Central Processing Facility)	-	KRW 2.6 trillion	INPEX, Australia	4th quarter of 2015	Samsung Heavy Industries
		Semi-submersible rig	1 unit	USD 620 million	Odfjell, Norway	by mid 2014	Daewoo Shipbuilding & Marine Engineering
	Feb	LNG-FSRU	-	-	Hoegh, Norway	-	Hyundai Heavy Industries
	Mar	Offshore Platform	1 unit	USD 560 million	DONG E&P A/S, Danish	April 2015	Daewoo Shipbuilding & Marine Engineering
		FPSO	1 unit	USD 2.0 billion	INPEX, Australia	April 2016	Daewoo Shipbuilding & Marine Engineering
	Apr	Drillship	1 vessel	USD 645 million	Ensco plc	Third quarter 2014	Samsung Heavy Industries
	May	Semi-submersible Drilling Rig	2 units	USD 1.1 billion	Songa Offshore, Norway	Mid 2015	Daewoo Shipbuilding & Marine Engineering
		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
	Jun	Semi-submersible drilling rig	1 unit	USD 700 million	Fred Olsen Energy, Norway	March 2015	Hyundai Heavy Industries
		LNG-FPSO	1 unit	-	Petroliam Nasional Berhad, Malaysia	June 2015	Daewoo Shipbuilding & Marine Engineering
	Jul	Drillship	1 vessel	USD 645 million	Ensco 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
	Oct	Drillship	4 vessels	USD 2.06 billion	Transocean, U.S.A	One-by-one from mid 2015	Daewoo Shipbuilding & Marine Engineering
		Drillship	1 vessel	USD 560 million	Atwood Oceanics, U.S.A	-	Daewoo Shipbuilding & Marine Engineering
		LNG-FSRU	1 vessel	USD 270 million	Hoegh 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
2013	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 of 2015	Hyundai Heavy Industries
	Jun	Ultra-deepwater Drillship	1 unit	USD 515 million	Ensco, United Kingdom	Third quarter of 2015	Samsung Heavy Industries
		FPSO	1 unit	USD 3.0 billion	Nigeria	Second half of 2017	Samsung Heavy Industries
		Jack-up Rig	2 units	USD 1.3 billion	Statoil, Norway	-	Samsung Heavy Industries
	Jul	Ultra-deepwater Drillship	2 units	USD 600 million	Seadrill, Norway	Second half of 2015	Samsung Heavy Industries
		Semi-Submersible Rig	1 vessel	USD 718 million	Stena, Sweden	First half of 2016	Samsung Heavy Industries
		Ultra-deepwater Drillship	1 unit	USD 570 million	Atwood Oceanics, U.S.A	The end of 2015	Daewoo Shipbuilding & Marine Engineering
	Sep	Drillship	1 unit	USD 550 million	-	Dec of 2015	Samsung Heavy Industries
		Ultra-deepwater Drillship	1 unit	USD 600 million	Ocean Rig, Greece	Dec of 2015	Samsung Heavy Industries
		Jack-up Rig	1 unit	USD 530 million	Maersk Drilling, Denmark	The middle of 2016	Daewoo Shipbuilding & Marine Engineering
	Oct	Drillship	2 vessels	USD 1.24 billion	-	Second half of 2015	Daewoo Shipbuilding & Marine Engineering
		Drillship	1 vessel	USD 520 million	Transocean, U.S.A	The middle of 2016	Daewoo Shipbuilding & Marine Engineering
		LNG-FSRU	1 unit	-	Gas Sayago (Joint venture)	Sep of 2016	Daewoo Shipbuilding & Marine Engineering
	Dec	LNG-FSRU	1 unit	-	BW Maritime, Singapore	Early 2016	Samsung Heavy Industries
		LNG-FSRU	1 unit	-	Mitsui OSK Line, Japan	The middle of 2016	Daewoo Shipbuilding & Marine Engineering
2014	Feb	LNG-FPSO	1 unit	USD 1.45 billion	Petroliam Nasional Berhad, Malaysia	2018	Samsung Heavy Industries
	Apr	Drillship	2 vessels	USD 1.29 billion	Oceania	First half of 2017	Samsung Heavy Industries
	Jul	Central Processing Platform	2 units	USD 700 million	Hess E&P Malaysia, Malaysia	The end of 2016	Hyundai Heavy Industries
		Fixed offshore platform	4 units	USD 1.94 billion	ADMA-OPCO, UAE	The end of 2019	Hyundai Heavy Industries
	Nov	Fixed Offshore Platform & Submarine Cable	4 units	USD 1.9 billion	ADMA-OPCO	Second half of 2019	Hyundai Heavy Industries
		Offshore Platform	1 unit	USD 700 Million	Royal Dutch Shell	_	Samsung Heavy Industries
		FPU	1 unit		_	_	
2015	Jun	Offshore Platform	2 unit	USD 1.06 billion	Statoil, Norway	The end of 2018	Samsung Heavy Industries
	Jul	FLNG	3 unit	USD 4.7 billion	Royal Dutch-Shell	_	Samsung Heavy Industries

* Note : Based on the press release and public announcements of each shipyards, internal estimation of Monthly KORSHIP (estimation until Jul 15, 2016)

Supersized containership losing popularity

- Efficiency and infrastructures hold the key

Supersized containership is losing favor in the market due to its disadvantages such as lower load share amid the decline in oil prices and global cargo traffic, along with difficulty related to transportation cost reduction which results from the trend towards large vessels.

Efficiency improvement is contingent upon achievement of over 90% load share. Currently, load share rate is no more than 70%. It is no exaggeration to say that shipping lines are recently operating empty vessels.

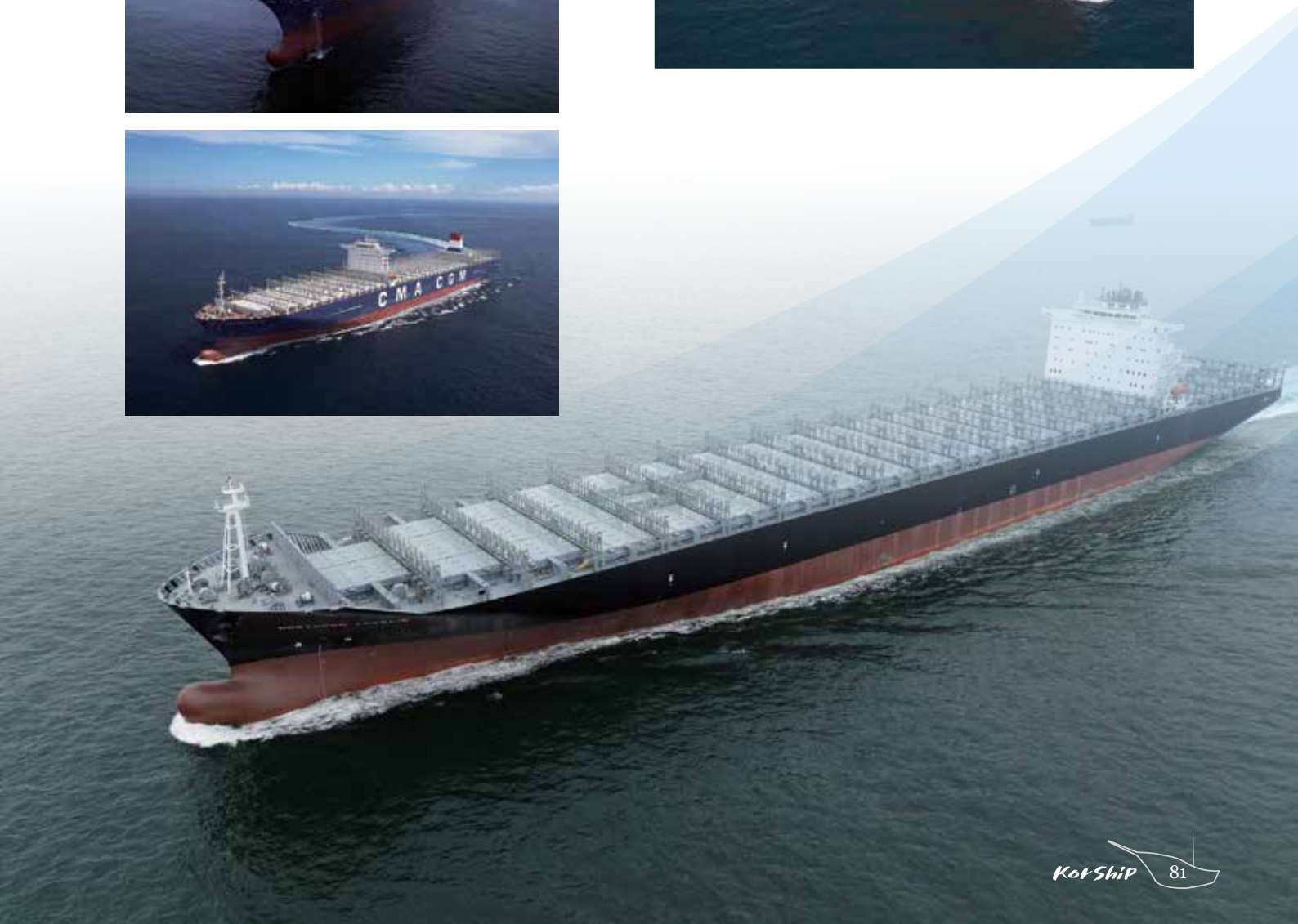
Major containership operators are loading containers equivalent to only 3,000 to 4,000 TEU onto containership with a capacity of 8,000 TEU. In the same way, 18,000 TEU containership is loaded with containers equivalent to 5,000 to 6,000 TEU. Furthermore, standby time is prolonged due to gigantic size and deep draft (depth of vessel) of supersized containership when it is moored at terminal. For instance, standby lasts about 1 and a half hour for 8,000 TEU vessel being moored at terminal. By contrast, supersized containership requires standby duration of 6 hours on average.

Moreover, most ports around the globe do not have infrastructures needed to ensure effective handling of supersized containership.

Some analysts predict that containerships larger than currently operating vessels would be unlikely to be ordered after 2020 in light of low demand for cargo transportation in containership market and diminishing efficiency of supersized containership.

CMA CGM

CMA CGM



MSC

CHINA SHIPPING LINE

MSC

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COSCO NEW YORK
COSCO

MPL ILLINOIS

MAERSK LINE

COSCO

Hapag-Lloyd

Hapag-Lloyd

COSCO

COSCO BEIJING
COSCO

COSCO

New Product

Portalevel™ Intrinsically Safe

Coltraco Ltd.

Coltraco Ultrasonics are excited to announce the release of the Portalevel™ Intrinsically Safe Zone 1 as part of their commitment to enhance consistent safety at both land and at sea.

The Portalevel™ Intrinsically Safe Ultrasonic Liquid Level Indicator is designed to provide enhanced Speed, Operation and Performance under high intensity testing requirements. The Zone 1 ATEX, UL and RINA approved Portalevel™ Intrinsically Safe services CO_2, old Halons, FM-200®, NOVEC™ 1230 and HFC-225 & 227 cylinders in 30 seconds, with an accuracy of up to +/-1.5mm.

The Zone 1 ATEX approval of the Portalevel™ Intrinsically Safe classifies that the equipment "provides a very high level of protection in continuously present explosive atmospheres". The efficient Portalevel™ Intrinsically Safe will in future be able to provide innovative safety to Gas Carrier's NOVEC™ 1230 fire suppression systems, the civil and military aerospace industry, LNG/LPG carriers and certain areas in power plants and petrochemical facilities.

-TEL: +44-20-7629-8475
-http://www.coltraco.co.uk

New epoxy coating for marine newbuildings

Hempel

Hempel announced that it is the launch of Hempadur Quattro XO 17820 in Canada, the US and Mexico. Responding to customer needs, this high performance two-component pure epoxy PSPC (Performance Standard for Protective Coatings) compliant coating has been developed for the marine newbuilding sector.

Hempadur Quattro XO 17820 was developed for water ballast tanks in new vessels, however it can also be used as a uni-primer for most vessel areas – above and below the waterline – providing high quality performance and peace of mind for customers.

Hempadur Quattro XO 17820 has been created specifically to suit the working methods of shipbuilders and so accommodates shorter re-coat intervals and reduces maintenance costs. Additionally, its higher (80%) volume solids ratio means less volatile organic compounds (VOCs) are released into the atmosphere, which is preferred in North America.

IMO (International Maritime Organization) requires the use of a PSPC certified coating for water ballast tanks. The launch today, of this new coating represents innovative pure epoxy technology that delivers the optimized performance demanded by our customers.

Benefits of Hempadur Quattro XO 17820 include:

- *High quality pure epoxy technology offering superior crack resistance, edge retention, coating flexibility and impact resistance.*
- *High efficiency for shipyards due to fast drying and year around applications from 14oF/-10°C to 104 oF/40°C.*
- *Option to upgrade with aluminum pigmentation and proprietary fiber reinforcement technology to enhance anti-corrosion properties and long-term durability with reduced maintenance expectations.*

For the decision makers, the high quality and robustness of Hempadur Quattro XO 17820 provides simplicity and reduced maintenance costs.

-TEL: +82-51-679-9300
-http://www.hempel.com

KOMEA (Korea Marine Equipment Association)
Member List

AMIR Marine Co., Ltd.
Location : YEONGDO-GU, BUSAN
Website : www.amir.co.kr
Main Products : Piston Ring
TEL : +82 51 413 9600

AMS Co., Ltd.
Location : HAEUNDAE-GU, BUSAN
Website : www.albatros.co.kr
Main Products : Unit Toilet/Wall & Celling Panel, Heat Exchangers (Plate Shell & Tube), etc.
TEL : +82 51 293 1035

A-TECH
Location : GANGSEO-GU, BUSAN
Website : www.atech2004.co.kr
Main Products : Small davit, Air motor, Air winch
TEL : +82 51 832 0723

BC TAECHANG IND. Corp.
Location : JUNG-GU, BUSAN
Website : www.bcinternational.co.kr
Main Products : Ultimate solution for onboard crew maintenance, Deck scaling machine
TEL : +82 51 442 6191

Bethel Engineering Co., Ltd.
Location : NAMYANGJU-SI, GYEONGGI
Website : www.nmg.kr
Main Products : Magic Grating (Steel grating)
TEL : +82 31 593 2712

B-I INDUSTRIAL Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.b-i.co.kr
Main Products : Fire Detection System, Gas Detection System, Navigation Watch Alarm System, Moisture Detection System
TEL : +82 51 441 5670

BIP INDUSTRIES Co., Ltd.
Location : GEUNJEONG-GU, BUSAN
Website : www.bn-bip.com
Main Products : Wall panel, Ceiling panel, Bathroom unit, Cabin unit, Floating floor, TLQ, Marine furniture, Marine door, etc.
TEL : +82 51 519 2000

BOGO Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.bogoco.co.kr
Main Products : Telephone system, Lighting fixture
TEL : +82 51 294 7771

BO MYUNG METAL Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.bmmetal.co.kr
Main Products : Cooper & Cooper-Alloy Pipes & Plates, Fittings, Flanges
TEL : +82 51 266 4101

Bumhan Industries Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.bumhan.com
Main Products : Air compressor, N2 generator, High pressure control valve
TEL : +82 55 251 6070

BY CONTROLS, Inc.
Location : GIMHAE-SI, GYUNGNAM
Website : www.bycontrols.com
Main Products : Watertight door, Pilot door, Hydaulic hatch, etc.
TEL : +82 55 345 6110

BYT Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.byhd.co.kr
Main Products : HARDWARE, OUTFITTING, MARINE OUTFITTING, NEW PRODUCTS
TEL : +82 51 974 5000

CENTURY Corp.
Location : YANGSAN-SI, GYUNGNAM
Website : www.capeind.com
Main Products : Cylinder liner, Man B&W Sulzer (Wartsila) Type www.capeind.com YANGSAN-SI, GYUNGNAM
TEL : +82 55 370 1234

CHK Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.chkj.co.kr
Main Products : Ref. container socket, Juction box
TEL : +82 51 831 9500

ChungSol Marine Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.chungsolmarine.co.kr
Main Products : Window wiper, Straight line type, Clear view screen, Window, Door, Hatch
TEL : +82 51 832 2226

ChungSong Industry Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.koweld.co.kr
Main Products : Welding auto carriage, LWS, etc.
TEL : +82 55 329 9500

CMR KOREA Co., Ltd.
Location : KUMJUNG-GU, BUSAN
Website : www.cmrkorea.com
Main Products : Marine telephone system, Public address system, Communal aerial system, Marine CCTV system, Marine clock system, Anemometer system, Rudder angle indicator system, Temperature sensor, Pressure sensor
TEL : +82 51 521 2883

Dae Chang Metal Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.dcm.co.kr
Main Products : Propeller boss, Chain wheel cam, Dummy ring, Valve body, etc.
TEL : +82 51 264 0831

Dae Heung Cooler Co., Ltd.
Location : POCHEON-SI, GYEONGGI
Website : www.cooler.co.kr
Main Products : Heat exchanger
TEL : +82 31 532 9667

DAE KWANG IND Co., Ltd.
Location : GANGSEO-GU, BUSAN
Main Products : SUS PIPE FITTING FLANGE
TEL : +82 51 831 5886

Daechun Industrial Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.daechun.co.kr
Main Products : Multi-core tube, Stainless steel tube
TEL : +82 55 345 2288

DAEHA Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.daehatech.co.kr
Main Products : Hydraulic Pressure Testing Equipment, Cylinder, Pump, Torque Wrench
TEL : +82 51 326 1870

DAEJIN SAT Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.daejinsat.com
Main Products : Ceiling panel
TEL : +82 52 225 2361

DAEJUNG Co., Ltd.
Location : SASANG-GU, BUSAN
Website : www.daejung.net
Main Products : Fiber Rope, Pet/PP Mat, Sports Net
TEL : +82 51 304 2511

DAEJUNG VALVE Co., Ltd.
Location : DALSEO-GU, DAEGU
Website : www.djvalves.com
Main Products : Butterfly Valves, Oil Field flow-line components, Control Valves, Actuators, Special Valves
TEL : +82 53 584 2276

Daemmstoff Industrie Korea Ltd.
Location : SAHA-GU, BUSAN
Website : www.daemmstoff.com
Main Products : KVM SEALING COMPOUND, MANGANA TETAINING COMPOUND (PUTTY, FIRE STOP, PANDA-90, etc.)
TEL : +82 51 261 7073

Daeyang Electric Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.daeyang.co.kr
Main Products : Lighting fixtures, Instruments, SAUV, UUV
TEL : +82 51 200 5221

DAEYANG INSTRUMENT. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : http://dic.daeyang.co.kr/08_affiliate/affiliate_01.php
Main Products : Precision instruments - Anemometer, Rudder angle indicator, etc.
TEL : +82 51 200 5212

DaiHan Anchor Chain MFG. Co., Ltd.
Location : NAM-GU, INCHEON
Website : www.dhac.co.kr
Main Products : Anchor chain, Offshore mooring stud, etc.
TEL : +82 32 862 0091

DHMC Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.dhmc-rudder.com
Main Products : Rudder, Block, etc.
TEL : +82 55 346 3663

DECKWIN. Co.
Location : YEONGDO-GU, BUSAN
Website : www.deckwin.com
Main Products : Cable winch, Windlass, Mooring Winch, Capstan etc.
TEL : +82 51 405 7890

DINGJIN MPTECH
Location : GIMHAE-SI, GYUNGNAM
Main Products : Part for Marine Engine, Shaft System
TEL : +82 55 720 7000

DK Tech Corporation
Location : GIMHAE-SI, GYUNGNAM
Website : www.dklok.com
Main Products : Instrumentation fitting & valve
TEL : +82 55 338 0114

DMC Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.dongnam-crane.co.kr
Main Products : Offshore crane, Deck cranes, Floating cranes
TEL : +82 55 720 3000

DNP Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.dnpco.kr
Main Products : Accommodation system
TEL : +82 51 831 4551

Dong Hae M-Tech Co., Ltd.
Location : SEO-GU, INCHEON
Website : www.east-sea.co.kr
Main Products : Grab bucket, Orange grab, Motor grab, Wood grab, etc.
TEL : +82 32 583 8061

Dong Kang M-Tech Co., Ltd.
Location : GANGNAM-GU, SEOUL
Website : www.dkmtech.com

Main Products : Water jet, Night navigator
TEL : +82 2 553 0181

Dong Woo Machinery & Engineering Co., Ltd.
Location : CHANGWON, GYUNGNAM
Main Products : Engine room overhead crane, F.O hose handling davit, etc.
TEL : +82 55 295 3261

Dong-A Valve Ind. Co.
Location : GANGSEO-GU, BUSAN
Website : www.donga-valve.com
Main Products : Manufactured low & high pressure valves, Flap check (duo-check) valve, etc.
TEL : +82 51 831 1500

Dongbang Marine Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.dbmarine.co.kr
Main Products : MARINE FIRE DETECTION & ALARM SYSTEM, MARINE FIRE EXTINGUISHING SYSTEM
TEL : +82 51 205 1585

DONGHWA ENTEC
Location : GANGSEO-GU, BUSAN
Website : www.dh.co.kr
Main Products : Heat exchanger, Plate cooler, etc.
TEL : +82 51 970 1000

DongHwa Pneutec Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.dhkomp.co.kr
Main Products : Air/gas compressor
TEL : +82 51 974 4800

D-I Industrial. Co., Ltd.
Location : JINJU-SI, GYEONGNAM
Website : www.d-i.co.kr
Main Products : Marine Transmission, Power Take off, Steering System
TEL : +82 55 760 5500

DooSan Engine Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.doosanengine.com
Main Products : Marine diesel engine, Diesel engines for power generation
TEL : +82 55 260 6000

DRB Holding Co., Ltd.
Location : YEUNGDEUNGPO-GU, SEOUL
Website : www.drbworld.com
Main Products : Marine rubber fender, Industrial rubber sealing & gasket, Industrial rubber track, Rubber damper
TEL : +82 2 2168 9133

ELSCOM Inc.
Location : SASANG-GU, BUSAN
Website : www.elscom.co.kr
Main Products : Explosion-Proof Products, Distribution Board Components, Solar Cable/PV JB
TEL : +82 51 329 8990

Emerson Process Management Korea Ltd.
Location : SEONGNAM-SI, GYEONGGI
Website : www.emersonprocess.co.kr
Main Products : Pressure, Temperature, Level, Analytical & Flow Measurenet, Valves, Tank radar level guaging, etc.
TEL : +82 2 3438 4600

ENTECH (Engineering & Technology Co., Ltd.)
Location : CHANGWON-SI, GYEONGNAM
Website : www.tkhic.com
Main Products : Engine Bed/Frame box, Crane Pedestal, Tubular (SAW Pipe), Air Reservoir, Jacket, Pile, Wind Tower
TEL : +82 70 4628 8844

ESAB SeAH Corp.
Location : CHANGWON, GYUNGNAM
Website : www.esab.co.kr
Main Products : Flux cored wire
TEL : +82 55 289 8111

Flutek, Ltd.
Location : SEONGSAN-GU, GYEONGNAM
Website : www.flutek.co.kr
Main Products : Axial piston pumps, Axial piston motors & reduction gear, Electro-hydraulic steering gear, Deck machinery, Staffa motor, ECO servo
TEL : +82 55 570 5800

FRIEND Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.thefriend.co.kr
Main Products : Engine valve spindle, Cable tray
TEL : +82 51 974 7911

GASTRON Co., Ltd.
Location : GUNPO-SI, GYEONGGI
Website : www.gastron.com
Main Products : Installation-Type Detector, Portable Gas Detector, Acid Leak Detecting Paint, Alarm Signalling
TEL : +82 31 490 0800

G.S HIGH-TECHER Co., Ltd.
Location : MIRYANG-SI, GYENGNAM
Website : http://gshightecher.koreasme.com
Main Products : Air vent head, Convex coupling
TEL : +82 51 832 0456

GENERAL MARINE BUSINESS
Location : NAM-GU, INCHEON
Website : www.gmbmarine.com
Main Products : Marine system (ship shore comm. system, emergency shutdown system, etc.), Defense Eng. (Control & monitoring system integration, etc.),Manufacturing & services (new shipbuilding, module production)
TEL : +82 52 270 3500

GESKO Co., Ltd.
Location : GANGSEO-GU, BUSAN
Main Products : CNG Transportation&Refilling, Fire Fighting system, Engineering for Fire fighting system & Ballast treatment system, Annual inspection
TEL : +82 51 973 9913

GS-Hydro Korea Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.gshydro.com
Main Products:Flare flange system, Retaining ring system
TEL : +82 51 266 8221

TECH FLOWER Co., Ltd.
Location : SASANG-GU, BUSAN
Website : www.haean21.com
Main Products : Marine crane, Deck machinery
TEL : +82 51 320 8222

Haewon Ind. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.haewon.net
Main Products : Water seal, Inflatable/mating ring
TEL : +82 51 831 4600

Halla Industrial Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.hallaiq.co.kr
Main Products : Non seal canned motor pump, Gear pump
TEL : +82 51 264 2201

Han Jo Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.hanjoms.co.kr
Main Products : Lubication oil filter, Fuel oil filter, Filter elements
TEL : +82 51 414 7201

Hankook Flexible Co.
Location : SASANG-GU, BUSAN
Website : www.hkflex.com
Main Products : Metalic flexible hose, Metallic expansion joint, Manufacturing of Metalic flexible hose assemblies
TEL : +82 51 508 6291

HanKuk Miboo Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.hankukmiboo.co.kr
Main Products : Spiral duct, Cold chamber, Deck covering, Level
TEL : +82 51 263 3621

HANLAIMS Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.hanlaims.com
Main Products : Instruments (Level gauge/Level switch) Tank remote sounding system/Cargo monitoring system, valve
TEL : +82 51 601 7016

HANSHIN ELECTRONICS Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.ehanshin.com
Main Products : Public address sys., Telephone sys.
TEL : +82 51 412 5551

HANSUN ENGINEERING Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.slok.co.kr
Main Products : Instrument Tube Fittings, Instrument Valves, Filters, Condensate Pot
TEL : +82 51 899 6700

HEARTMAN Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.heartman.co.kr
Main Products : Fuel injection nozzle for marine diesel engine, Fuel injection plunger ass'y for marine diesel engine
TEL : +82 51 264 8826

HI AIR KOREA Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.hiairkorea.co.kr
Main Products : Air handling unit, Spot cooler, Refrigeration condensing unit, Fire damper, Provision refrigeration plant, MGO cooling system, Packaged air conditioner, Ventilation fan, Spiral duct
TEL : +82 55 340 5000

Hi Tech Co., Ltd.
Location : GYUNGJU-SI, GYUNGBUK
Main Products : T-Bar, Gas Protect Plate
TEL : +82 54 776 5310

Ho Seung Enterprise Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.hosent.co.kr
Main Products : Package unit for engine room
TEL : +82 51 831 2233

HODU INDUSTRIAL Co.
Location : GANGSEO-GU, BUSAN
Website : www.hoducompany.com
Main Products : Catering furniture, Galley hood W/fire fighting, Galley E/Q (Deep fat fryer/Cooking range, etc.)
TEL : +82 51 271 3342

Hy-Lok Corporation
Location : GANGSEO-GU, BUSAN
Website : www.hy-lok.com
Main Products : Tube fitting & valve, Double lock & bleed valve, Cryogenic valve
TEL : +82 51 970 0800

HYUNDAI HEAVY INDUSTRIES Co., Ltd.
Location : DONG-GU, ULSAN
Website : www.hhi.co.kr
Main Products : Marine diesel engine & machinery w
TEL : +82 52 202 7291

Hyundai Elevator Co., Ltd.
Location : ICHEON-SI, GYEONGGI
Website : www.hyundaielevator.co.kr
Main Products : Lifts (elevator, escalator, moving walk), Logistics automation system, Parking system (automobiles, bicycles), SOC infrastructure systems (platform screen door, automatic folding canopy, gap zero, etc.)
TEL : +82 31 644 5114

Hyundai Fitting Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.hdfco.co.kr
Main Products : Flange
TEL : +82 51 831 0891

HLB Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.hdboat.com
Main Products:Lifeboat , GRP rigid-type rescue boat
TEL : +82 52 240 3500

Hyundai Marine Machinery Co., Ltd.
Location : SEO-GU, INCHEON-SI
Website : www.hmmco.co.kr
Main Products : W.O. incinerator, Aux/blower, F.D fan
TEL : +82 32 583 0671

HYUNDAI WELDING Co., Ltd.
Location : GANGNAM-GU, SEOUL
Website : www.hyundaiwelding.com
Main Products : Covered electrode arc welding consumables, Sub-merged arc welding flux & wire, Soild wire arc welding consumables, Flux cored wire, MIG TIG arc welding consumables, Welding machines
TEL : +82 2 6230 6883

I.M.E. CORPORATION
Location : GIMHAE-SI, GYUNGNAM
Website : www.promarine21.com
Main Products : Engine valve spindle & seat
TEL : +82 55 346 1127

ILJIN AND Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.iljinamst.co.kr
Main Products : Fire detection system, Gas detection system, Emission monitoring system, Water spray & cargo spray system, etc.
TEL : +82 51 755 6191

ILSHIN ENGINEERING Co., Ltd.
Location : SIHEONG-SI, DYEONGGI
Website : www.ilshineng.com
Main Products : Chemical equipment and Tanks
TEL : +82 31 499 4502

ILSUEUNG Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.ilseung.co.kr
Main Products : Sewage Treatment plant, Fresh water generator, Oil purifier
TEL : +82 51 831 4110

IL-SUNG IND. Co.
Location : SASANG-GU, BUSAN
Website : www.ilsunghs.co.kr
Main Products : Hot water calorifier, Silencer (For M/E, G/E, fan), Mist eliminator, Washable
TEL : +82 51 312 4056

International Machine Tool Co.
Location : SASANG-GU, BUSAN
Website : www.clampimt.com
Main Products : Vertical clamp, Horizontal clamp, etc.
TEL : +82 51 314 2038

INTRA PRECISION MANUFACTURE Co., Ltd.
Location : DONG-GU, BUSAN
Website : www.intraspare.co.kr
Main Products : PISTON CROWN, CYLINDER LINER, CYLINDER COVER, PISTON SKIRT, WATER JACKET
TEL : +82 51 466 4635

JHK Inc.
Location : YANGSAN-SI, GYUNGNAM
Main Products : Container fittings, Lashing fittings
TEL : +82 55 346 2225

JINSEONG LINER & PISTON
Location : DAEDEOK-GU, DAEJEON
Website : www.jinseong.com
Main Products : Cylinder liner, Piston
TEL : +82 42 931 8558

JONGHAP MACHINERY Co.
Location : YANGSAN-SI, GYUNGNAM
Website : http://jonghap.biz
Main Products : Sewage treatment plant, T-bar auto welding machine
TEL : +82 55 370 2600

JUNG GONG IND. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.jung-gong.com
Main Products : Marine window, Fire-resistant window, Marine wiper, Clear view screen,
TEL : +82 51 261 2911

JUNG-A MARINE
Location : GANGSEO-GU, BUSAN
Website : www.jung-a.co.kr
Main Products : Accommodation ladder, Pilot slant ladder, Wiper, CVS, Sunscreen davit,
TEL : +82 51 970 6420

JUNGSAN ENTERPRISE Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.jungsan.com
Main Products : Marine engine parts
TEL : +82 52 254 3290

K.C. Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.iccp-mgps.com
Main Products : Impressed current cathodic protection (I.C.C.P) system, Anti-fouling system (M.G.P.S), Shaft earthing device
TEL : +82 51 831 7720

Kangrim Heavy Industries Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.kangrim.com
Main Products : Marine boiler, Plant, LPG tank
TEL : +82 55 269 7700

Kangrim Insulation Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.kangrim.com
Main Products : Tank, Pipe insulation, Cold provision store
TEL : +82 51 200 6000

Keonchang Industry Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.keonchang.co.kr
Main Products : TOP CHARGING EQUIPMENT, HOPPER & CONVEYER, SIDE GUIDE ASS'Y
TEL : +82 51 203 0161

Keum Yong Machinery Co., Ltd.
Location : BUK-GU, DAEGU
Website : www.beumyong.com
Main Products : Exh. valve complete with spindle
TEL : +82 53 382 9044

Key Sung Metal Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.deysungmetal.com
Main Products : Marine valve
TEL : +82 51 831 3391

Keystone Valve (Korea)
Location : ANSEONG-SI, GYEONGGI
Website : www.keystonekorea.com
Main Products : All kinds of valves for offshore and shipbuilding
TEL : +82 51 604 4000

KHAN Co., Ltd.
Location : GEOJE-SI, GYEONGNAM
Website : www.khan-offshore.com
Main Products : Engineering services, Sea-trial & commissioning service, Facility for fabricaton, Modification
TEL : +82 55 639 7600

Kion Printing & Packaging Inc.
Location : GIMHAE-SI, GYUNGNAM
Website : www.kiwon.com
Main Products : Marine equipment & vacuum system
TEL : +82 55 313 9913

KOC ELECTRIC Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.kocelec.com
Main Products : H/V transformer (ATEX, WATER COOLED TYPE), UPS (Uninterruptible Power Supply), Bus way/Bus duct
TEL : +82 51 970 6302

Kokaco Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.kokaco.com
Main Products : Exhaust Valve Spindle&Bottom Piece Grinding Machine
TEL : +82 51 403 4114

Komeco Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.komeco.net
Main Products : Tacho sys., Electronic equip.
TEL : +82 51 724 5070

Kongsberg Maritime Korea Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.km.kongsberg.com
Main Products : Alarm monitoring system, Cargo monitoring system, Offshore technology
TEL : +82 51 749 8600

KOREA FILTER Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.korea-filter.co.kr
Main Products : STRAINER, OIL FILTER, AIR FILTER, AUTO STRAINER
TEL : +82 51 727 8360

KOTO Technical Co.
Location : SAHA-GU, BUSAN
Website : http://kotofft.com
Main Products : Maintain & repair items (all hydraulic systems, Adjust alignment, centering)
TEL : +82 51 417 8501

KORVAL Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.korval.co.kr
Main Products : Control Valves, Regulating Valves, Heat Sensor, Shut-Off Valves
TEL : +82 51 790 9700

KSP Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.kspvalve.com
Main Products : Exhaust valve complete, Exhaust valve spindle
TEL : +82 51 831 6274

KSV (Korea Special Valve) Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.ksv-valve.co.kr
Main Products : Valve spindle and Valve seat for marine diesel engine
TEL : +82 51 415 4466

KTE Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.kte.co.kr
Main Products : High voltage swichboard, Side thruster, Low voltage swichboard, Side thruster control system, Group starter panel, Alarm monitoring system, Electric equipment, etc.
TEL : +82 51 265 0255

Kuk Dong Elecom Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.kukdongelecom.com
Main Products : Lighting fixture
TEL : +82 51 266 0050

KTMI Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.saejinintech.com
Main Products : Emergency towing system
TEL : +82 51 971 9911

KUKDONG ELECTRIC Co., Ltd.
Location : JINCHEON-GUN, CHUNGBUK
Website : www.nexans.co.kr
Main Products : WIRE All kinds of cables for offshore and shipbuilding including JIS, BS, IEC, DIN, IEEE, etc.
TEL : +82 2 2140 3064

KUMGOKSTEEL INDUSTRY. Co., Ltd.
Location : SEO-GU, INCHEON
Website : www.kgsi.co.kr
Main Products : Steel Gratings, Manhole Covers and Steel Products
TEL : +82 32 564 6759

Kum Kang Precision Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.kkmarine.co.kr
Main Products : Marine valve, valve for engine, air reservoir tank
TEL : +82 51 262 4894

KANGNAM JEVISCO Co., Ltd.
Location : BUSANJIN-GU, BUSAN
Website : www.jevisco.com
Main Products : Shop primer, Anti-corrosive coatings, Anti-fouling coatings, etc.
TEL : +82 51 892 4221

Kwanglim Marine Tech. Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.klmt.co.kr
Main Products : Steel Door, Hull Apteher Blank, Radar Mast, Hi-Pressure Water Mist Fire Fighting System
TEL : +82 51 313 0055

KWANG SAN Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.kwangsan.com
Main Products : AIR VENT HEAD, EXP. JOINT, HEATING COIL, AIR VENT HEAD, EXP. JOINT, HEATING COIL, PIPE SPOOL, ETC.
TEL : +82 51 974 6316

Kwang Seong Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.ikwangsung.com
Main Products : PIPE CABLE HANGER, SPARE PART SEAT, ETC.
TEL : +82 55 338 2271

Kyung Eun Ceramics Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.ke-ceramics.com
Main Products : Ceramic packing
TEL : +82 55 345 7761

Kyungjin Shipping Co., Ltd.
Location : CHANGWON-SI, GYEONGNAM
Website : www.kyungjinshipping.com
Main Products : Exports & Imports of Marine Equipment, Shipping Agent Service, Shipbroking Service, Trading
TEL : +82 55 224 4383

Kyungsung Industry Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.e-clamp.com
Main Products : LNG carrier sus corner & anchor strips & Pipe clamp, etc.
TEL : +82 51 831 4960

LDC-KOREA Co., Ltd.
Location : HAEUNDAE-GU, BUSAN
Main Products : Traders (Marine Equipment), Ship Repair
TEL : +82 51 266 4037

Leeyoung Industrial Machinery Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.leeyoung.co.kr
Main Products : Lashing bridge, T-bulkhead block, Covered-block, Engine casing & funnel, Upper deck & module unit, etc.
TEL : +82 52 231 5800

LHE Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.lhe.co.kr
Main Products : Plate heat exchanger, Fresh water generator
TEL : +82 55 340 0625

LS Cable & System
Location : ANYANG-SI, GYEONGGI
Website : www.lscns.com
Main Products : Power cable, Marine & offshore cable, Telecom cable, SUBMARINE CABLE, WINDSOL, SUPERCONDUCTIVITY
TEL : +82 51 310 6781

LUXCO Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.luxco.co.kr
Main Products : Electrical equipment for internal combustion engines, Magnetic products, etc.
TEL : +82 51 260 1300

MIN SUNG Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.minsung.co.kr
Main Products : Steel outfitting, Access hatch, Swing away hatch, Cable tray, Electric cable box, etc.
TEL : +82 51 305 8862

Mirae Industries Co., Ltd.
Location : HAMAN-GUN, GYEONGNAM
Website : www.miraewinch.com
Main Products : Winch, Chain Stopper, Capstan
TEL : +82 55 587 8520

MODERN INTECH Co., Ltd.
Location : SASANG-GU, BUSAN
Website : www.mo-dern.com
Main Products : Fire retardant curtain, Mattress, Upholstery furniture, Fire retardant fabric, Carpet, Rubber flooring
TEL : +82 51 325 0260

MRC (Marine Radio Co., Ltd.)
Location : YOUNGDO-GU, BUSAN
Website : www.mrckorea.com
Main Products : Public address system, Auto telephone sys.
TEL : +82 51 414 7891

MSL Compressor Co., Ltd.
Location : POCHEON-SI, GYEONGGI
Website : www.mslcomp.com
Main Products : Breathing air compressor
TEL : +82 31 541 7000

Mt.H Control Valves Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.mth.co.kr
Main Products : Main starting valve, Crankcase relief valve, Cyogenic safety valves & control valve
TEL : +82 51 974 8800

NK Co., Ltd.
Location:SAHA-GU, BUSAN
Website:www.nkcf.com
Main Products:Ballast water treatment sys., CO_2 sys.
TEL:+82 51 200 0152

NOW Co., Ltd.
Location : YANGSAN-SI, GYEONGNAM
Website : http://nowcan.co.kr
Main Products : Duct, Damper, Fitting, Piston, Ring, Cylinder
TEL : +82 55 387 4811

ONNURIPLAN Co., Ltd.
Location : BUCHEON-SI, GYEONGGI
Website : www.onnuriplan.com
Main Products : Dust & Gas Masks, Sanitary Mask Covers, etc.
TEL : +82 32 681 7780

Oriental Precision & Engineering Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.opco.co.kr
Main Products : Crane, Windlass & Mooring Winch, Life Boat Davit
TEL : +82 51 202 0101

OSCG Co., Ltd.
Location : SASANG-GU, BUSAN
Website : www.oscg.net
Main Products : Cable gland and accessories, GRP junction box
TEL : +82 51 305 3910

OTS Co., Ltd.
Location : SUNCHEON-SI, JEONNAM
Website : www.otshi.co.kr
Main Products : Crane, Winch, A-Frame
TEL : +82 61 724 4100

PANASIA Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.worldpanasia.com
Main Products : Ballast water treatment system/level instrument, Seawater coarse filtration/ Emission gas control system, Engineering services
TEL : +82 51 831 1010

Pie Plus Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.piplus.co.kr
Main Products : Crankshaft, Rudder stock, Motor shaft
TEL : +82 51 831 9338

PROSAVE Co., Ltd.
Location : GIMHAE-SI, GYEONGNAM
Website : www.prosave.co.kr
Main Products : Crankcase Explosion Relief Valve, Smart High Velocity Pressure/ Vacuum Relief Valve, Air Release & Vacuum Breaker Valve
TEL : +82 55 313 3511

S&W Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.snwcorp.com
Main Products : Cam/cam shaft, Valve/seat ring, Engine bolts/ nuts, Bolts
TEL : +82 51 205 7411

S. A. M-Tech
Location : NAMDONG-GU, INCHEO
Website : www.samartkr.com
Main Products : Engine control lever, Engine control cable, Hydraulic steering system, Stern drive, Helm pump, Cylinder, etc.
TEL : +82 32 815 3614

SG Safety Corp.
Location : PYEONGTAEK-SI, GYEONGGI
Website : www.sgsafety.net
Main Products : Inflatable rubber products, Ship ballast water treatment system, Life rafts, Speed boats, River boats, Fishing boats, Water tanks, High-speed boats
TEL : +82 31 651 3012

SAMGONG Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.sam-gong.co.kr
Main Products : Oil purifier, Ship window, Ship accommodation ladder, Cathodic protection system, Elevator type tower gangway, Ship ballast water treatment system, Quick release mooring hook & road monitoring system
TEL : +82 51 200 3040

Samin Information System Co., Ltd.
Location : HAEUNDAE-GU, BUSAN
Website : www.saminis.com
Main Products : EcoInspection, Ecoserver Package
TEL : +82 70 7771 2104

SAMKUN CENTURY Co., Ltd.
Location : MIRYANG-SI, GYEONGNAM
Website : www.samkunok.com
Main Products : F.W. supply unit, BWTS, PE coating, Paint
TEL : +82 70 4034 0226

SAMYANG METAL IND. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.cuniship.com
Main Products : flanges, fittings
TEL : 82 51 266 6655

Samyoung Machinery Co., Ltd.
Location : GONGJU-SI, CHUNGNAM
Website : www.sym.co.kr
Main Products : Cylinder head, Cylinder liner, Piston & carrier, etc.
TEL : +82 41 840 3000

Samyoung M-TEK Co., Ltd.
Location : HAMAN-GUN, GYEONGNAM
Website : www.symtek.co.kr
Main Products : MBS, Chain wheel, Cylinder cover, etc.
TEL : +82 55 589 7000

SAMYUNG ENC Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.samyungenc.com
Main Products : AIS/GMDSS radio equip, etc.
TEL : +82 51 601 5555

Sandong Metal Industry Co., Ltd.
Location : GUMI-SI, GYEONGBUK
Website : www.smi-sdhitec.com
Main Products : Manifold, Plug valve, Choke valve, Integral Fittings
TEL : +82 54 472 8311

Saracom Co., Ltd.
Location : YEONGDO-GU, BUSAN
Website : www.saracom.net
Main Products : GMDSS equipment
TEL : +82 51 600 9000

Scana Korea Hydraulic Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.scana.co.kr
Main Products : Actuators, HPU and local control panel, Offloading systems/winches and mooring system/turret/swivel, etc.
TEL : +82 55 343 9007

SEJIN IND Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.sejin89.co.kr
Main Products : Tank top unit, Module unit, Purifier unit, Supply unit, etc.
TEL : +82 55 239 4700

Seobu Electric Ind. Co., Ltd.
Location : SAHA-GU, BUSAN
Main Products : Ground Monitor
TEL : +82 51 264 0670

SEOUL ELECTRIC CABLE Co., Ltd.
Location : UMSUONG-GUN, CHUNGBUK
Website : www.seoulcable.com
Main Products : Offshore & shipboard cables
TEL : +82 43 879 7200

Seun Electric Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.seunelectric.co.kr
Main Products : Battery charger, Alarm sys.
TEL : +82 51 208 4641

SEWON INDUSTRIES Ltd.
Location : HAMAN-GUN, GYEONGNAM
Website : www.sewon-ind.com
Main Products : High velocity P/V valve, Air vent head, Expansion joint, Flame arrester / Breather valve
TEL : +82 55 580 7200

SHINHAN HEAVY INDUSTRIES Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.shinhanheavy.co.kr
Main Products : Deckhouse, Rudder
TEL : +82 52 240 5000

Shin Heung ENG Co.
Location : GANGSEO-GU, BUSAN
Website : www.shinheungeng.co.kr
Main Products : Curtain, Upholstery, Sofa & Chair, Mattress, Carpet, Roller blind
TEL : +82 51 817 6455

Shin Myung Tech Co., Ltd.
Location : YANGSAN-SI, GYUNGNAM
Website : www.smdavit.com
Main Products : Air motor, Winch, Davit, Crane, Reel, Capstan, Pump, etc.
TEL : +82 55 363 7091

Shin Sung eng Co., Ltd.
Location : GANGSEO-GU, SEOUL
Website : www.ishinsung.com
Main Products : Air Con. Plant, Ref. Plant
TEL : +82 2 2600 9602

Shin Yeong Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.sy-ind.com
Main Products : Manhole, Access hatch
TEL : +82 55 346 0034

Shin-A Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.shina-ent.com
Main Products : Navigational/communication equip.
TEL : +82 51 204 6221

Shin-A Metal Tech Co., Ltd.
Location : BUK-GU, ULSAN
Website : www.shinametal.com
Main Products : Engine metal bearing, Bearings for medium & small engines, Main bearing shells, Segment & segment holder, Guide shoe, Top & bottom end bearing, Mesta bearing
TEL : +82 52 298 2100

Shindong Digitech Co., Ltd.
Location : YEOUNGDO-GU, BUSAN
Website : www.shindong.com
Main Products : Navigation & communication, Internal communication equipment
TEL : +82 51 461 5141

Shinshin Machinery Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.sspump.com
Main Products : VID (Cooling F.W & S.W pump), EHC (Volute casting centrifugal pump), NLG (External gear pump)
TEL : +82 51 713 0000

Silla Metal Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.sillametal.com
Main Products : Fixed pitch propeller (FPP), Controllable pitch propeller (CPP, Shafting, Stern equipment)
TEL : +82 51 831 5991

Simulation Tech Inc.
Location : GEUMCHEON-GO, SEOUL
Website : www.simulationtech.co.kr
Main Products : Voyage data recorder
TEL : +82 2 3281 0960

SKMARINTEC Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.skmarintec.co.kr
Main Products : Electrolytic Sewage Processing Eqiupment
TEL : +82 55 314 4620

SMECO Co., Ltd.
Location : YEONGI-GUN, CHUNGNAM
Website : www.smecopiston.com
Main Products : Piston, Piston liner
TEL : +82 44 864 3030

SMS Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.sms-marinesystem.com
Main Products : Hatch cover, Lashing bridge, Ro-Ro equipment, Hydro door
TEL : +82 51 290 1000

CAPE INDUSTRY Ltd.
Location : YANGSAN-SI, GYUNGNAM
Website : www.capeind.com
Main Products : Cylinder Liner
TEL : +82 55 370 1234

SPECS Corporation
Location : BUNDANG-GU, SEONGNAM
Website : www.specs.co.kr
Main Products : Oil Mist Detection System for Engine Room (AOMD), Oil Mist Detection System for Diesel Engine (COMD), Shaft Torque Power RPM Meter (TPM), etc.
TEL : +82 31 706 5211

STACO Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.staco.co.kr
Main Products : Wall & ceiling panel, Unit toilet
TEL : +82 51 831 7000

STACO CHALMERS Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.staco.co.kr
Main Products : Unit Cabin, Unit Toilet, Marine Door
TEL : +82 51 831 7000

STX Engine Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.stxengine.co.kr
Main Products : Marine diesel engine, Military diesel engine, power plant diesel engine, electronic communication equipment
TEL : +82 55 280 0114

STX Heavy Industries Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.stxhi.co.kr
Main Products : Turbocharger, Diesel engine parts, Industrial components, Shipuilding machinery, Cargo pump system, Casting parts
TEL : +82 55 280 0700

Suh Han Ind. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : wwww.suhhani.co.kr
Main Products : Cable tray and duct, Hot dip galvanizing, Ship window
TEL : +82 51 204 1920

SUNBO INDUSTRIES Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.sunboind.co.kr
Main Products : Package module unit, Tank top unit, E/R block, etc.
TEL:+82 51 260 5551

Sung Jin Geotec Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.sgtkor.com
Main Products : Ship block, Fin tube, Header pipe
TEL : +82 52 228 5801

Sung Kwang Bend Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.skbend.com
Main Products : Butt welding pipe fittings
TEL : +82 51 330 0200

Sung Mi Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.sung-mi.co.kr
Main Products : Door frame, Wall panel, Ceiling panel, Door hardware, Unit toilet
TEL : +82 55 329 1117

SUNG SIN INDUSTRIES Co., Ltd.
Location : GYEONGJU-SI, GYEONGBUK
Website : http://sungsin.koreasme.com
Main Products : Hatch coaming, T-Block, Water mist catcher, Water separator, Louver
TEL : +82 54 776 6441

Sungil SIM Co., Ltd.
Locatio : GANGSEO-GU, BUSAN
Website : www.sungilsim.com
Main Products : Pipe bending, Pipe spool, Marine Engine, Gas turbine
TEL : +82 51 831 8800

Suro Propeller & Machinery Co.
Location : YOUNGDO-GU, BUSAN
Website : www.suropump.co.kr
Main Products : Propeller, Propeller shaft
TEL : +82 51 415 0445

T.K. Corporation Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.tkbend.co.kr
Main Products : Butt-welding fittings, Forged fittings, Flanges
TEL : +82 51 831 6600

TAE KWANG Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.tkbend.co.kr
Main Products : Pipe Fittings, Fitting & Valve
TEL : +82 51 831 6550

TAE YOUNG TRADING Ltd.
Location : NOWON-GU, SEOUL
Website : www.marine-matarial.com
Main Products : Receptacles & wire accessories, Flood light, Deck light, Reflector lamps, HRF mercury lamps, Sodium lamps, Marine electrical equipment
TEL : +82 2 2272 1960

Taekyung Heavy Industries Co., Ltd.
Location : CHANGWON-SI, GYUNGNAM
Website : www.tkhic.com
Main Products : Engine Bed/Frame Box, Air Receiver/Gas ReceiverSteel Outfittings, Tubular(SAW Pipe), etc.
TEL : +82 70 4628 8844

TANKTECH Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.tanktech.co.kr
Main Products : Water-mist fire fighting system for engine room and accommodation, LNG fuel tank system, Offshore steel structure
TEL : +82 51 979 1600

TechMarine S/W Co., Ltd.
Location : DONG-GU, BUSAN
Website : www.techmarine.net
Main Products : Loading computer program, CAOS, Stowage program, LOFOS, LMS
TEL : +82 51 467 7003

Techcross Inc.
Location : GANGSEO-GU, BUSAN
Website : www.techcross.com
Main Products : Ballast water management system
TEL : +82 51 603 3500

TETRADYNE
Location : GURO-GU, SEOUL
Website : www.tetradyne.co.kr
Main Products : Marine Monitor, Marine Panel PC
TEL : +82 2 323 4972

TMC Co., Ltd.
Location : CHEONAN-SI, CHUNGNAM
Website : www.tmc-cable.com
Main Products : Marine cables, Oil & rig cables, Onshore cables, Special cables, Optical fiber cables
TEL : +82 41 589 6500

TOPSAFE Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.topsafe.co.kr
Main Products : High-velocity pressure vacuum valve, Breather valve, Flame arrestor, Emergency vent cover, Detonation flame arrestor
TEL : +82 55 338 9986

TTS INTERNATIONAL Corp.
Location : GANGSEO-GU, BUSAN
Website : www.ttsi.co.kr
Main Products : Cuni Pipe, Cuni Flange, Cuni Fitting
TEL : +82 51 832 9977

VISER Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.viser.co.kr
Main Products : PHE GASKET, Valve seat, Dust packing, etc.
TEL : +82 55 346 5575

WARTSILA ACCOMMODATION SYSTEMS KOREA, Inc.
Location : GOSEONG-GUN, GYEONGNAM
Website : www.waskorea.co.kr
Main Products : Unit toilet, Unit cabin, Wall panel, Ceiling panel
TEL : +82 55 673 7315

WhaYoung Co., Ltd.
Location : MIRYANG-SI, GYUNGNAM
Website : www.whayoung.co.kr
Main Products : Fuel pump ass'y for ship engine
TEL : +82 55 359 1100

WONIL Co., Ltd.
Location : MASAN-SI, GYEONGNAM
Website : www.ms-wonil.com
Main Products : Cylinder cover, Common rail unit, Silencer, Spraying plate, Rotor shaft
TEL : +82 55 253 1500

Woo Chang Ind. Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Main Products : Weather-tight steel door, Louver vent, Steel window box, Mooring fitting
TEL : +82 55 337 1651

WOOJOO M & E Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.wjme.com
Main Products : Exp. junction box, Warning alarm, etc.
TEL : +82 51 264 9130

Yoo Won Industry Ltd.
Location : SAHA-GU, BUSAN
Website : www.yoowonind.com
Main Products : Steering gear, Filter, Deck M/C
TEL : +82 51 205 8541

You Jeon Industry Co., Ltd.
Location : CHANGWON, GYUNGNAM
Main Products : Marine engine parts, Engine bed
TEL : +82 55 297 2121

YoungkWang Machine Co., Ltd.
Location : GYEONGJU-SI, GYEONGBUK
Website : www.ykmc.com
Main Products : Skid unit, Pressure vessel, Heat exchanger
TEL : +82 54 776 6456

Younglim Timber Co., Ltd.
Location : NAMDONG-GU, INCHEON
Website : www.younglim.com
Main Products : Wood Fire Retardant, Flooring Board, Furniture, Wood for Interiors
TEL : +82 32 811 9051

YOUNGIL PRECISION Co., Ltd.
Location : HAMAN-GUN, GYEONGNAM
Website : http://youngilco.kr
Main Products : Valvetrain components for all kinds of 4-Stroke Diesel Engine's
TEL : +82 55 585 2915

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Until : Send to head office by 15nd every month.

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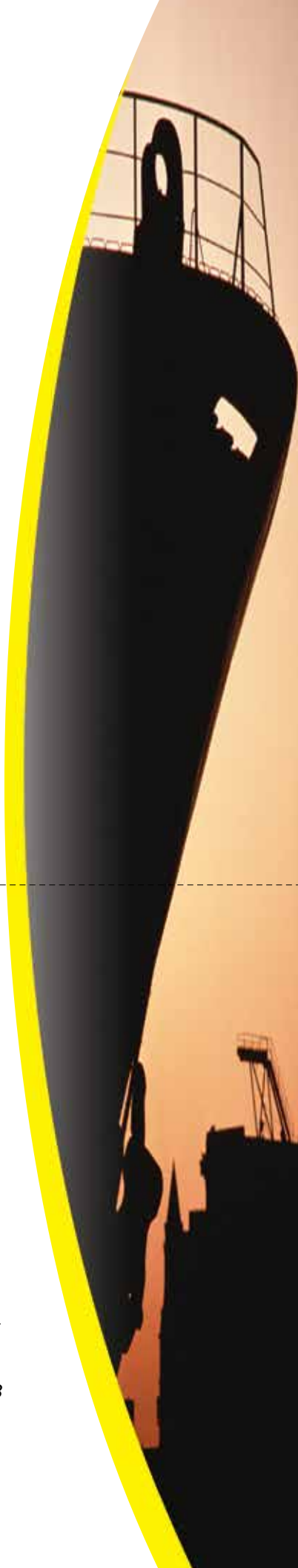

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