

Ocean News & Technology

May 2012

iRobot® Long-Duration,
Low-Logistics UUVs

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AUVs, Proven Work Horses
for the Underwater Industry

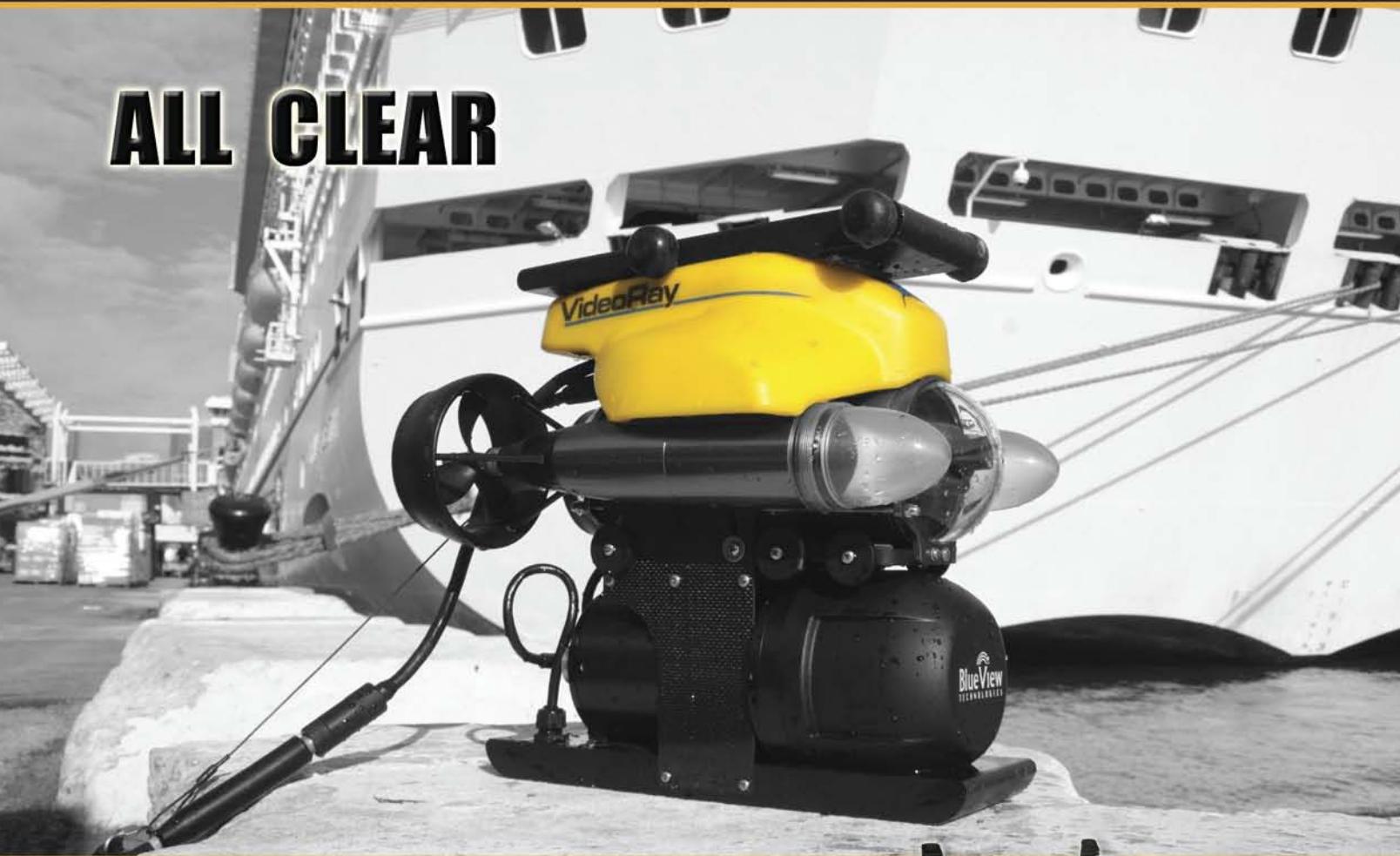


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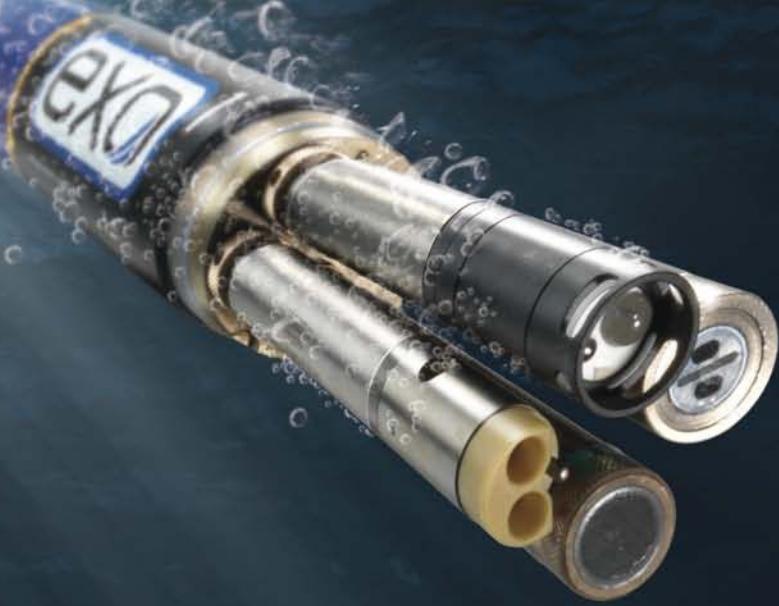


ABOVE: The VideoRay Pro 4 Remotely Operated Vehicle (ROV) fitted with 2D Imaging Sonar, Ship Hull Crawler attachment, and a non-acoustic tether based positioning system after completing a comprehensive hull inspection on a cruise ship in Miami, USA. With this ROV configuration, ship hull and port inspections can be conducted rapidly, safely, and with minimal personnel.
PHOTO: Steve Van Meter - Van Meter Consulting

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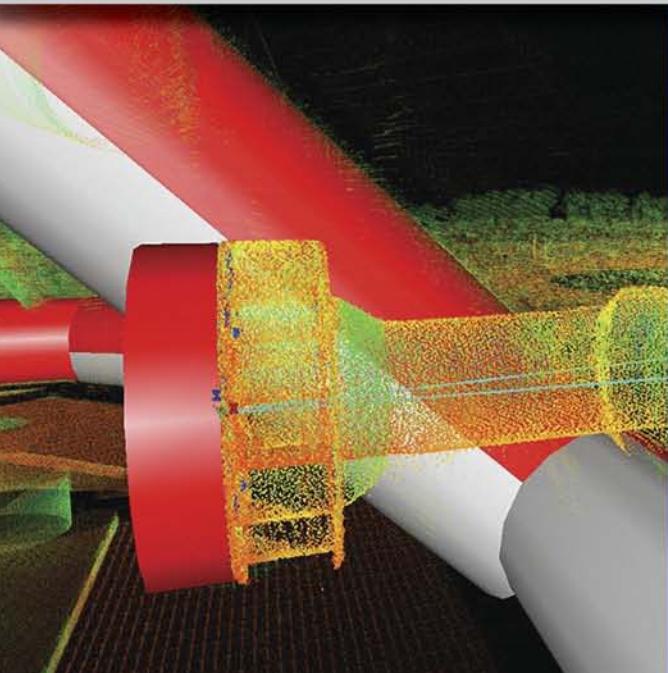


Making Impossible Jobs Possible

- | | |
|---------------------|---|
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| Challenge: | Target flanges recessed into existing manifolds |
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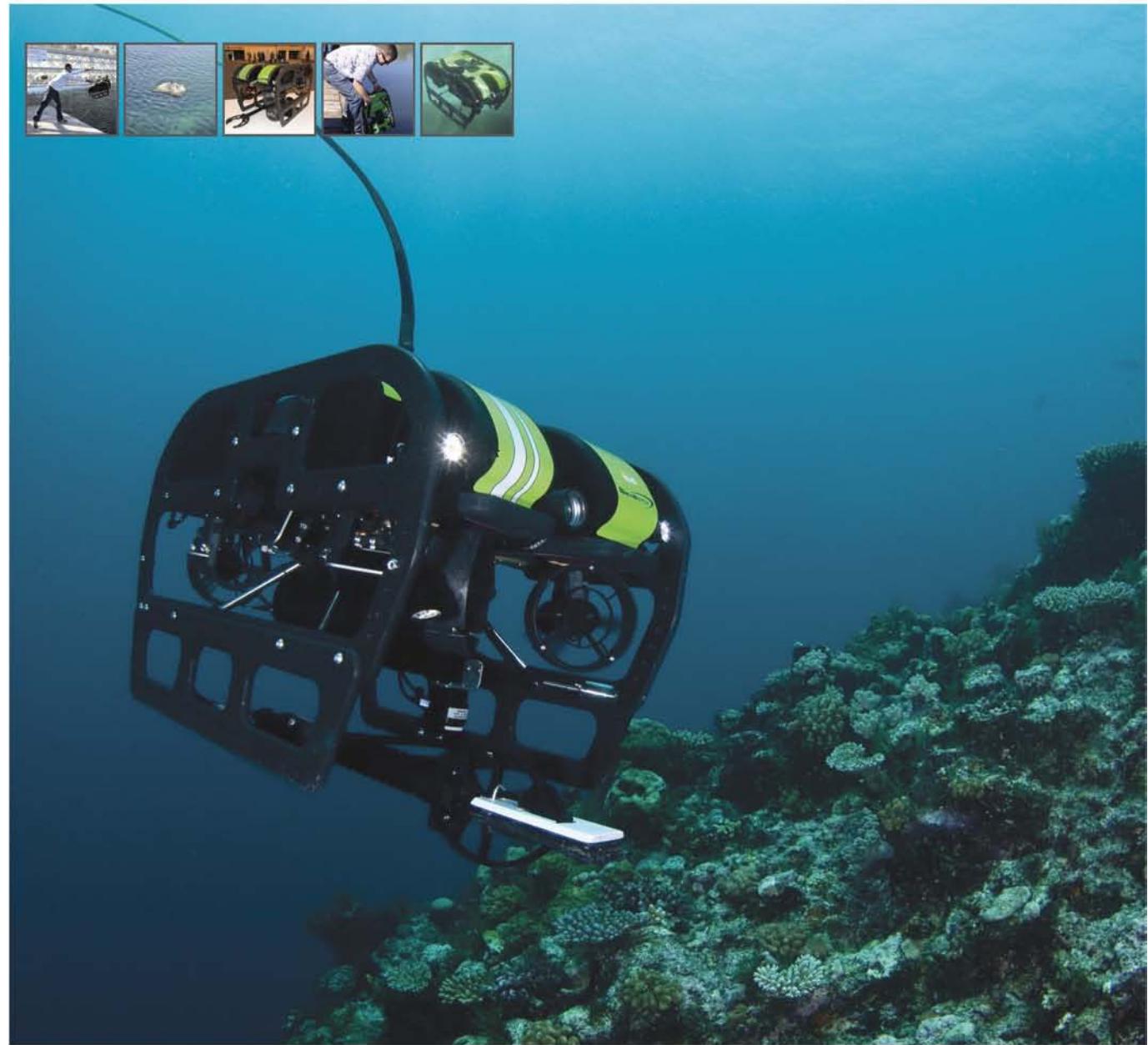
Dual vertical thrusters for enhanced control and power for demanding conditions.

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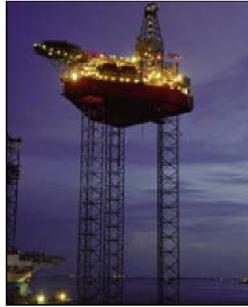
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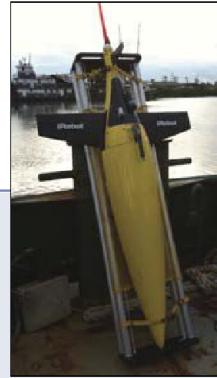
Ocean Industry



Offshore Industry



Feature Story



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Marlin AUV
(Photo Courtesy
Lockheed Martin)

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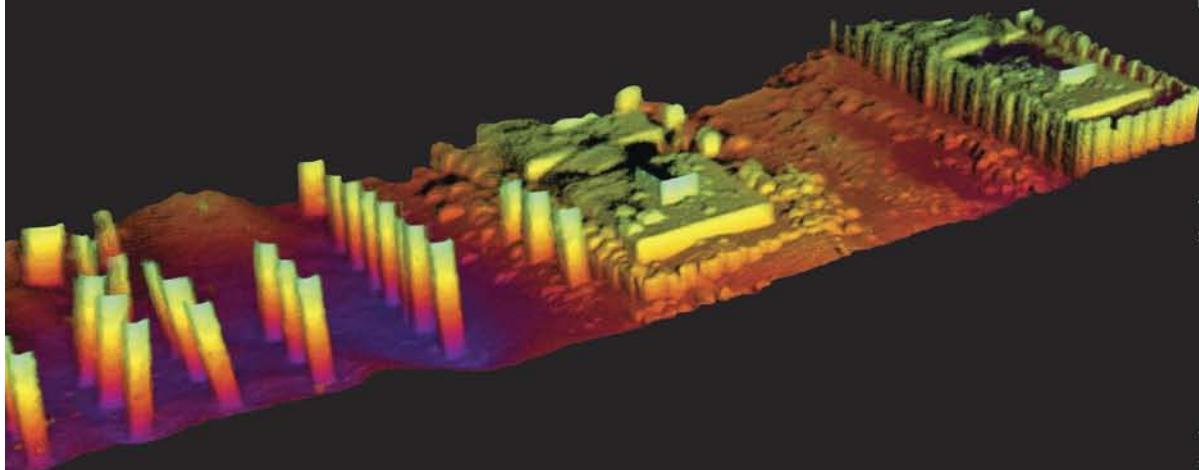
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By Dan White

Ocean News & Technology

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The (Mostly) Unrecognized

The Government and Private Sector Civilian

I felt it was time to recognize the thousands of people who support the military, not just in the U.S., but within every one of our allies.

I know civilians who support military operations are not usually put in harms way, and I recognize that distinction. However, the work that goes into military operations, the careful planning, the gathering of intelligence, the design and delivery of equipment, and much more help save the lives of our soldiers and give them an unprecedented advantage.

Many of these civilians have very high government clearances. They cannot tell their families what they are working on nor do they receive formal recognition as individuals for their contributions.

Some work for the government, others for government contractors. For example, there are naval shipyards and private shipyards. The civilians that work there are responsible for building the ships and submarines that our militaries use in combat.

Having worked at a U.S. naval shipyard (Mare Island Naval Shipyard) in the 1970s, I can attest to the dangers involved in building, working on, and testing nuclear submarines and Navy diving systems. I can also attest to the pride in the great technological accomplishments we made during the Cold War, developing underwater systems and tools still classified today.

One of the programs at that time involved the Navy Submarine USS Halibut commissioned at Mare Island in 1960. After several modifications, Halibut began service in May 1966 with the Deep Submergence Group, involved in deep sea search and recovery. Other "special operations" occupied Halibut until July 1968 when she was given the covert mission of locating K-129, a Soviet Golf II missile submarine, that had sunk the previous February. Finding the sunken boat in waters 3mi deep seemed impossible, but the mission was accomplished and Lyndon Johnson awarded Halibut the Presidential Unit Citation (PUC), the highest submarine award possible.

Halibut's success in locating and photographing K-129 resulted in President Nixon giving the go-ahead to the CIA's "Project Azorian." Howard Hugh's Global Marine, Inc. was contracted to design, build, and operate the "Hughes Glomar Explorer" in order to secretly salvage the sunken Soviet submarine from the ocean floor.

In late 1970, Halibut underwent further modifications to accommodate a special group of saturation divers using methods pioneered at SeaLab. This "Special Projects" boat was now a part of Submarine Development Group One.

In October of 1971, she set off on another operation, this time to launch one of the most critical secret operations undertaken by submarines during the cold war. For the successful completion of this mission, she was awarded the Navy Unit Citation (NUC). For repeat operations in 1972, 1974, and 1975, Halibut was awarded two additional NUCs and a second Presidential Unit Citation.

For successful operations such as these, you must consider the thousands of people consisting of government civilians and defense contractors, each and every one contributing to some important aspect of the programs — but there are no medals, ribbons, or plaques. They just do their jobs and crack a smile with their co-workers when it is reported that a top secret operation has been successful.

They do their job every day, many having sworn an oath to secrecy, punishable by prison sentences, to protect the information that gives the military an advantage against their enemies. Not being able to talk about their great accomplishments puts a strain on an individual and only a sense of self-accomplishment sustains his or her years of dedication.

I enjoy reading about the history of the U.S. Navy and the military heroes as well as the civilian heroes — many of whom I have been associated with over the years— men like Dr. John Pina Craven and many more less recognizable names. These people represent the brain trust that the military relies on to move forward technologically.

CAPT Russell "Gladys" Knight, USN and President of the Tailhook Association, said, "We in Naval Aviation have it great. We fly outstanding machines. We are in a profession that others dream about and most importantly, we work with some of the greatest folks in the world. But, because so many great people surround us, we often take this fact for granted. The caliber of people and the things they have done is amazing, and yet we often overlook the significance of what we all do, and what those around us have accomplished."

So we at ON&T want to recognize the civilians who support our militaries and whose stories go (mostly) untold.

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iRobot® Unmanned Underwater Vehicles

iRobot® continues to develop and expand mission capabilities of long-duration, low-logistics UUVs



The iRobot 1KA Seaglider can be programmed in advance or at the point of deployment

What is the iRobot Seaglider™?

The iRobot 1KA Seaglider, a long-range, high-endurance UUV, performs an increasing array of missions that last many months and cover thousands of miles. Originally designed by the University of Washington and further developed and delivered by iRobot to customers worldwide, Seaglider autonomously performs physical, chemical, and biological oceanography; persistent surveillance; marine environmental monitoring; and a variety of other missions for a fraction of the cost of traditional manned research vessels and moored instruments, which run as high as \$50,000 per day.

Seaglider's buoyancy engine enables efficient and long-term missions to operating depths up to 1,000m. Able to perform and gather data throughout shallow and deep dives in a single mission, Seaglider receives commands and transmits collected data on a programmable schedule to allow for continual monitoring and analysis and to guard against data loss. The Seaglider's modular sensor interfaces allow operators to equip their vehicle with a variety of sensors to provide specific long-term or daily data reports in a designated area to further the understanding or predictability of macro- and micro-scale changes.

Capabilities

- Oceanographic research
- Persistent environmental monitoring
- Surface and sub-surface current profiling
- Disaster modeling and mitigation
- Seep detection and plume forecasting

Advantages

- Operates between 50 and 1,000m
- Performs long-duration missions
- Controllable from anywhere in the world
- Enables continual monitoring and analysis
- Guards against data loss

Seaglider development

The increased payload capacity of iRobot's new ogive fairings has been well received in the oceanographic community. The ogive fairings increased payload capacity while reducing total drag on the vehicle. The rounded and tapered fairings increased the Seaglider's payload volume by 650% to more than 21,000cm³ and double the payload mass carrying capacity to 4kg. The greater payload capacity provides the opportunity to carry larger payloads than the original Seaglider. Later this year,



The iRobot IKA Seaglider was deployed to aide the monitoring of the Deep Water Horizon oil spill in the Gulf of Mexico

iRobot, in conjunction with NortekUSA, will make for sale a integrated, lightweight, low power current profiler. This will enable scientists to begin collecting long-term current data in areas where there may be interest in building offshore infrastructure or areas between existing offshore structures.

The Nortek Current Profiler measures speed and direction of underwater currents throughout the water column. The integration of the Nortek Current Profiler on the iRobot Seaglider provides a solution for the persistent monitoring of underwater currents for oceanographic research and commercial operations.

Recently, iRobot completed a successful deployment in the Weddell Sea, in conjunction with the University of East Anglia, of a Seaglider equipped with an Imagenex ES-853 Echosounder. The results of that trial have been promising, and iRobot plans to offer the Imagenex Echosounder as standard sensor option in late 2012.

Seaglider operational enhancements

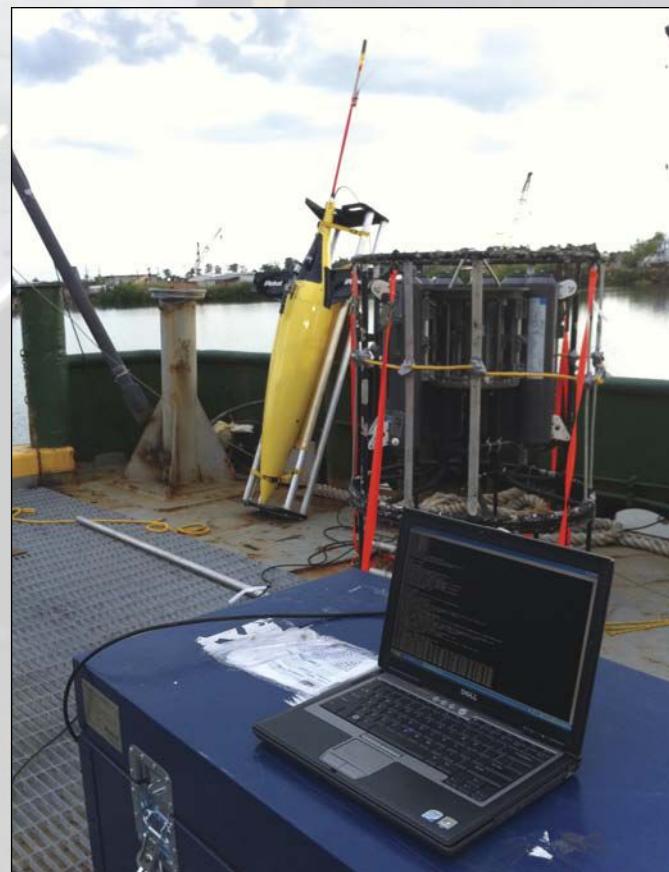
In addition to the increased sensor payload and new sensor offerings, iRobot is continuing to improve the overall operation of the Seaglider. iRobot engineers have been working on characterizing the Iridium communication performance and have developed reliable metrics to benchmark the glider's performance. Engineers have started work on integrating the new Iridium 9523 modem, which promises more reliable connections and higher throughput performance than the current Iridium 9522B modems. Over the last year, iRobot has made significant improvements to the

RUDICS-based connections methods, which when used results in far more reliable communication connection than the older PSTN connections. Finally, iRobot is planning to start offering a hosted shore station service beginning in May 2012. This service gives customers the ability to operate up to five Seagliders on a host base-station for one low annual fee. The service provides guaranteed 24/7 operational up time via a highly reliable RUDICS connection and secure operation of the gliders and eliminates the hassle of setting up and maintaining individual shore stations. Support for additional gliders is available. More than 135 Seaglider UUVs have been delivered to customers worldwide, including the U.S. Navy, government agencies, and research organizations. Seaglider has been deployed in a range of environments around the world, performing missions in the tropics and under polar ice, in freshwater and saltwater. In the future, Seagliders will be deployed on missions that last a year or more and cover more than 6,000mi.

Industry leadership

As a pioneer in the robot industry, iRobot's goal is to drive innovation, serve as an industry catalyst, and change the world by fueling the era of robots. iRobot remains committed to establishing robot and software platforms for invention and discovery. It continually strives to improve quantity and quality of data delivered to end customers within the private, research, and commercial marketplace.

For more information about iRobot, Seaglider and other UUVs, visit www.irobot.com.



The iRobot IKA Seaglider performs deck-dives prior to deployment to confirm mission and measurement parameters

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Grad 03-500M



Mag-03RC



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OCEAN INDUSTRY

MMT awarded marine survey contract for HVDC link between UK and Norway

Statnett SF and National Grid International Ltd have awarded MMT (Sweden) the marine survey contract for the NSN Seabed survey, a power transmission link between Norway and UK.

Statnett and National Grid are jointly developing a project to construct a high voltage direct current (HVDC) electrical interconnector between Norway and the UK. MMT will be performing the route survey for this project between Hylen, Norway and Blyth, UK. The survey will be performed from April to August 2012.

The length of the cable route is approximately 711km, and the assignment includes geophysical, geotechnical, benthic, archaeological, and ROV operations.

For the offshore portion, MMT will provide geophysical and benthic surveys from the MV Franklin. The offshore survey vessel Stril Explorer is assigned for the ROV and geotechnical investigations. MMT's vibrocoring and CPT will be launched from Stril Explorer for seabed sampling.

MMT will use the survey vessels SeaBeam and Askholmen for the nearshore survey.

The work will commence in 2012 and is expected to last approximately 5 months. Once installed, this will be the longest marine HVDC link in the world. MMT is looking forward to working with Statnett SF and National Grid International Ltd in this exciting and historical project.

For more information, visit www.mmt.se.



The return of U.S. Underwater Services

Benford Capital Partners, LLC (Benford Capital) and Coppermine Capital, LLC (Coppermine) acquired the assets of Neptune Underwater Services (USA), LLC, the U.S. diving business of Neptune Marine Services Limited (Neptune), in a newly formed entity called U.S. Underwater Services, LLC (U.S. Underwater Services). Benford Capital and Coppermine, in partnership with the Company's management team, are acquiring the business for the second time after selling it to Neptune in 2007. The name U.S. Underwater Services, the Company's brand prior to Neptune's involvement, was chosen to capitalize on its excellent reputation for quality, service, and reliability.

Based in Mansfield, Texas and operating out of a 50,000sq.ft facility, U.S. Underwater Services provides underwater inspection, construction, and diving services to drilling rigs, platforms, and pipelines in the Gulf of Mexico. The company also provides inspection services to inland customers, which consist of municipalities (e.g., water towers, dams, and water treatment facilities), government facilities, nuclear power plants, and industrial facilities.

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Kongsberg Maritime acquires Jotron Consultas

Kongsberg Maritime has acquired 100% of the shares in fleet management software specialist Jotron Consultas. A new product group consisting of all previous Jotron Consultas employees based at Kongsberg Maritime's premises in Horten, Norway will be formed as a result of the acquisition. Jotron Consultas' products are well established and are used by many of the world's leading shipping lines and maritime companies, helping and supporting them to provide and improve overall safety, operational efficiency, and transparency in ship management systems.

Oceanology International 2012 - a record breaker

Oceanology International 2012, held earlier this month at London's ExCeL, proved the most successful ever in over 40 years in terms of attendance and the number of exhibiting companies. With 7,728 attendees from more than 70 countries (a 10.8% increase from 2010) and over 525 exhibitors from 33 countries, the biennial show, broke all previous records. This year Interspill London 2012, with 110 exhibitors, was held alongside Oceanology International, attracting a total attendance figure of 1,346, meaning that the two conjoined shows attracted a grand total of 9,074.

BOEM forms South Carolina offshore renewable energy task force

The Bureau of Ocean Energy Management (BOEM) held its first offshore renewable energy task force meeting in cooperation with South Carolina's Energy Office. This intergovernmental task force was established to facilitate communication between BOEM and State, local, tribal, and Federal stakeholders concerning commercial renewable energy leasing and development on the Outer Continental Shelf (OCS) off the coast of South Carolina. The task force includes State government officials designated by Governor Nikki Haley, officials from affected Federal agencies, elected local government officials, and tribal leaders.

Drew Michel inducted into ADCI Commercial Diving Hall of Fame

The Marine Technology Society (MTS) is pleased to announce the induction of President Elect Drew Michel into the Association of Diving Contractors International (ADCI) Commercial Diving Hall of Fame. The event was held at the awards ceremony during the 20th Annual Underwater Intervention Conference, held earlier this year in New Orleans, Louisiana, and co-sponsored by the MTS Remotely Operated Vehicle (ROV) Committee and ADCI. Mr. Michel was honored for his nearly 50-year commitment to operational safety and effectiveness.

In addition to acquiring the assets of Neptune Marine Services (USA), U.S. Underwater Services and Neptune entered into a 10-year exclusive license agreement for the use of Neptune's patented NEPSYS® underwater dry welding technology in the Gulf of Mexico.

Since its inception in 1995, U.S. Underwater Services has become the leader in providing underwater inspection services (mandated by American Bureau of Shipping, Det Norske Veritas, Department of Interior, and the U.S. Coast Guard) to the drilling rig sector in the Gulf of Mexico.

"The combination of our people, experience, and an unparalleled commitment to safety and quality are what sets U.S. Underwater Services apart from our competition," said Bryan Nicholls, general manager and COO of U.S. Underwater Services. Michael Hale, chief financial officer, added, "We are excited to work with Benford Capital and Coppermine once again. They have an excellent track record of working closely with their portfolio companies to help them achieve their growth plans."

For more information, visit www.usunderwaterservices.com.

Coast Guard sinks ghost ship

The crew of the Coast Guard Cutter Anacapa successfully sank the derelict fishing vessel Ryou-Un Maru 180mi west of the Southeast Alaskan coast.

The Anacapa crew began its operation to sink the vessel, completing two gunnery evolutions by shooting highly explosive ammunition into the vessel until it sank in 6,072ft of water.



"For the safety of mariners, sinking the vessel was the quickest way to properly address the danger this unattended vessel posed," said Capt. Daniel Travers, Coast Guard District 17 incident manager. "The Anacapa crew did an outstanding job safely completing their mission."

The Coast Guard worked closely with Federal, State, and local agencies to assess the immediate dangers the vessel presented and determined that sinking the vessel at sea would be the best course of action to help minimize any navigation and environmental threats. Light sheening and minimal debris have been reported from the sinking of the vessel, and the sheening is expected to quickly dissipate at sea.

ABS strengthens presence on Southeast Asia

ABS, the leading provider of classification services to the global offshore industry, announces the expansion of its presence in Singapore. Recognizing the growing role Singapore is playing as a global offshore energy center, ABS is moving key offshore leadership positions from Houston to Singapore and is strengthening its research and development (R&D) capabilities at the ABS Singapore Offshore Technology Center.

Growth in the deepwater sector will continue to be driven by advances in technology, and Singapore will be at the center of these advancements in the Asia-Pacific region as the country positions itself as a regional deepwater hub.

The level of investment expected in the Asia-Pacific region (US\$225 billion in capex through 2015) will bring rapid growth in the deepwater arena that will require mature technical competence.

For more information, visit www.eagle.org.

Gulf of Mexico Foundation purchases wetlands in Galveston

The Gulf of Mexico Foundation, Inc. has purchased 15 acres of wetlands next to the future site of its Gulf of Mexico Habitat Restoration Technology Training Center (HRTTC) in Galveston, Texas. The purchase was made possible by \$200,000 contributed by the Offshore Technology Conference (OTC) at last year's conference when the OTC also presented the Foundation with its first ever OTC Annual Dinner Charity award.

"The services provided by natural habitats are essential to living and work-

ing in the coastal zone, and habitat restoration is one of the primary needs in the Gulf of Mexico Coastal Zone," said Dr. Quenton Dokken, president/CEO of the Gulf of Mexico Foundation. "The generosity of OTC will make it possible for us to introduce wetland ecology to thousands of visitors each year."

Contributions to fund the construction of the Gulf of Mexico Foundation's HRTTC have been received from the U.S. Economic Development Administration (EDA) and Transocean. The Foundation is establishing the HRTTC to facilitate job training in the field of habitat restoration and conservation. The OTC-funded wetlands will be used as an "open air – hands on" classroom and education visitor center.

For more information, visit www.gulfmex.org.

Jeff Bezos discovers F-1 rocket engine that sent Neil Armstrong to the moon



Amazon founder, chairman, and CEO, Jeff Bezos claims that using state-of-the-art deep sea sonar he has located the long lost submerged F-1 engines that powered the historic Apollo 11 astronauts to the moon. The five engines that were part of the first stage of the Saturn V rocket were found lying 14,000ft below the surface where they came to rest over 42 years ago.

In a blog on his website, Mr. Bezos says "...we're making plans to attempt to raise one or more of them from the ocean floor. We don't know yet what condition these engines might be in - they hit the ocean at high velocity..."

Bezos also pointed out that the engines remain the property of NASA, and he would expect at least one to be displayed at the Smithsonian. He has asked NASA to donate another to the Museum of Flight in Seattle.

For more information, visit www.bezosexpeditions.com.

Wilton Engineering secures major North Sea project with Subsea 7

Wilton Engineering Services Limited (Wilton Engineering) – the international design, engineering, and fabrication business – has secured a multi-million pound contract with Subsea 7.

Wilton Engineering, a Wilton Group company, will construct support clamps for work on DONG Energy's SIRI Caisson Support Project in the Danish sector of the North Sea.

Subsea 7 announced last year it had won an offshore engineering and construction frame agreement with DONG Energy in support of the project.

The Wilton Group, which employs 700 people at businesses in Aberdeen, Dundee, Teesside, Great Yarmouth, and Brazil, has secured oil and gas contracts worth more than £55m in the past 4 months.

Wilton business development director, Des Hatfield, said, "This latest project serves to underline our capabilities to work with global companies to deliver design, engineering, and fabrication solutions. We're delighted to be working on this project."

Wilton Engineering managing director, Steven Pearson, said, "Our enhanced capabilities mean we can provide an integrated solution for clients and its turnkey projects."

Wilton Engineering is carrying out the major task of fabricating large caisson clamps. This permanent solution consists of installing three piles next to the SIRI subsea storage tank and connecting them to the caissons with the fabricated clamps, including cable stays. This is part of an ongoing program.

SIRI is located in the north west part of the Danish sector of the North Sea. The SIRI platform is moored in 197ft (60m) of water and is a combined wellhead, processing, and accommodation facility.

Wilton Engineering provides bespoke, high-quality engineering and fabrication solutions to the offshore and petrochemical industries from its 50 acre Port Clarence offshore base on the River Tees.

Wilton Engineering is one of four businesses that make up the Wilton Group. Together with other group companies – PD&MS Energy, Wilton Dundee and Universal Coatings – it can offer

fully integrated turnkey packages across a range of onshore and offshore engineering sectors.

Marine Technology Society Member Pavilion success

Oceanology International is one the largest ocean science and technology trade shows in the world. As a leading international organization in the field, the Marine Technology Society sought to bring together organizational members to add value to those members and the attendees of the exhibit. The solution was the first MTS Member Pavilion, a concept that proved a success.

MTS business members in the MTS Member Pavilion and reception included Sound Oceans Systems, Inc.; SeaTechRim; Severn Marine Technologies, LLC; International Submarine Engineering, Ltd.; Oceanic Imaging Consultants; Teledyne RDI; OCEANS '12 MTS/IEEE Hampton Roads; VideoRay; and Geospace Offshore. Several member companies had additional space in the hall, but elected to participate with a kiosk-size space so as to be included in the Member Pavilion.

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Bourbon announces deliveries

Bourbon announces the extension of its flagship series Bourbon Liberty in line with its strategy to offer a very high standard of service for the most demanding clients. A naming ceremony was held at Sinopacific Zhejiang shipyards in China for two iconic Bourbon vessels: Bourbon Liberty 254, last vessel to be delivered of the Bourbon Liberty 200 series of 54 AHTS, and Bourbon Liberty 301, first vessel of the Bourbon Liberty 300 series of 20 AHTS. In June 2010, the group announced its "BOURBON 2015 Leadership Strategy" and ordered three new series of vessels from Sinopacific shipyards. Bourbon Liberty 301 is the first vessel of the first series to be delivered.

Close ties between DNV and KOGAS in LNG research and development

DNV has signed an MOU with Korea Gas Corporation (KOGAS), South Korea's State-run gas corporation, to cooperate on research and development in the LNG sector. While this is DNV's second MOU with KOGAS, following the first in 2010 to cooperate on EHSQ issues, DNV is the first international risk management organization in Korea to cooperate with KOGAS on research and development projects in the LNG sector. Based on the signed MOU, DNV and KOGAS will co-organize conferences and cooperate on R&D projects throughout the entire LNG value chain, from upstream to downstream, including gas reservoir exploration, natural gas production, liquefaction, transportation, storage, regasification, and supply.

Damen Shipyards delivers three identical ASD 2810 tugs to KOTUG and an ASD 3213 to Intertug

KOTUG will shortly be putting three Damen ASD 2810 tugs into operation. These tugs were ordered by Elizabeth Ltd in Malta and are being chartered by KOTUG, both part of the Kooren Maritime Services Group (KMS). Two tugs are being used in the port of Rotterdam and the third will see service in the port of Hamburg. It's the first time that Damen Shipyards has built tugs for the KMS Group. In other news, Damen Shipyards has delivered the ASD 3213 'Tanok' to Colombian tug operator Intertug S.A. Intertug (est. 1993) operates the country's most modern tug fleet in terms of horsepower and fleet age. The Damen ASD 3213 has a bollard pull of 86.5t and 80t astern and is one of the most powerful harbor tugs in the world. In addition, Intertug ordered an ASD 3212 that will be delivered from Damen Shipyards Galati (Romania) end of May 2012.

Imtech Marine completes three high-tech offshore ships in Singapore

Imtech Marine successfully completed three innovative new-build vessel projects in Singapore: Seven Borealis for Subsea 7, Rockpiper for a subsidiary of Royal Boskalis Westminster NV, and Flintstone for Tideway, part of the DEME Group. The ships will all operate in the oil and gas market. Imtech Marine has combined specific capabilities of its offices in Rotterdam, Shanghai, and Singapore. The supply package for two of the three ships includes advanced dynamic positioning (DP), diesel electric propulsion, vessel management (VMS), automation, navigation, and communication. The design and engineering was done in Rotterdam, production in Shanghai, and installation and commissioning by the Imtech Marine team in Singapore.

All American Marine delivers first quad propeller catamaran research vessel

All American Marine, Inc. (AAM) delivered the research vessel Sea Scout to C & C Technologies, Inc. (C & C) of Lafayette, Louisiana. The 134ft x 37ft aluminum vessel is believed to be the first catamaran featuring quad propeller propulsion and was custom designed to significantly increase C & C's surveying capabilities.

Sea Scout's design marks a shift for C & C, which typically operates steel monohull vessels. Commissioning a high performance and versatile catamaran design made the most sense for accomplishing C & C's diverse multi-mission requirements. Getting to the site quickly means more time on the job and fewer trips offshore.

In addition, the catamaran design offers great seakeeping ability, which allows the survey team to operate in all kinds of weather. "With this boat, we will be able to do more work in rougher seas," said Sea Scout's Captain, Jeramie Rivette of C & C Technologies. "That's really important in survey work where pitch, roll, and heave will often stop you from getting good data."

The vision for the revolutionary survey catamaran began in 2008, when C & C Technologies vice president, Scott Croft, toured the 83' R/V Manta that All American Marine had constructed for NOAA's National Marine Sanctuary program. Croft envisioned that a properly designed catamaran hull would optimize C & C's capabilities for deep and shallow water oceanographic survey, geophysical research, seismic survey, and AUV operations.

"The challenge was to design a vessel that would run at high speeds and over long distances to reach the project site, but also a vessel that would be efficient spending a long time on low power and low speed during surveying work," said Nic de Waal of Teknicraft Design Ltd., naval architect behind the Sea Scout. To meet this challenge, Sea Scout's two engine rooms are each equipped with a C32 ACERT 1,600bhp diesel engine, a C18 ACERT553 bhp diesel engine, and a C6.6 170ekW generator, all supplied by Caterpillar.

The vessel can travel to a work site on all four engines at a cruising speed of 26kts. At the job site, it runs on the smaller two engines coupled to ZF Marine gears with trolling valves to provide an economical speed range from 4 to 11kts. For long range capabilities, the vessel has a fuel tank capacity of 6,600gal, plus

two reserve tanks that provide an additional capacity of 4,400gal. Ballast tanks are located fore and aft to ensure optimal trim in various loading conditions.

The vessel is certified under ABS international load line standards and contains a certificate of inspection under USCG subchapter "T" regulations. Sea Scout was built to be SOLAS compliant and may be deployed internationally in the future. The wide and open aft deck is completely reconfigurable depending on the mission. The deck was reinforced to accommodate an equipment load of over 80,000lb, inclusive of two 20ft van containers that are utilized for AUV operations.

Inside, the main deck and focsles are dedicated to crew accommodations, which comprise a commercial galley, walk-in cooler, lounge, fitness facility, laundry room, 4 heads, and 12 staterooms with a sleeping complement of 26 berths. The 01 deck encompasses the survey lab, server room, and data processing office. The pilot house is on a raised mezzanine level to provide 360° visibility, while maintaining a profile with low wind resistance. Sea Scout's decks are complemented with a 14,000lb stern A-frame, a 10,000lb side A-frame, 16ft Zodiac skiff, 5ton hydraulic crane, and various mechanical and scientific winches.

For more information, visit www.allamericanmarine.com.

Furuno launches the new ECDIS FMD-3200/FMD-3300



Furuno announces that the new ECDIS (model names FMD-3200 and FMD-3300) will be ready for launch very shortly. The FMD-3200 (with 19in. LCD) and FMD-3300 (with 23.1in. LCD) deliver great enhancement in terms of user interface as well as functionality. Fully complying with the performance standard of ECDIS stipulated in IMO resolution MSC.232(82), the new ECDIS is suitable candidate designated for new installation as well as retrofit to fulfill ECDIS mandatory carriage that is phas-

ing in from July 2012 onward. The new ECDIS will also bring about streamlined chart management scheme, providing easy chart management independent of the chart providers. The new ECDIS is compatible with Jeppesen Dynamic Licensing, and it supports the Admiralty Information Overlay (AIO). More, its network expandability fully satisfies provisos for paperless operation of vessels.

The new ECDIS FMD-3200 and

FMD-3300 provide the operator with quick access to the tasks and functions to be performed in the midst of vessel operation. The new ECDIS employs intelligently arranged graphic user interface elements: status bar and instant access bar that deliver task-based operation scheme to give the operator direct access to necessary operational procedure.

For more information, visit www.furuno.co.jp.

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EDT Offshore takes delivery of two Damen fast crew suppliers

EDT Offshore (Cyprus), an operations and management company for offshore support and dredging services, has taken delivery of a Damen Fast Crew Supplier 3507 and an FCS 5009: the 'EDT Leda' and the EDT Nefeli. Both are built according to the Damen Sea Axe design that reduces slamming up to 75% and increases crew comfort. The EDT Nefeli is outfitted with DP1, FiFi 1, and a luxury interior for a high level of passenger comfort during longer trips.

EDT has a fleet of twenty diving support vessels (DP3), offshore support vessels, crew suppliers, and dredgers that operate worldwide. Three of the

company's crew suppliers and two dredgers are designed and built by Damen. According to chartering coordinator Miki Miroslav, safety and maintenance are key to EDT's business. "We update and upgrade our vessels constantly and stay in touch with our captains all the time. Our clients are experts in their own field, and they expect the same from us. We even have a 1972-built OSV that still meets today's safety regulations."

For more information, visit www.damen.nl.

Global maritime containerization market to reach 731M TEUs by 2017

GIA announces the release of a comprehensive global report on the maritime containerization market. Global market for maritime containerization is projected to reach 731 million TEUs by the year 2017. Growth will be primarily driven by increasing sea trade, developments in shipping networks and transshipment hubs, encouraging investments in port terminal facilities, growing capacity, and increased frequency of global maritime

freight transport. The market also stands to benefit from soaring demand for oil and LNG across Asia and the resulting growth in the transport of liquid and gaseous commodities.

Shipping containers represent the core of a highly automated system for transit of goods. Although humble in appearance, shipping containers—also known as maritime containerization—is the greatest invention of the modern era responsible for slashing transportation costs to an all time low and for triggering boom in global trade. Interestingly, China's emergence to the forefront of global economic power as the world's largest cost competitive exporting giant has been made possible only by the low-cost transportation enabled by shipping containers.

Demand for shipping containers is directly proportional to the GDP in a given economy. The importance of maritime transport can be put into perspective by the fact that almost 90% of goods traded across borders are transported across the oceans and seas of the world.

For more information, visit www.StrategyR.com.

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Ocean acidification linked with larval oyster failure in hatcheries

Marine researchers have definitively linked the collapse of oyster seed production at a commercial oyster hatchery in Oregon to an increase in ocean acidification. Larval growth at the hatchery declined to a level considered by the owners to be "non-economically viable." A study by the scientists found that increased seawater carbon dioxide (CO₂) levels, resulting in more corrosive ocean water, inhibited the larval oysters from developing their shells and growing at a pace that would make commercial production cost-effective. As atmospheric CO₂ levels continue to rise, this may serve as the proverbial canary in the coal mine for other ocean acidification impacts on shellfish. Results of the research are published in the journal Limnology and Oceanography, published by the Association for the Sciences of Limnology and Oceanography (ASLO).

URI oceanographer leading effort to enlist commercial ships to collect ocean data

A University of Rhode Island oceanographer is leading an effort to partner with the global shipping industry to systematically collect detailed data about the world's oceans using equipment installed on commercial vessels. H. Thomas Rossby, a professor at the Graduate School of Oceanography, said commercial ships on the high seas offer a cost-effective platform for collecting data that could be used to learn about currents, plankton, ocean chemistry, climate change, and other topics. According to a report written by Rossby and colleagues on a working group sponsored by the Scientific Committee on Oceanic Research and the International Association for the Physical Sciences of the Oceans, "the ocean is vastly under-observed, particularly below the ocean surface, where satellites cannot measure the ocean's properties. ...Observations below the surface depend on getting platforms (ships, moored buoys, floats, gliders, etc.) to locations far beyond the coasts, which can be expensive."

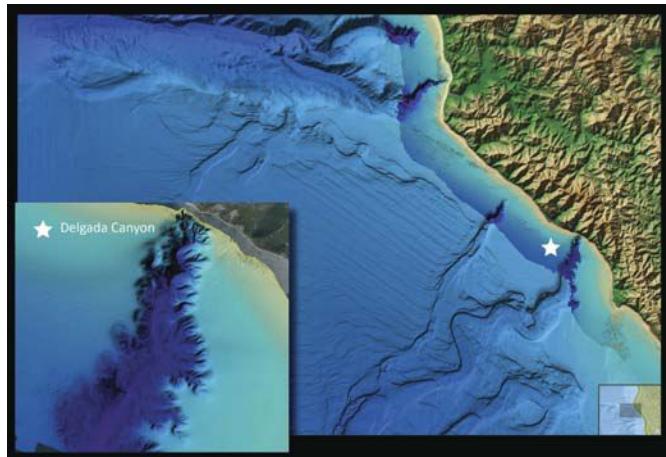
Aquatic robot audits health of seabed

The watery depths of Western Australia's Ningaloo coast was audited by marine engineers and scientists using an aquatic robot and technology developed by University of Sydney mechatronic experts. The innovative technology assisted scientists from the Australian Institute of Marine Science (AIMS) in detailed mapping of the seabed communities of Ningaloo Reef's deeper waters, which form part of Australia's Integrated Marine Observing System (IMOS). An AUV took up to 50,000 images in a day with its high resolution cameras and collected detailed multi-beam sonar and water-column measurements while underway.

Hundreds of dolphins dead on Peru coast

A catastrophe has hit the dolphins of Peru. Hundreds of dead dolphins washed ashore between San Jose and Piura on the country's north coast. Hardy Jones, executive director of BlueVoice.org, and Dr. Carlos Yaipen Llanos of ORCA Peru covered 135km of beach running north from the fishing village of San Jose. They counted 615 dead dolphins ranging in age from newborns to fully mature males. Most of the dead are long-beaked common dolphins (*delphinus capensis*). The die-off, or Unusual Mortality Event (UME), was first noticed in January by fishermen who reported it to authorities. So far, there is no definitive explanation for the extraordinary mass mortality.

NOAA releases new views of Earth's ocean floor



NOAA has made seafloor maps and other data on the world's coasts, continental shelves, and deep ocean available for easy viewing online. Anyone with Internet access can now explore undersea features and obtain detailed depictions of the seafloor and coasts, including deep canyons, ripples, landslides, and likely fish habitat.

The new online data viewer compiles seafloor data from the nearshore to the deep blue, including the latest high-resolution bathymetric (sea bottom) data collected by NOAA's Office of Coast Survey primarily to support nautical charting.

"NOAA's ocean bottom data are critical to so many mission requirements, including coastal safety and resiliency, navigation, healthy oceans, and more. They are also just plain beautiful," said Susan McLean, chief of NOAA's Marine Geology and Geophysics Division in Boulder, Colorado.

McLean's division is part of NOAA's National Geophysical Data Center, responsible for compiling, archiving, and distributing Earth system data, including Earth observations from space, marine geology information, and international natural hazard data and imagery. NGDC's seafloor data have long been free and open to the public in original science formatting, but that often required the use of specialized software to convert the data into maps and other products.

The new interface makes exploration easy and intuitive, using a "color-shaded relief" technique to depict bathymetric data and derived maps and models. For example, a user can zoom into Delgada Canyon, one of a series of deep canyons off the northern California coast between Fort Bragg and Eureka. These floor descends steeply from shallow yellows into dark blues and purples.

Not all NOAA seafloor data are accessible yet through the new viewer; some datasets still require specialized software for generating maps. To learn more and access the viewer, visit <http://maps.ngdc.noaa.gov/viewers/bathymetry>.

CSA staff participate in aerial marine mammal surveys

CSA International, Inc. (CSA) is pleased to report that Ms. Mary Jo Barkaszi, Business Line Manager of the newest CSA Business Line, Marine Mammals, is currently participating as part of the National Oceanic and Atmospheric Administration (NOAA) Atlantic Marine Assessment

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Program for Protected Species (AMAPPS) science team conducting aerial surveys for marine species in the northeastern U.S. AMAPPS is a multi-agency program designed to collect broad-scale data over multiple years on the seasonal distribution and abundance of marine mammals, marine turtles, and sea birds using direct aerial and shipboard surveys of coastal U.S. Atlantic Ocean waters.

These important surveys are designed to fill existing data gaps and provide vital information essential to the support of conservation initiatives mandated under the National Environmental Policy Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, and Endangered

Species Act. Weather permitting, the team conducts daily aerial surveys from a NOAA Twin Otter aircraft fitted with special bubble windows and a "belly window." Flight patterns follow track lines covering the coastal waters from Cape May, New Jersey to the mouth of the Gulf of St. Lawrence (Canada), from the coast line to about the 2,000-m depth contour.

For more information visit <http://www.nefsc.noaa.gov/psb/AMAPPS/> or www.csaintl.com.

WHOI researchers, collaborators receive \$1.4M to study life in ocean's greatest depths

Scientists from the Woods Hole Oceanographic Institution (WHOI), University of Hawaii, Whitman College, and international colleagues will conduct the first systematic study of life in the deepest marine habitat on Earth—ocean trenches.

Due to the extreme pressures of these deep-sea environments and the technical challenges involved in reaching them, ocean trenches are among the least

explored environments on the planet.

The team was awarded a \$1.4 million collaborative grant from the National Science Foundation for a 3-year program of studies in ocean trenches whose depths range from 19,685 to 36,089ft (6,000 to 11,000m), known as the hadal zone.

The program takes advantage of recent advances in imaging and collecting technology and the sampling and exploration capabilities of the deep-diving hybrid ROV Nereus, which explored Earth's deepest trench—the Mariana—in 2009 to provide new and unprecedented access to the deepest parts of the ocean floor.

The Hadal Ecosystem Studies (HADES) program includes international collaborators at the University of Aberdeen (UA) in Scotland, National Institute of Water and Atmospheric Research (NIWA) in New Zealand, and The National Oceanography Centre (NOC) at the University of Southampton.

For more information, visit www.whoi.edu.



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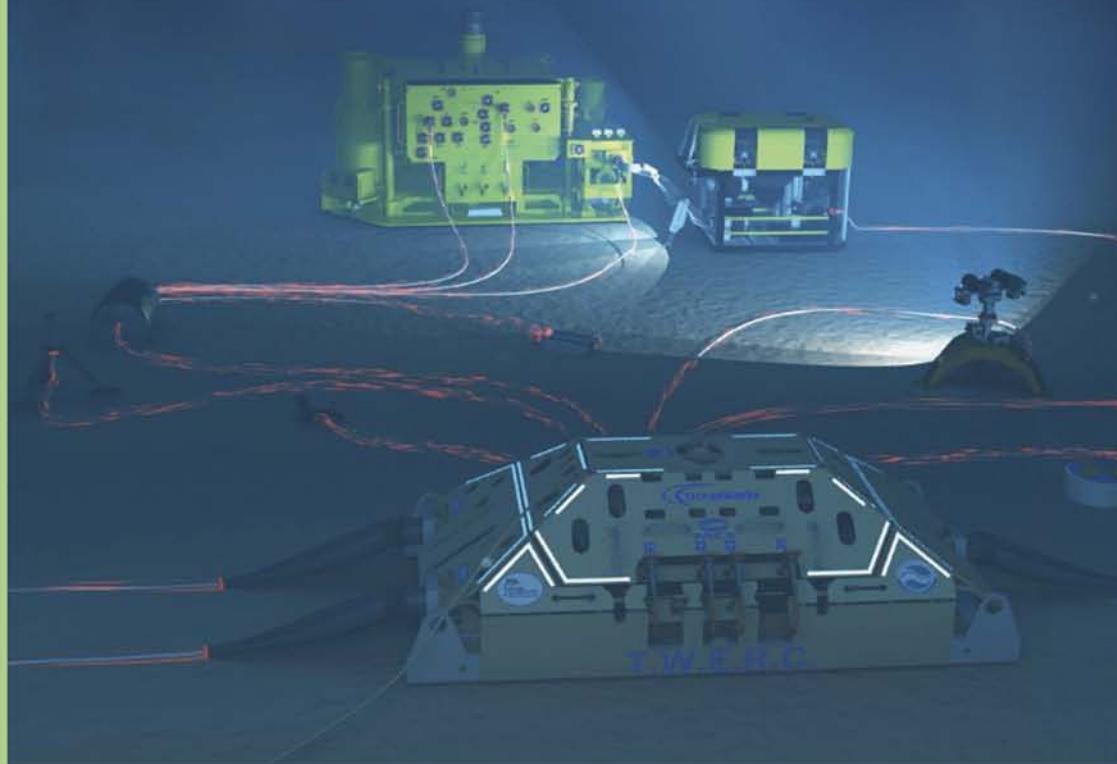


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Sonars and Underwater Cameras Aid Aquaculture Industry

By: Chris Combs, Sales Manager, J.W. Fishers Manufacturing, Inc.

The worldwide demand for seafood products is expected to more than double in the next 10 to 15 years. However, the amount of seafood being harvested from our oceans is expected to decline over that period due to over-fishing. One solution to the problem is aquaculture, the farming of aquatic species such as fish, crustaceans, and mollusks. Brian O'Hanlon, founder of Open Blue Sea Farms, is one of the pioneers in the field of open ocean fish farming. The key concept behind this method is moving the holding pens into deep water. Having the submerged cages offshore increases the flow of seawater to the fish, creating a cleaner and more healthy environment. Problems can arise in traditional nearshore aquaculture due to higher concentrations of waste and contaminants which can breed disease. To avoid this, the fish in coastal farms are fed antibiotics, antifungal agents, and anti-parasitical agents. Offshore farms eliminate this process, reducing costs and providing the public with a better seafood product with fewer chemicals.

With a background in marine biology and two generations of New York's Fulton Street fishmongers in his blood, O'Hanlon thinks he's found a better way to harvest fish in a more sustainable and environmentally friendly way. He pioneered the use of advanced submersible cage designs for deep water and was the first to stock mutton snapper and cobia in

open ocean cages. His nets are anchored to the ocean floor 8mi off the coast of Panama in the clear blue waters of the Caribbean Sea.

With open ocean cages, the need for regular inspections is crucial. If the netting is torn or the cage breaks loose from its moorings, fish and gear could be lost. With some of the holding pens extending more than 150ft deep into the ocean, it is not practical to use divers because of their limited bottom time at these depths. One technology being employed to aid the modern day aquafarmer is side scan-sonar. High frequency sonar has the ability to produce detailed images of the cages, the mooring lines, and anchors. When Open Blue made the decision to acquire a sonar, they went to one of the experts in the field of underwater search equipment, JW Fishers Mfg. Operations manager Philip Nicolson contacted Fishers Factory to discuss the Open Blue's requirements. Major considerations were quality of the images, the ruggedness and reliability of the system, and a quick delivery time. Once it was established that Fishers could meet all of their needs, Open Blue decided on the dual frequency SSS-100K/600K, which would provide both long-range scan capability as well as short-range, high-resolution pictures. Shortly after the sonar arrived on site, Nicolson reported, "We've been very busy here with the side scan. It works great! We're getting excellent images of the cages and all the support structures."

Another piece of technology being employed in the aquaculture industry is the underwater video system. Several fish farms in Norway are using inexpensive drop cameras like the Fishers MC-1 mini camera to view the condition of the nets and health of the fish. In Canada, the Dept. of Fisheries and Aquaculture (DFA), which is responsible for monitoring the industry, is using Fishers SeaOtter ROV to inspect the country's aquafarms. One DFA officer reports, "We send the ROV down under the nets to determine the amount of waste present and to check for dead or dying fish. It's really a very useful tool. It can go deeper than our divers and stay there as long as we need it to."

For more information on Open Blue Sea Farms, visit www.obsf.com.

For more information on Canada's Dept. Fisheries and Aquaculture, visit www.gov.ns.ca/fish.

For more information on JW Fishers underwater search equipment, visit www.jwfishers.com.



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Cape Wind selects construction contractor
 Cape Wind has selected the joint venture team of Flatiron Construction Corp., Cal Dive International, Inc. (NYSE:DVR), and Cashman Equipment Corp. as its construction contractor to build America's first offshore wind farm in Nantucket Sound. Boston-based Cashman Equipment Corp. has constructed many marine projects in Massachusetts and New England and is one of the leading providers of floating marine equipment in the country and provides floating marine equipment worldwide. Colorado-based Flatiron Construction Corp. is one of the leading construction and civil engineering firms in the U.S. Houston-based Cal Dive International, Inc. is a market leading U.S. based offshore energy marine construction and manned diving firm. Cape Wind has encouraged the joint venture to seek out subcontracting opportunities with local firms that may be able to offer competitive equipment or services. Cape Wind expects to begin construction in 2013.

U.S. DOE EERE Federal funding opportunity
 On behalf of the DOE Office of Energy Efficiency and Renewable Energy (EERE), the Wind and Water Power Program (WWPP) intends to issue a Funding Opportunity Announcement (FOA) titled "In-Water Wave Energy Conversion (WEC) Device Testing Support." The DOE intends to fund one industry-led project that will deploy a long-term (1 year), in-water WEC device. The device will be deployed at the Navy Wave Energy Test Site facility in Kaneohe Bay on the Hawaiian Island of Oahu. Prospective applicants to the FOA should begin developing partnerships, formulating ideas, and gathering data in anticipation of its issuance. It is anticipated that this FOA will be posted to EERE Exchange in FY12.

The European Consortium led by the EDF Group wins three projects

The European Consortium led by the EDF Group has won the French offshore wind energy call for tenders for the Saint-Nazaire, Courseulles-sur-Mer, and Fécamp projects. These projects, corresponding up to 1,500MW of new installed capacity, go hand in hand with an ambitious industrial plan that should create about 7,500 direct and indirect jobs, notably with the manufacturing of Alstom's Haliade 150 wind turbine. This European Consortium has been formed by EDF Energies Nouvelles and is gathering together in a partnership with Danish group DONG Energy, Nass&Wind Offshore, and wpd Offshore, with Alstom as its exclusive turbines supplier.

Kongsberg Maritime wins contract for Meygen tidal stream project

A contract has been awarded to Kongsberg Maritime Ltd. to conduct underwater noise studies for an offshore renewables project that could eventually lead to 400MW being installed in the Inner Sound of the Pentland Firth. The contract, awarded by MeyGen Limited, will involve Kongsberg Maritime Ltd conducting both baseline and operational noise measurements from prototype tidal devices to assess the potential effects of underwater noise on marine life.

Scottish Enterprise partners with 2-B Energy



Dutch renewables company 2-B Energy has joined forces with Scottish Enterprise to deliver cutting-edge offshore wind technology with the potential to reduce costs by up to 45%.

The organizations will work together to support commercialization of 2-B's unique two-bladed offshore turbine concept through development of offshore test and demonstration facilities in Scotland – potentially by the end of 2014.

Recognized as potentially game-changing technology, the 2-B concept bucks the trend toward the more conventional three-bladed horizontal axis onshore wind technology currently being deployed offshore.

Its revolutionary design significantly reduces the number of components required throughout the lifetime of the turbine, which should result in significantly lower operation and maintenance costs.

The 2-B wind plant size harmonizes well with the state of the art size of 6MW and a rotor diameter of 140 m, but distinguishes itself from other turbines with its two-bladed rotor on a full lattice structure that goes all the way to the seabed.

The Scottish European Green Energy Centre (SEGEC), based in Aberdeen, has supported 2-B's application for European funding, through the EU Framework Programme 7, for development of the company's technology and offshore demonstrator in Scotland.

This project is targeted for development at the Scottish Enterprise-owned Fife Energy Park in Methil where 2-B Energy has stepped up its ambitions and focus has shifted from a single nearshore unit to two units offshore in a broader project.

The project will be part of a test and demonstration hub of activity that will accommodate a range of potential interests in the Scottish offshore wind sector.

Offshore wind is set to become Scotland's next industrial revolution, with the potential to attract billions of pounds of investment and create tens of thousands of highly-skilled and sustainable jobs.

The industry represents the biggest opportunity for sustainable economic growth in Scotland for a generation and will play a vital role in meeting the Scottish government's target for renewables to generate 100% of the country's domestic electricity demand, alongside other sources, to enable Scotland to remain a net exporter of power.

For more information, visit www.scotland.gov.uk.

Tocardo breaks into Korea

Tocardo International, the leading producer of hydro-power turbines, has signed an exclusive dealership agreement to sell its renewable energy technology in South Korea. Tocardo signed the deal with the German-Korean corporation Korwind. The company has extensive experience with the South Korean renewable energy market and a strong track record of building trade links between Korea and northwest Europe.

Tocardo is the only company in the world that produces and sells commercially viable water turbines. Its market-ready turbines can generate energy in any environment with flowing water: offshore tidal currents or inshore rivers.



From a geographic and economic point of view, South Korea is one of the world's most promising countries for the application of tidal energy generation. Through its agreement with Korwind, Tocardo is one of the first to make its turbines commercially available there. Korwind will use its extensive network of Korean commercial and government relationships to implement the Dutch hydro-power specialist's pioneering technology.

For more information, visit www.tocardo.com.

200 turbines to be installed in New Zealand

Crest Energy Limited has been granted consents to construct a marine tidal turbine power station in the mouth of the Kaipara Harbour in Northland, northern New Zealand. The project comprises up to 200 completely submerged marine tidal turbines with a maximum generating capacity of around 200MW, located invisibly underwater.

Crest Energy estimates its plans, when fully implemented, will generate sufficient power for an area from

Albany to Cape Reinga by harnessing the energy of the tide.

A number of factors make the Kaipara Harbour suited to marine turbines. Up to 8,000 million m³ of water pass in and out of the Harbour each day, which is the same as a cube of water 2km x 2km x 2km. The harbour is rarely used for commercial shipping due to the treacherous tides and sand bars at its mouth.

The project maintains New Zealand's tradition of harnessing renewable energy. Over half of New Zealand's electricity is produced from hydroelectric, geothermal, wind, and other sustainable sources.

Estimated total costs for the project over the first 10 years are about NZ\$600 million, offset by modest but growing revenues from year four.

For more information, visit www.crest-energy.com.

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REpower signs contract for 332MW German offshore project

REpower Systems SE has signed a contract with PNE WIND AG to deliver 54 offshore wind turbines. The 6M turbines, each with 6,150kW of rated power, are intended for the Gode Wind I wind farm. The project is based in the German North Sea, around 35km north of the East Frisian Islands in the Exclusive Economic Zone of Germany. This is the biggest-ever offshore project with REpower turbines and one of the world's biggest open-sea projects with

turbines in the multi-megawatt class.

The wind turbines are set to be installed and commissioned in 2015. At the Gode Wind I site, the water is between 28 and 34m deep. Andreas Nauen CEO of REpower Systems SE, stated, "We are delighted that PNE, one of the most successful German developers, is placing its trust in our 6M. PNE is also one of the first developers in Germany to switch to multi-megawatt turbines with an output in excess of 5MW. This is a real breakthrough, particularly for the numerous future projects in even deeper water."

For more information, visit www.repower.de.

Forward progress for renewable ocean thermal energy in Curaçao

As part of the opening ceremony of Bluerise's OTEC Advanced Research and Demonstration Prototype at the Delft University of Technology, Curaçao Airport Holding N.V. (CAH) and Bluerise B.V. have signed an Memorandum of Understanding (MoU) for a Power Purchase Agreement (PPA) to further strengthen their cooperation in realizing an Ocean Thermal Energy

Conversion (OTEC) plant.

Under the projected PPA, Bluerise will sell power to CAH and CAH will make cold water from its Sea Water Airconditioning (SWAC) system available to be used in Bluerise' OTEC plant.

"This MoU and our prototype reflect the substantial progress we have made as a startup company over the last months," says Remi Blokker, CEO of Bluerise. "Combined with the synergistic advantages of other deep seawater technologies, as outlined in our Ecopark design, we firmly believe that OTEC will prove to be a very attractive and essential part of future island energy systems, with its baseload and low cost electricity production."

Simon Kloppenburg, advisor airport development at Curaçao Airport Holding says, "Our aim is to become self-sufficient with a focus on using renewable energy sources. OTEC, with its baseload capacity is an ideal match for us, particularly because it can be coupled with our SWAC system that is currently under development".

For more information, visit www.bluerise.nl.

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SeaCat Inspects 24km Long Water Tunnel

By Jörg Kalwa

In a mission lasting almost 7hr, the autonomous underwater vehicle SeaCat made by Atlas Elektronik dived through a water supply tunnel 24km long in the vicinity of Stuttgart, successfully investigating the tube for damage. With this survey on 6 March 2012, it at last became possible to inspect the tunnel known as "Albstollen" in the State of Baden-Württemberg for the first time in 40 years.



Lowering SeaCat through the shaft into the tunnel

The "Albstollen," with a length of 24km and a diameter of 2.25m, forms part of the water supply system operated by Bodensee-Wasserversorgung (BWV) with headquarters in Stuttgart. As the largest German long-distance water distribution system, it provides fresh water from Lake Constance to four million people in 320 communities. As one of two main lines, the Albstollen passes through the Swabian Jura range to supply Stuttgart and the northern part of Baden-Württemberg.

Although the concrete duct had been checked regularly in the course of its over 40-year lifetime through measurements of the hydraulic friction losses and the leakage rate, a visual inspection of its condition over the entire length had not been technically possible until now. As a leading German manufacturer of unmanned underwater vehicles, Atlas Elektronik was, therefore, asked to inspect the water tunnel by means of an autonomous diving robot. For the challenging task, the "SeaCat" autonomous underwater vehicle had been selected due to its advantageous size and the ability to operate either remotely controlled or fully autonomously.

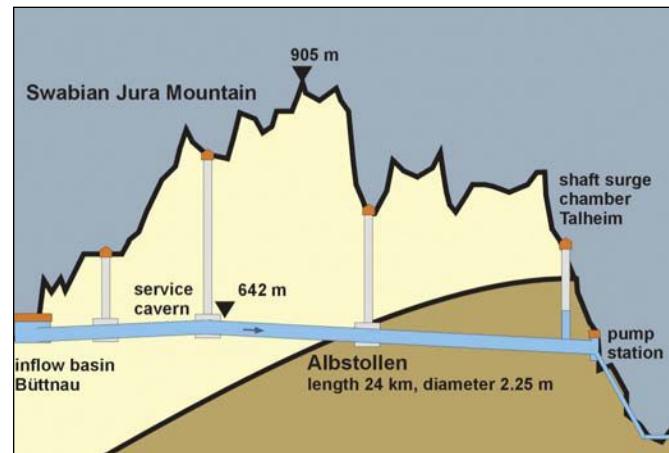
The SeaCat Team of Atlas designed a specific inspection head that allows recording high-resolution video data over the total length of the tunnel, while moving continuously through the tube at a speed of about 2kts and remaining centered with the aid of optical distance sensors.

After a thorough disinfection, the vehicle was lowered into the inflow reservoir at Büttnau on the morning of 6 March. The AUV was connected to its laptop-based control station using a fiber-optic Ethernet cable. As a full hybrid vehicle, the SeaCat was guided manually through the first 40m of the tube. Obstacles like a butterfly valve and narrow turns prevented a full automatic operation. After passing these, the autonomous guidance system was activated but still under observation of the operator. All systems worked as expected, so the cable was cut after 300m. The

inspection head took over the control for the next 7hr and 24km without any external supervision. Merely the registration of motor noise when the vehicle passed three maintenance caverns on its way indicated the progress of the mission.

The exit point of the trip was the shaft surge chamber at Talheim, a concrete structure comprising a shaft 38m deep and about 8m in diameter. This pressure-balancing well is normally half-filled with water. The water tunnel is routed through the well, forming a semi-circular channel at the bottom. A diver's lamp was positioned at this point to provide a light, indicating that the AUV had reached its final destination. This visual signal was detected by the vehicle, causing the autonomous guidance system to stop the vehicle and let it rise to the surface.

This pioneering accomplishment was made possible by outstanding teamwork between the staff of BWV and Atlas Elektronik. While the mission demonstrated the technical reliability of the SeaCat, it also showed that the water tunnel was still in good condition after 40 years of continuous use.



Cross-section of the Albstollen tunnel

The SeaCat AUV is a torpedo-shaped underwater vehicle about 2.5m in length and 30cm in diameter. As a hybrid vehicle, it can be operated either remotely controlled or fully autonomously with an endurance of up to 8hr and a range of 40km. Navigation is achieved by exploiting an aided inertial navigation system. Video cameras and a variety of sonars can be carried as payload sensors. Typical areas of application include the inspection and mapping of inshore lakes, coastal sea areas, harbours, and marine structures such as dams or the foundations of wind turbines.

For more information, visit www.atlas-elektronik.com.



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The U.S. Navy 30-year shipbuilding plan submitted to Congress

The U.S. Navy 30-year shipbuilding plan submitted to Congress assumes that shipbuilding funding will rise from fiscal 2018 and will continue through 2032, during which all major vessels will be retired, leaving the Navy able to prevent cost overruns. But the report warns that "if any of these assumptions prove to be faulty, future shipbuilding plans will include fewer ships and battle force inventory levels will change, inevitably falling below 300 ships." The plan states that the fleet may include 12 to 14 ballistic missile submarines, 11 nuclear-power aircraft carriers, 48 attack submarines, up to four cruise missile submarines. It may also include 90 large surface combatants, 55 small surface combatants, 32 amphibious landing ships, 29 logistics ships, and 33 support vessels. The Navy's current fleet of 282 ships is expected to be around 300 ships by 2019 with 55 new lighter, more agile coastal warships to meet mission requirements in the near term.

General Dynamics awarded \$8M by U.S. Navy for Virginia-class submarine work

General Dynamics Electric Boat has been awarded an \$8.3M contract modification by the U.S. Navy to procure components for Virginia-class nuclear-powered attack submarines. Electric Boat is a wholly owned subsidiary of General Dynamics (NYSE: GD). Under the contract modification, Electric Boat will procure material for the construction of advanced integrated low pressure electrolyzers used on Virginia-class submarines. The lead-yard services contract being modified has a potential cumulative value of \$881million through 2014 if all options are exercised and funded.

DCNS delivered the fourth Skjold FPB to Norwegian Navy

DCNS delivered the fourth-of-class fast patrol boat (FPB) P964-Glimt to the Royal Norwegian Navy. The six-boat Skjold program is led by a consortium comprising DCNS and two Norwegian contractors, with DCNS acting as the combat system design authority and co-supplier. Skjold FPBs are designed specifically for maritime security and safety missions in Norway's littoral waters. The combat system is tailored to demanding environments and reduced crewing. The communications and sensor suites are fully compatible with active participation in international and NATO-led operations. With a length of around 50m, Skjold-class FPBs are heavily armed for their size. The combat system features eight anti-ship missiles and a 76mm gun that can engage several targets at once at ranges exceeding 12km.

SAIC awarded contract by U.S. Space and Naval Warfare Systems Center Atlantic

Science Applications International Corporation (SAIC) (NYSE: SAI) announced it was awarded a prime contract by the U.S. Space and Naval Warfare Systems Center (SSC) Atlantic to provide networking, joint base, and technology transition services in support of the warfighter. The multiple-award, indefinite delivery/indefinite quantity (IDIQ) contract has a 1-year base period of performance, four 1-year options, and a cumulative total for all orders of approximately \$230 million, if all options are exercised.

Ingalls Shipbuilding awarded \$76 Million contract for sixth NSC



USCG Stratton - (WMSL 752)

Huntington Ingalls Industries (NYSE:HII) announced that its Ingalls Shipbuilding division has received a \$76million fixed-price contract from the U.S. Coast Guard to purchase long-lead materials for a sixth National Security Cutter (NSC). Construction and delivery of the yet-to-be-named WMSL 755 will be performed at the company's Pascagoula facility. A second phase of the contract, when awarded, would bring the overall value to \$88million.

"This award demonstrates the Coast Guard's ongoing commitment to the National Security Cutter program and continued confidence in our shipbuilders," said Mike Duthu, Ingalls' program manager, Coast Guard programs. "This procurement contract enables us to focus on effective and efficient supply chain management so we can secure the best price for equipment and materials, while also meeting our schedule commitments with our U.S. Coast Guard customer."

The advance procurement funds will be used to purchase major items for WMSL 755, including steel, the main propulsion systems, generators, electrical switchboards, and major castings.

Ingalls has delivered the first three NSCs, the flagship of the Coast Guard's cutter fleet, designed to replace the 378ft Hamilton-class high-endurance cutters, which entered service during the 1960s. The first two ships are performing missions for the Coast Guard, while the third ship, Stratton (WMSL 752), was commissioned on 31 March in Alameda, California. The fourth NSC, also named Hamilton (WMSL 753), is currently under construction, and the fifth, Joshua James (WMSL 754), will start fabrication later this year.

Ingalls builds the NSC hulls and mechanical and electrical systems, while Lockheed Martin builds and integrates the command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities.

NSCs are 418ft long with a 54ft beam and displace 4,500tons with a full load. They have a top speed of 28kts, a range of 12,000mi, an endurance of 60 days, and a crew of 110.

For more information, visit www.huntingtoningalls.com.

Students' underwater robots face off in national competition

Students from across the country competed with underwater robots for a national title during the Office of Naval Research (ONR)-funded 2012 National SeaPerch Challenge in Manassas Park, Virginia, 11 to 13 April.

The event brought together top middle and high school teams to compete with underwater robots they built as part of a curriculum designed to boost their skills and interest in science, technology, engineering, and mathematics (STEM).

The SeaPerch program is an initiative under the Department of the Navy's STEM Coordination Office, which facilitates outreach efforts across the service. Chief of Naval Research, Rear Adm. Matthew Klunder, presented awards to winning teams.

The competition challenges are designed to reflect Navy-relevant operations. This year, the 70 teams competed in two events: an obstacle course and a salvage operation. Both took place in a community center indoor pool. For the obstacle course, teams had to navigate through 24in. rings that were oriented in any direction, surface, re-submerge, and return through the course. The salvage operation involved five 5gal buckets inverted on the pool's bottom, which each team had to float to the surface and then bring poolside.

For more information, visit www.navy.mil/local/onr.



SeeByte selected by U.S. Office of the Secretary of Defense for foreign comparative testing

SeeByte, the global leader in creating smart software technology for unmanned systems, has been selected by the U.S. Office of the Secretary of Defense, Comparative Test Office, to participate in a Foreign Comparative Testing (FCT) Program in support of a U.S. Navy Program of Record managed by the Naval Sea Systems Command, EOD Program Office. The FCT is designed to test selected foreign technologies as evaluated by U.S. Military Operators, with a view to future procurement.

SeeByte will integrate existing autonomy software into the Common Operator Interface for Navy EOD (COIN). These autonomy modules constitute an adaptive mission planner for UUVs. The program will include a first phase encompassing an extended evaluation effort for the system. It will also include a second phase that will cover the completion of integration with Navy systems, further evaluation through sea testing and simulation, generation of final and complete documentation, and training of Navy personnel.

For more information, visit www.seebyte.com.



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Raytheon delivers U.S. Navy's first dual-frequency sonar

Raytheon Company completed delivery of the electronics for the AN/SQQ-90 tactical sonar suite, the complex sonar for the first ship of the U.S. Navy's DDG 1000-class multimission destroyer. The AN/SQQ-90 tactical sonar suite, the first dual-frequency hull-mounted sonar of the Navy's surface fleet, is a major advancement in undersea warfare capability and will provide broad warfighting coverage to DDG 1000.

Raytheon delivered the sonar electronics completely assembled and integrated into an Electronic Modular Enclosure (EME), an innovation to 21st century shipbuilding designed into the Zumwalt-class destroyer program for affordability. The EME delivers benefits not only in upfront integration and testing before delivery to the shipyard for ship installation, but also minimizes the footprint occupied onboard the ship (size and weight) and maximizes efficiencies in both power and cooling.

The AN/SQQ-90 comprises the AN/SQS-60 hull-mounted, mid-frequency sonar; the AN/SQS-61 hull-mounted, high-frequency sonar; and the AN/SQR-20 multi-function towed array sonar and handling system. Raytheon is the AN/SQQ-90 systems integrator, bringing together the full functionality of the suite's sonar system elements. Through automation and unique information management, DDG 1000's AN/SQQ-90 can be operated by one-third the crew of current Aegis platforms.

For more information, visit www.raytheon.com.

Textron Defense Systems and Hydronalix team for small naval surface system development

Textron Defense Systems, an operating unit of Textron Systems, a Textron Inc. company, and Hydronalix announced that the organizations have teamed to develop small naval surface systems.

The agreement combines Textron Defense Systems' years of experience engineering and manufacturing sophisti-

cated sensor systems and precision weapons with Hydronalix's high-speed, unique, man-portable watercraft. Together, the organizations will explore designs and applications for a family of small naval surface systems capable of executing port security, littoral operations, mine countermeasures, and other critical military and homeland security missions.

Among Textron Defense Systems' array of technologies is a suite of Unattended Ground Sensors designed to provide situational awareness reliably over a long mission life as well as ground- and air-based smart weapons that are proven to be both precise and safe to noncombatants.

Hydronalix is leading the way in developing maritime micro-robotics and is best known for its Emergency Integrated Lifesaving Lanyard (EMILY). Funded by the U.S. Department of Homeland Security, EMILY delivers speeds up to 24mph and is used to assist first responders for rescuing swimmers in distress.

For more information, visit www.textron.com.

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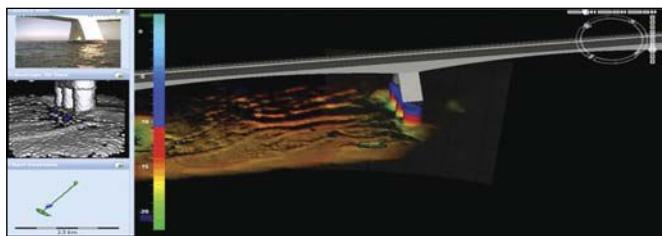
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Real-Time 3D Sonar Technology for Real-Time Decisions

By Stephen Auld, Managing Director and Greg Nipper, Sales Manager, CodaOctopus

Advances in acoustic technology, processing power, and software development have increased significantly over the last 10 to 15 years. These advances led to dramatic changes in how sonar data is viewed and used to aid decision making in the subsea arena. CodaOctopus, with offices in the UK, Norway, and the US, has been at the forefront of innovative techniques for real-time 3D sonar solutions from its inception. As a result, over the last 5 years several different market sectors have realized significant benefits of using the high-definition Echoscope® sonar with the Underwater Survey Explorer (USE) software. Recently, a new market segment of ROV operators and integrators has been looking to take advantage of real-time 3D sonar imagery with the newly released Dimension® and Vantage™ hardware and software combination.

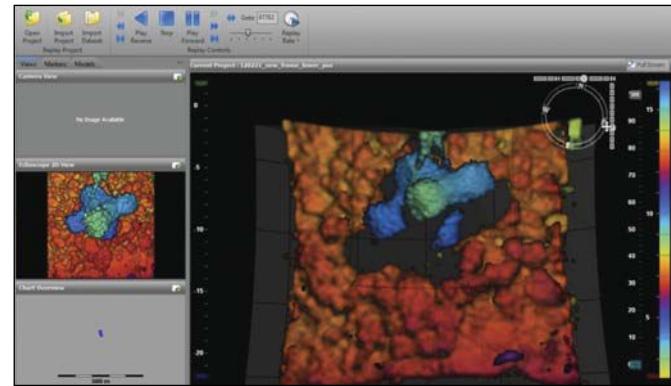


Computer generated model of a bridge adding context to the high-definition sonar returns

Augmented reality with CGMs

Augmented reality is a concept brought into USE software by CodaOctopus, whereby Echoscope® sonar returns from the underwater environment are aided by the use of computer generated models (CGMs). These CGMs are used by the operator, who may be a surveyor, vessel skipper, ROV pilot or crane operator, to add visual context to imagery returned from the sonar, leading to a better understanding for decision making purposes. In cases where geographical coordinates, heading, and vessel attitude are known, this visualization can take the form of “painting” sonar imagery over the CGM as the structure is illuminated, or insonified, with sound.

Under certain conditions, geo-referencing is not required to achieve the benefits of augmented reality. Given the volumetric beamform pattern generated by the Echoscope® in conjunction with an object or target of known dimension (e.g., a marine construction block), CodaOctopus has successfully delivered software algorithms with real-time target-matching of a CGM based purely on the sonar returns. Several breakwater construction projects around the world have used this technique, with one operator reporting a doubling of productivity.



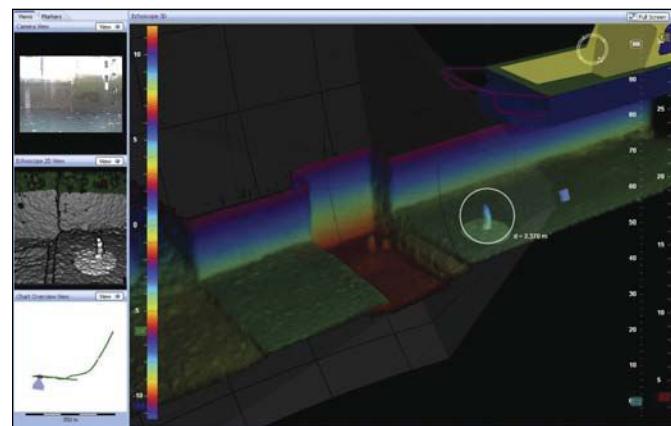
Instantaneous 2D and 3D views of a hanging marine construction block called an ACCROPODE™ II Unit

Marine construction, dredging and trenching

Working conditions with low visibility involving complex structures or with the need to avoid certain subsurface targets (e.g., pipelines, jack-up rigs, mono-piles, and jetties) place added pressure to subsea operations and their aims of working efficiently and safely. Real-time 3D sonars provide an aid to these types of operations by immediately tying together visualization with a wide field of view (FOV); positioning of one subsea object to another; and measurements, being either absolute or relative depending on positioning, heading, and attitude aiding of the 3D sonar.

Mattress laying

The common practice of mattress laying, which ensures the integrity of assets like pipelines and cables from the effects of scouring, has long been associated with the use of sonars. Now, instead of building an image by scanning an



Using the UISTM, small subsea targets can be highlighted in both 3D and 2D edge detection windows

Looking for a Navigation Solution?

acoustic transmission, real-time 3D sonar images can be used to increase productivity for this important application. Furthermore, using patented rendering techniques and associating a color palette based on an engineering datum plane, the online surveyor can, in most cases, immediately see the entire mattress currently being laid and its position and height relative to those of its neighboring mattresses. The decision point to release a mattress, given a greater understanding of its actual position, can therefore be made with a higher degree of certainty.

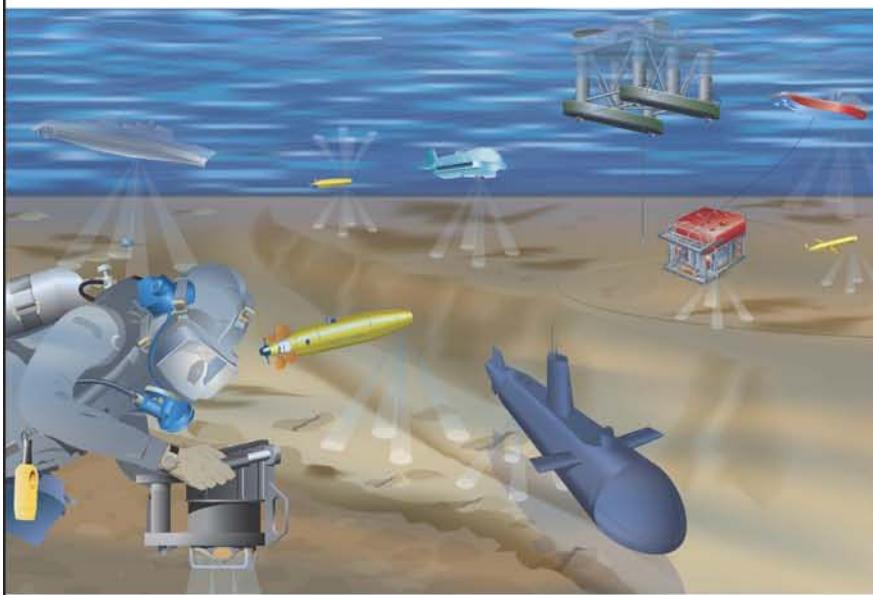
Port security

Another major marine sector, with a large emphasis in the US, which has benefitted from advanced real-time 3D sonar imagery, has been that of port security. Achieving very high-definition sonar imagery (i.e., over 16,000 beams/pulse, with around 10 pulses/second) has enabled suspicious underwater targets to be visualized instantaneously. The Underwater Inspection System (UIS™), combines the Echoscope® sonar with aiding devices, such as an above-waterline camera and motion reference unit, to help law enforcement agencies and port authorities immediately survey the subsea scene without any need for post-processing.

Conclusions

Sonar technology has moved from being just a depth sensor to tying together real-time visualization with the ability to position objects subsea while maintaining a measurable dataset. Several markets, as discussed above, have used the Echoscope® and the full UIS™ package to ensure they are maximizing the benefits of this unique technology. With the ever increasing demands on offshore operators, this move to using high-definition, advanced real-time sonar solutions has led to better decision making, increases in productivity and improved safety through reducing risk to divers.

For more information:
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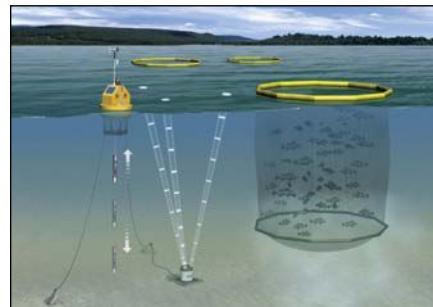
YSI – More Than 60 Years of Innovation in Water Quality Monitoring in Tough Environments

The legacy of YSI Inc. reaches back to 1948 and a three-man partnership that was forged at Antioch College in Yellow Springs, Ohio. The engineers' concept for a 16k random access memory (RAM) with on-board crystal clock met the Air Force's need for a programmable timing device with precision and resolution well beyond anything available at the time. This successful prototype led to Air Force contracts that produced cash flow to support development and commercialization of further ideas.

YSI's first commercial instruments included the Model 3A Dielectric Constant meter; interchangeable thermistor temperature probes, a notable industry first; and associated temperature instrumentation.

The history of YSI would be incomplete without mention of Dr. Leland Clark, to whom not only YSI, but the

world, owes a debt of gratitude. Dr. Clark was a researcher with whom YSI worked closely. He is best known for having developed the aptly-named Clark oxygen electrode that allows dissolved oxygen to be measured in liquids. This has been applied in the environmental, biomedical, and industrial fields.



YSI water quality sondes deliver real-time data from aquaculture sea pens

Over the ensuing decades, the company adhered to a well-defined plan of providing quality products and sensor technology to niche markets around the world. Additionally, new product development and business processes incorporated environmentally responsible practices, such as recycling, reduced-footprint packaging, and energy conservation.

From sampling to monitoring with water quality sondes

In the 1990s, YSI introduced what became its most significant product line to date: the 6-Series environmental monitoring sondes. These instruments brought together YSI's proven dissolved oxygen sensor with additional sensors—including conductivity, turbidity, chlorophyll, and blue-green algae—into a family of products specific to monitoring water quality. Customers were able to leap out of the lab and into the field, where data were obtained more immediately and accurately and could be collected over longer periods of time.

In the past two decades, YSI has extended its product development to continue to address the pressing concerns facing the world's water resources. It has increased its focus on integrated monitoring systems for remote monitoring, such as buoys, floating platforms, and underwater vehicles

that use the water quality sensors. Technical innovations also have helped customers get more out of their instruments and extend deployment times, such as antifouling technologies and efficient power management.

Leadership

After several decades as an employee-owned company, YSI joined Xylem Inc. in 2011. Xylem is a public pure-play water business that spun off from ITT Corporation and is led by CEO Gretchen McClain. YSI merged with Xylem's Analytics division, led by President Chris McIntyre, while YSI's senior vice president Gayle Rominger was tapped to assume the larger responsibilities of Business Development for Xylem Analytics. YSI's strengths in engineering and sensor development dovetail nicely with the strong field and lab instrumentation and customer focus that make up Xylem Analytics.

EXO sondes: The intersection of environment and observation

This year YSI introduced the new EXO CTD, which is well-suited for the ocean and aquaculture markets. The EXO water quality monitoring platform builds on YSI's 60 years of experience in electrochemical and optical sensor development, but moves it beyond its main freshwater applications and into the tougher environment of marine monitoring. Rugged materials, a depth rating of 250m, and a flexible suite of high-accuracy sensors—including fDOM and Total Algae—improve EXO with the qualities that oceanographers have requested.

YSI sondes, including EXO, can be installed at remote aquaculture pens and on ocean monitoring buoys or rosettes to collect the high-quality, real-time data for those who work to protect our natural resources.

For more information visit www.ysi.com or www.EXOwater.com.



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OFFSHORE INDUSTRY

Support rises for U.S. offshore drilling: Pew Research Center poll

Interest in alternative energy sources like wind and solar has waned among Americans over the last year, while support for offshore oil and gas drilling has climbed back up to pre-BP oil spill levels, according to a recent poll.

Of those surveyed by the Pew Research Center, 52% support alternative energy, down 11% compared with March 2011. However, interest in developing oil, coal, and natural gas resources rose by 10%.

Support for offshore oil and gas drilling in U.S. waters has also recovered to its levels prior to the 2010 BP oil spill in the Gulf of Mexico. Nearly two-thirds of those surveyed now favor allowing increased offshore drilling, up from 57% a year ago and 44% in June 2010, during the spill.

The partisan divide on renewable energy versus oil, coal, and natural gas development has also become more pronounced over the last year.

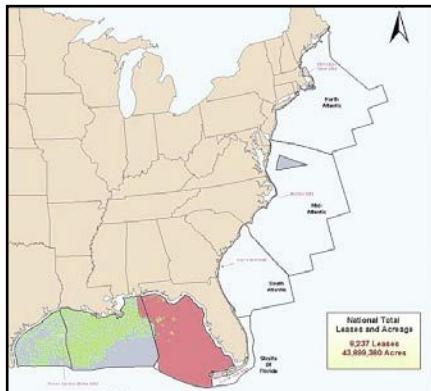
Eighty-nine percent of Republicans favor allowing more offshore oil and gas drilling while only half of Democrats agree, according the survey. However, a 64% of independents support increased drilling off the U.S. coast.

U.S. Interior plan moves forward for Atlantic seismic research

The U.S. Interior Department is seeking public comment on a plan to allow energy companies to begin seismic testing to find oil and natural reserves in the Atlantic Ocean. But the plan does not put the region on the leasing schedule.

Officials have released a Programmatic Environmental Impact Statement on seismic testing for public review. The testing would be used to determine how much oil and natural gas is available and where the best places to drill would be, among other things. The studies also help identify archaeological and geologic hazards to avoid. Companies would use the information to determine where to apply for energy leases, although no leases are currently available in the region that could be opened up for exploration until at least 2017.

Supporters of drilling argued that there needs to be a plan in place soon to sell drilling leases to make the seismic



testing valuable. Environmental groups said seismic testing could harm wildlife, even before any drilling begins.

"Without an Atlantic coast lease sale in their 5-year plan, the administration's wishful thinking on seismic research has no ultimate purpose," the American Petroleum Institute upstream director Erik Milito said in a statement.

UK oil production in 2011 falls 17.4% to lowest since 1970s

UK oil production fell more than 17% to average 1.04mmbl/d in 2011, recent government figures show. Output fell 17.4% compared with 2010 to average 381.2mmbl, the Department of Energy and Climate Change (DECC) said in a statement, the lowest level of production since the 1970s.

"This decrease stems from a number of unexpected slowdowns ... as well as a general decline in UK production from established fields," the statement said. UK oil output peaked at more than 2.7mmbl/d in 1999 and has been on a downward trend since 2000. As well as the drop in oil output, the DECC figures also showed production of natural gas in 2011 fell even more sharply than oil output, declining by 20.8%.

Meanwhile, oil and gas firms operating in the UK North Sea will be guaranteed tax relief for the costs of retiring old rigs and platform and be given fresh tax allowances, totaling \$5.55billion, for harder-to-access deepwater fields. The move comes as the UK seeks to spur renewed investment in its energy sector, Chancellor of the Exchequer George Osborne said recently in his annual budget speech to lawmakers.

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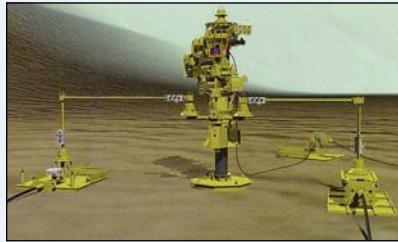
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Global subsea tree utilization rates to rocket over next 3 years

Global subsea tree manufacturers' utilization rates are expected to increase to an average of 75% in the next 3 years, up from 49% in the 2009-2011 period, according to Infield Systems' "Global Perspectives Subsea Market Report to 2016."

The outlook shows a well-supplied market with a total capacity of 690 trees, Infield says, adding that toward the end of the forecast period, it expects higher utilization rates and the start of a saturated market, driven mostly by the increasing demand for subsea trees in main phases in Brazil and West Africa.

The report aims to provide a comprehensive analysis of the subsea market's many facets. Information highlights the differing market dynamics, the changing investment opportunities, the emergence and implementation of new technology, and the dominance of different companies and manufacturers in each region.



The dual challenges of sustaining production in mature regions and effectively tapping uncapped reserves in growth areas boost the potential for subsea capital expenditure through the forecast period. Operators are forced to venture into remote and harsher locations, Infield points out.

These projects require top-tier equipment that can cost significantly more than the standard equivalent. Infield estimates that ultra-deepwater installations will account for almost 25% of the annual tree market by 2016. And more than 50% of the forecast subsea market is expected to relate to subsea tiebacks to a floating or fixed platform or a terminal.

Mergers and acquisitions rose sharply in East Africa during Q1

Mergers and acquisitions (M&A) rose sharply in the first quarter of the year in East Africa compared with the same period a year ago, following increased deal making in the oil and gas sectors.

There were 12 M&A deals in all sectors with a total value of \$3 billion completed or announced in the first quarter of 2012 – the highest during the first 3 months of any year – compared with six deals worth \$17 million in the same period a year ago, according to Thomson One Banker, which provides access to financial data on public companies as well as merger and acquisition information and market data.

Uganda and Tanzania, which have discovered commercially viable oil and gas deposits, had the most M&A activities and deals. The acquisition of a 66% interest in the exploration areas of Tullow Oil by a consortium of investors led by China National Offshore Oil Corporation (CNOOC) and Total SA for \$2.9 billion was the largest deal closed in February.

Larger international firms have been keen on buying into smaller firms in an attempt to add financial muscle to the exploration of oil and gas.

Tanzania has discovered over 7.5Tcf of natural gas, with experts saying the discovery could rise to 60mcf in coming years as more exploration companies drill more wells.

Uganda's oil discovery is placed at 1.1Bbbl, and with many prospects still to be drilled, Tullow Oil believes the basin has an additional 1.4Bbbl of oil waiting to be discovered.

Interior approval brings Shell closer to drilling offshore Alaska

The Interior Department has approved a plan that brings Shell closer to drilling in waters off the coast of Alaska this summer.

The department's Bureau of Safety and Environmental Enforcement (BSEE) announced that it approved Shell's oil spill response plan for exploration in the Beaufort Sea, which is located in Arctic waters off Alaska's northern coast.

Interior said it subjected the plan to additional scrutiny based on a series of tighter safety and environmental standards put in place following the massive 2010 Gulf of Mexico oil spill.

"We have conducted an exhaustive review of Shell's response plan for the Beaufort Sea," BSEE director James Watson said in a news release. "Our focus moving forward will be to hold Shell accountable and to follow up with



Shell Oil's offshore drilling rig Kulluk

exercises, reviews, and inspections to ensure that all personnel and equipment are positioned and ready."

Shell called approval of the plan a "major milestone" in its longtime efforts to drill in the Arctic.

Government boosts 2012 natural gas production estimate for U.S.

The U.S. government sharply raised its estimate for domestic natural gas production this year for a third month in a row. The Energy Information Administration (EIA) also projected greater gas consumption for the year, primarily due to switching by utilities to gas from pricier coal.

In its April Short-Term Energy Outlook, EIA said it expected marketed natural gas production in 2012 to rise by 3bcfd, or 4.5%, to a record 69.22bcfd, up from its March outlook that had output this year at 67.91bcfd. The expected gains in marketed output follow a 4.8bcfd, or 7.9%, increase in 2011 to 66.22bcfd, the largest year-over-year increase in history and easily eclipsing the previous record of 62.05bcfd in 1973.

Natural gas consumption this year is expected to rise 2.84bcfd, or 4.3% from 2011, to 69.60bcf daily. EIA said large gains in electric power use will offset declines in residential and commercial demand.

The steady rise to record production, primarily due to increased supplies from shale, has lessened the nation's dependence on Canadian imports, which have dropped from about 15% of total supply 4 years ago to about 11% now.

A steep drop in gas drilling—the Baker Hughes gas rig count is down 31% since peaking at 936 in October—has raised expectations that historically low gas prices might finally force producers to slow output, but EIA noted the decline has not yet had an impact on production.

Meanwhile, LNG imports are expected to fall by 0.3bcfd, or 28%, to about

0.7bcfd in 2012. Imports will likely come in the form of contractual cargo to the Everett terminal in Boston and the Elba Island terminal in Georgia, the EIA said.

Schlumberger inks agreement to sell Wilson International Inc.

Schlumberger entered into an agreement with National Oilwell Varco, Inc. to sell its Wilson distribution business. Schlumberger acquired Wilson International Inc. as part of the acquisition of Smith International in 2010. Closing of the transaction is subject to customary regulatory approvals.

"Schlumberger's global supply chain has benefited from Wilson's best-in-class distribution practices, and we look forward to working with Wilson in the future," said Paal Kibsgaard, Schlumberger chief executive officer.

Founded in 1921, Wilson is a leading distributor of pipe, valves, and fittings as well as mill, tool, and safety products and services to the international energy business and to other industrial customers. The company manages a distribution business of approximately 200 sales and operations locations across the United States, with a growing presence in other key international geographies.

Oil and gas companies spending more on computer software

As the oil and gas business model continues to evolve in the face of multiple external and internal forces, companies are increasing their investment in software solutions to help them better manage challenges. To this end, industry professionals are looking for a simpler upstream technology environment that will enable operational excellence and efficiencies while simultaneously mitigating risks and addressing new drilling regulations, according to a recent Accenture and Microsoft Corp. survey.

The survey of 200 professionals in international, national, and independent oil and gas-related companies showed that 74.5% spent as much or more "focus and investment" on IT in 2011 as they did in 2010. According to the results, many are using these investments to facilitate a more integrated and efficient operation platform in conjunction with building a global collaborative environment. Respondents view the cloud as a technology in line with making these goals a reality, with most reporting they have plans in place to use cloud services in the future, while many have already adopted them.

Lerwick Harbour's deepwater facility opens ahead of schedule

An additional deepwater facility at Lerwick Harbour in Shetland has been brought into operation ahead of schedule to support a major subsea project in the North Sea.

Work was accelerated on an 80m section of the quay under development at Greenhead to make it available for use by Technip, a world leader in energy industry project management, engineering, and construction.

Technip announced in September that it had been awarded a contract by Maersk Oil North Sea UK Ltd. for the Gryphon Area Reinstatement Program, covering installation of 15 dynamic risers, 2 dynamic and two static umbilicals, and 11 flexible flow-lines as well as subsea equipment. Technip will use Lerwick Harbour as its main offshore support base during project execution.

Designated Berth Seven, the new quay was originally due for completion in February, but the Technip requirement meant Lerwick Port Authority advancing the timetable for most of the facility. The section was handed over by the main contractor, Tulloch Developments, on 20 February.

Early completion has enabled Technip to hire in a specialist crane erected on the port's latest heavy-lift pad that is incorporated into the quay. The 1,250ton capacity Sarens crane is believed to be the biggest yet seen at the Harbour.

The coaster, Abis Belfast, arrived in late February with the first of numerous deliveries of reels by various vessels. In early March, the ROV support vessel, Fugro Symphony, berthed at the new quay to collect the first of the reels, weighing up to 270tons each, for installation on the field in a project expected to take around 6 months.

International logistics and marine service companies, Peterson SBS and GAC Shipping, are providing support to Technip from local bases.

Sandra Laurenson, Lerwick Port Authority chief executive, said, "Berth Seven is a common-user facility, but designed with support of offshore industry operations very much in mind. With 9m water depth and an extensive laydown area, it is another important addition at a time when larger vessels are using the port. The facility brings improvements for current users and will help attract more traffic, across a range of activities."



Fugro Symphony loading at the new quay

Over 30 illegal oil, gas platforms uncovered offshore China

Chinese patrols have uncovered more than 30 illegal platforms used for oil and gas exploration, State news agency Xinhua reported.

The agency quoted a source with the South China Sea branch of the State Oceanic Administration (SOA) as saying a China Marine Surveillance patrol team recently finished its third mission targeted at the illegal exploration of oil and gas in the South China Sea.

Six surveillance ships inspected oil fields in the East China Sea and the Chunxiao and Pinghu gas fields close to the Diaoyu islands on 16 March, Xinhua said. The Diaoyu islands, known as Senkaku in Japanese, are the subject of a boundary dispute between Japan and China. The Chinese fleet included the Haijian 66 ship, which the SOA said

"successfully kept the unauthorized Japanese survey ships out of the East China Sea waters under Chinese jurisdiction," according to Xinhua.

Western Gulf of Mexico Lease Sale 218 nets \$325M in high bids

BOEM completed its required evaluation to ensure that the public receives fair market value for tracts leased as part of Western Gulf of Mexico Oil and Gas Lease Sale 218, which was held last December.

After extensive economic analysis, BOEM said it awarded 181 leases on tracts covering 1,036,205acres to the successful high bidders who participated in the sale, which made 3,913 unleased blocks covering more than 21 million acres available offshore Texas. The accepted high bids are valued at \$324,971,001, BOEM said.

During the sale, 20 companies submitted 241 bids totaling \$712,725,998 on 191 tracts. A total of \$337,688,341 was received in high bids. BOEM rejected nine high bids, totaling \$12,596,540, after determining that the value of those bids was insufficient to provide the public with fair market value for the tracts.

In addition, a successful high bidder forfeited a lease and the 1/5th bonus that was submitted with the bid. As a result, BOEM collected \$30,200 of the \$151,000 bid on the forfeited tract. BOEM holds the 1/5th bonus paid in advance if full payment is not made, or if a company declines the lease after BOEM officially accepts a high bid.

BOEM will re-offer these tracts as part of the next Western Gulf of Mexico sale, which is currently scheduled for late 2012.

Report studies growth of support vessel market through 2016

Infield Systems has issued its "Global Perspective Specialist Vessels Market Report to 2016," which provides coverage of the construction and construction support vessels that are employed in the development of offshore oil and gas fields. The third edition of this report provides analysis of global and regional trends and the supply and demand dynamics for 2007 through 2016.

The report assesses the demand for offshore construction activity on a global basis to identify key regions and gauge supply developments as the world's economy slowly emerges from the recent economic downturn.

The arrival of transcontinental pipelines and the deepwater tie-in of various satellite wells corresponds to an increased level of subsea installations, and Infield says it expects to see activity increase throughout the period of analysis.

Demand has the potential to peak during 2015, Infield says. The report notes that the largest level of demand has traditionally been found within North America and the Gulf of Mexico, in particular.

However, the company says it also expects substantial growth in Asia and West Africa to 2016. The growth in activity throughout Africa will be driven by West African projects where developments within Angola, Nigeria, and (to a lesser extent) Ghana are likely to characterize the region.



Petrobras signs \$1.5B deal for subsea trees
 FMC Technologies, Inc. has signed a 4-year, \$1.5billion agreement with Petrobras to supply pre-salt development subsea equipment, including 78 subsea trees. FMC's total scope of supply could include as many as 130 subsea trees, subsea multiplex controls, and related tools and equipment. The tree systems are for use offshore Brazil in water depths up to 8,200ft. The equipment will be engineered at FMC's South American Technology Center and manufactured at FMC's subsea facility, both in Rio de Janeiro. The subsea trees will achieve 70% Brazilian local content, and deliveries are scheduled to start in 2014.

Technip to switch Schiehallion FPSOs for BP

Technip has won its largest UK offshore contract to date, valued at around \$792million, for work at BP's Quad 204 project west of Shetland. BP is replacing the existing Schiehallion production floater with a new FPSO and is installing extensive new subsea infrastructure. The aim is to recover an additional 450mmbl of reserves and to extend production through 2035. Offshore work should start in 2013. Technip's office near Aberdeen will manage the contract, while the company's spool-base in Evanton, northern Scotland, will fabricate the 15 steel pipelines. The Le Trait facility in northern France will manufacture all flexible pipelines. Various vessels from Technip's fleet will execute the installations.

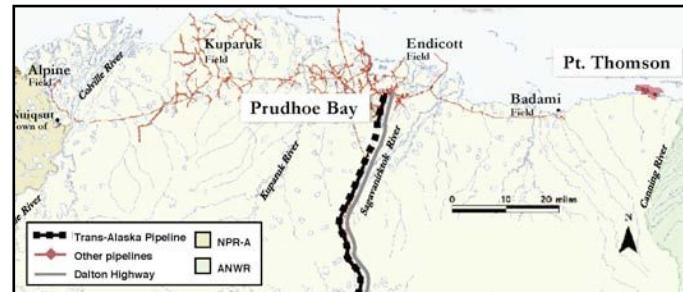
FMC awarded \$70M production system contract

FMC Technologies, Inc. signed an agreement with Statoil for the manufacture and supply of subsea production equipment to support the Fram H-Nord development. The contract has a value of approximately \$70million in revenue to FMC. FMC's scope of supply includes one subsea production tree, one manifold, and one multi-phase meter. The company will also supply an integrated template structure, one umbilical, two wellheads, and additional controls and equipment. The Fram H-Nord field is located in the Norwegian sector of the North Sea in water depths of approximately 1,200ft. The equipment will be based on the standard fast-track subsea solution designed by FMC for Statoil. Deliveries are expected to occur throughout 2013.

McDermott lands Al-Khafji Joint Operations project

McDermott International, Inc. said one of its subsidiaries was awarded an engineering, procurement, construction, and installation project for Al-Khafji Joint Operations, in the Hout field in water depths up to 31m. The project comprises more than 600tons of structures, including a tripod jacket, deck and flare tower, and 42km of 24in. subsea pipeline. McDermott will also carry out modifications to a number of existing platforms in the Hout field through its dedicated brownfield division in Jebel Ali. McDermott's scope of work includes the use of vessels from its global fleet, scheduled to mobilize in the third quarter of 2013. The Hout field is located in the Divided Zone between Saudi Arabia and Kuwait.

Deal includes alternate route for Alaska natgas



A landmark agreement between Alaska's major producers and the State over future development of the Pt. Thomson field includes a second option for marketing the trillions of cubic feet of natural gas stranded on the North Slope. Rather than shipping the gas via an overland pipeline through Canada to the Lower 48, the favored route before the U.S. gas shale glut emerged, it would go through a new pipeline to tidewater in south-central Alaska, be converted to LNG, and then transported by LNG tankers to the Pacific Rim. Some of the gas would be stripped from the pipeline to service Alaska communities.

The LNG option was strongly favored by the State, which found its way into the agreement, resolving a long-standing dispute between the State and North Slope producers ExxonMobil, BP, and ConocoPhillips over development of Pt. Thomson, a large gas condensate field with oil reserves located about 60mi east of the supergiant Prudhoe Bay field.



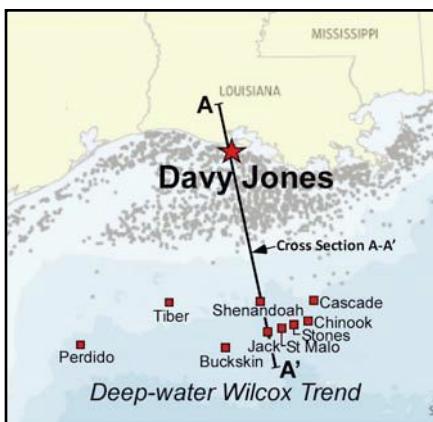
Aerial view of Pt. Thomson field

Trans-Alaska Pipeline System (TAPS). The agreement holds the producers to commitments and timetables to drill wells and infrastructure at Pt. Thomson, and to construct a 70,000bbl/d common carrier pipeline to tie into the 800mi TAPS crude pipeline headed south to Valdez. If the companies do not begin liquids production by the winter of 2015-2016, significant amounts of State-owned Pt. Thomson acreage would automatically return to the State.

The settlement also "incentivizes" efforts to commercialize the North Slope's vast gas resources by helping to position Pt. Thomson for gas development; facilitating the alignment of interests between the major North Slope producers and the State; and installing critical infrastructure for gas sales, including a separate gas pipeline to tidewater and LNG conversion facilities.

"The animating principle of this settlement is that the companies must earn their acreage. The more work, more commitment, more investment, and more production that occur, the more acreage the companies will retain," said Natural Resources Commissioner Dan Sullivan.

Gulf of Mexico

**McMoRan working to start natural gas production from Davy Jones**

Independent producer McMoRan Exploration Co. says work is under way to begin commercial natural gas production from its Davy Jones No. 1 well off the Louisiana coast.

McMoRan has said the area – consisting of four lease blocks in the shallow water Gulf of Mexico shelf – could contain 2Tcf to 6Tcf of natural gas. The company said a pressure buildup was followed by a gas flare from the well. McMoRan said initial samples indicated the natural gas is high quality.

McMoRan said blockage from drilling fluid has prevented the company from getting a measurable flow rate. Operations were under way to remove tubing from the well and clear drilling fluid to get a flow rate during the second quarter, followed by commercial production soon after that.

The company holds a 63.4% working interest and a 50.2% net revenue interest in Davy Jones. Other working interest owners include Energy XXI, with a 15.8% stake; JX Nippon Oil Exploration (Gulf) Ltd., with a 12% working interest; and Moncrief Offshore LLC, with a 8.8% stake.

BHP Billiton approves \$708M initial funding for Mad Dog Phase 2

Resources giant BHP Billiton Ltd. (BHP) said that it has approved an initial \$708million in spending on the deep-water Mad Dog Phase 2 project in the Gulf of Mexico that could produce about 130,000bbl/d. A final investment decision on the project is expected next year, with first production scheduled for 2018, BHP said in a statement.

“The extension of this field will underpin continued valuable liquids production from the Gulf of Mexico and further enhance our growth profile,” said Michael Yeager, the chief execu-

tive of the Melbourne-based company’s petroleum division.

BHP has a 23.9% stake in the Mad Dog partnership, while operator BP plc (BP) holds 60.5% interest, and Chevron Corp. owns the remainder.

The initial funding will be invested in detailed engineering and purchase of items related to the hull, topsides, and subsea equipment, BHP said.

The Mad Dog Phase 2 project

includes the development of a second spar facility with all subsea production and injection wells. The new facility is estimated to have a design capacity of approximately 130,000bbl/d that would be exported via the Mardi Gras pipelines.

“Mad Dog Phase 2 will join our extensive Gulf of Mexico portfolio that includes Mad Dog and Atlantis as well as the Shenzi and Neptune platforms that we operate,” Yeager said.

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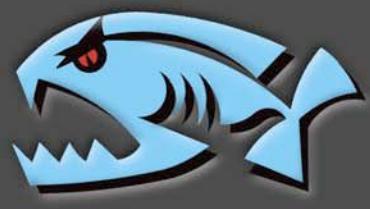
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Enesco to pay \$645M for sixth ultra-deepwater drillship

Enesco plc ordered a new advanced-capability, ultra-deepwater drillship to be built at the Samsung Heavy Industries, Co. Ltd. Shipyard in Geoje, South Korea. The vessel, ENSCO DS-8, will be the sixth Samsung DP3 drillship in the Enesco fleet, extending the benefits of Enesco's fleet standardization strategy. It is scheduled for delivery in the third quarter of 2014, the company said.

The contract also includes options for two additional drillships of the same design. The fleet expansion will extend Enesco's advantage of operating the newest ultra-deepwater fleet among global drilling contractors.

Including commissioning, systems integration testing, project management and spares, the construction cost is expected to be about \$645 million. Consistent with the previous five Samsung ultra-deepwater drillships ordered since 2007, the new unit will have advanced capabilities to meet the demands of ultra-deepwater drilling in water depths of up to 12,000ft and a total vertical drilling depth of 40,000ft.

New features on ENSCO DS-8

include retractable thrusters, enhanced safety and environmental features, improved dynamic positioning capabilities, and advanced drilling and completion functionality such as below-main-deck riser storage, triple fluid systems, offline conditioning capability, and enhanced client and third-party facilities.

Helix Well Ops UK completes first well intervention in West Africa

Helix Well Ops UK has completed a 3-month campaign on West Africa's first well intervention work and subsea operations from a mono-hull intervention vessel. Using the 132m Well Enhancer, the company performed a subsea tree change out, well suspensions, and maintenance as well as production enhancement on seven wells in water depths of up to 471m.

Well Ops executive said that providing operators with alternatives to rig-based well interventions were a benefit to West African oil and gas projects.

The company said this is the deepest operation conducted from Well Enhancer since it joined the fleet in 2009. Well Enhancer features a 150ton multi-purpose tower and provides ROV, saturation diving,



The 132 meter vessel Well Enhancer

and riser-based as well as riser-less well intervention services.

Apache Kenya secures drillship Deepsea Metro 1 for offshore block

Apache Kenya has secured the use of deepwater drilling ship Deepsea Metro 1 from Odfjell Drilling to drill the Mbawa Prospect, offshore Kenya. The prospect, located in Kenya Block L8 in the Lamu Basin, is estimated to have a maximum potential of 4.9Bbbl in place at the main Tertiary-Cretaceous level. Additional potential is also to be tested at the deeper Upper Jurassic level and shallower Tertiary levels. Apache is planning to spud the well during the third quarter of 2012. It is expected to take about 45 to 60 days to complete to a planned total depth of 3,250m subsea in water depth of 860m.

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Seadrill's jack-up West Callisto

Aramco signs up Seadrill jackup to drill offshore Saudi Arabia

Saudi Aramco has contracted Seadrill's jack-up West Callisto for duty offshore Saudi Arabia. The rig will work for a minimum of 3 years with an optional 1-year extension.

Potential revenue to Seadrill for the 3 year period is \$164million, plus a \$20million mobilization fee to cover upgrades, dry tow vessel expenses, and the dayrate during the mobilization period.

West Callisto is operating in Southeast Asia and should complete its program in August. It will then start the transit to the Middle East, ready to start operations for Saudi Aramco in September.

Atwood Oceanics announces contract for the Atwood Mako

Atwood Oceanics, Inc. said that one of its subsidiaries was awarded a contract by Salamander Energy (Bualuang) Ltd., for the newbuild jack-up Atwood Mako. The day rate for work offshore Thailand will be \$145,000, and the award is for a firm duration of 12 months.

The Atwood Mako is currently under construction with PPL Shipyard PTE LTD in Singapore and will have a rated water depth of 400ft, accommodations for 150 personnel, and significant offline handling features. Contract commencement is expected in direct continuation of shipyard delivery, currently anticipated to be September 2012.

Drydocks World to build Prelude FPSO turret for Shell LNG project

Drydocks World will build the turret for Shell's Prelude floating LNG project offshore Western Australia. What will be the world's largest marine turret is being built under contract with SBM Offshore N.V. The Drydocks work scope includes fabrication and load-out of six modules that will constitute the internal turret.

Rigs & Vessels

SBM will provide the design, material, and equipment under its contract with a Technip-Samsung Heavy Industries consortium. The turret will be 98ft in diameter, 295ft tall, and weigh 12,677tons. The FLNG vessel will measure 1,600ft in length and weigh about 661,397tons when loaded.

The facility design calls for the vessel to weathervane in response to weather conditions and is being designed to withstand a Category 5 storm.

Sembcorp subsidiary wins \$568M contract to build ultra-deepwater rig

Sembcorp Marine subsidiary Jurong Shipyard secured a \$568million contract from North Atlantic Drilling to build an ultra-deepwater semi-submersible rig for deployment in the North Sea and Barents Sea. The rig will be based on the Moss Maritime CS60 design.

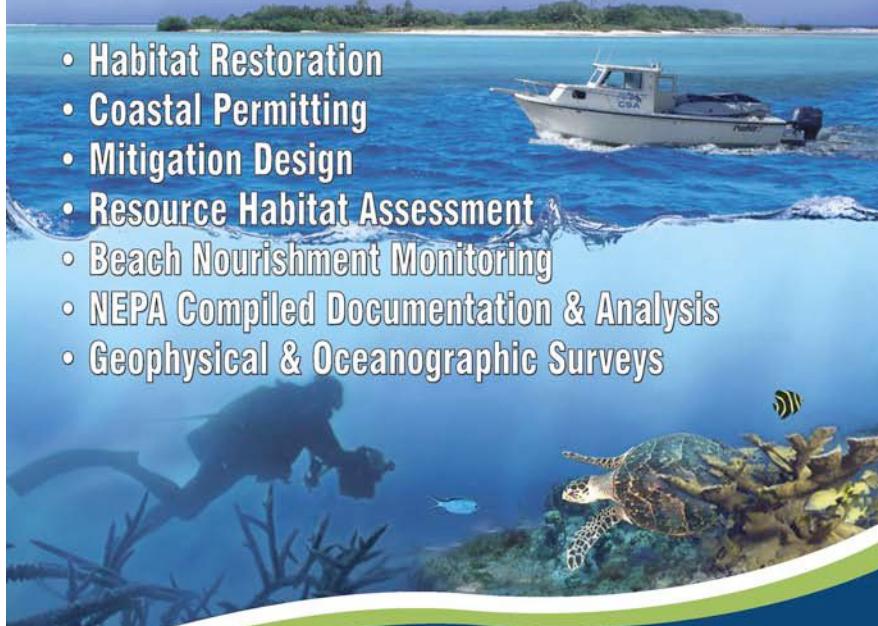
The rig will be built for a water depth of 10,000ft, with a maximum drilling depth of 40,000ft.



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Statoil confirms large deepwater gas discovery offshore Tanzania

Statoil's deepwater Zafarani discovery in Block 2 off Tanzania is a large gas field, the company said, noting that logging results suggest at least 5Tcf of gas in place. The well has so far encountered 393ft of good quality reservoir with high porosity and high permeability. No gas-water contact has yet been established, and drilling continues.

"This discovery could potentially be a catalyst for large-scale natural gas developments in Tanzania," said an executive of Tanzania Petroleum Development Corp. (TPDC). Statoil and its partner ExxonMobil earlier signed an addendum to the production sharing agreement for Block 2, which clarifies the commercial terms for a gas field development in the block with the Tanzanian authorities.

Statoil was awarded the block license in 2007, which covers an area of 2,123sq.mi. Water depth at the Zafarani location is 8,471ft. The well's planned total depth is 16,732ft. TPDC has the right to a 10% working interest in the development phase.

Conoco starts drilling program offshore Western Australia

ConocoPhillips has spud the first of five wells in the Greater Poseidon area, off the Western Australia coast. Boreas-1 is the first well to be drilled using the Transocean Legend semi-submersible drilling rig and will test the presence and quality of reservoirs within the Boreas-1 fault block in permit WA-315-P.

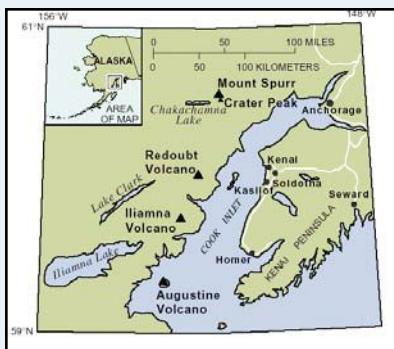
The rig will then move to the Zephyros-1, located in permit in WA-398-P, and the third well, Proteus-1, which is also located in WA-398-P on a large tilted fault block around 14km southeast of Poseidon-1. The company said additional well locations will be announced once it obtains joint venture approval, reported proactiveinvestors.com.

ConocoPhillips is the operator of WA-314-P, WA-315-P, and WA-398-P permits containing the Poseidon and Kronos gas discoveries in which Karoon Gas holds a 40% stake. The company is funding 80% of the drilling and testing costs for the initial US\$128million of expenditure.

India to continue auctioning oil and gas blocks: Minister Jaipal Reddy

India plans to continue auctioning exploratory blocks and won't immediately switch to a new process of accepting bids at any time due to data-related issues, Oil Minister Jaipal Reddy said.

The South Asian nation last year said



Alaska's Kitchen Lights unit in Cook Inlet granted 4-year extension

Alaska's Division of Oil and Gas has granted a 4-year extension to the term of the Kitchen Lights unit, operated by Furie Operating Alaska LLC. The unit had been due to expire on 31 January of this year, but has now been extended to 31 January 2016.

Furie had applied for a unit extension on 5 December. Furie, previously Escopeta Oil, brought the Spartan 151 jack-up rig to Cook Inlet last year and started drilling the Kitchen Lights No. 1 well, in the northern part of the inlet. The well reached a depth of 8,805ft, about half the target depth, before the company had to suspend drilling for the winter.

However, the company announced a significant natural gas find in the Sterling and Beluga formations.

Furie applied for a unit extension,

with a 4-year exploration plan that involves re-entering and completing the Kitchen Lights No.1 well and proceeding to drill four to five additional exploration wells in the unit. The company says it is also planning to submit a Kitchen Lights plan of development that will involve the installation of a monopod platform for gas production.

"We want Furie to have every opportunity to be a success story at Kitchen Lights unit," said Division of Oil and Gas director William Barron when announcing the unit extension.

"This agreement gives the company a reasonable timeline to move forward with the exploration and development drilling outlined in the plan of exploration as well as the incentive to do so. If the company does not meet its exploration or development obligations in a timely manner, the agreement provides for the termination or contraction of the unit acreage."



Spartan 151 jack-up arrives in Alaska

it would scrap its system of periodically auctioning oil and gas blocks and start an open-acreage licensing system. The proposed process is more investor-friendly and is expected to reduce difficulties faced by private players, who compete against aggressive consortia of state-run companies. The introduction of the new system is facing delays as the government hasn't been able to award a contract to build a national data bank of all its natural resources. After the award of the contract, it will take at least a year to build the data bank, the official said.

Petrobras finds oil in Santos Basin, offshore Brazil's Sao Paulo

Petrobras said it discovered oil accumulation off the coast of Sao Paulo State in Brazil. Sampling tests at well 4-SPS-86B (Carcará) in Block BM-S-8 in the ultra-deep waters of the pre-salt of Santos Basin confirmed the presence of oil of about 31° API in reservoirs 5,750m deep.

The company said it will continue to drill the well in a bid to determine the lower limit of the reservoirs as well as to

identify other possible zones of interest. Petrobras is the operator of the consortium, with a 66% stake, Petrogal Brasil owns 14%, Barra Energia do Brasil Petróleo e Gás holds 10%, and Queiroz Galvão Exploração e Produção also has 10%.

Shell lines up more wells, 3D data acquisition off French Guiana

Exploration drilling should resume mid-year on the Guyane Maritime permit off French Guiana, according to Wessex Exploration. New operator Shell has contracted the drillship Stena Drillmax ICE for a follow-up program to last year's Zaedyus oil discovery. The other partners in the permit are Total, Tullow Oil, and Northpet, owned 50% by Wessex and Northern Petroleum. In the Zaedyus exploration well, 236ft of net oil pay was discovered in two turbidite sand systems, proving that the Jubilee play is mirrored across the Atlantic from West Africa. Second-phase drilling will likely start with a delineation well on the discovery, followed by an exploration well on a neighboring prospect.

Production

Alaska predicts slowing decline in North Slope oil production

Oil production from Alaska's North Slope will decline by about 3% annually over the next decade, a slower rate than in recent years, according to a semi-annual forecast released in April by the Alaska Department of Revenue. The Department's spring forecast predicted that production through the current fiscal year, which ends June 30, will average 580,000bbl/d, a 3% decline from production in the previous fiscal year.

Production will fall to 563,000bbl/d in fiscal 2013, another 3% decline, according to the forecast. That fall will continue through the coming decade, it said. The Department's forecast also predicts that prices will average \$114.59/bbl in the current fiscal year and fall to \$110.44/bbl in Fiscal 2013.

The forecast anticipates production from new fields, offsetting a deeper reduction of "currently producing sectors," where output will fall by 7% in the current fiscal year, 12% in Fiscal 2013, and decline by an average rate of 8% over the coming decade.

North Slope oil production peaked in 1988 at 2.1mmbbl/d. Oil flow through the

Trans Alaska Pipeline System averaged 609,805bbl/d in February and 617,509bbl/d for the year to date, according to Alyeska Pipeline Service Co., the system's operator.

Tamar gas field on track for startup during first half of 2013

Delek Group said the deepwater Tamar gas field in the Levantine basin offshore Israel remains on track for production during the first half of 2013. Gas will flow from Tamar through two 16in. subsea pipelines to the nearshore Tamar platform, which is linked to an existing pipeline to the onshore terminal at Ashdod.

Among recent agreements signed by the Tamar partners, the most notable was a 15-year take-or-pay agreement under which Israeli utility IEC will purchase up to 2.75Tcf with an option of up to 3.5Tcf from the project. Cumulative revenues from this transaction could reach \$23billion if the option is exercised.

The partners have also signed a Memorandum of Understanding with Daewoo Shipbuilding concerning construction of a floating LNG terminal.

Elsewhere in the Israeli offshore sector, Delek estimates reserves at the

Leviathan discovery presently at 16.7Tcf. The Homer Ferrington rig is working on the Leviathan 1 well where operations have resumed following a suspension last April 2011. The drilling program has an estimated budget of \$45million, excluding any potential production tests.

Exploratory drilling continues on the Pinnacles #1 well close to Mari-B, which contains prospective resources estimated at 47.6Bcf.

Centrica ramping up southern North Sea gas production

Centrica expects to deliver first gas before mid-year from its Ensign project in the UK southern North Sea. However, one of the wells already drilled has failed and will have to be re-drilled following completion of other planned development wells on the field, according to reports. Later this year, Centrica aims to start up the Seven Seas field in the same region, followed by first gas from the York field in early 2013. The company is progressing development of the Kew gas field and expects to make final investment decisions later this year on the Annabel East and Olympus developments.

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Johan Sverdrup field owners sign pre-unit agreement

Owners of the Johan Sverdrup field in the North Sea have signed a pre-unit agreement, operator Statoil has announced. Under the terms of the deal, the owners of Production Licences (PL) 265 and 501 will cooperate in the planning of the field towards an investment decision and submit their proposals to the Ministry of Petroleum and Energy in Norway.

Statoil said that an agreement for the development and operational phase will be signed between the licensees to establish the best field solution for Johan Sverdrup. The field is located in a water depth of 110m and has estimated resources of between 1.7 and 3.3Bboe. It is targeted to come on stream in 2017 as a phased development, with an expected production lifetime of 50 years.

Statoil operates PL265 with a 40% interest, along with partner State-holding companies Petoro (30%), Det Norske Oljeselskap (20%), and Lundin (10%). Lundin is operator of PL501 with a 40% stake, with partners Statoil and Maersk Oil holding 40% and 20%, respectively.

Phase 1A development drilling begins at Jubilee field off Ghana

Phase 1A development drilling has started on the Jubilee field off Ghana, according to operator Tullow Oil. Under the \$1.1billion program, eight new wells will be drilled comprising five producers and three water injectors. The first of these wells should come onstream in late June.

Phase 1 remedial work continues – measures will include acid stimulations and recompletions of some underperforming wells. This overhaul and the additional Phase 1A wells should allow production to build toward the FPSO's design capacity of 120,000bbl/d.

Tullow expects Jubilee's production to average between 70,000bbl/d and 90,000bbl/d in 2012, depending on the well performance achieved from the Phase 1 recovery program and the execution schedule of the Phase 1A wells.

EPC Offshore wins development contract from Hurricane Exploration

EPC Offshore has secured a contract from Hurricane Exploration to select the optimum concept for the development of Hurricane's Lancaster field, located off the coast of the UK's Shetland Isles.

The first phase of the contract, worth \$3.19million, is expected to run until the end of the year, with front-end engineering design starting in 2013. The develop-

Bolidt underlay worth weight for ConocoPhillips



ConocoPhillips' Ekofisk facility in Norwegian sector of the North Sea

Efforts by ConocoPhillips to achieve the lightest weight possible for the superstructure of its Ekofisk L accommodation facility have been demonstrated by its selection of an underlay construction material, which will remain unseen.

The oil major has selected BOLISCREEN 400 for the high-profile North Sea unit, which will replace the long-standing Ekofisk H and Ekofisk Q as part of ConocoPhillips plans to prolong activities in the Ekofisk field by up to 40 years.

Ekofisk L's topside is currently under construction at Singapore's Sembawang (SMOE) shipyard, while the unit's support struts and structures are under completion at the Aker Verdal facility in Norway. The completed unit is due to enter service before the end of 2013.

As well as acting as an accommodation unit, Ekofisk L will also be a new field center for the Greater Ekofisk Area, and the platform will be connected to the existing Ekofisk Complex via a bridge.

"BOLISCREEN 400 will cover an area of around 14,000m² onboard Ekofisk L and will play a critical role in ensuring that the unit's steel surfaces are leveled to accept the installation of cabins and public spaces," said Jacco van Overbeek, Bolidt director global shipbuilding division. "The material is about 20% lighter than conventional epoxy-based products."

In addition to its 552 cabins, the DNV-classed accommodation unit will also have space for a number of field center functions, such as a heli-deck and hangars, 75 office work spaces, and a number of auxiliary systems, such as fire, water, and freshwater supply.

Following an internal review by ConocoPhillips and the necessary product approval by its Health & Safety contractors, BOLISCREEN 400 is being delivered in eight batches to SOE, with application due to start during April 2012.

The Ekofisk field, in the Norwegian sector of the North Sea, remains one of the region's most important oil fields. Production began in 1971 after the construction of a series of offshore platforms by Phillips Petroleum Co. ConocoPhillips was granted permission for the installation of Ekofisk L, in March 2010.

ment will see the company deploy a team of engineers and technical specialists at Hurricane's Surrey offices, having worked earlier with the company on appraisal of the field.

EPC Offshore chief executive officer, Keith Wallace, said his company was looking forward to the project.

"This new partnership with Hurricane

really cements our position as the people who turn opportunities into assets," he said. "As we continue to grow and increase our portfolio, we are achieving some of our key strategic initiatives, such as an increased market presence and increased service delivery for our clients."

Hurricane Exploration has a 100% ownership stake in the Lancaster Field.

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Gulf Engine designs, fabricates and assembles the Gulf-Tek Equipment line. Gulf-Tek has recently added CAVI-TEK subsurface pressure washers to the already proven line of offshore rental equipment. Units are diesel engine driven, marine rated and offshore ready. CAVI-TEK units are Class I Div II rated. Applications include subsurface barnacle removal, antifouling and rust scale removal. CAVI-TEK units are available from 10 gpm @ 2000 psi thru to 20 gpm @ 4000 psi. Electric explosion proof units are also available.



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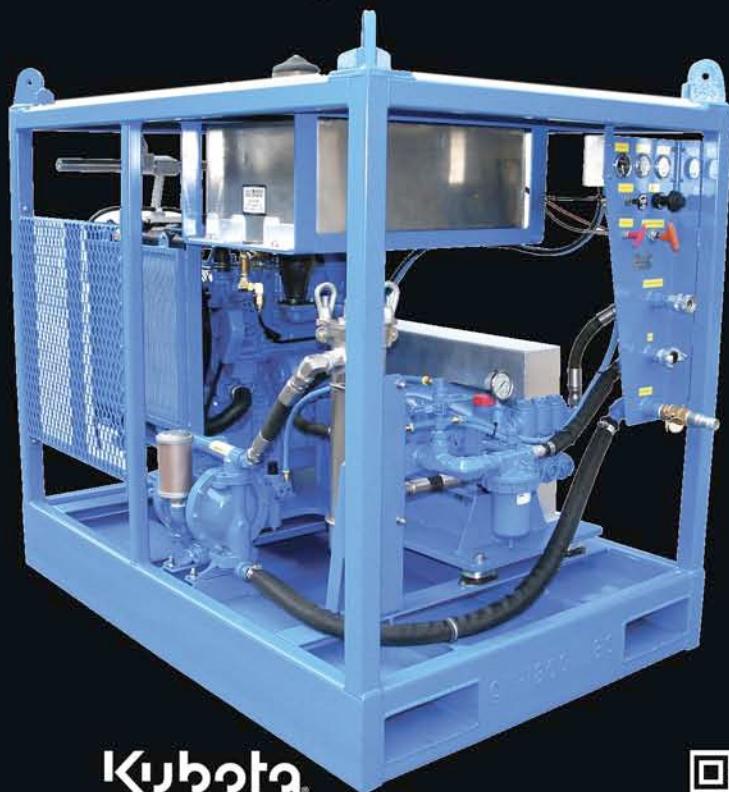
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Moyno HTD™ high temperature downhole pump solutions

The Moyno high temperature down-hole pumps, designated Moyno HTD™ pumps, provide solutions to high temperature applications that previously prevented operators from using downhole progressing cavity pumps (PCPs).

After extensive research and development as well as thorough in-field application testing, one of the products that Robbins & Myers Energy Services Group's launched was the Moyno HTD660™ Down-Hole Pump. This product features metal-to-metal rotor-stator technology. The stator does not include elastomer.



The Moyno HTD660™ High Temperature Down-Hole Pumps features the capability of handling downhole temperatures to 660°F; closely controlled tolerances between the metal-to-metal rotor-stator clearance for superior performance; produces low levels of vibration comparable to conventional downhole PCPs; and is ideally suited to handle hot oil encountered during thermal recovery methods, such as steam-assisted gravity drainage (SAGD) and cyclic steam stimulation (CSS).

For more information, visit www.rmenergy.com.

Pulse Structural Monitoring unveils DrillASSURE additions

Pulse Structural Monitoring, an Acteon company, has unveiled the latest additions to its DrillASSURE™ drilling riser monitoring system software.

DrillASSURE provides critical information to support day-to-day drilling operations and longer-term integrity management through a combination of hardware, software and analytical tools. The DrillASSURE system utilizes real-time software in conjunction with input from sensors on the topside vessel, Lower Marine Riser Package (LMRP), and along the length of the riser to provide a fully integrated solution to optimize drilling operators and improve safety.

The interfaces are designed to help operators and contractors optimize the usage of their drill joint inventory, identify optimum operating windows, and conduct safe campaigns by constantly analyzing conditions in real-time.

Notable DrillASSURE system capabilities include the ability to measure upper flex joint angles and lower stress joint angles; display all relevant parameters on one screen; display real-time operation limits of the measured parameters; raise an alarm if measurements exceed limits; optimize vessel positioning and joint inspection; and analyze and interpret fatigue and vortex induced vibration.

"Pulse's priority is to help operators and contractors save time and money by streamlining their drilling campaigns, while adhering to the most rigorous safety standards. DrillASSURE achieves this by providing data that can be easily interpreted and acted upon quickly," said Jeff Diestler, Pulse Structural Monitoring business development manager.

For more information, contact Diestler at jeff.diestler@pulse-monitoring.com.

MTNW completes mooring controls retrofit for two Rowan jack-up rigs

Measurement Technology NW (MTNW) said it successfully installed and commissioned winch control systems for two Rowan jack-ups: the J.P. Bussell and the Gorilla II. MTNW collaborated with Applied Measurements of Texas to ensure the winch control retrofit was successful from the initial design to final installation and commissioning on several Letourneau W-1500 Anchor winches.

Before the J.P. Bussell (225-C Tarzan class jack-up) and the Gorilla II (200-C Slotilever class jack-up) commenced contract operations in southeast Asia last year, they underwent a controls and equipment retrofit in Singapore at the Keppel FELS shipyard. MTNW was brought in during the retrofit by Applied Measurements to provide a new PLC-based controls and monitoring solution for the mooring winch systems that includes running line tensiometers, a PLC control station with remote I/O, LCI-90i local displays, and a central computer system combining existing monitoring software with new PLC interface functionality.

"Now that we offer PLC-based winch controls, software for data-logging, and the line riders to monitor winch activity, we are providing a full end-to-end mooring solution for customers," said Tom Rezanka, managing director of MTNW. "Since we design and build every aspect of these winch control solutions from the



steel to the software, we can guarantee better accuracy and faster delivery."

Applied Measurements chose to work with MTNW 3-sheave line riders to monitor the jack-ups' anchor winches. By integrating the line riders with the mooring controls, this system provides accurate and real-time feedback regarding the actions of the operator and the position-tension of the mooring line.

For more information, visit www.appliedmeasure.com.

Severn Trent wins contract to supply water treatment system

The Type-Approved BALPURE® ballast water treatment system from Severn Trent De Nora has been selected for use by EMAS on the Lewek Constellation, a 22,000-dwt ultra-deep water rigid and flexible pipelay heavy lift construction vessel DP3. The vessel is being built in Vung Tau, Vietnam. BALPURE is the first ballast water treatment system ordered by EMAS for use on any of its vessels.

BALPURE, which utilizes electrolytic disinfection technology, is a reliable and economical ballast water treatment approach that has been proven to surpass IMO D-2 standards by ten-fold.

BALPURE's slip stream treatment approach, where approximately 1% of the total ballast water flow is used to generate the hypochlorite disinfection solution, enables remote mounting away from critical ballast systems. The slip stream approach, coupled with a design that requires treatment only during the uptake of the ballasting cycle, requires significantly less electric power when compared to competing technologies, ensuring low operational costs. Severn Trent De Nora is a joint venture between Severn Trent Services and Gruppo De Nora.

For more information, visit www.severntrent.com.



Hydratight launches updated Emergency Pipeline Repair System

Global joint integrity services company Hydratight has launched an updated Emergency Pipeline Repair System (EPRS) to offer better disaster planning and contingency services to operators and contractors.

Following the dramatic reaction to the Gulf disaster in early 2011, ever-increasing demands are being placed on oil and gas operators to provide safer, faster, and more effective contingency plans to react to major accidents. The potential for environmental damage of subsea pipelines requires a critical level of risk management and repair planning.

For over 20 years, Hydratight's MORGRIP mechanical connector has provided the world standard for weldless pipeline tie-in, repair, and emergency contingencies—both topside and subsea.

The tailored EPRS provides a way for operators and installation contractors to meet their pipeline contingency needs with greater urgency.

By joining the EPRS "club," operators and contractors gain guaranteed highest priority treatment and fast delivery of the required Morgrip device and



expert installation assistance, if required. Hydratight joins member companies in preparing a full list of MORGRIP and associated engineering needs, offers designs for type approval, and regularly updates this information. Members also get advance knowledge of the likely cost of instituting the full repair.

Schlumberger unveils resistivity, borehole imaging service

Schlumberger has introduced its new MicroScope high-resolution resistivity and imaging-while-drilling service. The service gives laterolog resistivity and full borehole images in conductive mud from a single collar.

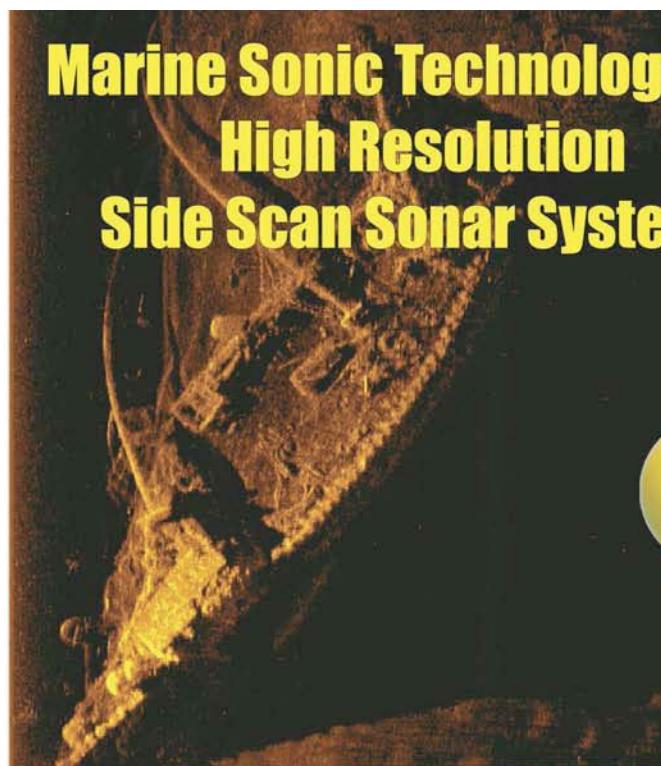
"The application of MicroScope in a challenging, thin tight gas reservoir has helped us make accurate real-time decisions while drilling," said Peng Hai Run, chief geologist, PetroChina SWOGC.

"The success of this well has opened more opportunities to our company in developing the thin target reservoirs," he added.

"Optimal placement of the borehole in the reservoir, accurate evaluation of formation properties, and identification of geological features that impact producibility are key elements of a successful well," said Andy Hendricks, president, drilling and measurements, Schlumberger.

"This service, already successful in more than 150 jobs across 10 countries, addresses these challenges in unconventional shale plays, carbonate, and clastic reservoirs."

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Strong Growth in Offshore Operations and Maintenance Expenditure Forecast

By Jennifer Harbour, Douglas-Westwood

Over \$335 billion worth of expenditure is expected over the next 5 years on offshore oil and gas operations & maintenance (O&M), according to a new report, The World Offshore Operations & Maintenance Market Forecast 2012-2016, by Douglas-Westwood (DW). Growth of 8% in expenditure is forecast annually from 2012-2016, with O&M markets considerably less vulnerable to downturn than their capital-led counterparts.

Industry drivers

Growing global energy demand

The underlying driver for all activity, both onshore and offshore, is the growth in global energy demand that, for the medium-term at least, means demand for hydrocarbons (predominantly oil and gas). Over the long-term, the trend towards increasing energy consumption is clear. This has more than tripled over the past 50 years, driven mainly by demand growth in the developing economies of China and India. Inversely, 2008 saw primary energy consumption decrease in a number of countries due to a combination of the global financial crisis and growing environmental concern.

Despite improvements in energy efficiency, usage growth in the developing countries is expected to maintain an upward pressure on demand.

Oil supply pressures

At the end of 2011, there were 230 countries and territories in the world; 43% of these (100) now produce oil and natural gas liquids, have produced them in the past, or are expected to produce them in the future (at commercial levels).

However, 66 countries, including the UK, U.S., and Russia are already well past their production peak (greater than 5 years) while the remainder will see peak within the next 25 years. The impact of this is that we are likely to see global oil production limit within the next decade (DW estimate-2016).

Cost inflation and oil price

O&M markets are more robust than those led by capital expenditure. Oil price fluctuations do not generally have the same level of impact on O&M expenditure compared to capital expenditure-related activities such as drilling and field development. This is mainly due to O&M expenditure being vital to ensuring ongoing production levels, the principal revenue stream for offshore operators, are maintained. As a result, DW expect that the majority of the markets covered in the World Offshore Operations & Maintenance Market Forecast are considerably more robust than those relating to the initial development of oil and gas fields, with any significant up or downturns in global expenditure being driven principally by industry cost inflation (or deflation).

Despite this, a number of the services covered in this report, such as well stimulation, wireline operations, subsea well intervention, and platform drilling, are highly price sensitive and their economic viability depends on a number of criteria, including oil price, vessel/unit/rig rates, and potential upside in oil or gas flowrates.

Buoyant oil prices have caused rampant cost inflation in the

upstream oil and gas sector over the past 5 years. Since the turn of the 21st century, global energy demand has grown rapidly, driven largely by the modernization of the large Asian economies of China and India. This growth in demand, coupled with concerns of future oil supplies, resulted in rapid growth in oil prices. In turn, this upward trend in prices drove a flurry of field development activity, placing significant constraints on the available infrastructure and capacity in the market, leading to rampant cost inflation in all sectors of the oil and gas industry.

Post-2008 oil prices slumped following the global recession of the same year. As commodity prices dropped, so too did demand for oil and gas-related services such as drilling and intervention work, which in turn has seen a downturn in pricing for equipment and services. Industry costs have recovered and are expected to continue to grow over the next 5 years, but DW expect the operator community to exert far more influence on pricing in order to prevent a repeat of the extreme inflation of the 2003-2008 period.

Role of offshore production

As onshore reservoirs continue to mature and new prospects become few and far between, a greater proportion of oil and gas production will be met by the offshore sector.

Since 1945, offshore production has taken an increasing proportion of global supply; however, it was the oil crises of 1973 and 1979 that really emphasized both the necessity and importance of diversification. Where previously the Western world had depended heavily on Middle Eastern oil, the results of the OPEC embargo and Iran-Iraq conflict over the 1973 and 1981 period highlighted the dangers of over-reliance on politically volatile states. As a result, the Western world began to look closer to home for oil, sparking a boom in both North American drilling activity and North Sea oil production.

Since the 1980s, the focus on offshore production has become less political and more of a necessity as onshore reservoirs continue to mature and new prospects become increasingly scarce. The move to deeper waters in West Africa, Latin America, and the Gulf of Mexico will also play a key role in meeting future demand for oil. DW believe that by 2018, 37% of global oil supply will come from offshore with 11% coming from deepwater.

Gas is growing in importance as its potential production peak is in 2032, much later than that of oil. The abundance of natural gas, coupled with its relative environmental soundness, its multiple applications across the electricity generation, residential, commercial, and industrial sectors and its growing value in the transport sector, means that it will progressively play a more central role in meeting global demand for energy over the next two decades.

Today, much natural gas production is a by-product of oil production. In remote offshore areas such as West Africa, E&P companies will often flare associated gas as they lack the necessary infrastructure to process and produce it.

As natural gas becomes more important in the global energy mix, we expect the current appetite for flaring to diminish, leading to a boost in offshore natural gas production over the next 10 years.

Industry sectors

Offshore oil and gas O&M covers a variety of sectors. Operations relate to services required for ongoing production, including the supply of labor and raw materials. Maintenance is related to ongoing inspection, repair, and upkeep of installed infrastructure, including protective coatings, electronics, and process systems, valves and flowlines equipment, and the maintenance of production wells.

Platform drilling and well integrity

Drilling is often regarded as a Capital Expenditure and while the majority of offshore drilling activity is performed through Mobile Offshore Drilling Units (MODUs), a significant proportion is carried out from the actual production platform. By its very nature, most platform drilling occurs after hook-up and production has commenced and, as such, it has been included in the operational expenditure forecast. Platform drilling is not solely development; new breakthroughs in directional drilling have seen many sidetracks (extensions of existing wellbores) being used to gather geological data from the surrounding area and has opened up the potential for exploration drilling to discover stranded reserves in the immediate vicinity.

Production services

Production services relate to expenditure incurred as a result of hydrocarbon production, ranging from reservoir management, stimulation activities (such as perforation & fracturing) to waste management of produced water. Production services are, therefore, a combination of well intervention and services that include wireline operations such as production logging to coiled tubing work such as fracturing and other pumping services. DW's market forecast for production services includes power generation, produced water services, wireline services, and stimulation services (proppant fracturing and acidization).

Logistics

Given the remote nature of many offshore installations, logistics play a major role in offshore field costs; supplies, materials, and personnel must be transported to and from shore by either vessel or helicopter.

Support services

Manned offshore installations can house hundreds of workers and, as a result, a number of support services such as catering, laundry, medic, and radio services are required in order to attend to the needs of the offshore workforce.

Subsea IRM

Subsea Inspection, Repair, and Maintenance (IRM) covers all subsea hardware and can be performed by specialist vessels, ROVs and divers. Subsea IRM services also include subsea well intervention services, both by mobile drilling rigs and by specialist monohull intervention vessels.

Asset services

Asset services relate to expenditure on the upkeep and maintenance of offshore platforms that does not relate directly to the production process. Since the beginning of offshore exploration, 12,067 fixed platforms of varying size and function have been installed offshore. Many of these are now reaching the end of their intended life and while "old" assets are still functional, they require an increased level of maintenance in order to ensure both productivity and a safe working environment for offshore workers. Asset integrity covers fabric maintenance services, including

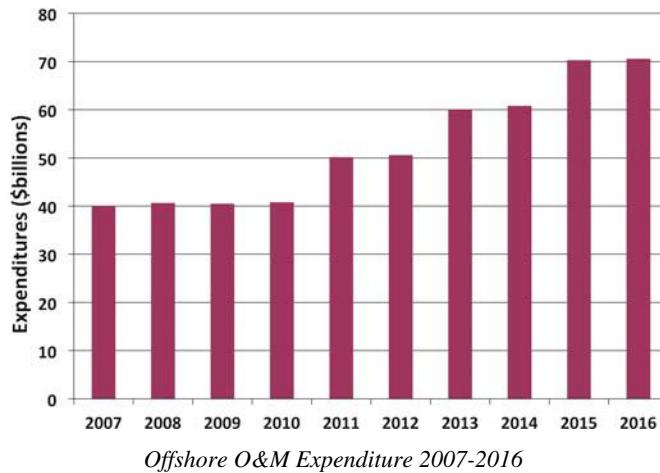
deck painting, blasting, and industrial cleaning services. Also included is the floating platform lease market.

Regional forecast

In 2011, demand for offshore O&M services totalled over \$52 billion, having grown at a compound rate of over 6% over the past 5 years. Over the next 5 years, we expect a greater level of growth as the market recovers from the effects of the global downturn of 2008-2009. This will be driven by a combination of high oil prices, buoyant offshore development activity, and rampant price inflation for equipment and services.

O&M markets are considerably less vulnerable to downturn than their capital-led counterparts. While global offshore drilling activity dropped by an estimated 14% between 2008-2009, total offshore production (the principal driver for all operational activity) grew by 1%. The global offshore O&M market fell, but only slightly, despite widespread price deflation for equipment and services.

Historical dominance of mature western basins is to be challenged. Between 2007-2011, 40% of global demand was accounted for by Western Europe and North America. Although we expect market growth in all regions (despite the UK and rest of Western Europe regions facing terminal production decline), we expect the Western Europe and North American share of global demand over the forecast period to drop by a few percent. This shift will be driven by a combination of increasing offshore production in regions such as the Middle East and the movement towards deepwater in less mature regions such as Africa and Latin America.



Offshore O&M Expenditure 2007-2016

Conclusions

Production services dominate O&M market expenditure. Over the 2007-2011 period, demand for production-related services accounted for 44% of global O&M demand. These services are directly associated with production levels from offshore facilities and are intensified as an oil or gas reservoir matures and requires additional effort to sustain production. The inevitable maturing of offshore fields will drive compound growth of over 7% in the production services sector as operators struggle to come to terms with decreasing downhole pressure and increasing water cuts.

The asset services market is set to outgrow all other market sectors. For example, the trend toward leasing of floating production systems has led to substantial growth. Between 2012 and 2016, 136 new units are expected to be installed—over half of which are likely to be leased, which will drive significant growth in the asset services market over the next 5 years.

For more information, visit www.douglas-westwood.com.

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- Abandonment & Clearance Surveys
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Metocean surveys are the precursor to all offshore exploration and appraisal drilling, and are a vital ingredient in the design, installation and inspection of all offshore pipelines, fixed structures and floating production facilities. The Metocean field continues to evolve with rapid changes in instrumentation, computing and understanding of the physical processes of the environment.

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The Conference provides insight into the technology to meet the modern inspection requirements of the offshore energy industry, with emphasis on safe & effective repairs and maintenance accomplished by divers, ROVs, AUVs & remote monitoring. The event also focuses on the regulatory side, welcoming presentations from the agencies governing IRM regulations as well as new requirements imposed by the operators themselves.

IRM Technology, Methodology & Industry Standards Utilizing:

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- Pipeline IRM
- Subsea Field IRM
- New Regulations & Requirements

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2012

CTC Marine Projects integrated trenching spread solution

CTC Marine Projects, Ltd., a subsidiary of DeepOcean Group Holding AS, announced the introduction of an industry-leading integrated trenching spread.

This month, CTC will mobilize the DeepOcean Group-owned Northern Wave vessel for trenching support operations. The vessel will be equipped with 1.5MW jet trencher PT-1 and mechanical trencher T2.

This complete trenching package, comprising the North Sea's most powerful jet trencher and a track-based mechanical cutter from a company-owned vessel with in-house survey crew, will provide the ideal, cost-effective trenching solution from a single platform. With the added advantage of a pre-mobilized spread, CTC is ideally positioned to undertake short lead-time projects and other spot market activities.

CTC is in the process of adding jetting capabilities and 3m swords to T2, making this track-based vehicle the ideal trencher to operate in high current areas that predominate in shallow water regions where offshore wind projects are planned.

For more information, visit www.deepoceangroup.com.



Mariscope presents new ROV with system integration

During Oceanology International, Mariscope presented the first ROV designed for measuring a series of parameters in the ocean that normally are not integrated on ROVs. With the increasing demand to measure parameters like oil in water, CO₂ and methane, ROVs face a variety of new skills. Not only the offshore industry, but also aquaculture, ports, and the scientific community have a need to increase the parameters they measure. The advantage of ROVs carrying these types of instruments is that the measurement takes places exactly where the operator needs it.

For example, in order to detect Methane production due to heavy concentration of anaerobic sediments under fish harvesting cages, the only way to get there is using an ROV. Pipe leak detection is also possible with the use of such systems, "sniffing" the spill through these very sensible sensors, without needing to take samples.

In order to integrate this combination of measuring devices and sensors on an ROV, not only power supply and data transfer had to be managed, but also display and data management on the surface. The Mariscope team is steadily increasing this integration of systems, along with the upcoming new measuring devices that appear on the market.

For more information, visit www.mariscope.de.



SC Marine Research SRL takes delivery of two Iver2 AUVs

OceanServer Technology, Inc. has recently delivered two AUVs to SC Marine Research SRL located in Bucharest, Romania. Marine Research is a new and dynamic company devoted to the research of aquatic environments in and around Romania.

The two IVER2 systems will initially be used to map the sea bottom around the Danube Delta located on the Black Sea. The purpose of this research is to identify and localize benthic habitats and document their characteristics. The Danube Delta is the second largest delta in Europe and is considered one of the best preserved on the continent.

Going forward, other survey applications are expected to include mapping inland Romanian waters such as lakes, reservoirs, and sections of the Danube River.



The AUVs are both equipped with side-scan sonar, and one system has the Imagenex Delta-T multiple beam sonar system designed to provide high-speed imaging for use in hydrographic surveys of the Black Sea. In addition to the sonar systems, the vehicles have the capability to collect acoustic Doppler current profiler (ADCP) data along with conductivity, temperature, and depth (CTD) for continuous *in situ* measurements used to characterize sound velocity in support of hydrographic surveying.

For more information, visit www.ocean-server.com.

Sonardyne receives £2.1M SPRINT order from Saipem

Sonardyne International Ltd has received an order valued at over £2.1million from international oil and gas turnkey contractor, Saipem. The order includes six Subsea Precision Reference Inertial Navigation Technology (SPRINT) systems and associated acoustic positioning equipment, making it Sonardyne's largest sale of acoustically aided inertial navigation technology to date.

SPRINT will be deployed in April in the West Delta Deep Marine concession (WDDM). This natural gas field is situated about 90km offshore the Northwest Nile Delta at water depths between 400m and 1,000m. Saipem is responsible for the engineering, procurement, construction, and installation of a total of eight new subsea wellheads and relevant infrastructures, umbilicals, and flowlines.

Since its launch in 2010, SPRINT has been operationally proven to extend the operating limits and increase the efficiency of subsea operations when



using Ultra Short BaseLine (USBL) and Long BaseLine (LBL) positioning systems. In the Sparse LBL mode that Saipem plans to operate SPRINT in at WDDM, surveyors will be able to obtain accurate high integrity positioning data with less equipment to deploy than full LBL. This will significantly reduce operation time and vessel costs.

SPRINT tightly couples Sonardyne's Lodestar INS platform with Fusion 6G, the industry standard LBL system. With known transponder positions, the Lodestar mounted on an ROV can use the ranges from one or more seabed-deployed transponders to acoustically aid the INS and constrain error growth in the absolute position output.

For more information, visit www.sonardyne.com.

ECA Robotics announces delivery of six inspection ROVs

ECA Robotics is currently delivering six ROV systems for survey and light work. Three of the H300 ROVs in the standard configuration went to a scientific university in Turkey. One H300 ROV system specially designed for the monitoring of recovery and salvage operations has been delivered via its partner Sea & Land Technologies in Singapore. Two H800 ROVs, delivered by the same partner, went to offshore contractors in Indonesia.

The H800, is a new ROV and part of the ECA Robotics ROV range. It is depth rated to 800m, equipped with six thrusters, and designed to carry out underwater inspection and light work tasks. All of the systems are commercialized under the trademark name ECA Hytec™ and manufactured at Montpellier in France.

For more information visit www.ecahytec.com.

Hydroid ships four REMUS 100 AUVs to Japanese MOD

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Underwater Intervention

manufacturer of AUVs, announced that it has shipped four REMUS 100 systems to the Japanese Ministry of Defense (MOD). The AUVs will be used for mine countermeasure operations as well as investigating and mapping seafloor dispersion of contaminants following last year's 9.0 earthquake and subsequent tsunami.

The four REMUS AUVs will also be used to assist with mine countermeasure operations such as detecting underwater mines, improvised explosive devices, and other undetonated ordnances as well as finding and classifying submerged objects.

The order for the MOD purchase was submitted by SEA Corporation, Hydroid's representative in Japan.

For more information, visit www.km.kongsberg.com.

SMD showcases the ATOM ultra-compact hydraulic ROV at OTC

The ultra-compact ATOM is a hydraulic work class ROV with the highest power-to-weight ratio in its class. The system is suitable for drill support, IRM, survey, and light con-



struction duties and is ideal for mobilization on vessels and rigs with limited deck space.

Designed with ease of operation and maintenance in mind, ATOM boasts the latest DVECS II distributed control system with graphical displays and pilot aids, coupled with new generation Curvetech™ components.

The delivery of the first two ATOM systems will mark a significant development in SMD's ROV business by extending the range of systems available to the market. A third system, built for stock, will be on display at the company's booth at OTC.

Bluefin receives subcontract award for Phase II of DARPA's deep sea operations program

Bluefin Robotics, a leader in the design and manufacturing of UUVs has been awarded a Phase II subcontract from Applied Physical Sciences Corp. (APS) for the Deep Sea Operations (DSOP) Technology and System Development Program sponsored by the Defense Advanced Research Projects Agency (DARPA). Bluefin Robotics will assist in developing systems of configurable technology to address anti-submarine warfare (ASW) surveillance needs over large, operationally relevant areas.

The system(s) will operate with sensors or sources near the ocean bottom; exploit the advantages of distributed nodes; configure to a range of operations, environments, and time scales; and adapt to the mobility of surface assets or evolving threats. Additionally, the program will provide the ability to achieve long-range detection and classification, the means to communicate underwater over long distances, and the ability to manage energy to endure in

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The APS DSOP team consists of Applied Physical Sciences Corp., Bluefin Robotics, Massachusetts Institute of Technology, H. Schmidt Consulting, Scientific Systems Company, Inc., and General Dynamics Advanced Information Systems. The prime contract awarded to APS was competitively procured through the DARPA Announcement, number 11-24, published via the Federal Business Opportunities website, with 16 offers received. The Space and Naval Warfare Systems Center Pacific, San Diego, California, is the contracting activity.

For more information, visit www.bluefinrobotics.com.

Slocum glider to support ocean observatories initiative

The Ocean Observatories Initiative (OOI) conducted a successful Production Readiness Review for the program's coastal gliders, completing a significant step toward operation of this important part of the OOI.

A successful production readiness review makes it possible for the vendor to move forward with production of the gliders. There will be a total of 24 gliders in operation on the east and west coasts. One of the most significant events for the program is the initiation of glider operations for the Coastal Global Scale Node (CGSN) part of the program.

Teledyne Webb Research of East Falmouth, Massachusetts is providing coastal gliders supporting the Pioneer and Endurance Arrays of the CGSN component of the OOI.

These "Slocum" gliders will aid the transformational nature of the OOI by enabling continuous monitoring at the coastal pioneer and endurance arrays, allowing near real-time series data from remote locations. The data they collect will enhance that collected by fixed buoys, and the glider's satellite telemetry system will allow the vehicles to relay their data to shore. This communication ability enables scientists to alter the vehicle's mission instructions for adaptive sampling in response to events in the ocean.

For more information, visit www.oceanleadership.org.

DeepOcean Group Holding AS wins project for COOEC in South China Sea

CTC Marine Projects, Ltd., a subsidiary of DeepOcean Group Holding AS, announced the award of a major trenching

contract for COOEC on the Liwan 3-1 Project in China, located 350km offshore Shenzhen, China.

CTC will be responsible for the trenching of approximately 174km of 30in. pipeline from the shallow water host platform of the Liwan field development in water depth of 205m. For this workscope, CTC will use the MSV Volantis equipped with two ROVs and the world's most powerful jet trenching ROV, the 2.1MW UT-1 Trencher.

Tony Stokes, director of CTC's Asia Pacific operations, states, "This project, along with the recently completed project with the Volantis and UT-1 in South Korea, shows the demand for CTC's trenching technology in the thriving Southeast Asia region. We look forward to a successful campaign and are very pleased to cooperate with COOEC Subsea on such an epic project."

For more information, visit www.deepoceangroup.com.

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Globe Wireless and Jotron sign distribution agreement

Globe Wireless, a leading provider of communications, operational, and IT solutions to the maritime industry, announced the signing of a distribution agreement to sell Jotron B120 VSAT antennas to its maritime customers. This will be part of the Globe iFusion VSAT customized turnkey solution, combined with Inmarsat FleetBroadband, to provide high-speed broadband connectivity with true global coverage. The Jotron B120 is an innovative stabilized antenna offering a simple and clean design. Use of the latest technology allows for high performance from very compact and robust RF and electrical components. The antenna can withstand the most demanding sea conditions and has proven itself through extensive sea trials performed during harsh North Sea winter conditions on demanding supply vessels. Jotron's advanced tracking receiver ensures optimum satellite tracking for all types of received carriers. The Jotron B120 gives full flexibility in combinations of satellite frequencies and polarizations, including super extended transmit band.

MTN upgrades maritime TV service

MTN Satellite Communications (MTN) has announced version 2 of its MTN Worldwide TV service for cruise passengers and crew. MTN Worldwide TV is a digital, multi-channel television service for the maritime industry, delivering programming from eight U.S. and international television networks, including BBC World News, CNBC, Fox News, MSNBC, Sky News, Sky Sports News, Sport 24, and E! Entertainment Television as well as offering special event programming such as Premier League Soccer and onboard events. It uses MTN's satellite network of three overlapping satellite beams that integrate with a cruise ship's existing Television Receive-Only (TVRO) antenna and onboard video distribution system. The latest version of the system can deliver entertainment programming and specific cruise content streaming to Wi-Fi-enabled devices such as laptops, tablets, and smartphones.

RigNet deploys iDirect hub in the Middle East

VT iDirect, Inc., a company of VT Systems, Inc., announced that RigNet, Inc. has deployed a new Series 15100 universal satellite hub in Doha, Qatar. The new Evolution hub will extend RigNet's VSAT coverage in the Middle East and enhance the company's satellite service portfolio for current and new customers in the oil and gas sector. iDirect is a world leader in satellite-based IP communications technology. As a managed services provider, RigNet delivers turnkey solutions for installing and managing VSAT networks. Using iDirect's Intelligent Platform, RigNet supports a wide range of applications critical for the oil and gas industry, such as broadband data, voice and video communications, and real-time data management. Through RigNet, oil and gas companies can keep their offshore sites connected with central offices to improve operational efficiencies. Built on the next-generation DVB-S2 transmission standard with Adaptive Coding and Modulation (ACM), the iDirect Evolution platform delivers exceptional bandwidth efficiency and availability, enabling RigNet to meet the high Service Level Agreements that its customers require to ensure critical enterprise applications run smoothly. Additionally, iDirect's advanced mobility capabilities allow RigNet to deliver total coverage for every location, user, and application.

KVH mini-VSAT broadband network has the largest market share

Photo Courtesy of Vroon

Launched in late 2007, the mini-VSAT Broadband(SM) service from KVH Industries, Inc. has quickly grown to become the world's leading maritime VSAT network, according to a new industry research report from Euroconsult, the leading international research and analysis firm specializing in the satellite and space sectors. In "Maritime Telecom Solutions by Satellite, Global Market Analysis & Forecasts," Euroconsult estimates at the end of 2011, KVH's mini-VSAT Broadband service accounted for 16% of an estimated market of just under 9,000 activated maritime VSAT terminals. KVH's market share was reported to be 20% higher than the next closest competitor.

To date, more than 2,000 KVH TracPhone® systems have been shipped for the mini-VSAT Broadband service, which KVH believes is far more than any other maritime VSAT solution. KVH reported in its 2011 year-end investor conference call that its maritime VSAT revenues grew by more than 60% in 2011. Euroconsult estimates the overall maritime VSAT market has grown at a rate of 15% per year since 2008 and that by the end of 2021, maritime VSAT services will account for 55% of a \$1.7 billion maritime communications market.

KVH's mini-VSAT Broadband network was designed from the ground up to be a new generation maritime satellite communications solution. Unlike older maritime VSAT services using time division multiple access (TDMA) technology, which was originally designed for stationary land use, the KVH service relies on state-of-the-art ArcLight® spread spectrum technology provided by KVH's partner ViaSat, which was developed specifically for mobile use. The spread spectrum technology enables KVH to use antennas for its mini-VSAT Broadband service that are 85% smaller than TDMA VSAT antennas, while providing similar speed and coverage, thereby reducing the capital equipment and installation costs for maritime customers. The service is very fast, providing Internet downloads as fast as 4 Mbps, and has significantly lower latency (time delays) in data transmissions, making it ideal for new cloud-based applications being adopted by leading ship management companies.

KVH is the only maritime VSAT provider to manufacture its own fully integrated onboard terminal, own and operate a global VSAT network, and provide worldwide 24/7/365 after-sale support.

For more information, visit www.kvh.com.

Ocean News & Technology

2012 EDITORIAL CALENDAR

January/February 2012

Editorial: Inspection & Light Work Class ROVs, Oceanography & Meteorology
Distribution: NACE • Oceanology International
Deadline: January 15th
Product Focus: Diving Equipment & Buoyancy Materials

March

Editorial: Defense & Naval Systems, Maritime Security, Decommissioning, Plug & Abandonment
Distribution: Decommissioning & Abandonment Summit
Deadline: February 15th
Product Focus: Navigation, Mapping & Signal Processing; Diver Detection Systems

April

Editorial: Offshore Technology
Distribution: Global Marine Renewable Energy • OTC
Deadline: March 15th
Product Focus: Connectors, Cables & Umbilicals

May

Editorial: AUVs & Gliders, UW Imaging & Processing, Aquaculture & Marine Resources
Distribution: UDT Europe • Anti-Submarine Warfare
Deadline: April 15
Product Focus: Cameras, Lights & Imaging Sonars

June

Editorial: Workclass ROVs, Wave & Tidal, Ocean Observing Systems
Distribution: EnergyOcean Int'l
Deadline: May 15th
Product Focus: Subsea Tools & Manipulators

July

Editorial: Offshore Mooring, Subsea Fiber Optic Networks, Company Showcase
Distribution: Offshore Northern Seas • AUVEI
Deadline: June 15th
Product Focus: Tracking & Positioning Systems, Seismic Monitoring

August

Editorial: Ocean Mapping & Survey, Subsea Telecom, Deepwater Pipeline Repair & Maintenance
Distribution: TBA
Deadline: July 15th
Product Focus: Multibeam & Side Scan Sonars

September

Editorial: Coastal Engineering, Environmental Assessment & Monitoring, Offshore Wind
Distribution: Oceans MTS/IEEE • Ocean Innovation
Deadline: August 15th
Product Focus: Buoys & Monitoring Instrumentation

October

Editorial: Offshore Communication, Offshore IRM, OTEC
Distribution: Offshore Communications • Subsea Survey IRM • Clean Gulf
• North Sea Decommissioning
Deadline: September 15th
Product Focus: Acoustic Modems, Releases & Transponders, Marine Communications

November

Editorial: Offshore Vessels, Marine Construction
Distribution: International Workboat
Deadline: October 15th
Product Focus: Workboats, Diving Systems

December

Editorial: Year in Review, Marine Salvage Operations, Commercial Diving
Distribution: Underwater Intervention
Deadline: November 15th
Product Focus: Handling Equipment, Winches & Control Systems, Battery Technology

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Comtech EF Data integrates converter with C2SAT antenna

Comtech EF Data Corporation announced the successful integration of its LPOD Block Up Converter with C2SAT's 2.4m C Stabilized VSAT Antenna. The integration of the innovative products will provide maritime users with a premier satellite-based broadband communication solution for oceanic vessels in motion.

The LPOD Block Up Converters were engineered with efficient thermal and mechanical packaging based on Comtech EF Data's extensive experience in outdoor RF transceivers. The LPOD eliminates the traditional requirement for the modem to supply a DC power source and a 10MHz reference to the BUCs and LNBs. The optional internal reference and LNB bias T greatly simplify multi-carrier operation and provides cost-effective redundancy. The LPOD's compact size and weight make it ideally suited for installations with limited mounting space.

The C2SAT 2.4m C is a 4-axes, marine stabilized VSAT antenna compatible with C-Band satellites. The

4-axes antenna allows the RF equipment to move freely, maintaining an optimal position towards the satellite without large and sudden movements, even during harsh conditions and heavy seas. The system does not experience dead angles or high elevation problems. The high reliability makes the antennas suitable for main connection points, as they can carry large volumes of information without interruption.

For more information, visit www.comtechefdata.com.

Intelsat's maritime infrastructure continues to advance

Intelsat S.A. and International Launch Services (ILS) announced that an ILS Proton M vehicle successfully launched the Intelsat 22 satellite from the Baikonur Cosmodrome in Kazakhstan. After a 15.5hr mission, the Breeze M successfully released the Intelsat 22 satellite, weighing 6,199kg, into supersynchronous transfer orbit (SSTO) at a 65,000km apogee.

The satellite will further enhance Intelsat's maritime and aeronautical services on four continents. Once opera-

tional in May, it will replace Intelsat 709 at 72° East and is expected to have a useful life of approximately 18 years.

Built by Boeing Space & Intelligence Systems, the satellite will provide C- and Ku-band capacity for media, government, and network services customers in Africa, Asia, Europe, and the Middle East. In addition, Intelsat 22 will host a specialized UHF communications payload for the Australian Defence Force (ADF).

This was the first SSTO mission for ILS Proton, and it provided an additional 200kg of performance for this mission. The launch of the Intelsat 22 satellite marks the second ILS Proton launch of the year and the 71st commercial launch overall for ILS. The Proton Breeze M vehicle is built by Khrunichev State Research and Space Production Center of Moscow, one of the pillars of the aerospace industry and majority owner of ILS. Proton has conducted 374 missions since its maiden flight in 1965.

For more information, visit www.intelsat.com.

The advertisement features a dark background with water droplets. On the left, the Sound Metrics logo (a blue stylized wave icon) is next to the text "SOUND METRICS". Below it, the words "INTRODUCING..." are written in a large, white, sans-serif font. To the right, the word "ARIS" is displayed in a large, metallic, 3D-style font. In the center-left, there is a black, rectangular sonar unit with a circular port on top. The word "ARIS" is printed on the side of the unit, along with "EXPLORER 3000". In the bottom-left corner of the ad, there is a small badge with the text "DIDSON TECHNOLOGY". At the bottom, the website "soundmetrics.com" is listed. On the right side, there is a smaller inset image showing a sonar scan of a tire with rope at 3.0 MHz. The inset has the caption "Tire with rope at 3.0 MHz" and the text "Next generation DIDSON Technology in a compact Dual-Frequency Sonar". At the very bottom, the text "Visit us at OI 2012 in Booth F305" is visible.

First U.S. DoD operational deployment of 4G LTE

Oceus Networks announced that the U.S. Navy has selected the company's market-leading Xiphos™ mobile communications networking solution for a pilot for a new Navy portable maritime C2 system, making this the first operational deployment of 4G LTE for the U.S. Department of Defense.

The pilot will be conducted over the next year with the Kearsarge Expeditionary Strike Group, homeported in Norfolk, Virginia. The Xiphos tactical cellular solution will provide high-capacity secure wireless broadband for real time access to intelligence, surveillance, and reconnaissance (ISR) data for intra-ship communications over the horizon and inter-ship communications via commercial hand-held devices.

Oceus' mobile, ruggedized networks can be placed aboard ships, installed in tactical warfighter vehicles, mounted on UAV's and other aerial platforms, and can be soon soldier back-packed into austere environments — wherever secure robust high-speed voice, video, and data communications capabilities are needed.

Available now, the Xiphos family of ruggedized and mobile 4G LTE networks, which are commonly known as full-featured cellular base stations, currently supports up to hundreds of simultaneous sessions, has data rates scalable from 37Mbps to 350Mbps, and has a terrestrial range up to 62mi radius per node, enabling networks to cover the Navy's tactical area of operations. The Xiphos family of systems are built on the 4G LTE commercial standards, allowing the Navy to fully leverage the commercial investment in this technology.

For more information, visit www.oceusnetworks.com.

Teekay Corporation goes live on Veslon Nautical's Veslink

Veson Nautical, a provider of maritime commercial management and trading software solutions, announced that Teekay Corporation, a world leader in energy shipping, has gone live on Veslink, Veson's highly-configurable web-based service that allows ships to exchange real-time data with onshore offices.

Teekay installed Veson Nautical's Integrated Maritime Operations System (IMOS) in September 2011. With the combined solution of IMOS and Veslink, Teekay has streamlined and standardized vessel reporting and performance analysis for their fleet of more than 75 tanker and LNG vessels.

Since Q3 2011, Teekay has lever-

aged Veson's IMOS as its voyage management and accounting system of record for much of its 143 vessels, including Aframaxes, Suezmaxes, LNG carriers, product carriers, and shuttle tankers. The addition of Veslink allows Teekay to exert more control over the massive amount of mission-critical information generated by the fleet — data are entered onboard in a structured way, vetted by voyage operators for accuracy, and then automatically

imported into IMOS where the data drives crucial reporting metrics for benchmarking fleet performance.

This integration translates into streamlined interaction among chartering, operations, and accounting departments. Teekay is already realizing many benefits, including up-to-the-minute vessel and cargo information, reduced manual entry, and minimal data errors.

For more information, visit www.veson.com.

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Volume 18 • Issue 4 65

France-Alderney-Britain interconnector announced
Alderney Renewable Energy (ARE), the tidal energy developer, has signed an agreement for a major submarine power cable interconnector project aimed at creating one of the most significant tidal power sites in Europe. The agreement is between ARE and its partner, Transmission Capital (TCL), and French grid operator RTE (Réseau de Transport d'Électricité) to work on the development of a submarine power interconnector cable between France, Alderney, and Britain. This interconnector, known as the FABLink, will enable the export of up to 4GW of tidal power from Alderney's waters and a power trading link between countries. Alderney is the northernmost of the Channel Islands. The island has signed an agreement with the French industrial group DCNS for the development of tidal arrays in Alderney's waters.

TEAMS repairs completed ahead of schedule

Repair works on the TEAMS (The East African Marine Systems) cable that was damaged on 25 February 2012 have been successfully completed. This cut, which occurred at the Kenyan coast, damaged a crucial link for the bulk of Internet and international voice traffic in the region. A landmark public-private partnership, TEAMS is the premier under-sea cable system serving the entire East African region. Besides the Government of Kenya, other shareholders in the TEAMS consortium include Safaricom, Jamii Telecom, Wananchi, Essar, Kenya Data Networks, Access Kenya, Telkom Orange, and Bandwidth & Cloud Services. It is estimated that the repairs of the cable, including costs for temporary traffic restoration via other cables during the TEAMS cable outage is about US\$6 million, excluding loss of business as a result of heavily constrained bandwidth.

Telebras, Angola Cable sign deal for new system
Telebras and Angola Cable have signed an agreement for the joint construction of a submarine fiber optic cable linking Brazil and Angola. The cable should be completed by the first half of 2014. The 6,000km cable will connect Fortaleza, Brazil with Luanda, Angola. When completed, the Brazilian government expects the cable to lower the cost of Internet bandwidth by about 80%. The new cable will help provide vast amounts of bandwidth for the 2014 World Cup to be held in Brazil. In addition to reducing bandwidth costs, the cable will help to strengthen ties between the two Portuguese-speaking countries.

Pacific Fibre announces sales of US\$200 million
Pacific Fibre announced it has secured a fifth foundation customer, taking total sales to US\$ 200 million. The company also set a timeframe on closing their financing, announcing that it expects to complete its funding arrangements for the cable project in mid-June. Pacific Fibre is submarine fiber optic cable project that will link Australia, New Zealand, and California. The system will take approximately 2 years to build. The Pacific Fibre system will assist in meeting the accelerating demand for international bandwidth in Australia and New Zealand and introduce competition to the current duopoly held by Telecom New Zealand's Southern Cross Cable and Telstra's own international cables. The volume of data downloaded by Australians doubled between 2010 and 2011 – driven by adoption of iPads, smartphones, and online video.

SHETL to develop subsea electricity cable



Scottish Hydro Electric Transmission Limited (SHETL), the licensed transmission owner in northern Scotland, is planning to develop a 109km subsea electricity cable between Caithness and Moray to transmit the large volume of existing and planned electricity from renewable sources in northern Scotland.

The proposed subsea cable, which will connect to onshore substations at Spittal in Caithness and Blackhillock near Keith in Moray, is one of a number of transmission network reinforcements being undertaken by SHETL. The cable will be capable of transmitting around 1,200MW of electricity and will be developed using high voltage direct current technology.

Work is being carried out by SHETL to reinforce the electricity transmission network in Caithness. This work includes replacing the existing electricity substation at Dounreay and installing new conductors on the existing power line between Dounreay and Beauly. Looking to the requirements of generators beyond those accommodated by these works, SHETL is proposing to develop the subsea cable and the necessary onshore network reconfigurations, upgrades, and new substations required to support the cable.

There are a number of proposed electricity generation developments in northern Scotland, including marine generation in the Pentland Firth, and Orkney waters, major wind farm proposals on Shetland, offshore wind farm projects in the Moray Firth and further renewables on the Scottish mainland. The development of the subsea cable will support these proposed developments but is not dependent on any specific development. The proposal retains the flexibility to accommodate generation developments as and when the need to do so arises.

The relevant planning consent has been granted for a new substation at Spittal, and a planning application will shortly be submitted to The Moray Council seeking consent to rebuild and extend the existing substation at Blackhillock. The next stage in the development of the subsea cable will be to carry out the relevant seabed survey work.

For more information, visit www.sse.com.

Commercial services launched on LION2

France Telecom-Orange and the other members of the LION2 consortium—the Group's subsidiaries Mauritius Telecom, Orange Madagascar, and Telkom Kenya as well as two other operators, Emtel Ltd and Société Réunionnaise du Radiotéléphone—celebrated in Mayotte the launch of commercial services for the broadband submarine cable LION2. This cable provides the island of Mayotte with broadband connectivity for the first time and reinforces international network connectivity for Kenya.

Following the launch of the LION (Lower Indian Ocean Network) submarine cable at the end of 2009, this new cable concludes the second phase of the Group's plans to expand broadband Internet connectivity in the Indian Ocean. The LION cable, which links Madagascar to the global broadband network via Réunion and Mauritius islands, has now been extended to Kenya via Mayotte with the LION2 cable.

Through its landing station at

Kaweni (Mamoudzou), LION2 will provide Mayotte, for the first time, with access to a broadband Internet network, benefitting from a transmission capacity and service quality equivalent to those available in Europe.

In Kenya, the LION2 cable is connected through a new landing station that has been built at Nyali, close to Mombasa. This cable is particularly important for Kenya as it strengthens the country's connectivity to international networks and covers its capacity requirements for years to come. In addition, the new cable also provides an alternative route for passing secure broadband transmissions through Europe and Asia for all African countries in which the Group is located. By providing access to a fourth submarine cable, Kenya gains the flexibility to redirect traffic between the cables as required.

The 2,700km long fiber optic cable uses wavelength division multiplexing (WDM), currently the most advanced technology for submarine cables. This technology enables cable capacity, which

currently offers a maximum potential capacity of 1.28Tbps, to be increased without additional submarine work.

The construction of the LION2 cable represents a total investment of around 57million euros, about 38million euros of which will come from France Telecom SA and its subsidiaries.

Through the development of its submarine networks, France Telecom-Orange is helping build a high-quality global network. The cables constitute broadband arteries that give the Group high-performance tools at controlled cost to meet growing demand from its customers.

As such, they are a key asset for the Group's objective of providing widespread Internet access (narrowband and broadband) in Africa, where it is present in around 20 countries. As part of this approach, France Telecom-Orange is also actively involved in the deployment of the ACE (Africa Coast to Europe) cable, which follows the west coast of Africa.

For more information, visit www.orange.com.

S-Boom Geophysical Systems

By harnessing the combined power of three of their AA202 Boomer Plates to provide a single pulse, the Applied Acoustics' **S-Boom System** is re-defining the boundaries of shallow seismic surveying. Already recognised for producing high resolution seabed profiles, the fusion of these three transducers delivers a source level high enough to significantly increase sub-bottom penetration without loss of data quality.

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Digicel leads project to deliver high-capacity cable to Haiti



Two years after Haiti was struck by a devastating 7.0 magnitude earthquake, the country is set to receive a major boost with the delivery of a US\$16 million, 200km submarine fiber optic cable that will link the country to the world via Internet connectivity.

The project—which is being led by Digicel, a leading mobile phone operator in the Caribbean, in conjunction with Columbus Networks, a submarine fiber optic cable network provider in the region, and Alcatel-Lucent—will dramati-

cally expand the range and quality of fixed and mobile broadband services and content delivered throughout the country.

The earthquake in January 2010 damaged or destroyed much of Haiti's communications network – including the country's only other subsea cable link which, to date, has not been fully restored. As a result, the Haitian population and the Haitian economy have suffered from the lack of high-capacity broadband connectivity that is pivotal to business, public sector, and social activity.

Once completed, the FibraLink Extension to Haiti will provide a secure, high-capacity subsea link with 21 other countries in the Caribbean region—as well as with the United States and the main internet backbone gateway located in south Florida. Digicel is funding the entire project and has drawn on Alcatel-Lucent and Columbus Networks' technology and demonstrated expertise necessary for the deployment of the high-capacity link.

Digicel's undersea cable project is the latest in its ongoing recovery and rebuilding efforts in Haiti. As the single largest private investor in Haiti, Digicel has invested over U\$600 million to date

and employs over 900 people directly and more than 60,000 people indirectly.

Alcatel-Lucent originally deployed the FibraLink system, which provides coastal and terrestrial connectivity from Kingston to Ocho Rios and Montego Bay in Jamaica, with direct connectivity to the U.S. by integrating into other parts of the Columbus Networks infrastructure.

For more information, visit www.digiceljamaica.com.

Telstra International deploys Infinera's coherent 40Gbps DTN solution

Infinera announced that Telstra International has become Infinera's 100th customer and has deployed Infinera's 40Gbps DTN solution for its optical subsea network in Asia. The deployment spans approximately 9,000km between Hong Kong, Taiwan, Japan and South Korea. Telstra selected Infinera's DTN solution for its simplicity, scalability, and cutting-edge technology.

Infinera's DTN platform enables service providers to upgrade existing submarine cables with coherent 40Gbps waves supporting FlexCoherent. The

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Infinera solution is upgradable in the future to 100Gbps FlexCoherent, including Soft Decision Forward Error Correction, which will deliver 7.3Tbps of capacity over Telstra's Reach North Asia Loop (RNAL) fiber plant.

Infinera's Subsea Solutions have been deployed worldwide for customers, totaling more than 100,000km, including routes across the Atlantic, between North, Central, and South America, in the Middle East, and in the Indian Ocean.

Infinera's product portfolio includes Infinera's DTN platform, powered by photonic integrated circuits (PICs) for subsea and terrestrial networks; Infinera ATN, a scalable metro WDM transport platform; and Infinera's DTN-X platform with 500Gbps FlexCoherent super-channels. All of Infinera's products are supported by Infinera's Managed Services offering.

For more information, visit www.telstrainternational.com.

Tata completes TGN-EA

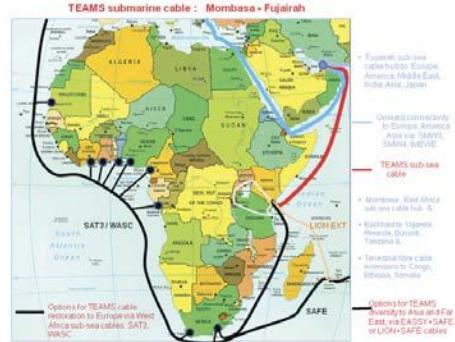
Tata Communications announced the completion of the world's first

round-the-world fiber optic cable network with the official launch of its Tata Global Network – Eurasia (TGN-EA) cable. The cable connects Europe to India, through Egypt, bringing increased capacity, resilience, and enhanced communications links to not only the Middle East, but to the rest of the world.

The completion of the final link across Egypt enables Tata Communications to offer its customers unique access to a wholly-owned express route cable from Europe to India, with improved latency, redundancy, and scalability. In conjunction with the company's recently launched TGN-Gulf, these routes will cater to the increasing demand for voice, video, and data services in and out of the Gulf region.

The round-the-world ring also offers city-to-city connections in contrast to more traditional networks that only link cable landing stations. This approach is more cost-effective and flexible and provides a faster time to market delivery as well as being easier to maintain and manage.

The completion of the final TGN-EA link follows significant investment



from Tata Communications in its global network in recent years. The TGN-EA cable system now interconnects Europe, India, the Gulf, and Middle East seamlessly with the rest of the world while consistently providing higher quality bandwidth on a global scale. Tata Communications owns and operates the world's largest subsea cable network, which reaches countries representing 99.7% of the world's GDP.

The 9,280km TGN-EA system that links Europe and India, running across the Mediterranean and the Middle East, offers customers the lowest levels of latency with RTD around 92msec with speeds from 2Mbps to 10Gbps available.

For more information, visit www.tatacommunications.com.

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Nexans wins contract for Northwind offshore wind farm

Nexans has won a contract worth more than 50million Euro to supply a total of 57km of high-voltage subsea power export cables to Northwind NV in the North Sea. The project comprises 14km of cable to connect Belwind Phase 2 to the Northwind wind farm (formerly known as Eldepasco), together with an additional 43km of cable that will transfer a total of 381MW produced by both wind farms to the onshore grid connection at Zeebrugge.

In addition to the design, type-testing, and supply of the XLPE subsea cables, Nexans will also supply mechanical and electrical accessories. This includes the onshore transition joints to connect the subsea cables to the land cables and the accessories for the two platforms, including hang-off and GIS (gas insulated switchgear) terminations and four repair joints.

The Northwind wind farm will comprise 72 wind turbines, capable of a total of 216MW installed capacity. The power will be delivered to the Belgian electricity network at the ELIA HV con-

Power Cables

nexion station in Zeebrugge. The 14km section of 245kV cable connecting Belwind Phase 2 to Northwind will consist of three copper cores, each with a cross-section of 400mm².

The majority of the 43km, 245kV connection from Northwind to Zeebrugge will comprise three 1,000mm² copper cores. However, there is a length of the route where the cable has to traverse a sea channel subjected to regular dredging, requiring it to be buried down to 9m in the seabed for protection. In order to maintain the electrical performance of the cable along this channel, the copper cross-section will be increased to 1,200mm² on a 4km section. This section of cable will have an outer diameter of 265mm and will weigh 130kg/m.

The subsea cables will be manufactured at Nexans' specialized facility in Halden, Norway. They will also include two FO48 fiber optic elements, manufactured in the Nexans Rognan plant, to enable data communications, control, and monitoring for the power transmission system.

For more information, visit www.nexans.com.

Global Marine Energy awarded Lincs offshore wind farm contract

Centrica Renewables Energy Ltd has contracted Global Marine Energy Ltd. to provide the cable landing works related to the west export nearshore cable at the Lincs Offshore wind farm.

Lincs offshore wind farm, which began construction in 2010, is located off the east coast of the UK and is one of several renewable projects under development by Centrica Renewable Energy Ltd. The project is immediately adjacent to the Lynn and Inner Dowsing wind farms, two of Centrica's renewable projects completed and fully operational in 2009.

Global Marine Energy will be performing the work beginning in April 2012 and expects completion in July. Due to the shallow water conditions at the project site, Global Marine will be utilizing the cable barge Nautilus Maxi to deliver the project.

When operational by the end of 2012, the wind farm is expected to power the annual electricity requirements of approximately 200,000 households.

For more information, visit www.globalmarine-energy.com.

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Power Cables

Cable installation at Sheringham Shoal completed

A total of 56km of infield cables have been installed by contractor Visser & Smit using the 86m vessel Team Oman, which has been working on and off at the wind farm site in the Greater Wash for 18 months. The vessel is now en route to Sunderland for demobilization before moving on to her next job.

The wind farm, operated by Scira Offshore Energy, has 36 of its 88 turbines in place and is scheduled for completion in late summer 2012.

Although all the infield cables have been laid, Visser & Smit has one final task, which is to trench the cable into the seabed to ensure it is protected from fishing gear, vessel anchors, and other potential hazards.

The 87m Toisa Warrior will continue to carry out the cable burial work, with completion expected to be by this summer.

The wind farm project is owned equally by Statoil and Statkraft through joint venture company Scira Offshore Energy Limited. Statoil is the project manager during construction, while Scira will be responsible for the long-

term operations and maintenance.

For more information, visit www.scira.co.uk.

Siemens to expand in future market for subsea power grid solutions

Siemens is acquiring the Connectors and Measurements Division of Expro Holdings UK, a company specializing in the oil and gas industry. The unit engineers and manufactures subsea components such as cable connectors, sensors, and measuring devices. This equipment forms a crucial part of the power grid that Siemens is currently developing for use on the seabed at depths down to 3,000m. In 2011, the Expro division booked sales of about 90 million euros and currently has a workforce of about 450 in the UK, Norway, the U.S., Brazil, and Malaysia. The purchase price is around 470 million euros. The transaction is conditional upon approval by the responsible anti-trust authorities.

For more information, visit www.siemens.com.

Tender for Sumatra-Java cable to be released

PT PLN, the electric power utility for Indonesia, plans to release a tender soon for the supply of an HVDC submarine power cable to connect Sumatra and Java.

PLN said that it would release the tender to experienced suppliers of submarine power cable projects. Construction is planned to begin in 2013, with the cable becoming operational in 2017.

The cable will be about 700km long and will link Muara Enim in south Sumatra with Bogor in west Java. The project will cost more than US\$2 billion.

The 3,000MW cable will help meet the growing demand for electricity in Java by connecting it to coal-burning power plants in Sumatra. It is also intended to meet the needs of electric power in Sumatra and Java-Bali. In the future, it will continue to provide for economic growth on both islands.

For more information, visit www.pln.co.id.

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OE14-408 Digital Stills Camera
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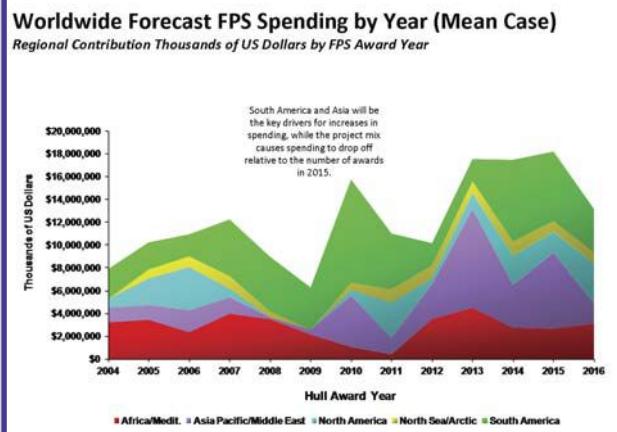
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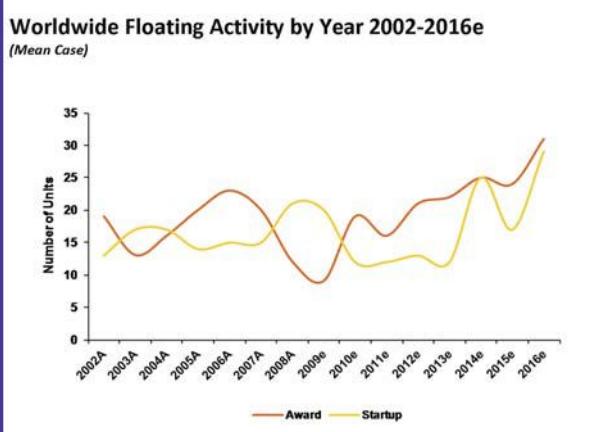
Offshore At-A-Glance

Quest Offshore Activity Report

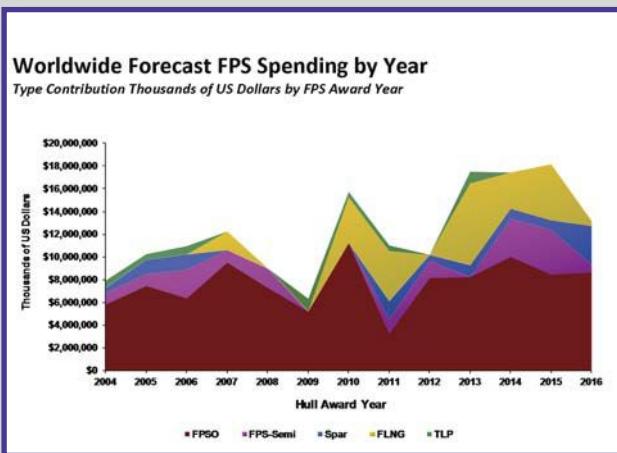
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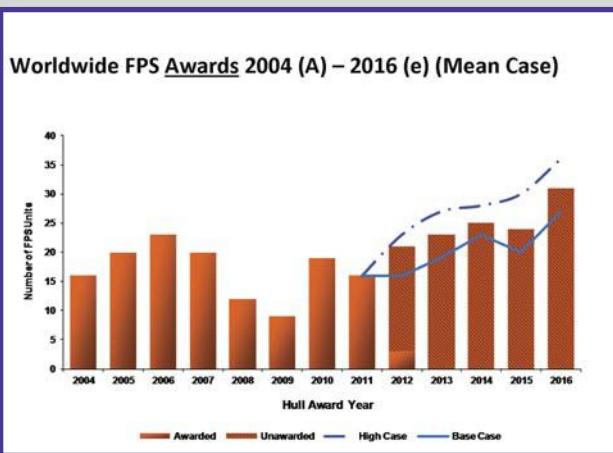
Floating Production Activity



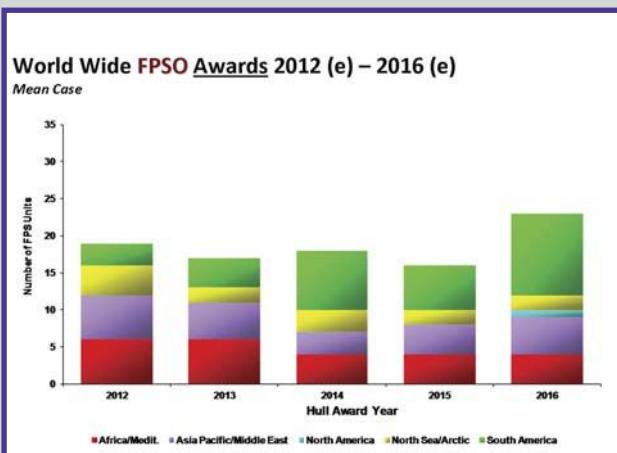
Forecast FPS Spending



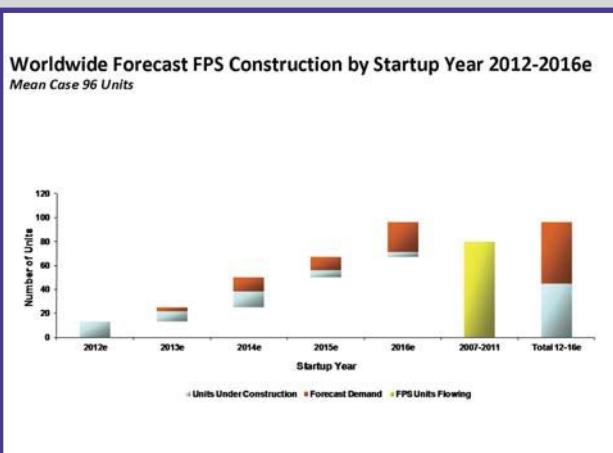
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Worldwide FPSO Awards



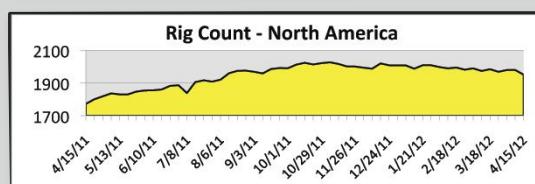
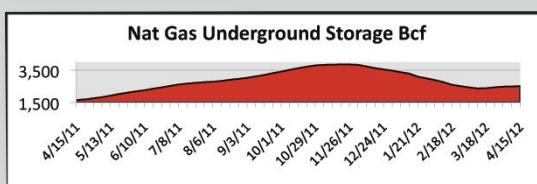
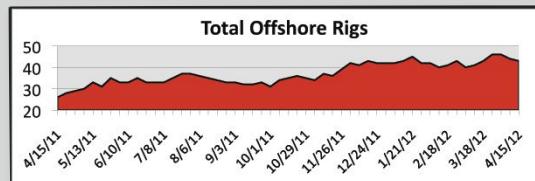
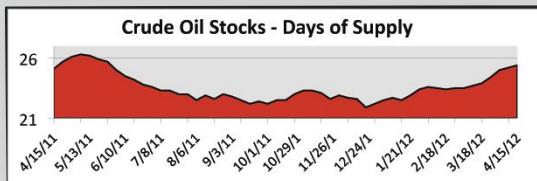
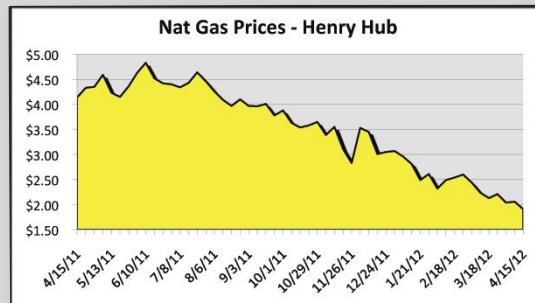
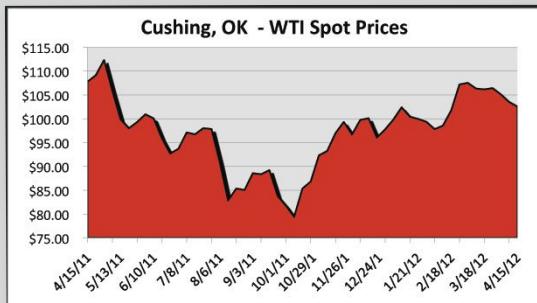
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Oil & Gas Industry Trends

Monitoring the pulse of the US Offshore Oil & Gas Industry

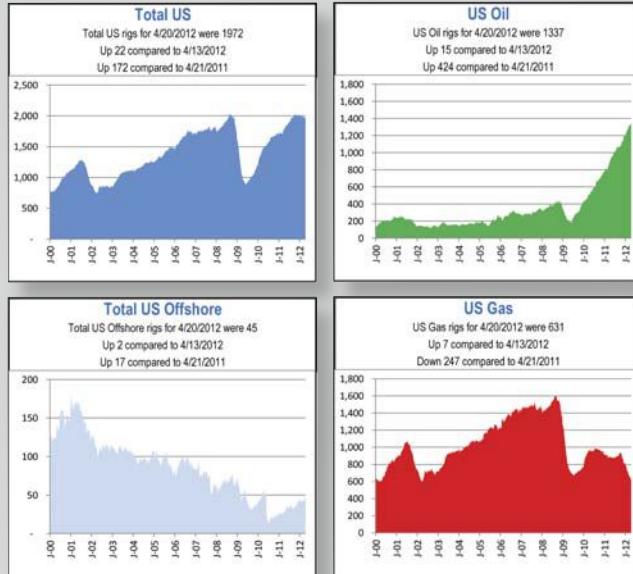


positive trend at least 3 weeks
 changing trend < 3 weeks
 negative trend at least 3 weeks

Baker Hughes Rig Report

North American Rig Report April 20, 2012

Location	Week of 4/20	Week +/-	Week Ago	Year +/-	Year Ago
Land	1904	19	1885	150	1754
Inland Waters	23	1	22	5	18
Offshore	45	2	43	17	28
U.S. Total	1972	22	1950	172	1800
Gulf of Mexico	45	2	43	18	27
Canada	146	-18	164	3	143
N. America	2118	4	2114	175	1943



Gulf of Mexico Data

Current Deepwater Activity

Operator	Area/ Block	OCS Lease	Rig Name	Prospect Name	Water Depth(ft)
Petrobras America Inc.	WR 206	G16965	PRIDE DEEP OCEAN MENDOCINO	Cascade	8,143
Shell Offshore Inc.	AC 857	G17565	H&P 205	Great White	7,815
Shell Gulf of Mexico Inc.	MC 391	G26252	T.O. DEEPWATER NAUTILUS	Appomattox #3	7,157
Union Oil Co. of California	WR 677	G18753	T.O. DISCOVERER INSPIRATION	Saint Malo	7,040
Anadarko Petroleum Corp.	WR 793	G33982	ENSCO 8500	Sparticus	7,008
Chevron USA Inc.	WR 758	G17015	T.O. DISCOVERER CLEAR LEADER	Jack	6,960
BP Exploration & Production Inc.	GC 743	G15607	T.O. DEVELOPMENT DRILLER II	Atlantis	6,834
LLOG Exploration Offshore, LLC	MC 300	G22868	NOBLE AMOS RUNNER	Marmalard	6,113
Noble Energy, Inc.	MC 948	G28030	ENSCO 8501	Bob	6,060
BP Exploration & Production inc.	MC 778	G14658	THUNDER HORSE PDQ	Thunder Horse South	6,033
BP Exploration & Production inc.	KC 292	G25792	SEADRILL WEST SIRIUS	Kaskida	6,031
Cobalt International Energy, LP	GC 814	G32534	ENSCO 8503	Ligurian	5,837
Murphy E&P Co.	MC 734	G21778	T.O. DEEPWATER PATHFINDER	Thunderhawk	5,712
BP Exploration & Production inc.	GC 743	G15607	T.O. DEVELOPMENT DRILLER III	Atlantis	5,405
Anadarko Petroleum Corp.	GC 903	G24197	T.O. DISCOVERER AMERICAS	Heidelberg	5,260
Chevron USA Inc.	WR 29	G16942	T.O. DISCOVERER INDIA	Big Foot	5,187
Exxon Mobil Corp.	AC 25	G10380	NABORS MODS 201	Hoover	4,808
BHP Billiton Petroleum (GOM)	GC 654	G20085	GSF C.R. LUIGS	Shenzi	4,337
Chevron USA Inc.	GC 640	G20082	T.O. DISCOVERER DEEP SEAS	Tahiti 2	4,292
Anadarko Petroleum Corp.	GC 608	G18402	BLAKE 1007	Genghis Khan	4,287
BHP Billiton Petroleum (GOM) Inc.	GC 610	G16764	T.O. DEVELOPMENT DRILLER I	Shenzi	4,270
Shell Offshore Inc.	MC 940	G31534	NOBLE DANNY ADKINS	Vito	4,004
ATP Oil & Gas Corp.	MC 941	G16661	NABORS 202	Mirage	4,000
Shell Offshore Inc.	MC 935	G07976	NOBLE DRILLER	Europa	3,797
Nexen Petroleum USA Inc.	GC 504	G22968	ENSCO 8502	Kakuna	3,600
BP Exploration & Production Inc.	VK 914	G08785	T.O. DISCOVERER ENTERPRISE	Nile	3,535
Shell Offshore Inc.	GB 516	G08252	NOBLE JIM DAY	Serrano	3,400
Statoil USA E&P Inc.	GC 404	G28076	MAERSK DEVELOPER	Kilchurn	3,146
Shell Offshore Inc.	MC 807	G07957	NOBLE BULLY 1	Mars B	3,030
Shell Offshore Inc.	GC 158	G07995	H&P 202	Brutus	2,978
Shell Offshore Inc.	GB 426	G07493	AUGER	Auger	2,862
W&T Energy VI, LLCC	MC 243	G19931	NABORS SUPER S.D. XIX	Matterhorn	2,816
Chevron USA Inc.	GC 205	G05911	NABORS 85 (MAYRONNE 162)	Genesis	2,590
Shell Gulf of Mexico Inc.	GB 385	G10350	NOBLE JIM THOMPSON	Llano	2,514
Anadarko Petroleum Corp.	VK 826	G06888	NABORS P-10	Neptune	1,925
Hess Corp.	GB 260	G07462	NABORS S.D. XVI	Baldpate	1,648
Exxon Mobil Corp.	MC 355	G02964	DIAMOND OCEAN VICTORY	Zinc	1,458

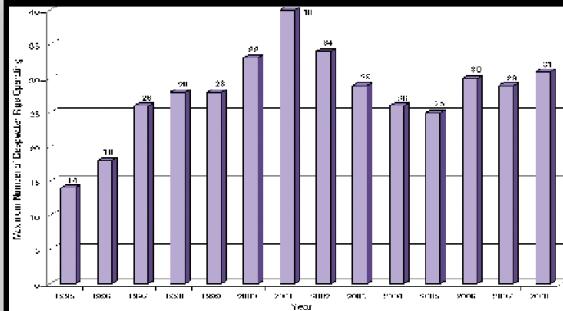
Deepwater prospects with drilling and workover activity: 37

Current Deepwater Activity as of Monday, April 16 , 2012

Activity by Water Depth

Water Depth in Meters	Active Leases	Approved Applications	Active
0 to 200	1,761	34,198	2,971
201 to 400	120	1,111	20
401 to 800	280	841	10
801 to 1,000	399	534	9
1,000 & above	3,354	1,721	24

Rig activity by year



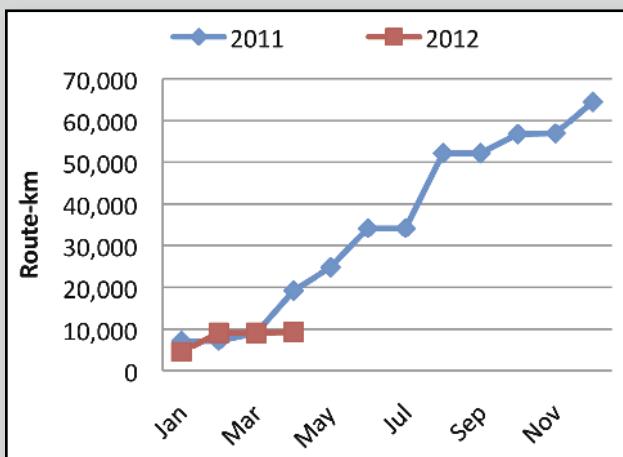
Activity by water depth Information current as of Monday, April 16, 2012

Maximum number of rigs operating in the deepwater Gulf of Mexico. The rig unit includes platform rigs operating on deepwater production facilities in addition to the MODU's. The numbers do not distinguish between rigs drilling and those in service for completion and workover operations.

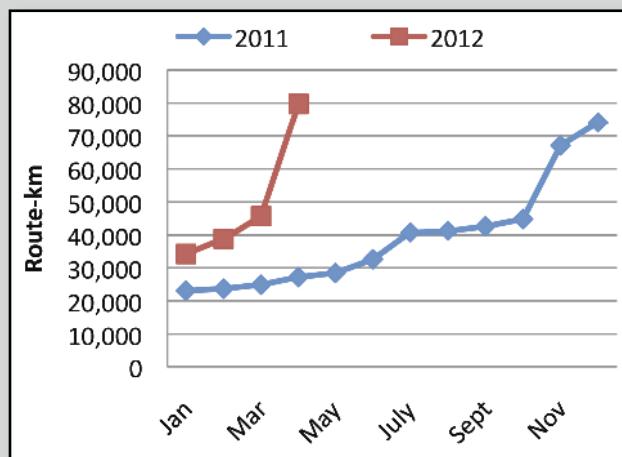
Information provided courtesy of the U.S. Bureau of Ocean Energy Management

Subsea Telcom & Power Cable Data

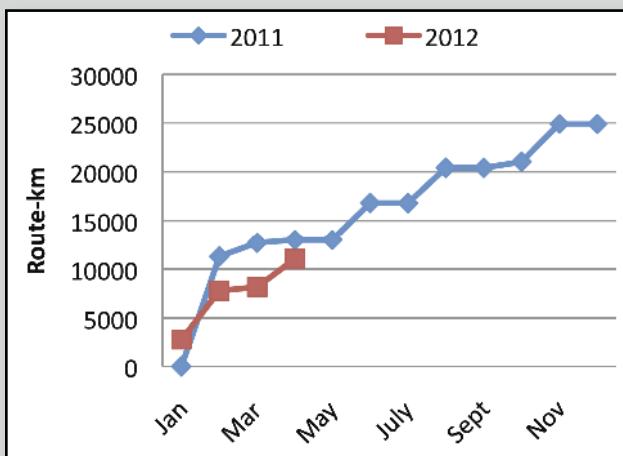
FO Cable Awards by month



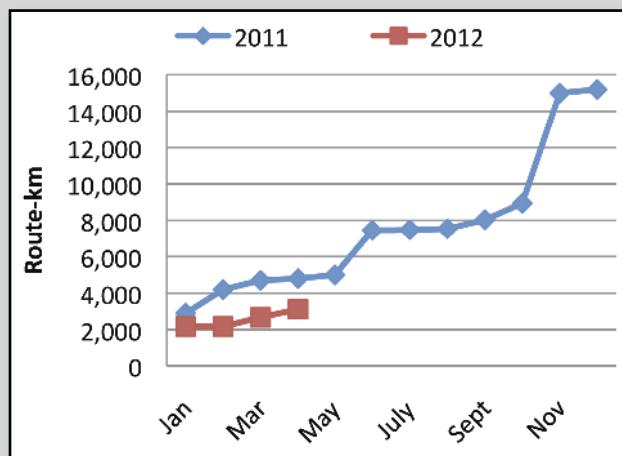
FO Cable Announcements 2011



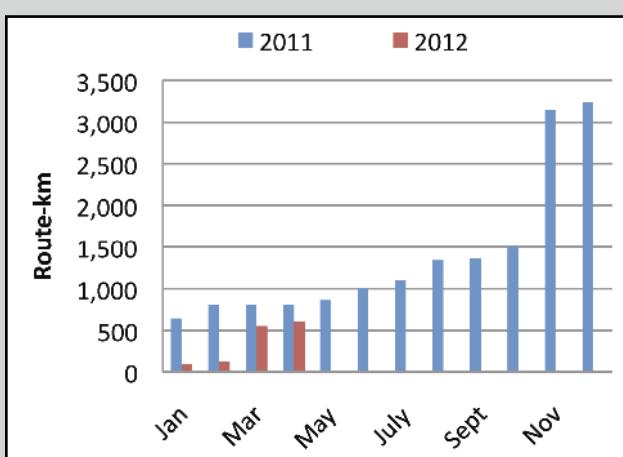
Submarine FO Cables Entering Service 2011 in route-km



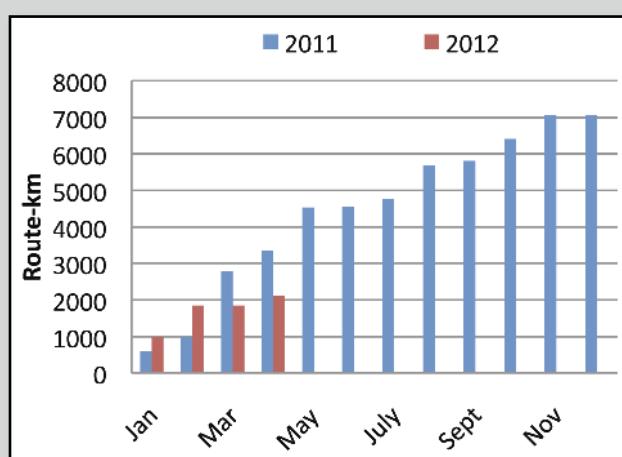
Upgrades of Existing Cable Systems in Gbps



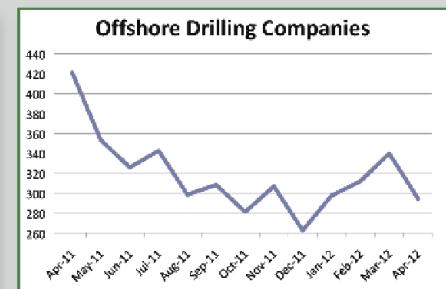
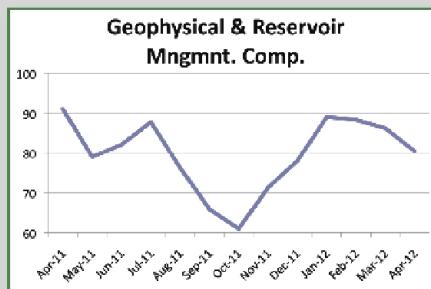
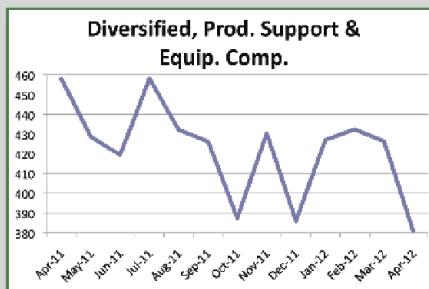
Submarine Power Cable Awards 2011 in route-km



Submarine Power Cable Announcements 2011 in route-km



Monthly Stock Figures & Composite Index



Industry Company Name	Symbol	Close Mid-April	Close Mid-March	Change	Change %	High 52 week	Low
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	40.25	48.24	-7.99	-16.6%	81.00	39.40
Cameron Intl. Corp.	CAM	49.54	52.72	-3.18	-6.0%	58.50	38.77
Drill-Quip, Inc.	DRQ	64.90	68.11	-3.21	-4.7%	77.75	47.40
Halliburton Company	HAL	31.93	33.94	-2.01	-5.9%	57.77	27.21
Tenaris SA	TS	34.95	42.07	-7.12	-16.9%	51.07	23.29
Newpark Resources, Inc.	NR	7.23	7.97	-0.74	-9.3%	10.62	5.19
Schlumberger Ltd.	SLB	67.71	75.95	-8.24	-10.8%	95.53	54.79
Superior Energy Services, Inc.	SPN	24.65	28.06	-3.41	-12.2%	42.87	22.19
Weatherford International, Inc.	WFT	13.33	17.14	-3.81	-22.2%	22.76	10.85
Deep Down, Inc.	DPDW	0.07	0.06	0.01	16.7%	0.29	0.05
FMC Technologies	FTI	46.41	52.19	(5.78)	-11.1%	55.19	34.46
Total Diversified, Production, Support and Equipment.....		380.97	426.45	-45.48	-10.7%	553.35	303.60

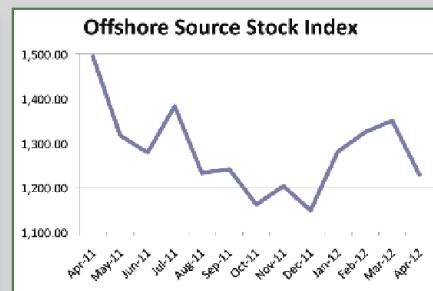
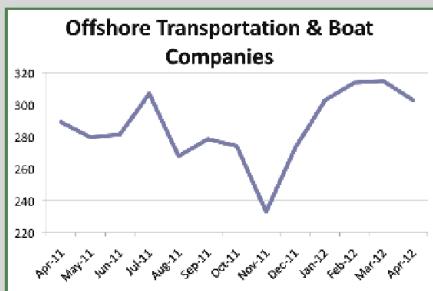
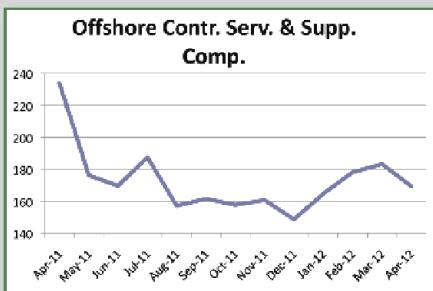
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	28.22	35.08	-6.86	-19.6%	46.61	21.57
Mitcham Industries, Inc.	MIND	22.65	20.70	1.95	9.4%	26.76	9.52
Compagnie Gnrale de Gophysique-Veritas	CGV	29.60	30.48	-0.88	-2.9%	38.09	15.08
Total Geophysical / Reservoir Management.....		80.47	86.26	-5.79	-6.7%	111.46	46.17

Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	41.46	47.98	-6.52	-13.6%	48.91	30.64
Diamond Offshore Drilling, Inc.	DO	64.67	71.43	-6.76	-9.5%	78.63	51.16
ENSCO International, Inc.	ESV	51.73	57.44	-5.71	-9.9%	60.31	37.39
Nabors Industries, Inc.	NBR	15.48	20.69	-5.21	-25.2%	32.47	11.05
Noble Drilling Corp.	NE	35.20	41.15	-5.95	-14.5%	43.93	27.33
Parker Drilling Company	PKD	5.19	6.32	-1.13	-17.9%	7.62	3.60
Rowan Companies, Inc.	RDC	33.06	36.46	-3.40	-9.3%	42.42	28.13
Transocean Offshore, Inc.	RIG	47.77	58.48	-10.71	-18.3%	76.27	38.21
Total Offshore Drilling.....		294.56	339.95	-45.39	-13.4%	390.56	227.51

DISCLAIMER

The information on this page is provided for information and comparison purposes only and should not be used to make financial and business decisions and is accurate to the best of our knowledge for the period indicated.

Monthly Stock Figures & Composite Index



Industry Company Name	Symbol	Close Mid-April	Close Mid-March	Change	Change %	High 52 week	Low
Offshore Contractors, Services and Support Companies							
Cal Dive International, Inc.	DVR	3.54	3.58	(0.04)	-1.1%	8.19	1.50
Helix Energy Solutions Group, Inc.	HLX	16.34	18.72	-2.38	-12.7%	21.65	11.57
Gulf Island Fabrication	GIFI	25.68	30.35	-4.67	-15.4%	36.00	19.55
McDermott International, Inc.	MDR	11.21	13.49	-2.28	-16.9%	24.54	9.34
Oceaneering International	OII	50.66	54.01	-3.35	-6.2%	57.16	31.77
Subsea 7 SA	SUBCY.PK	25.29	25.08	0.21	0.8%	27.52	16.82
Technip ADS	TKPPY.PK	28.17	28.65	-0.48	-1.7%	29.90	17.52
Tetra Technologies, Inc.	TTI	8.53	9.38	-0.85	-9.1%	15.10	6.77
Total Offshore Contractors, Service and Support.....	169.42	183.26	-13.84	-7.6%	220.06	114.84	
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	94.16	97.71	-3.55	-3.6%	109.50	75.04
Gulfmark Offshore, Inc.	GLF	47.67	48.61	-0.94	-1.9%	56.41	32.34
Bristow Group	BRS	45.99	48.00	-2.01	-4.2%	52.89	37.98
PHI, Inc.	PHII	22.50	22.55	-0.05	-0.2%	26.36	16.95
Tidewater, Inc.	TDW	52.30	55.72	-3.42	-6.1%	63.27	38.80
Trico Marine Services, Inc.	TRMAQ.PK	0.04	0.04	0.00	0.0%	0.19	0.01
Hornbeck Offshore	HOS	40.08	41.99	-1.91	-4.5%	43.83	19.80
Total Offshore Transportation and Boat	302.74	314.62	-11.88	-3.8%	352.45	220.92	
Total Diversified, Production, Support and Equipment	380.97	426.45	-45.48	-10.7%	553.35	306.60	
Total Geophysical / Reservoir Management	80.47	86.26	-5.79	-6.7%	111.46	46.17	
Total Offshore Drilling	294.56	339.95	-45.39	-13.4%	390.56	227.51	
Total Offshore Contractors, Service and Support	169.42	183.26	-13.84	-7.6%	220.06	114.84	
Total Offshore Transportation and Boat	302.74	314.62	-11.88	-3.8%	352.45	220.92	
Total Offshore Source Index...	1,228.16	1,350.54	-122.38	-9.1%	1,627.88	913.04	

Aurora™ light emitting plasma deep submergence light



BIRNS, Inc., an ISO 9001:2008 certified global leader in the design and manufacture of unique lines of high performance lights, connectors, penetrators, and custom cable assemblies for severe environments, has launched the most powerful, cutting-edge underwater vehicle light on the market: the new BIRNS Aurora™. This high intensity Light Emitting Plasma (LEP) deep submergence light provides dazzling, electronically dimmable, 14,000 lumen brilliance to usher in the next generation of extreme depth subsea lighting systems.

LEP is an exciting new lighting technology that is a more powerful and efficient alternative to LED, tungsten

halogen and metal halide lighting. Its light sources use a solid-state device to generate RF energy to power a plasma light source. Unlike traditional metal halide lights, the BIRNS Aurora does not require metal electrodes to drive power into the source, thus it has a more robust quartz vessel. This unique LEP light has a 30,000hr lamp life, produces a continuous spectrum, and delivers an exceptionally high lumen density—in fact, the single bulb (approximately 2mm long) produces a blazing 14,000 lumens of brilliant white light at 5,300K at a Color Rendering Index (CRI) of 94.

The prototype BIRNS Aurora was unveiled last year. The original version had its electronics in a separate system from the housing. In the final version, launched in January, the electronic driver is in the same pressure housing as the lamp. Also new for 2012 is the seamless electronic dimming software (operable on any PC) that permits easy and continuous (i.e., step-free) slide-bar dimming down to 20%—with no reduction in color temperature or colour rendering index (CRI) performance. The software also has pre-set 10% dimming increments (at 90%, 80%, 70%, etc.), enabling the BIRNS Aurora to be dimmed with a single mouse click. The luminaire also has a hot-restrike feature that immediately brings the lamp to full brightness from any dimmed setting.

For more information, visit www.birns.com.

48 channel optical wet-mate Hydralight connector

SEA CON Advanced Products, LLC of Bellville, Texas, U.S. is currently developing a high count optical wet-mate HYDRALIGHT connector with a maximum of 48 Angled Physical Contacts (APC) optical channels.

The external size is identical to the current standard field-proven, 8-channel HYDRALIGHT family of connectors with an increased fiber interface, utilizing high density optic ferrules. The design is being driven initially through the need to optimize optical data transfer between the surface platform and a vast array of optical sensors that are deployed subsea.

The critical fiber-to-fiber joint is made without exposure to external contamination in a harsh subsea environment. This is achieved as both ends of the optical termination are protected from seawater, sand, and silt by being enclosed within separate, oil-filled and pressure-compensated chambers.

For more information, visit www.seaconworldwide.com or visit at OTC booth 5255.



SeaHawk™ subsea video surveillance system



The SeaHawk subsea surveillance system enables real-time, visual monitoring and recording of wellbore conditions. Able to capture minute oil drops or gas bubbles on video, it can help you identify leaks early and respond accordingly to avert spills. In addition, it allows you to detect hydrate growth, icing, or scaling instantaneously, rather than periodically, as when using ROVs; as a result, it increases lead time for remediation procedures.

The system can also reduce ROV-inspection frequency. And, when troubleshooting, it offers an effective means to confirm that actuated valves are correctly positioned. Modular in design, the SeaHawk system has a depth rating of 3,281ft (1,000m) with aluminum housing or 9,843ft (3,000m) with optional titanium housing.

For more information, visit www.weatherford.com.



iXBlue QUADRANS selected by French navy

iXBlue has won a contract to supply the French Navy with 35 QUADRANS gyrocompass and attitude reference systems. The Navy will take delivery of the units over a 3-year period starting later this year. They will replace obsolete navigation aids on a number of smaller ships, including the Navy's first Aviso class vessel (sometimes described as a sloop or corvette), the Commandant Bouan, built in 1984.

Benoit Kerouanton, product manager, says, "iXBlue enjoys a very strong relationship with the French Navy, which values our ability to supply class-leading navigation equipment plus the necessary technical support to ensure its perfect integration with other key systems aboard its vessels."

The QUADRANS units, which are IMO and IMO-HSC certified, are based on iXBlue's highly regarded fiberoptic gyroscope (FOG) technology and offer a series of advantages. They are fully strap-down units, small and lightweight with low power requirements; they can be quickly set under all conditions to provide accurate data at a rapid rate with precise time stamping, and they are easy to use, highly reliable, and maintenance-free during their service life.

It is this combination of performance and practical advantages that has seen more than 30 of the world's navies select iXBlue FOG technology in recent years.

For more information, visit www.ixblue.com.

Silixa intelligent distributed acoustic sensor system

Silixa Ltd, the world's leading provider of sensing solutions for the energy and security industries, showcased its new pioneering intelligent distributed acoustic sensing system (iDASTM) at the SPE Intelligent Energy 2012 conference in Utrecht, 27-29 March.

iDAS enables high-quality digital recording of acoustic waves at every point along many kilometers of optical fiber cable up to frequency >100kHz with a wide dynamic range (>90dB). The distributed sensing system is used in a wide variety of well surveillance applications, including distributed flow metering, distributed seismic imaging, fracture mapping, and well integrity monitoring.

iDAS technology can be combined with Silixa's world-leading distributed temperature sensor, UltimaTM DTS, to provide a continuum of benefits throughout the life of a well from exploration to drilling and completion, production, and reservoir management. Applications include seismic appraisal at the borehole, cement evaluation, monitoring fracturing and fracture analysis, flow profiling, monitoring casing leaks, gas lift, and electric submersible pump optimisation. Silixa has developed a range of advanced embedded data handling and visualisation tools to process the high volume of data generated by iDAS.

The fiber can be deployed in linear, directional, or multi-dimensional array configurations. Acoustic array processing techniques allow the speed of sound in the material surrounding the fiber to be accurately determined. In multiphase flow measurement, the speed of sound can be used to profile the fluid composition, such as the presence of gas in oil at different zones along the wellbore. In addition, the fluid velocity can be mapped by measuring the difference in speeds of sound due to Doppler shift introduced in the moving fluid.

For more information, visit www.silixa.com.

BlueView Technologies introduces certified training

BlueView Technologies, the world leader in compact acoustic imaging and measurement technology, introduces BlueView U Certified Training. The comprehensive 3-day, hands-on training and education course provides practical how-to application information, operational details, basic sonar theory, and more. Open to existing, new, and potential BlueView equipment users this course covers BlueView 2D multibeam imaging sonar, 3D MicroBathymetric sensors, and 3D mechanical scanning systems. The 3-day course blends in-classroom tutorial sessions, in-water demonstrations, and hands-on exercises.

For more information, visit www.blueview.com.

Iver2

Autonomous Underwater Vehicle





Iver2 AUV— Ideally suited to execute a variety of missions in near coastal environments

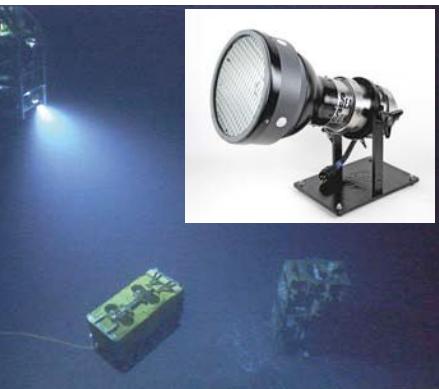
- Easy to operate
- Single person launch and recovery
- Commercial open system architecture
- Intuitive mission planner
- Science payloads available
- Low cost AUV 54K USD



IVER2 Autonomous Underwater Vehicle

www.ocean-server.com

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SeaSun® underwater lighting equals safety

SeaSun® Lighting Systems are self-contained, high-powered underwater work lights that provide stadium type illumination to assist saturation diving and ROV operations offshore. The umbrella and intensity of illumination provided by the lights allow divers, support crews, ROV operators, and marine engineers to see a much greater area of the work site than possible before, significantly increasing safety and productivity.

The SeaSun® lights have evolved from over 23 years of experience lighting underwater scenes on motion picture and television productions, starting with the feature film *The Abyss* in 1988. In 1991, the *Abyss* lights received a Technical Achievement Award from The Academy of Motion Picture Arts and Sciences for "Safety and Portability" on motion picture sets and, to date, have worked on many film productions, including *Armageddon*, *Titanic*, *Pearl Harbor*, *Navy Seals*, *Waterworld*, and *Men of Honor*.

The first SeaSun® system to work in the Gulf of Mexico was deployed in May 2005. To date, SeaSun® lighting has logged more than 850,000hrs of underwater operation on numerous projects in the Gulf.

Currently, there are three versions of SeaSun® lighting packages available: Three light Shallow Water (100m), Single Worklight (200m) and ROV Deep Single (3000m and 6000m).

The ROV Deep single light is mounted in the ROV cage and separates the hi-powered light from the ROV's cameras to

simulate sunlight from above and significantly increases visibility for ROV pilots.

SeaSun® lighting systems are available through Fast Forward Rentals in Lafayette, Louisiana and Oceaneering Deepwater Technical Solutions in Houston, Texas.

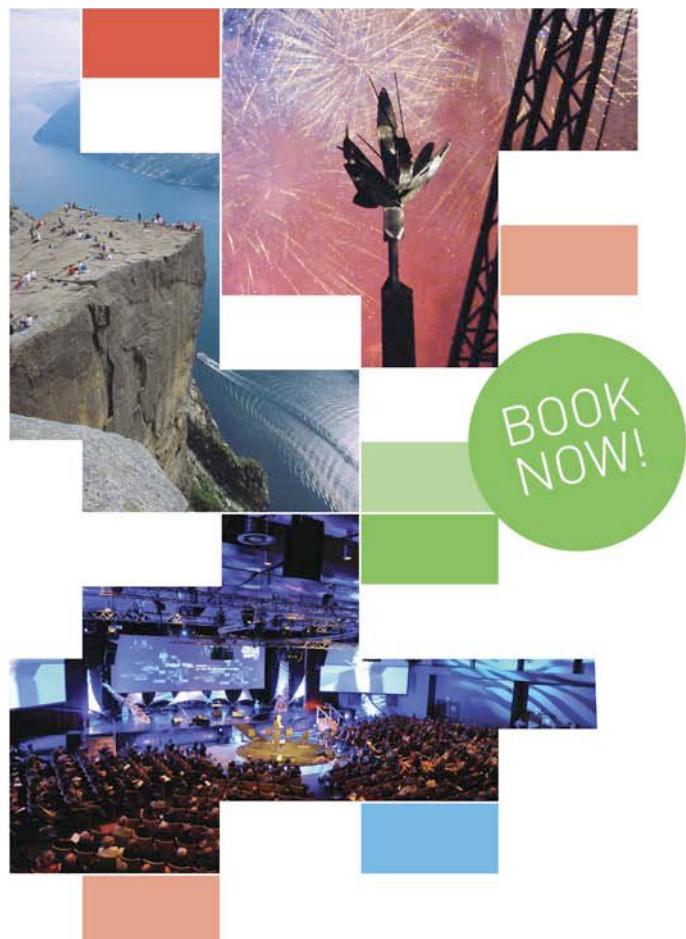
For more information, please visit www.seasununderwater.com.

Unique System UK orders £1m of Sonardyne 6G equipment

Unique System (UK), a Unique Maritime Group company, which is one of the world's leading integrated turnkey subsea and offshore solution providers, announced the purchase of 6G acoustic positioning equipment from Sonardyne International Limited.

The purchase was made on the final day of the Oceanology International 2012 exhibition and conference held in London and is Sonardyne's fourth major order from a rental company in the last 2 weeks.

Unique System (UK) Ltd, which is part of the Unique Maritime Group based in Sharjah, UAE, is a major dis-



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tributor and rental company for advanced marine and diving equipment. It offers an extensive range of products, services, and turnkey solutions to the diving and survey industries.

The Fusion LBL 6G equipment ordered by Unique System will be added to the equipment inventory pool held at its new regional headquarters in Aberdeen and will be made available for use on survey construction projects across Europe. 6G products utilize Sonardyne's ultra-wideband width, digital ranging, and telemetry protocols, offering ease of use, reliable performance, and the flexibility to reconfigure the equipment to meet the broadest possible range of subsea positioning and wireless communication applications.

Ray Hughes, managing director of Unique System UK, said, "This order comes at a time of significant advancement for the company. As we continue to expand and develop our European infrastructure and facilities, so too are we growing the size of our rental stock. This is our first investment in 6G technology, which has been purchased in

direct response to client demand for the flexibility, excellent performance, and cost savings that Sonardyne's latest technology platform delivers."

Commenting on the order, John Ramsden, managing director of Sonardyne International, said, "Unique System's order rounds up a very successful few weeks for 6G. The technology is having a positive impact across the subsea sector, saving owners time and money, and, above all, reducing risk. This latest order is further confirmation that Sonardyne 6G is an essential component of any rental company's stock of products."

For more information, visit www.uniquegroup.com

Submersible FlowCAM® from Fluid Imaging Technologies passes milestone

The Submersible FlowCAM® imaging particle analysis system from marine instrumentation manufacturer Fluid Imaging Technologies, Yarmouth, Maine recently surpassed 6 weeks of continuous, unattended operation during *in situ* deployment in the coastal waters



of Florida. Featuring patent-pending, chemical-free, biofouling control technology from Battelle, Columbus, Ohio, the Submersible FlowCAM automatically detects waterborne particles and microscopic organisms, acquires high-resolution digital images of each one



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detected, and counts, measures, and characterizes them using a choice of 32 properties such as size, shape, and fluorescence. During the 6-week, remote deployment, the Submersible FlowCAM acquired and measured thousands of images sampled at a variety of depths from its mooring. The data was accessed online in real-time from the company's Yarmouth, Maine test laboratory and saved for further analysis while the FlowCAM's built-in, proprietary pattern recognition software automatically differentiated, identified, and quantified each individual microorganism and particle. On-the-fly adjustments to the flow rate, camera speed, sampling schedule protocols, and other parameters were also available remotely.

The Submersible FlowCAM includes the same patented FlowCAM imaging technology proven effective by the U.S. Naval Research Labs, Scripps Institution of Oceanography; the National Institute of Oceanography, Goa, India; the Xiamen Marine Environmental Monitoring Center, Xiamen, China; and in hundreds of other installations worldwide. The

Submersible FlowCAM operates in freshwater, ocean water, and estuarine environments and may be configured to be deployed aboard AUV and tethered behind research vessels and sampling boats in addition to being moored. A full, 1-year warranty is included.

For more information, visit www.fluidimaging.com.

New SubConn® 25-pin connector series combines power and signal connection

Demands placed on underwater connectors have increased as underwater technology projects combine increasing numbers of sensors and each sensor requires multiple connections. Often, connectors need to combine power and signal – power to supply the sensors and signals for information.

SubConn Inc. has developed a new series of SubConn® connectors designed to carry more power and signal connections than previously available. This new SubConn® range has 25 pins – 3 for power and 22 for signal.

Basing new thinking on proven design, reliability is a crucial factor and



basing new design on existing technology takes full advantage of proven dependability. The new SubConn® series is based on the existing C-size series, offering the assured quality and reliability already proven in decades of use offshore. Using the same dimensions as the standard C-size connector also makes it compatible with the same locking sleeves, nuts, and other accessories.

The series is available as a circular connector, in bulkhead version with $\frac{3}{4}$ in. thread, and in an attachable version that can be moulded on. The three power pins have a rating of 600V, 10A per pin, are standard pin size and the 22 signal pins are micro pin size.

For more information, visit www.subconn.com.

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Published every week, this electronic industry resource will keep you updated on current events, technology, and opportunities in the global oceans marketplace.

Seateronics underwater metrology

Over the last 18 months, Seateronics, an Acteon company, Technip, Star Net Geomatics, and BlueView Technologies have been involved in developing the BlueView 3D system for underwater metrology. This work has included several onshore dry dock trials in Peterhead and Fraserburgh, UK. Seateronics, along with Star Net, is now a recommended execution contractor for BlueView BV5000 multibeam surveys for inspection and metrology projects, as it understands the system's capabilities and clients' subsea measurement requirements.

The BlueView 3D system combines terrestrial laser and underwater 3D multibeam sonar scanning technology to provide a unique and innovative solution to complex subsea metrology operations.

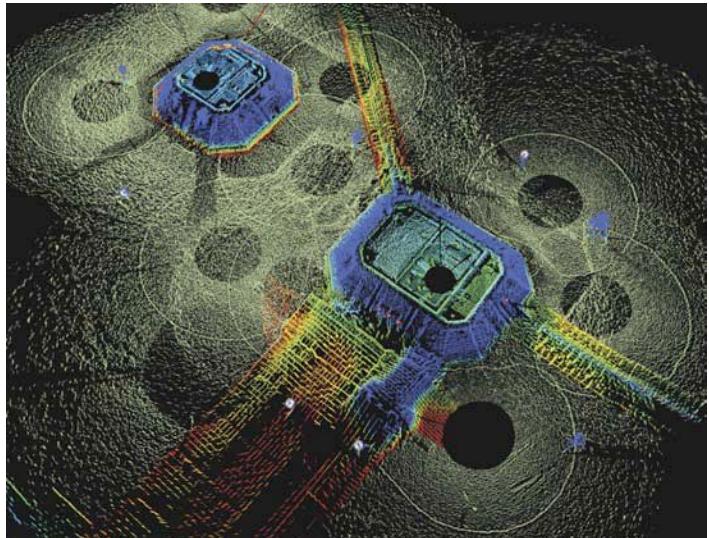
Seateronics has recently supplied a complete BlueView BV5000-1350 system and personnel for subsea metrology on Talisman Energy (UK) Ltd's Auk North project in the North Sea, the third successful use of this technology. Coupled with Star Net's extensive experience in advanced data processing techniques, the technology provided very precise measurements between the subsea connection flanges on two manifolds in the Auk North field development.

A new manifold was to be integrated into a field with an existing manifold. The spool piece required between the new and the existing manifold was required to be accurate to 70mm and have an alignment error of less than 1°. All the metrology aids had been removed from the existing structure, which caused design issues. However, Star Net had laser surveyed the existing manifold before its deployment as part of a previous onshore dimensional control survey. This dataset became critical in the project execution, as the subcontractor was able to generate temporary metrology aids from the survey data. The location of the flanges within the structures caused additional issues from the access point of view.

The BlueView BV5000-1350 system, supplied by Seateronics, was successfully deployed by its offshore personnel to perform multiple scans around the subsea structures. Data quality control was overseen by Star Net operatives onboard the vessel. Traditional laser scan data augmented this survey data to position the flanges accurately relative to each other and provide precise measurement information to aid the fabrication of the adjoining spool piece.

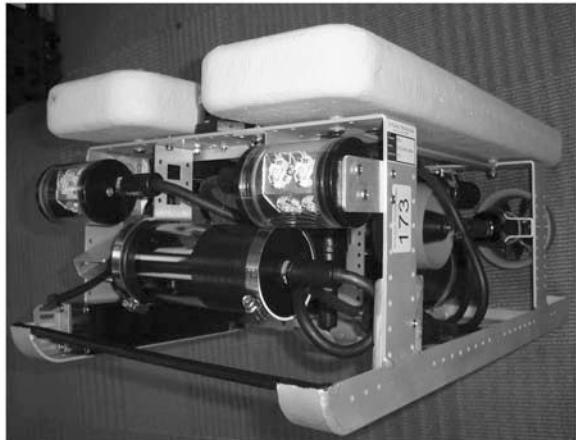
Following the metrology survey, the spool piece was designed and fabricated. As part of the project's completion, Star Net surveyed the two-piece pipe section and brought the sections together to confirm the fabrication tolerances.

For more information, visit www.seateronics-group.com.



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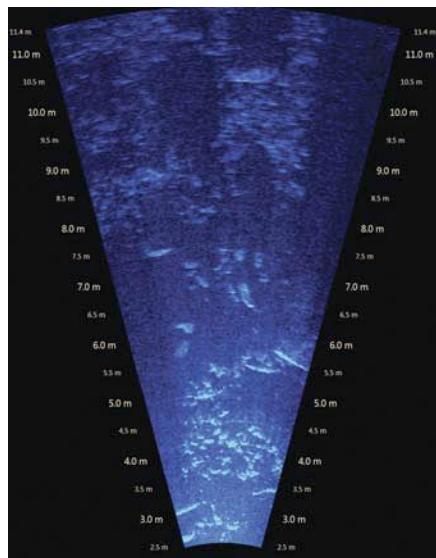
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ARIS sonar imaging system offers clearer details

Across England and Wales, The Environment Agency monitors fish life in rivers and waterways. It investigates rare and threatened species, such as eel and lamprey, and enumerates salmon and sea trout migrations. The agency also investigates fish behavior around in-river structures, like abstraction sites and pump houses, tidal flap structures, and fish passes.

The Environment Agency already uses the DIDSON multi-beam sonar system for fish studies, which has proven to be highly effective in river monitoring. However, with The Environment Agency responsible for such a large area to monitor, demand has now outstripped the availability of the seven existing units, and The Environment Agency fisheries technical experts were keen to increase their remote non-invasive monitoring capacity.

They have ordered new, additional sonar units through underwater technology supplier, MacArtney Underwater Technology. MacArtney will supply three of the new generation sonar mod-



els from Sound Metrics Corp, the Adaptive Resolution Imaging Sonar (ARIS) for their specialized fish monitoring work.

All the new ARIS Explorer range of sonar's are low powered, drawing less than 15W – half the nominal 30W required for the current DIDSON. It also requires less maintenance, as the sealed lens arrangement eliminates the

need for a silt box and the internal focus drive mechanism avoids potential jamming issues.

The DIDSON system is still a popular choice for imaging sonar units for fisheries, and Marine Scotland has recently placed an order for a standard 300m rated DIDSON system. This system will be used by the Scotland Freshwater Laboratory for fisheries investigation and fisheries research projects. MacArtney Underwater Technology will supply the DIDSON, a range of accessories, commissioning, and training. The Environment Agency in Wales has also purchased a DIDSON Long Range imaging sonar.

All ARIS and DIDSON system orders include the sonar, Pan & Tilt rotators, special lens items, commissioning, and training, if and as required.

For more information, visit www.macartney.com.

AAE announces multiple USBL orders for Japanese Naval Forces

The Japan Maritime Self Defence Force (JMSDF) has awarded a major contract to Applied Acoustic Engineering (AAE) for the supply of a number of USBL tracking systems and associated equipment.

Following sea trials in Japan and a competitive tender process, JMSDF took the decision to invest in seven of AAE's Alpha Portable systems after witnessing and accepting the key criteria of tracking stability, portability, and ease of use. Predominantly intended for use with their naval search and rescue dive teams, JMSDF have also specified AAE's 210 Micro/Remote transponders as the ideal beacon to attach to its divers.

The contract award, issued in conjunction with Toyo Corporation, AAE's exclusive representatives for Japan, reaffirms the company's position as a leading manufacturer of subsea acoustic systems for commercial and military applications.

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Sales manager for AAE, Gavin Willoughby, commented, "This is a hugely significant order for our company, which demonstrates our capability and enhances our reputation as a major supplier to the defence industry. We are extremely proud to add JMSDF to our portfolio of high profile clients."

OSIL unveils new Tern buoy

OSIL recently launched their new 1.2m Tern buoy. The platform was greeted with enthusiastic interest from visitors to the Oceanology International exhibition in London.

The Tern buoy is designed for extended deployment in harsh coastal environments in deeper water depths and is suitable for all applications, including scientific studies, water quality monitoring, coastal engineering projects, harbour and coastal monitoring, and maritime traffic control.

The system is extremely robust, with all instrumentation and cables held internally, protected by the rugged enclosed top section designed to minimize damage from the elements or interference. All sensors are secured

within a central structure that offers good water flow for water quality sensors while also providing a very high degree of protection for valuable, sensitive, or delicate equipment. The platform also offers a higher visibility profile, easily seen in high-traffic areas.

The versatile 1.2m platform has approximately 400kg net buoyancy and is supplied with a range of sensors that can be specified by the customer (including CTD, DO, pH/ORP, turbidity, chlorophyll, rhodamine, current speed/direction, a GPS locator and meteorological sensors such as wind speed/direction, air temperature, humidity, pressure, solar radiation).

All buoys are fitted with solar panels, battery back up, navigation/warning lights (IALA standard lamp), and other markings as necessary (St. Andrews cross, internal radar reflector, etc.).

A range of telemetry options are available (UHF/VHF, GSM, GPRS, Satellite), selected to suit both the location and application requirements.

For more information, visit www.osil.co.uk.



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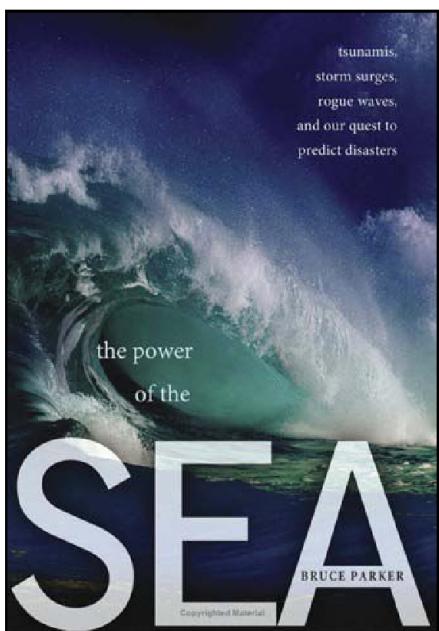
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Media Reviews

The Power of the Sea: Tsunamis, Storm Surges, Rogue Waves and Our Quest to Predict Disasters

By Bruce Parker



The Power of the Sea describes our struggle to understand the physics of the sea, so we can use that knowledge to predict when the sea will unleash its fury against us. In a wide-sweeping narrative spanning much of human history, Bruce Parker, former chief scientist of the National Ocean Service, interweaves thrilling and often moving stories of unpredicted natural disaster with an accessible account of scientific discovery. The result is a compelling scientific journey, from ancient man's first crude tide predictions to today's advanced early warning ability based on the Global Ocean Observing System. The new paperback edition includes a dramatic new chapter on the 2011 Japan Tsunami.

Bruce Parker is a world recognized expert in the oceans. He is former Chief Scientist of the National Ocean Service in NOAA and presently a Visiting Professor at the Center for Maritime Systems at the Stevens Institute of Technology in New Jersey. He has a Ph.D. in physical oceanography from The Johns Hopkins University. Among his awards are the U.S. Department of Commerce Gold Medal and the Commodore Cooper Medal from the International Hydrographic Organization. He lives in Virginia.

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People & Company News

Torsten Marten has taken up the new post of Brazil operations manager at NCS Survey, an Acteon company. Torsten is based in Rio de Janeiro and will look after all NCS's current and future operations in the country. A graduate in hydrography and ocean science from the University of Plymouth, UK, Torsten has over 17 years of experience in the offshore survey industry in field and project management roles. He joins NCS from Subsea 7, where he was a project surveyor involved in major deep-water projects, including Total's Pazflor development in Angola and the Petrobras PRA-1 tie-in project in Brazil.

Murphy Oil Corp. elected **Claiborne P. Deming** to be chairman of the board of directors following the death of **William C. Nolan, Jr.** In December 2011, the company announced that Nolan would retire as chairman effective 1 May, 2012, but would remain on the board. Deming was originally elected to assume the chairmanship position effective 1 May, 2012. But Nolan died on 12 March 2012 at the



Marten

Medical Center of South Arkansas in El Dorado following a brief illness. He was 72 years old. Nolan received his undergraduate degree from Yale University in 1961, and his law degree from Yale Law School in 1964. After graduation, he worked in Murphy's Law Department until 1969 when he left to found the Nolan and Alderson law firm. He was also president of Noalmark Broadcasting Corp. which owns radio stations in Arkansas and New Mexico. Nolan had been a Murphy director since 1977 and served as chairman since 15 July 2002.

Pharos Offshore Group is pleased to announce the addition of **Scott Gartshore** as chief technical Officer to the executive team. A marine industry veteran, Scott's previous roles include project manager and senior engineer as well as trenching systems sales manager at IHC Engineering Business Ltd. Pharos Offshore Group CEO, Phil Walker, says, "Pharos Offshore Group is expanding to meet the growing need for



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our ITAT 800™, MENTOR 800™, and UTV™ subsea trenching systems. Scott's depth of technical knowledge and experience makes him a valuable addition in leading our engineering and operational teams." Gartshore will lead Pharos' sub-sea trenching equipment development programs, while providing technical oversight to all operational marine contracting projects.

T.D. Williamson (TDW) said that **Bruce Thames** was promoted to the position of senior vice president and chief operating officer. He will be responsible for overseeing completion of strategic TDW initiatives as well as driving the day-to-day execution of business around the world. Thames has 25 years of experience serving the international oil and gas industry. Thames, 49, joined TDW in 2005 as director of business development. He subsequently served as vice president, North America, and most recently, vice president, Eastern Hemisphere, during which time he was instrumental in building operational capabilities to better serve customers throughout Europe, Africa, the Middle East, and Asia Pacific.



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Devin International, a subsidiary of Greene's Energy Group, promoted **Joe Miller** to vice president and general manager. Miller has 31 years of experience in the oil and gas industry. Throughout his career, he has held sales and management positions with Downhole Rental and Supply and Grant Norpac, Inc., in addition to co-inventing four U.S. equipment patents. Based in Lafayette, Louisiana, Miller will oversee company management as well as domestic and international sales efforts. He will maintain his close relationship with Devin International's equipment design and development team. Miller earned a bachelor of science degree from the University of Southern Mississippi. Additionally, he has completed 43 hours of post graduate work from the University of Mississippi. He is a member of the Society of Petroleum Engineers and the Intervention & Coiled Tubing Association.



Miller

Market leading asset rental business Ashtead Technology announced the appointment of several new key members of staff to their Singapore facility. **Steve Williams** has joined the company as the new regional general manager. He joins Ashtead Technology from Ferguson Seacabs where he was the RGM of their SE Asian business since 2008; He has significant experience of developing business within SE Asia as well as in the Middle East and Africa. **Kevin Murray-Taylor** has joined the team in the position of regional sales manager, following 2 years with Ashtead Technology (Aberdeen) in the position of sales manager, covering the UK and Europe. **Michael Bain** has joined Ashtead Technology in the position of internal technical sales manager, bringing a wealth of experience in the Asia Pacific region. Michael has previously worked for DPS (Forum Energy Technologies), Sonardyne, and Seatronics and has been working in the Asia Pacific region for the past 7 years.

Weatherford International Ltd. said **John H. Briscoe** was appointed senior vice president and chief financial officer. Briscoe, 54, joined Weatherford in August 2011 as vice president and chief accounting officer. Prior to joining the company, Briscoe served as vice president and controller of Transocean Ltd. Briscoe started his career with 7 years in public accounting, beginning with the firm of KPMG and ending with Ernst & Young as an audit manager, and has over 30 years of

experience. **Andrew P. Becnel**, chief financial officer, and **James M. Hudgins**, vice president, tax, left the company at the end of March.

International energy consultancy Xodus Group created a new chief technology officer position to lead its integration of surface and subsurface services. **Stephane Constant**, who became a non-executive director last year, has taken up the full-time post, bringing a wealth of subsurface expertise. Constant was co-founder and technical director of subsurface consultancy Horizon Energy Partners, which he built to 100 people and sold to SGS in 2008. He started his career with Elf (now Total) in 1991 as a reservoir engineer responsible for various UK operated assets. He also worked for AGIP in Aberdeen from 1996 to 1997 as a senior reservoir engineer. In 1998, he joined Premier Oil in Singapore as the lead reservoir engineer for the Yetagun field, offshore Myanmar. After Horizon Energy Partners, he founded Oyster Energy, a co-investment company, which he sold to Elko Energy in 2009.

CTC Marine Projects, Ltd., part of DeepOcean Group Holding AS, an integrated provider of subsea engineering and trenching services, announced the appointment of **Tony Inglis** as new managing director. Inglis, who is a chartered engineer, previously held the position as managing director at CTC from June 2006 through October 2008. Under his leadership, the company performed well and his re-appointment is a positive step in the development of CTC.

Imtech Marine, a leading company in the global maritime market, operating as full-service provider and system integrator of technology solutions, announced the opening of a new office in Aberdeen. This new location in the Imtech Marine network will open officially on 25 April and will provide services to international and locally based vessels and platform operators, such as electrical engineering support and emergency call out services.

DNV acquires Vattenfall's shares in Swedish Transmission Research Institute (STRI) to expand its presence in the power transmission sector. STRI is a specialist consultancy firm providing advanced studies of high voltage power transmission systems and accredited high voltage testing.



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www.cleanpacific.org

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www.oceantechexpo.com

May 29-31, 2012:
UDT Europe / Anti-Submarine Warfare
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www.udt-global.com

June 3-6, 2012:
AWEA Offshore Wind
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www.windpowerexpo.com

June 19-21, 2012:
EnergyOcean International 2012
Boston, MA
www.energyocean.com

August 6-9, 2012:
AUVSI's Unmanned Systems N.A.
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www.auvsi.org

August 28-31, 2012:
Offshore Northern Seas
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September 11-12, 2012:
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www.mtsociety.org/conferences

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www.oceans12mtsieehamptonroads.org

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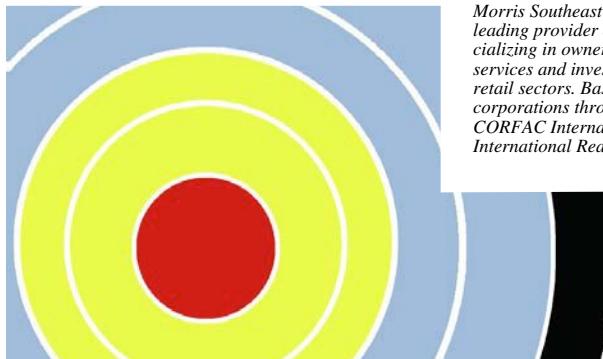
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E-mail: cisales@channeltech.com
Website: www.channeltechgroup.com
Contact: K.Ruelas, pres.; K.Aties, Director of Business Development; E.Bickel, technical sales

Piezoelectric ceramics - Channel Industries, A Division of Channel Technologies Group (CTG) is a custom manufacturer of piezoelectric ceramics in lead-zirconate and barium titanate compositions. Since 1959 Channel Industries ceramics have been at the heart of thousands of underwater acoustic applications and systems. Hydrophones, towed arrays, modems, side-scan sonar, etc. Military and commercial applications worldwide for over 50 years.



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MaRE provides an International Brokerage and Equipment Sourcing service to the underwater industry. We are the world's leading source of used ROV systems and components. "DeepSearch", a free-issue database, is distributed monthly highlighting used ROVs and associated equipment for sale worldwide. Our Procurement department offers an equipment and spares sourcing service which complements the brokerage side of the business. MaRE also provides Consultancy on all aspects of remote underwater technology.

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BlueView delivers state of the art, compact acoustic imaging, measurement, and automation solutions for defense, energy, civil engineering, transportation, and port security applications worldwide. BlueView's advanced acoustic systems support underwater operations from a wide variety of platforms, including ROVs, AUVs, surface vessels, fixed mounts, portable tripods, and diver handheld systems.

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Website: www.imagenex.com
Contact: Steve Curnew

Imagenex is an innovative company specializing in advanced acoustic underwater sensors. The company's products include multibeam, mechanical scanning, and sidescan sonars. The Delta T is a compact, cost-effective multibeam sonar, small enough to fit on most underwater vehicles for obstacle avoidance, navigation and profiling applications. The profiling versions feature an output for real-time 3D plotting and are compatible with third party post-processing software. The Model 881A is a small multi-frequency sonar for imaging or profiling applications. There is an Azimuth Drive available for the 837B Delta T and the 881A for profiling applications from stationary platforms. The Model 881L features improved performance via Ethernet communications. Two sidescan sonars, the SportiScan and the YellowFin, feature a revolutionary price/performance ratio. For more information please visit www.imagenex.com

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Sound Engineering Solutions – Sonatech, A Division of Channel Technologies Group (CTG) develops innovative solutions for underwater acoustic applications. Existing technologies span a wide variety of acoustic systems, including sonar systems, navigation systems, and custom acoustic solutions. Our solutions are based on a 36-year career of developing high-performance, high-reliability undersea systems that are continually improved through research and development.



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E-mail: sales@soundmetrics.com
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- C. NAVIGATION / POSITIONING
- D. RESEARCH & DEVELOPMENT
- E. OCEAN INSTRUMENTATION
- F. OFFSHORE OIL & GAS
- G. COMMUNICATIONS / UTILITIES

- H. SCIENCE, ENVIRONMENTAL
- I. EDUCATIONAL INSTITUTION / LIBRARY
- J. GOVERNMENT MILITARY
- K. GOVERNMENT CIVILIAN
- L. MARINE HARDWARE / DECK EQUIP.
- M. FISHING INDUSTRY, AQUACULTURE
- N. SURVEY, MAPPING, GEOPHYSICAL

- O. DIVING EQUIPMENT / SERVICES / RENTAL
- P. CONSULTING, DATA SERVICES
- Q. MARINE ELECTRICAL / ELECTRONICS
- R. COMPUTER SERVICES / SOFTWARE
- S. OTHER (specify) _____

4 Which category best describes your job function? (circle only one)

- T OWNER / EXECUTIVE
- U MANAGEMENT / PROFESSOR
- V ENGINEER / SCIENTIST
- W TECHNICIAN / OPERATOR

- X BUYER
- Y SALES
- Z OTHER (specify) _____

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simultaneous positioning and communication - no need to switch between positioning mode and modem mode

- multiple target tracking
- reliable data transmissions
- range: up to 8000 m
- accuracy: up to 0.04 degrees

LBL POSITIONING SYSTEMS

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- multiple target tracking
- range: up to 8000 m
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Underwater Vehicle Instrumentation

Scanning and Multibeam Sonar



KONGSBERG

MS 1000 Series Scanning Sonar & Altimeters, M3 Multibeam Sonar™

Description

The Kongsberg 1000 Series Scanning Sonar is the design platform for single-beam imaging, profiling sonar, and altimeters. The 1171 models provide updated electronics and a more compact design. Models rated to full ocean depth (11,000 meters) are available.



1171 Profiling
Sonar Head

Operation of the 1000 Series and processing of sonar data is controlled by MS 1000 software running on a commercially available off-the-shelf (COTS) computer, in laptop, rackmount, or desktop configuration. The use of COTS computer hardware provides you with a wide range of backup options. Dedicated operator keypads simplify operation.



Altimeter



1171 Imaging Sonar
Head 4000 meter

The M3 MultiMode MultiBeam Sonar™, a compact and versatile multibeam sonar provides high-resolution, easy-to-interpret images. The M3 sonar combines the high refresh rate of a conventional multibeam with image quality comparable to single-beam sonar. This combination provides wide angle, long range (150 m) viewing capability with ultra-short range (0.2 m) underwater sonar vision. The M3 sonar thereby



M3 Sonar 4000 m

provides ROV obstacle avoidance and inspection capability in a single unit.

M3 Operating Software provides a new, user-friendly interface with simplified controls that enable the operator to set the sonar operating parameters without the adjustment of many complex sonar parameters. Operators can simply choose one of multiple application modes. Slider type controls are provided for commonly used functions, and operator-selected “widgets” open windows to display data when required.



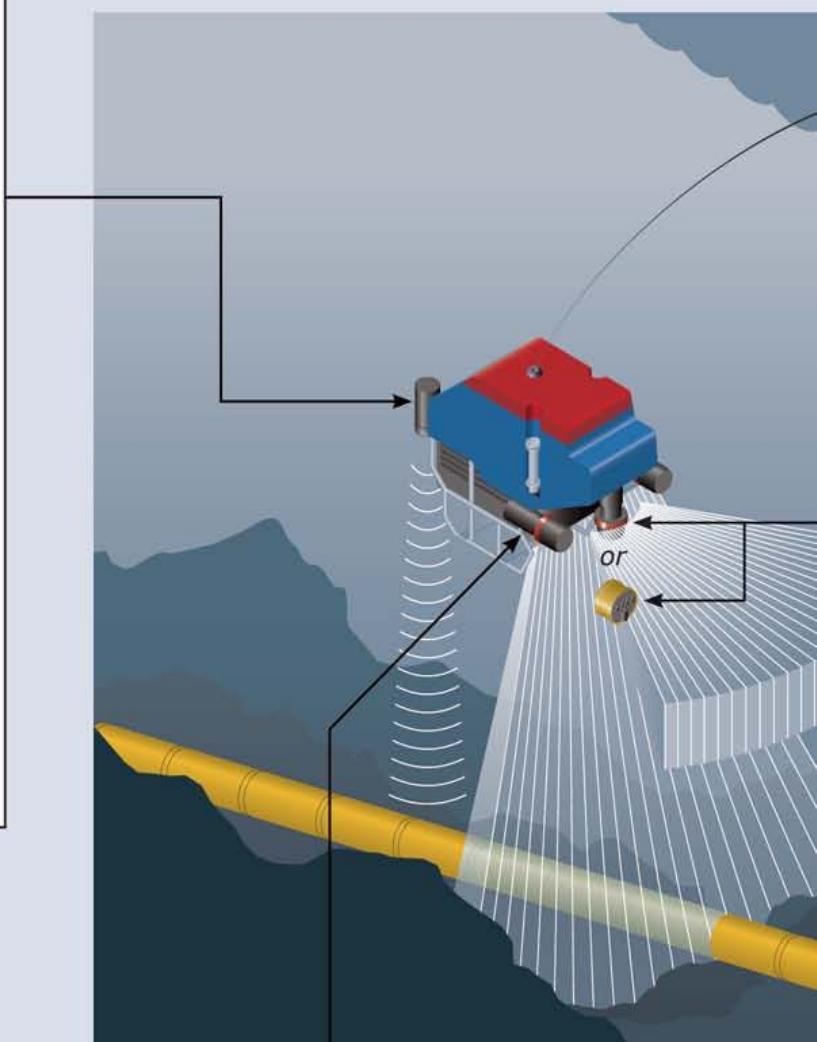
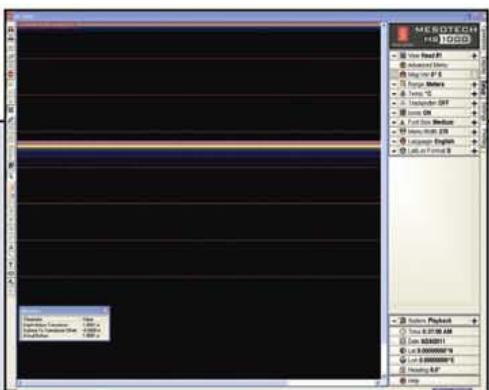
Pan and Tilt Unit



Altitude

Kongsberg altimeters are widely used for ROV positioning and docking as they are:

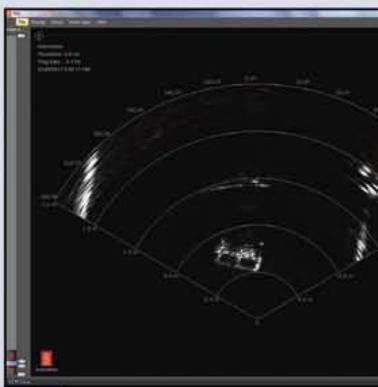
- Reliable and low-maintenance to minimize life-cycle costs
- Designed for deep ocean applications; some models depth-rated to 11,000 meters
- Adaptable to smaller ROVs utilizing a compact, lightweight design
- Available in a range of models and frequencies to suit specific requirements
- Versatile, available in stand-alone (NMEA output) or host-driven (MS 1000 software) configurations to suit your requirements



Pipeline Survey—Free Span Detection

Profiling sonar in conjunction with specialized software provides free span detection and pipeline inspection data in a package that is:

- Accurate
- Reliable and low-maintenance, minimizing expensive ROV downtime
- Cost-effective OEM designs are available for ROVs and AUVs.

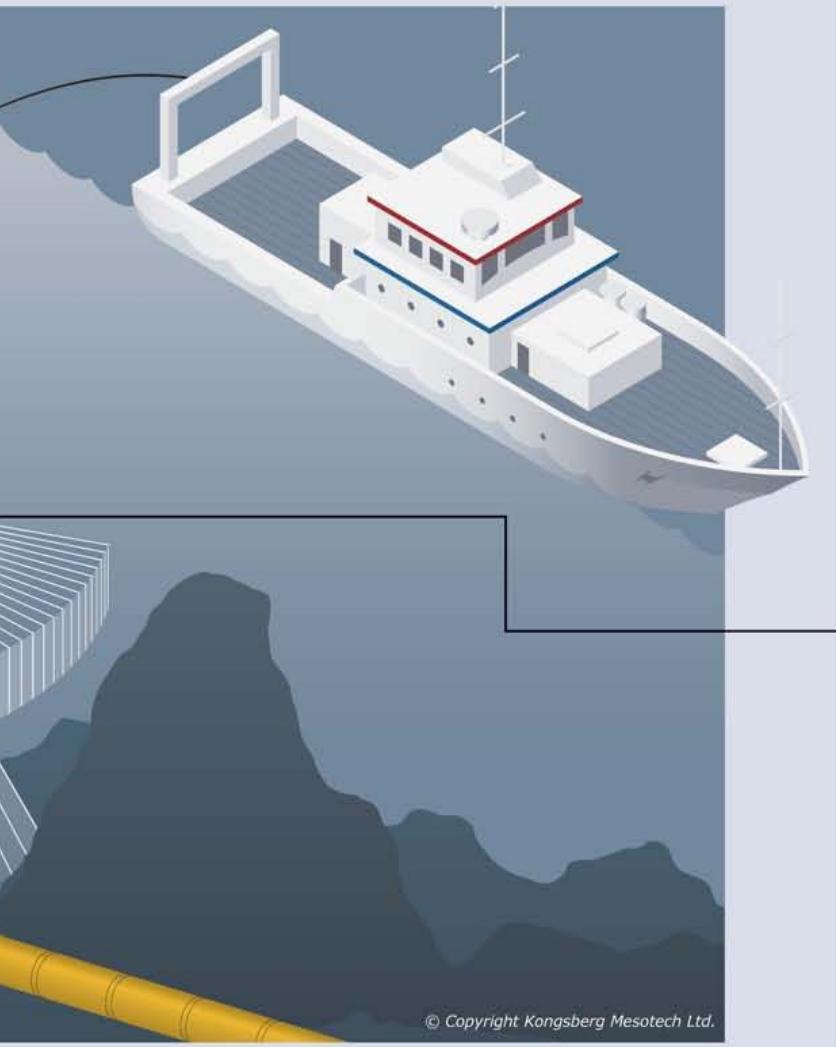


Intervention

M3 MultiMode Multi

- Versatility, with 1 cm resolution from 0.2 to 150 m using true beamforming
- Extreme shock and vibration resistance
- Maximum viewing width
- Rugged Pan-and-Tilt design
- Easier interfacing with host computers
- Compact and cost-effective

Instrumentation



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beam Sonar provides:
range resolution from
the zoom windows
vibration resistance
window with 140 x 30 degree viewing angle coverage
option expands viewing coverage
with other systems through Ethernet telemetry
effective sonar imaging



Obstacle Avoidance and Target Detection

The MS 1000

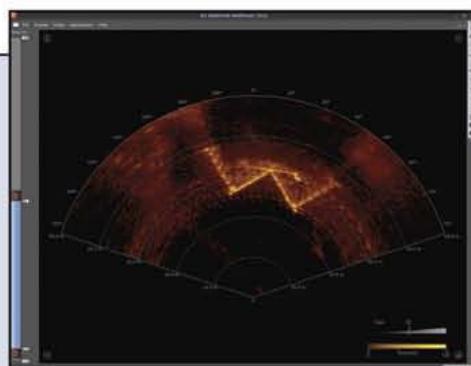
Scanning Sonar product range provides:

- A broad product selection depth-rated to 650, 1500, 3000, 4000, 6000, and 11000 meters
- A broad range of frequencies and “tunable” units to suit your application
- Reliable, low-maintenance units that minimize expensive ROV downtime
- Open standard telemetry options (Ethernet, RS232, RS485) with more freedom for users
- A range of connector choices to meet your requirements, simplifying installation and spare parts inventory



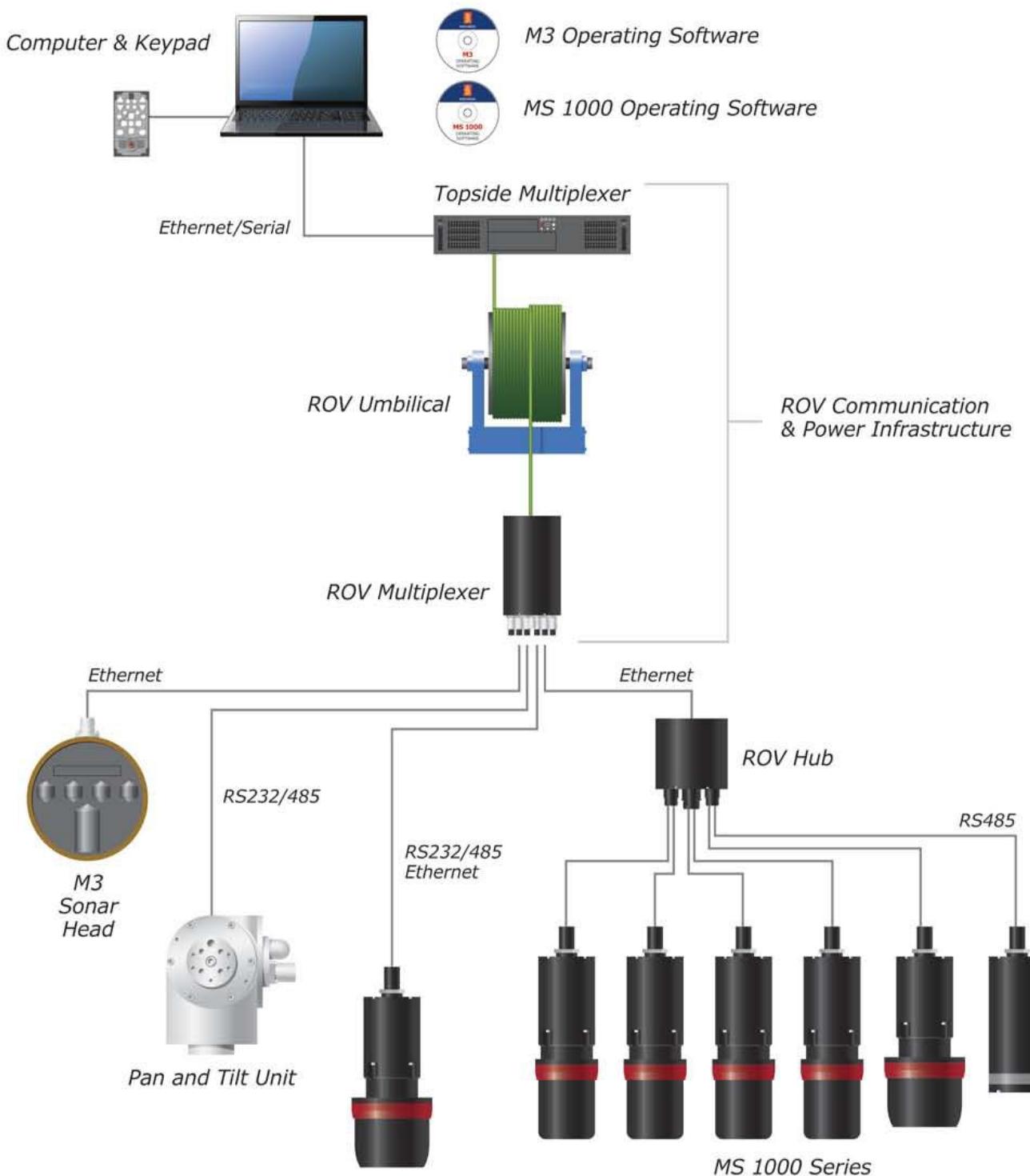
M3 Multibeam Sonar provides:

- The high refresh rate of conventional multibeam sonar with image quality comparable to scanning sonar
- Maximum viewing window with 140 x 30 degree viewing angle coverage
- Sonar-based close range viewing capability and long-range obstacle avoidance capability
- True zoom windows that enable target evaluation while continuing to fly the ROV
- Minimal electrical demand on the ROV based on 22 watts nominal power draw
- Operation on Observation Class ROVs



THE FULL PICTURE

Interconnect Diagram



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