

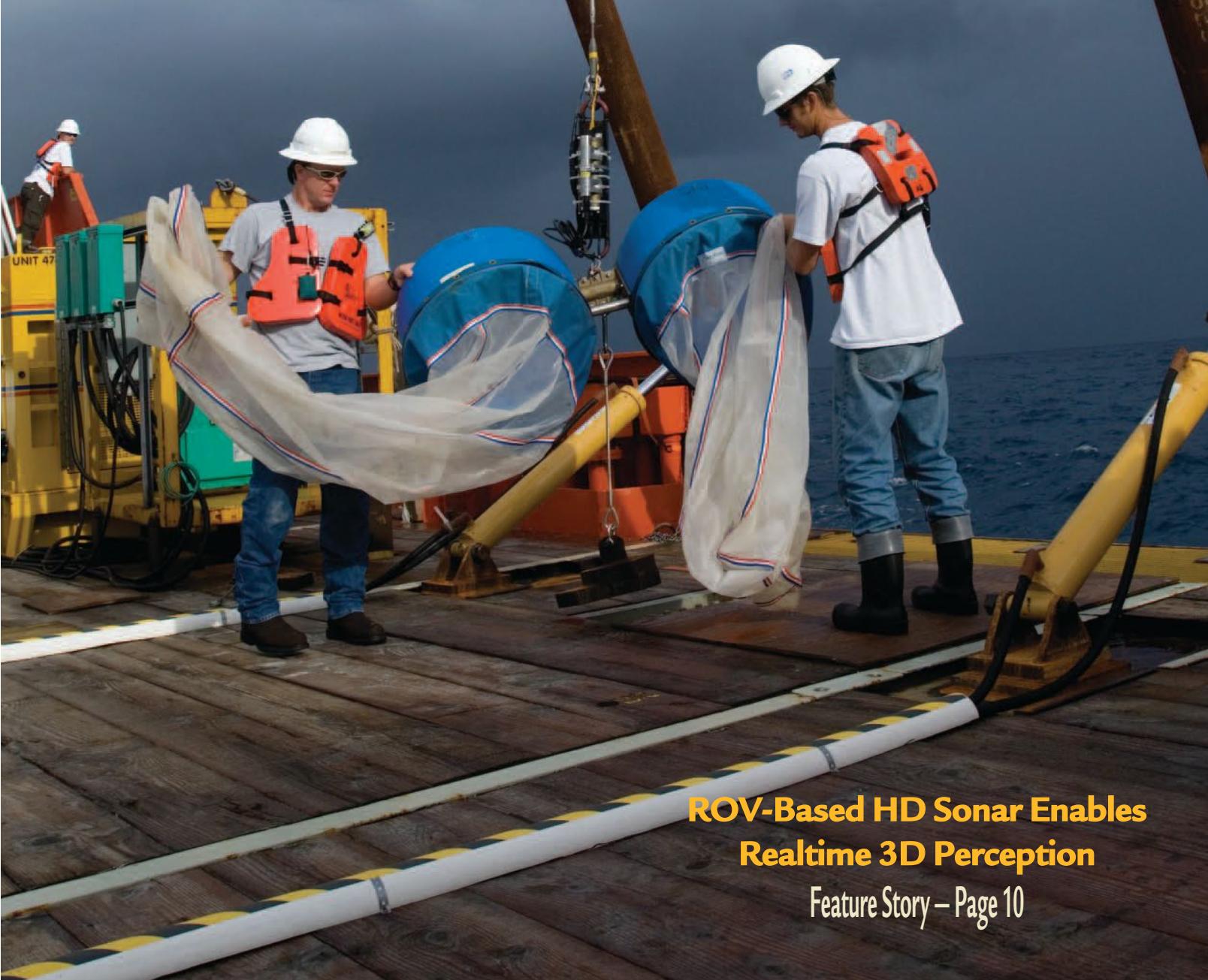
News for the Ocean Industry
Ocean

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News
& Technology

January/February 2012

Small ROVs Secure a Place in Aquaculture, Inspection and Oceanographic Work

With new technology and compact sensors, small ROVs provide increased capability



**ROV-Based HD Sonar Enables
Realtime 3D Perception**

Feature Story – Page 10



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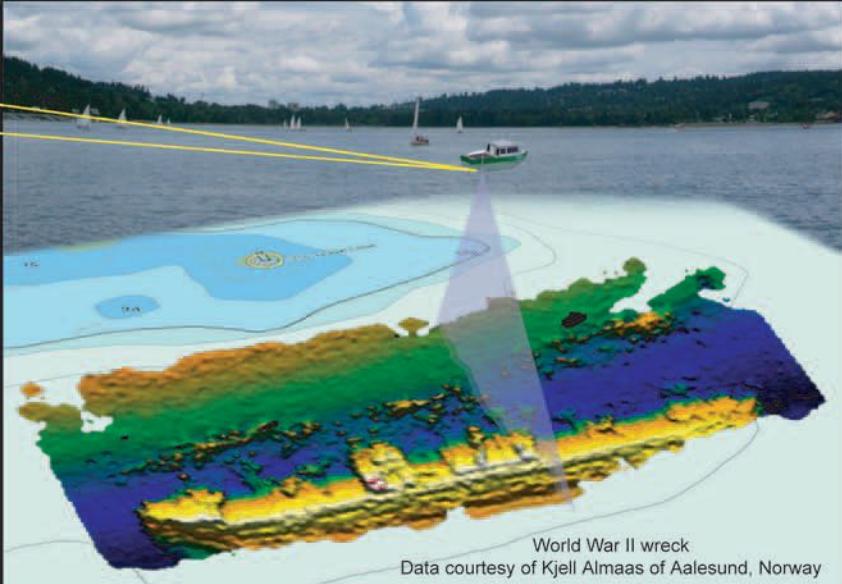
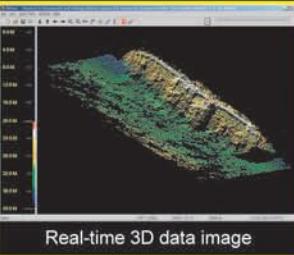
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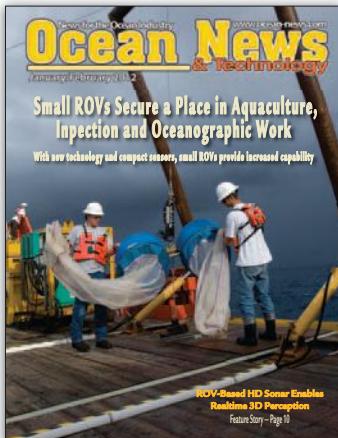
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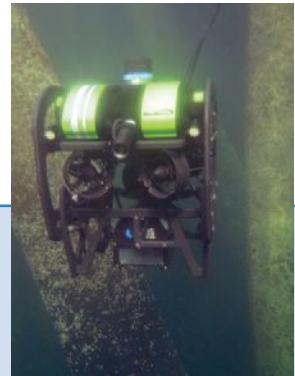
Cover Photo



Plankton Sampling Nets
Being Deployed in the Gulf
of Mexico.

Photo Courtesy of:
CSA International, Inc.

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By Dan White

Ocean News & Technology

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The 2011 Subsea Survey IRM Panel

This panel addressed some real issues relating to the ROVs of the next decade

Subsea Survey IRM was held in Houston 13-15 December 2011. The technical program was one of the best ever.

At the previous conference in 2010, a panel session was started to attempt to get a look at the future of the deepwater ROV.

The questions posed to the eight panel experts centered around "It's the year 2020, what does the deepwater oil and gas UUV look like?" I recommend you go back to the editorial published in the December 2010 issue (Vol. 16, Issue 9, pg. 8) and revisit the outcome of that panel session.

The reason for the question in the first place is that ON&T has seen a move towards "resident" UUVs using hybrid ROVs (part ROV, part AUV) for deepwater oil and gas operations. The argument is still the age old "the umbilical is the limiting component" for deepwater operations. Rising from this are designs that eliminate the umbilical from the equation and going to batteries and deepwater charging stations. Panelist Graham Hawkes made a bold statement that "if we were to design the very first ROV today, we would do it differently." He was referring to the great improvements in battery technology and fiber optic cables and electronics, which were not available in those days.

The panel discussions were fascinating, leaving the panel split over the answer to the original question. Some agreed the ROV would transform itself into a hybrid electric-powered vehicle that, in most cases, would live on the seafloor at the subsea field it was to support. The others believe that the ROV would not change much at all and would continue to operate just the way it has for years. There were arguments for and against either approach that left the answer up to the individual UUV developer. Clearly, both approaches will continue to forge ahead over the next decade.

The panel session was reconvened at the 2011 conference with some new panelists along with some of the previous. It included Ian Griffiths (SMD), David Medeiros (Oceaneering), Norm Robertson (ROV Product Services), Jason Stanley (Schilling Robotics), Michael Donavon (Buefin Robotics), James McFarlane (ISE), Steven Kopits (Douglas Westwood), Dan McLeod (Lockheed Martin), and Chris Roper (representing Saab Seaeye). The panel session was moderated by Drew Michel.

This session took off on a whole new line of discussions that provided continuity with the last panel session while exploring new avenues. The main question posed by Michel was "What critical technologies need to be improved or developed

[to support the oilfield of 2020]?" A fascinating discussion followed.

Some technologies were discussed, but the panel quickly got to the heart of the matter. It is clear that there will be a shortage in skilled ROV pilots in the future. The best defense for this problem is to make the job of operating the deepwater ROV easier, eliminating the skills learned only from years of operating underwater vehicles.

How do you get a new operator up to speed quickly? How do you address the shortage of experienced operators that will come from the ROV boom predicted by Steven Kopits of Douglas Westwood?

The panel came to the conclusion that the only way to survive the upcoming shortage was to have commonality among ROVs such that any operator could move from one ROV to another without special training. To do this, "common standards" must be developed that can be adopted by all ROV manufacturers. This responsibility fell to the associations to develop.

David Medeiros stated that Oceaneering's ROVs are all headed in that direction so that any operator can operate any ROV in the fleet anywhere in the world.

Modular sensors developed to common standards were the next step. Then ease of operating the deepwater ROV would be improved by the use of 3D high-definition viewing systems combined with features like force feedback.

We tried that and it didn't work, you say. Well, the new technologies that are coming available in all of these areas are nothing like what came before.

Force feedback is an expensive and unnecessary option, you say. Not if you are going to have to use less-trained and experienced personnel.

The same goes for maintaining the vehicles, which must be built not only with common parts and standard interfaces, but must be modular so that a new technician only has to know how to replace an assembly, not take it apart and repair it.

A simple answer — maybe not. The associations face the challenge of common standards, while the manufacturers face the problem of operator shortage.

One solution in place with subsea hardware provider FMC is to take control of the ROV design (they now own Schilling) such that it interfaces seamlessly to its subsea field components and IRM capabilities are built-in.

Personally, I can't wait to reconvene the panel again in 2012.

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ROV-Based HD Sonar Enables Realtime 3D Perspective



By Jesse Rodocker, SeaBotix, and Joe Burch, Sound Metrics



ARIS Explorer 3000 HD Sonar using DIDSON technology (top). The vLBV in a structured environment showing the ARIS sonar, vLBV and Scanning sonar (bottom).

Living in a three dimensional world (3D) has taught our brains to see images in three dimensions, even though the observations that pass through our eyes are only two dimensional (2D). It's the slightly differing information contained in multiple 2D perspectives that allows us to extrapolate 3D images. The same concept is now being realized in underwater robotic work in zero optical visibility water using high-definition sonar.

Use of robotic systems such as remotely operated vehicles (ROVs) is ever evolving. There are numerous challenges when operating in an underwater environment – unstable conditions, poor visibility, hazardous structures, and unpredictable currents, to name a few. Beyond these environmental conditions, operating underwater can have task-specific requirements. A small, properly equipped maneuverable ROV can deal with most underwater environmental challenges and provide sufficient information for making decisions.

ROV systems are used to conduct surveys, search and locate targets, and collect data and/or physical samples as well as complete other tasks. Virtually all missions require some form of visual image collection. However, capturing optical data can often be difficult due to poor visibility. Water turbidity, poor lighting, and the inability to get within close proximity of the target are but a few of the obstacles.

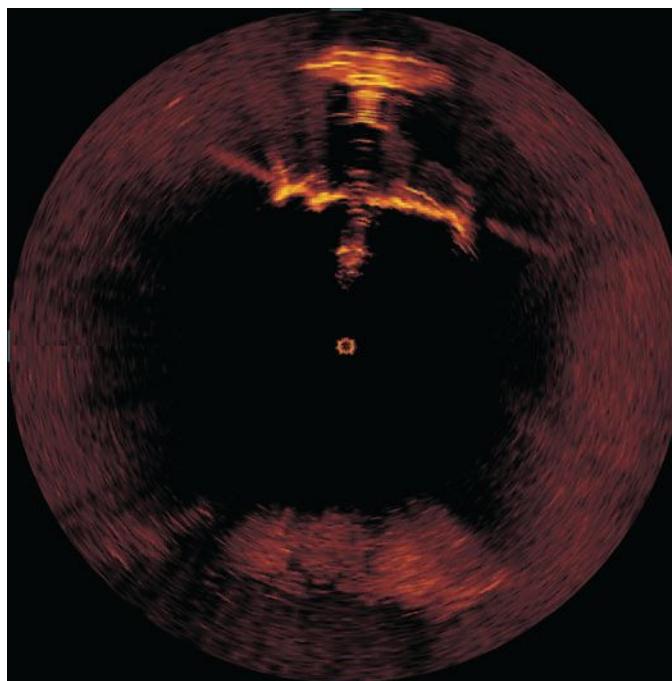
ROV systems today are fitted with increasingly improved optical cameras, bright lighting systems, and video enhancement technologies. However, when visibility is compromised by turbid water conditions, optics are often of little use. Light wavelengths are small compared to the size of suspended particles. These particles cause the light waves to be blocked, deflected, and scattered, yielding poor or no visibility of the target. However, sound wavelengths are large compared to these suspended particles, which in turn allows most of the energy to pass. Knowing this, underwater operations have long become dependent on sonar technology to not only locate, but also help identify targets in turbid water.

Scanning sonars have provided ROV operators a tool to help locate and navigate to targets. Once located, the targets can frequently be identified by an optical visual inspection. Added benefits of a scanning sonar is its full 360° scan sector that provides valuable situational awareness. Use of lower frequencies allows for longer ranges, and a single channel transducer can provide clean, low noise images. Improving the technology to a multi-beam imaging sonar provides fast image update rates, which allows real-time imaging from a moving platform and/or moving targets. Rather than an operator having to interpret low-resolution scanning sonar data, they may now be provided with more video-like imagery.



The ARIS is mounted to a skid that can be tilted up or down 15° depending on mission requirements.

Light Work Class ROVs



Tritech 360° scanning sonar image of plane wreck demonstrating situational awareness and large area coverage. Range is 30 meters.

The performance of an imaging sonar is determined by a number of specifications, most notably the operating frequency, acoustic beam width, and dynamic range. Generally speaking, a lower frequency increases the distance at which an object can be detected, whereas higher frequencies and smaller beam widths deliver clearer images and higher definition at closer ranges.

Sound Metrics, the creators of the high-resolution DIDSON (Dual-frequency IDentification SONar) lens based multi-beam sonar has developed their next generation sonar, ARIS (Adaptive Resolution Imaging Sonar). The ARIS uses the same DIDSON technology to beamform crisp, clear images at the speed of sound through acoustic lenses. ARIS models include the Explorer 1200 (1.2 and 0.7MHz frequencies), the Explorer 1800 (1.8 and 1.2MHz frequencies), and the all new Explorer 3000 (3.0 and 1.8MHz frequencies). Sound Metrics is introducing a whole new category of High Definition Sonar imaging with the Explorer 3000. Its improved image clarity is the result of increasing the physical transducer count by 30% and using a new lens prescription that produces finer resolution from each transducer. All the DIDSON Technology sonars offer a lower frequency used for object detection along with a higher frequency for identification imaging.

SeaBotix Inc. has developed a new class of MiniROV systems with the 2011 launch of the vectored Little Benthic Vehicle (vLBV). The vLBV was the culmination of years worth of field operations, client feedback, and development. Vectored platforms offer a number of advantages over conventional ROVs, including greater stability, increased maneuverability, enhanced capability, and improved sensor payload. By placing four thrusters in a vectored configuration, the ROV can maneuver around objects in more demanding conditions. All these features of the vLBV have been realized in a system weighing only 18kg, which does not require any special deployment/handling equipment.

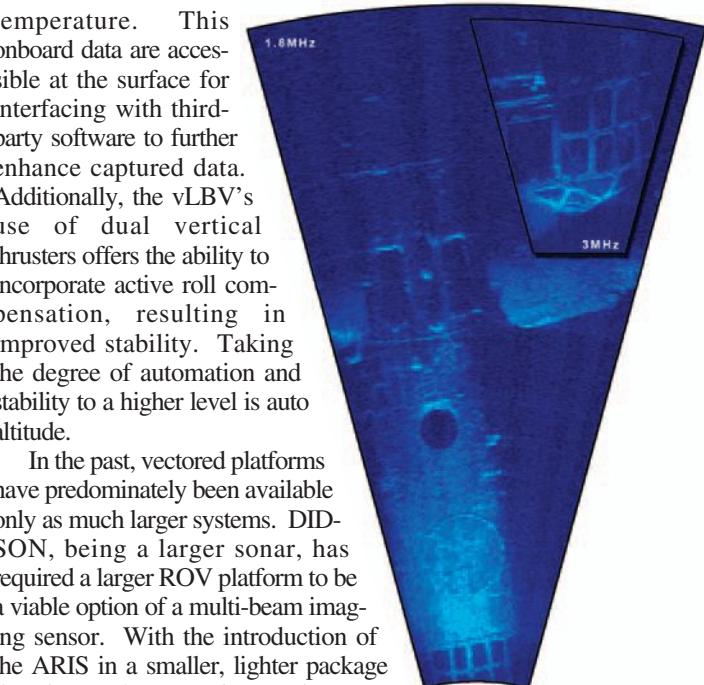
Expanding on the vLBV's mechanical capabilities are built-in high resolution sensors, including pitch, roll, heading, depth, and

temperature. This onboard data are accessible at the surface for interfacing with third-party software to further enhance captured data. Additionally, the vLBV's use of dual vertical thrusters offers the ability to incorporate active roll compensation, resulting in improved stability. Taking the degree of automation and stability to a higher level is auto altitude.

In the past, vectored platforms have predominately been available only as much larger systems. DIDSON, being a larger sonar, has required a larger ROV platform to be a viable option of a multi-beam imaging sensor. With the introduction of the ARIS in a smaller, lighter package than its predecessor, integration onto smaller ROV systems like the vLBV is now possible.

Combining their strengths, SeaBotix and Sound Metrics have set out to augment ROV-based sonar applications. The vLBV provides the stable, capable platform and the ARIS delivers clear, high-definition sonar imagery.

Now getting back to three dimensional thoughts as they pertain to the observer of ROV-captured data. All the sonars mentioned above produce data in two dimensions; range and cross range. Range is the radial distance away from the ROV, and cross-range is measured left and right of the center axis in front of the ROV. The challenge is to quickly perceive vertical information about a target



Low and high frequency scans of plane wreck



Rolling sonar provides 3D perception

Feature Story

(the third dimension). This provides differing perspectives of an object, allowing the brain to do what it does naturally – interpret the visual information into 3D imagery. Rolling the sonar 90 degrees slowly about the forward axis of the vehicle is how the observer is provided with differing two dimension perspectives. Rolling the sensor exchanges horizontal left right target information for images showing vertical target information. This gradually transitions from the usual apparent top down perspective through a 90° roll into an apparent side perspective of the object, which yields the depth perception. The observer's brain has just integrated the varying 2D sonar views into a natural 3D perspective of the imaged object without any conscious effort.

An operator can now stand off a target and with confidence, capture real-time, high-quality imagery in black water conditions. This roll capability enables measurements of objects in all three dimensions from accurate sonar data. This roll capability also provides the operator with the ability to match sonar orientation to the slope of the terrain. By rolling the sonar to become parallel with the terrain, the sonar image quality can be maximized. Rolling the sonar allows for terrain matching of the image to surfaces in any orientation, from horizontal to vertical.

Incorporating a variety of technologies and sensors into a single system presents a variety of opportunities. The vLBV fitted with a scanning sonar, ARIS imaging sonar, acoustic positioning, optical camera, grabber, and lighting is a formidable tool for a diverse range of missions. A scanning sonar provides the longer

range, 360° coverage to locate and navigate to targets where the ARIS provides high-definition imagery and accurate dimensional information. The optical camera and lighting provides real-time visual data where conditions permit and the grabber offers possible object recovery.

The possible applications are vast in number. Operators can use the system to search for objects such as mines, where the added height (Z-axis) information can be used to more accurately identify and classify the target. There is also broad area search capability coupled to ultra-fine image detail on a stable platform that can operate in demanding environmental conditions.

To better understand the concept of rolling the ARIS sonar to create a 3D perspective, a video has been created.

Visit www.seabotix.com/products/vlbv_aris_roll.mov to view the video in real time.

For more information on the vLBV visit www.seabotix.com/products/vlbv300.htm. For more information on ARIS sonars, visit www.soundmetrics.com.



seabotix.com



soundmetrics.com



.....ARIS video

The advertisement features a large, dark, rectangular sonar unit with a blue circular logo containing a stylized wave pattern and the word "ARIS". The logo is located on the front panel, with "EXPLORER 3000" printed below it. To the left of the unit, the "SOUND METRICS" logo is displayed, consisting of a blue circular icon followed by the company name in white capital letters. Below the main unit, a smaller rectangular badge reads "DIDSON TECHNOLOGY". At the bottom left, the website "soundmetrics.com" is written in blue. On the right side of the ad, the word "ARIS" is written in large, metallic, 3D-style letters. Below this, a text box contains the text "Next generation DIDSON Technology in a compact Dual-Frequency Sonar". To the right of the text box is a blue-toned sonar image showing a circular object with internal structures. In the bottom right corner of the image, the text "Tire with rope at 3.0 MHz" is visible. At the very bottom right, the text "Visit us at OI 2012 in Booth F305" is displayed.

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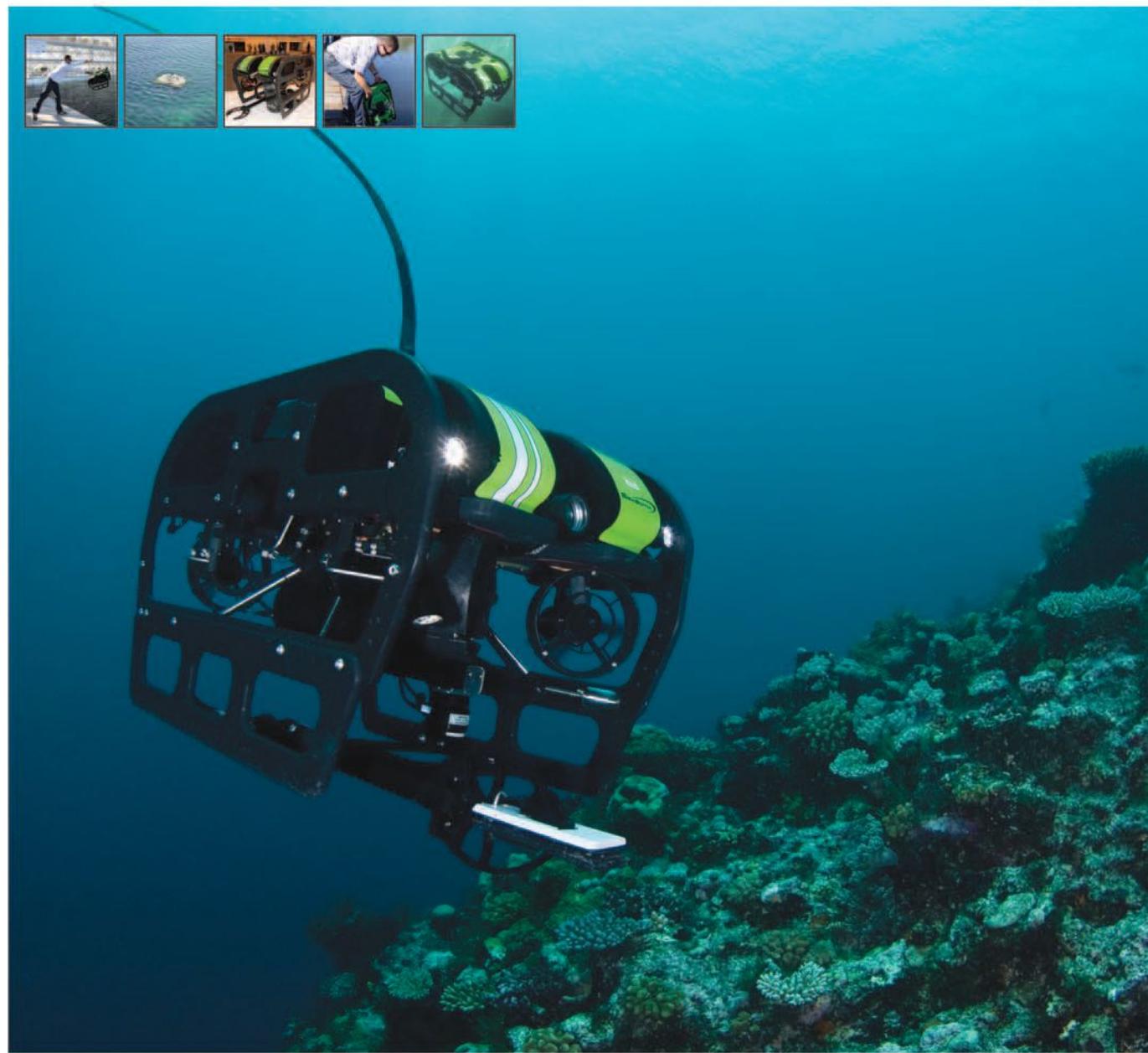
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OCEAN INDUSTRY

Australia's military finds WWII Japanese submarine

A Japanese World War II (WWII) submarine wreck was found partially buried in the seabed of a Papua New Guinea harbor during a search for unexploded munitions, Australia's military said.

HMS Gascoyne, a mine hunter of the Australian Navy, has discovered a Japanese submarine of WWII vintage lying in the Pacific Ocean at a depth of 55m while working in the area to clear WWII-era explosives. The location is in the Simpson Harbor off the coast of Rabaul, an outpost off the South Pacific. Simpson Harbor is in the town of Rabaul, which was a major Japanese military base on the northeast coast of the South Pacific nation.

The wreck is partially buried in sand, but upright. Australian Navy historians concluded from underwater images that the wreck is Japanese, the statement said. The Royal Australian Navy will now work with Japanese authorities to assist in determining the wreck's identity.

Experts reviewing the underwater photos believe the wreck is a Japanese midget submarine, which were transported by ship or larger submarines and used covertly to infiltrate enemy targets, including Pearl Harbor in Hawaii and Sydney Harbor. Such a submarine could have been destroyed by an American air raid or naval bombardment or even scuttled by the Japanese toward the end of the war.

Bellamare and TrakLogik sign joint development agreement for developing an advanced underwater imaging system

Bellamare, a Californian center of excellence in the field of subsea engineering, and TrakLogik, a San Diego-based developer of innovative pattern-recognition technologies, announced the formation of a strategic alliance to position both companies to capture the next generation unmanned and manned underwater video digital signal processing products.

The main focus of the first project is developing a novel integrated system for monitoring plankton distribution in the Pacific and Atlantic Oceans. Current technologies available for the study of many zooplankters remain limited in comparison to the spatial-temporal resolution and data acquisition rate available for physical oceanographic measurements. To address these issues, Bellamare had designed a towed, very high-resolution digital imaging system that is capable of sampling large water volumes sufficient for accurate quantification of plankton *in situ*.

The optical system combines state-of-the-art digital imaging and computer technologies (e.g., incorporating machine vision technology) with a shadowgraph light scheme. The images are high quality, enabling clear identification of organisms (e.g. larvaceans, gelatinous zooplankters, chaetognaths and larval fish), often to family or generic level.

TrakLogik, a high-tech company developing the state-of-the-art tracking algorithms, provides mathematical solutions, software, and eventually a hardware design, for recognizing plankton species in the underwater video. Because of the variety of shapes, sizes, and orientations of marine species, plankton identification is an overwhelmingly challenging problem.

For classification, they use a unique combination of semi-analytical methods for generalization of image patterns, with the diversity-oriented recognition technology based on Radial-Based Neural Network, with dedicated compact hardware available from their partner, CogniMem Technology, for real-time recognition.

The two companies are targeting a number of products and programs in both scientific and commercial areas. Their first jointly developed solution is expected to be completed by mid-2012.

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BlueView secures integration agreement with Outland Technology

BlueView Technologies, the world leader in compact acoustic imaging and measurement technology, and Outland Technology, Inc., an ROV manufacturer in Slidell, Louisiana with a combined 60+ years in electronics and undersea work, signed a Systems Integrator Agreement that enables Outland to re-sell BlueView 2D and 3D products on Outland ROVs. Outland has a long history of designing and manufacturing a broad range of high-quality underwater video and audio products using high-volume components adapted for specific applications. BlueView's compact, real-time multibeam imaging sonar systems will expand Outland's ROV capabilities by enhancing low and zero visibility operations.

Optimarin signs a BWT systems framework agreement with DOF

Optimarin, the provider of simple and flexible Ballast Water Treatment (BWT) systems for the global maritime industry, has signed a framework agreement with DOF for the delivery of BWT systems. The agreement establishes the terms governing contracts to be awarded within 2012 to 2015, in particular price and delivery. The bulk of the contracts are retrofit, but Optimarin confirms options for newbuildings. DOF is a major international group of companies that own and operate a modern fleet of 75 PSV, AHTS, CSV and Subsea ROV vessels.

Greenpeace and Palau bust pirates in Palau shark sanctuary

Palauan fisheries officials have boarded and detained a Taiwanese fishing vessel suspected of illegal fishing activities during a joint patrol with Greenpeace of the Pacific Island nation's exclusive economic zone. The Greenpeace ship Esperanza and the Palauan patrol boat, PSS President H.I. Remeliik, are currently escorting the vessel Sheng Chi Hui to port. A Greenpeace helicopter flight spotted the sharks and fins on board the Sheng Chi Hui on the morning of 8 December, while the fishing vessel was inside Palau waters – which were declared a shark sanctuary in 2009. Between 21% and 46% of all fishing in the Western Central Pacific Ocean is thought to be illegal, unregulated and unreported.

ADCI scholarship award recipients for 2012

The Association of Diving Contractors (ADC) has announced the 2012 scholarship winners.

The first recipient was Kimberly Mellon, of Woolwich, NJ. The sponsoring company was Commerce Construction Corporation.

The second recipient was David J. Furka, of Lafayette, LA. The sponsoring company was Fugro Chance.

Congratulations to both students, who will be entering their freshman year of college this fall.

Each recipient will receive \$4,000 toward educational costs. A special thanks to Dori Ritter, (Chairperson of the ADCI Scholarship Committee) and the rest of the committee members for their outstanding selections.

Seanic announces new location

Houston-based Seanic Ocean Systems (Seanic) is excited to announce they have moved to a new and much larger facility. "We believe this facility is well suited to meet our customers growing demand to

repair, maintain, and store their intervention tooling," said Tom Ayars, president of Seanic. "It also gives us the capability to take on larger projects and comfortably host client representatives while each project is underway."

"To celebrate the move, we invited our valued customers and trusted vendors to a Holiday Open House on 8 December," said Karen North, Business Development. "As a small but rapidly growing company we recognize that without their continued business and support, our expansion would not have been possible."

Seanic is based in Houston, Texas and was formed to address the growing demand for simple, rugged, and reliable subsea tooling for remote intervention. Along with engineered solutions, Seanic also offers experience in the design, manufacturing, storage, repair, and maintenance of subsea products. Seanic provides a standard product line of ROV tooling worldwide, such as torque tools, FLOT's, standard and zero leak hot stabs, manifolds, buckets, and ROV interface panels just to name a few. Seanic's facility is ideally suited to provide an effective



team-based environment for meeting customer's needs.

For more information, visit www.seanicusa.com.

RBG introduces new dive intervention craft

RBG, the leading provider of assess, inspect, and repair (AIR) services to the global energy industry that was recently acquired by Stork Technical Services (STS), has enhanced its subsea service capability with the launch of two purpose-built dive intervention craft (IC).

RBG invested around £2million in the ICs, which will support the delivery of specialist marine and subsea services, including subsea intervention, air and nitrox diving, survey and light ROV work, throughout RBG's global operations. In the coming

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weeks, the ICs are being deployed for a number of integrated subsea IRM (inspection, repair, and maintenance) activities, both inshore and offshore.

The ICs are equipped with a range of advanced technology, such as a bespoke diver recovery system and software based dive management systems, that have been specifically designed to provide a safe operating environment for the divers and crew onboard.

The ICs offer a stand-alone shallow water diving solution up to depths of 50m and can operate at ranges up to 150 nautical miles offshore. The craft can also be launched by a bespoke davit system from the RBG chartered Olympic Triton vessel to allow continuous onsite diving, which provides significant efficiency and logistical benefits to customers. The ICs provide a flexible alternative to dive support vessels for maintenance and survey activity, which often have restricted access to areas around rigs and FPSOs.

For more information, visit www.storktechnicalservices.com.

DNV and KEMA create a world-leading energy and sustainability company

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

DNV and KEMA will form a world-leading energy consulting, testing, and certification company that can drive the worldwide transition towards a safe, reli-

able, efficient, and clean energy ecosystem. DNV KEMA will consist of all 1,800 KEMA employees and 500 employees from DNV's renewable energy and sustainability activities. The new company will be led by Thijs Aarten, CEO of KEMA, and headquartered in Arnhem, The Netherlands. Aarten will report to a supervisory board chaired by DNV CEO Henrik O. Madsen.

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

The global energy sector is heading toward significant changes and investments. The International Energy Agency (IEA) estimates that \$10 trillion will be spent between 2010 and 2030. Stricter environmental regulations and increased

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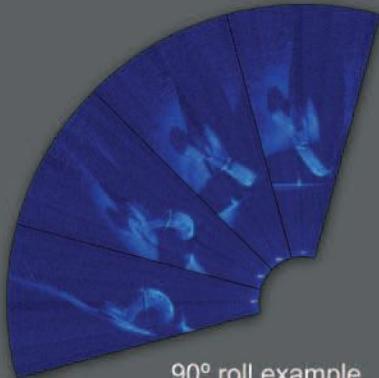
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fuel costs will drive a transition towards cleaner fossil fuel and more cost-effective power generation. This transition, including that towards integrating more renewable power into the energy grids, will require system-wide changes. In the U.S.,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

For more information, visit www.dnv.com.

Ashtead Technology launches new Integrated Technical Services Group

Subsea equipment rental specialist Ashtead Technology announced the launch of a new Integrated Technical Services Group as a key part of its strategic growth strategy. The launch of this diversified service offering will include enhanced capabilities for bespoke systems integration, equipment maintenance, and repair in the field. This will be supported by substantial investment in new equipment and modern calibration facilities through a network of regional offices around the globe.

To support this new offering, significant investment has also been made in strengthening the senior management team in Aberdeen, with new personnel joining the company, including Ross Macleod, Mark Ellington, and Craig Towers. These are well known and highly respected individuals in the offshore services sector and will, without doubt, contribute hugely to the development of the new group.

Based in Aberdeen, with regional offices in Singapore and Houston and agencies in Norway, Dubai and Australia, Ashtead Technology is a leading provider of equipment for the global subsea construction and maintenance market.

In recognition of changing client requirements, Ashtead Technology has made this move to offer an enhanced service that delivers significant added value and is designed to simplify and increase efficiency in offshore operations.

This investment in people and capability is a natural step in Ashtead's long term commitment to the global offshore industry, strategically positioning the business for the long-term both in the oil and gas and the emerging renewable energy markets.

Ashtead Technology is currently developing new facilities and recruiting additional technical and sales personnel at a number of levels worldwide.

For more information, visit www.ashtead-technology.com.

Harris CapRock announces AssuredCare™ program

Harris CapRock Communications, the world's largest provider of fully managed communications for remote and harsh environments, announced it is finalizing development of AssuredCare™, its comprehensive customer service and network management program. The AssuredCare program will enable Harris CapRock customers to have improved real-time visibility in their global communications. AssuredCare combines highly trained customer service personnel, extensive support infrastructure, proactive monitoring systems that automatically detect more than 80% of potential network issues enabling immediate resolution, and a best-in-class customer portal. AssuredCare integrates best practices and capabilities from all four organizations that combined to form Harris CapRock in April 2011.

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View with WIDE-i SeaCam® shows cable wrapped around shackle.

ABS Chief Executive warns on class move into ship design

ABS President and CEO Christopher J. Wiernicki has warned that a move into ship design by some class societies creates a fundamental conflict of interest with their role as independent providers of safety approval and certification. Wiernicki used his keynote address at the Houston Mare Forum USA conference to question the rationale of some class societies in promoting energy-optimized designs created in-house, a development he described as "deeply troubling." Wiernicki said the issue went to the heart of the underlying principle for classification, yet he was surprised to have heard no other voices questioning the growing intrusion of class into an area of ethical quicksand.

Increasing energy efficiency in offshore shipping

A project has been established to identify energy efficiency and fuel-saving initiatives for the offshore shipping industry. The partnership involves a collaboration of 8 Norwegian offshore shipping companies. The Joint Industry Project is called Energy Efficient Offshore Partners and consists of BOA Offshore, Eidesvik Offshore, Farstad Shipping, Gulf Offshore Norge, Havila Shipping, Siem Offshore, Solstad Offshore, and the classification society Det Norske Veritas (DNV) who is project manager. The project aims to identify and implement best practice solutions with regard to energy efficiency, acknowledging that the synergies between energy efficiency and environmental impact will be a competitive advantage for the partners. With the knowledge that the offshore industry can reduce emissions, the partners recognize that there will be a much greater impact through working together as a co-operation than individually.

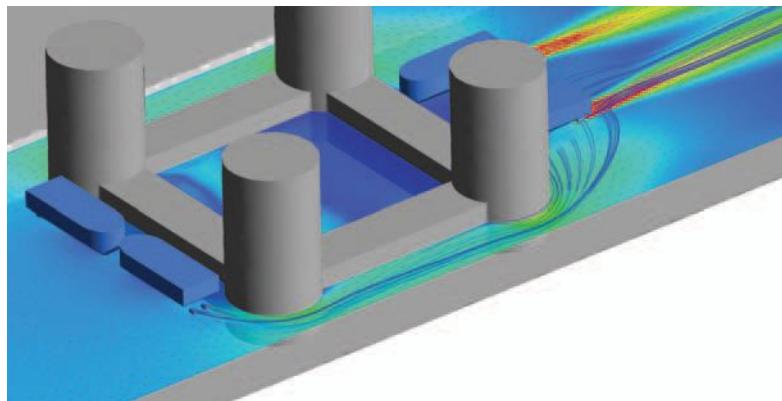
World's largest heavy lift vessel to be classed by DNV

Dockwise's new heavy lift vessel, the Dockwise Vanguard, will be able to lift and transport units of up to 110,000 tonnes. The maximum capacity of an existing vessel is 75,000 tonnes. With its width of nearly 80m and length of 275m, this is the first semi-submersible heavy lift vessel to be built in accordance with DNV's new class rules for this type of ship. The vessel has no forecastle, which allows it to carry cargo of "unlimited" length. Its deckhouse is mainly positioned outside its hull, allowing it to carry 70m wide cargo.

ABS Group concludes acquisition of Safetec Nordic AS

ABS Group of Companies, Inc. concluded its acquisition of Safetec Nordic AS, with a signing ceremony attended by senior ABS, ABS Group, and Safetec management in Trondheim, Norway, on 5 January, 2012. ABS and ABS Group Chairman, Robert D. Somerville, ABS vice president David Weinstein, ABS Group CEO and president Tony Nassif and ABS Consulting president David Walker joined Safetec CEO Jan Morten Ertsaas, Safetec board chairman Jon Daniel Nesje, and Professor Jan Erik Vinnem to sign the agreement bringing Safetec into the ABS Consulting organization.

BMT to provide tow simulation services for Chevron's platforms



Hereema Marine Contractors Nederland B.V Inc. (HMC) has awarded a contract to BMT Fluid Mechanics in partnership with BMT ARGOSS to provide tow simulation services for the inshore tow of Chevron-operated Jack St. Malo and Big Foot production platforms to be installed in the Gulf of Mexico.

BMT will be engineering, procuring, installing, and commissioning a purpose-built simulation facility to be located in Houston, Texas for the purpose of training tug captains and other marine personnel involved with the inshore towing of the platforms from the Ingleside integration yards. The inshore tows are particularly challenging because of the extremely small hull clearances within the shipping channels leading from the yards out to the Gulf. Up to five independently controlled tug boats will be effectively, rigidly coupled to the hull to perform the 15 mile wet-tows.

BMT's PC Rembrandt real-time maneuvering training software will be the basis of the simulator. The simulator will provide a realistic hands-on facility for tug captains to develop safe operating strategies for the tow and develop rational weather and tide operating limits.



The delivery of the project relies heavily on BMT's extensive experience with shallow water hydrodynamics, maneuvering simulation, hydrodynamic model testing, and

Computational Fluid Dynamics (CFD). A comprehensive experimental and numerical study of the maneuvering characteristics will be performed initially, followed by integration of the data into, and customization of the PC Rembrandt simulator.

BMT has unique experience in providing valuable expert knowledge and support to the project, having successfully provided towing simulation services for the inshore shallow water towing campaigns of BP's Thunderhorse and Atlantis semi-submersibles through the same channels.

For more information, visit www.bmt.org.

M Ship Co. thinks "Outside the Box" with new approach to hull testing

Hull testing literally has been taken out of the box and into the open ocean with M Ship Co.'s new Rapid Empirical Innovation (REI) program. The REI approach allows scaled-down hull models of recreational and racing sailboats, motor vessels, and cargo and military ships to be towed in real-life weather conditions by a self-powered FLOWT (fast, low-cost, open-water testing) platform rather than by a traditional towing mechanism used in a controlled indoor basin or tank. Among other advantages, the REI program saves designers, naval architects and boat builders 50% to 80% of the cost that it would take to utilize a conventional tow tank, without sacrificing accuracy or waiting for tank access.

"The REI program certainly is an unconventional approach to conventional tank testing," said M Ship Co. Executive director and co-Founder Bill Burns, describing the FLOWT platform's 20-ft pontooned hull, which — with its knife-edged hulls, multiple computer work stations, and various adaptable structures — looks something like an inspired Lego® design while underway, "but the implications of it are of far-reaching importance to the people who shape our industry."



Burns explained that two hull models can be evaluated in tandem, providing immediate and direct hull-to-hull comparisons. After the hulls are fabricated, they are outfitted with identical high-frequency 6-DOF accelerometers that provide comprehensive motion and acceleration comparisons. The models are then tested on the FLOWT platform, which provides real-time force, trim, and acceleration measurements and allows the hulls to be analyzed on power, speed, payload, fuel efficiency, range capability, and ride quality.

"We can offer test programs that can use a constant baseline with a new design or test two new designs at the same time," said Burns. "Fully instrumented, rough water testing at the same time is unique and offers immediate and unequivocal comparison of ride quality performance between designs."

M Ship Co.'s REI program has tested a range of vessels, including catamarans, displacement monohulls, advanced planing hulls, and submersibles. In addition to optimizing design for ride quality, speed, and fuel efficiency, its applications include validating CFD and untested claims; comparing different designs with instant results; developing a unique design for market differentiation; and proving concepts for patentability and investment.

Accuracy of the REI program's data has been validated at the U.S. Navy's David Taylor Model Basin, one of the largest ship model basins in the world, where it was re-analyzed in both smooth and rough water.

"The REI results exceeded our 95% threshold," said Burns. "The REI calm water resistance measurement has been shown to have an absolute accuracy of 4% at 5 knots model scale and improves to 3% at 15 knots model scale. The results are well within the scatter range you would expect between different tow tanks."

M Ship Co., an award-winning naval architecture and research firm with offices in San Diego, California, and Newport, Rhode Island, is no stranger to thinking outside the box. In fact, its reputation has been made developing transformational solutions for the maritime industry. Its proprietary, globally patented M-hull® technology has been applied to, among other projects, the development and building of the U.S. military's radical, high-speed futuristic ship, the M80

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Stiletto, which was contracted in 2004 as an operational experiment for the Pentagon's Office of Force Transformation and went on to be deployed in active duty service where she successfully conducted counter-illicit drug trafficking operations with USSOUTHCOM in the Caribbean.

For more information, visit <http://mshipco.com/>.

Waste heat is the key to reducing fuel consumption and emissions

Steadily increasing fossil fuel prices, and the future scarcity of fossil fuels in combination with an increased environmental awareness by ship owners and local and harbor authorities, throughout the world has compelled for ecological and sustainable technology to reduce the environmental impact during ship operations. Voith developed a solution.

Voith has developed a new technology in order to respond to the concerns of global warming and its impact on the society: "Voith SteamTrac", a compact, state-of-the-art modern waste heat recovery system for combustion engines

used in marine applications as well as for rail, road, and industry applications, achieve a significant reduction of fuel consumption and emissions of toxic and hazardous gases i.e. carbon dioxide). Apart from its ecological advantages and lower fuel consumption, the SteamTrac system also enhances the economy of ship's drivelines.

The operating principle of the system can be resumed as follows: the heat from the exhaust system is used to warm the operating medium in the evaporator to superheated steam. The steam is expanded into the expander and generates mechanical energy that can be fed back into the combustion engine's crankshaft or to a gearbox power take in (PTI). The operating medium is liquefied downstream the piston expander in a condenser followed by storage into an operating medium tank. The entire process is controlled and monitored by a control module.

"The effect is significant and appeals to many ship owners," says Marcel Flipse, Executive Vice President of Voith Turbo Marine SteamTrac B.V. based in Twello, The Netherlands, which

was newly founded on 1 October 2011. In the future, the new company will sell Voith SteamTracs all over the world. Flipse underlines that the new technology is suitable for both new marine developments and retrofits. "In principle, SteamTracs can be installed to all combustion engines."

Possible marine applications are inland waterway vessels, short sea ships, fishing boats and ferries.

Voith Turbo, the specialist for hydrodynamic drive, coupling, and braking systems for road, rail, and industrial applications, as well as for ship propulsion systems, is a Group Division of Voith GmbH.

Voith sets standards in the markets energy, oil and gas, paper, raw materials, and transportation and automotive. Founded in 1867, Voith employs almost 40,000 people, generates €5.2 billion in sales, operates in about 50 countries around the world and is today one of Europe's largest family-owned companies.

For more information, visit www.voithturbo.de.



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Navigation Buoys Out with the Old and In with the New

By Ashley Tasker, Vice President of Marine, Trelleborg Offshore

The size and diversity of the offshore surface marketplace makes it one of the most demanding environments to work in. It is a global market covering numerous activities across the offshore oil and gas industry and, as such, requires high performance and reliable technology, particularly in these challenging economic times. This article explains how the latest developments in navigation buoyancy technology offer a practical and cost-effective solution that is making the fundamental problems associated with traditional systems a thing of the past.

Navigation buoys play a vital role in the offshore world; they are the road signs of the sea, providing safe passage against the dangers hidden below the water. Therefore, the performance of these buoyancy aids is crucial to ship safety, and systems must prove to be reliable, stable, and durable, standing the test of time.

While navigation buoyancy systems have traditionally been constructed with high-maintenance steel hulls, cheaper plastic rotationally molded buoys have become popular recently. However, this trend is now being tested due to the realization of worrying performance issues, particularly when sited in exposed locations.

Steel buoys, which have been used for more than 100 years, are very heavy, difficult to handle and manage, and have high maintenance requirements resulting in the need for them to be brought ashore for refurbishment every four years.

Furthermore, with the current economic climate continuing to set the agenda across much of the offshore industry, both high levels of planned and unplanned maintenance, together with in-service failures of alternative technologies, are proving to be a major cause of concern.

Out with the Old

With advances in materials technologies came alternatives to traditional steel. There are now typically four main hull types used in buoy construction — steel, rotationally molded, GRP, and Elastomer Foam. Popular materials used for the superstructure have always been steel, aluminum, plastic, and marine ply wood.



While these different materials each offer their own specific benefits, they also come with a number of worrying disadvantages. For example, while steel hulls are durable, providing an extremely long life, they are high maintenance and require specialist repair and handling equipment.

Rotationally molded buoys, on the other hand, are lightweight, require little maintenance and have a low purchase cost, but they can be easily damaged by impact and UV. Also, with the service life history of these products now available to the industry, certain failings are found to occur in service, such as stress cracking of sectional "joined" hulls and superstructure failures.

For example, repair of damaged sectional hulls may seem to be a low cost option as only the damaged piece appears to need replacing. However, the reality is somewhat different. More often than not, due to the properties of the plastic material used, the "new" piece does not actually fit into the space leading to cracking of the sectional hull; instead a full replacement is usually the only durable option.

Whole Life Costs

So with service and performance history now becoming available to the industry, more and more authorities are not willing to sacrifice longevity and durability of service for initial purchase cost and, in many instances, are reverting to steel buoys, setting up maintenance processes to enable refurbishment requirements.



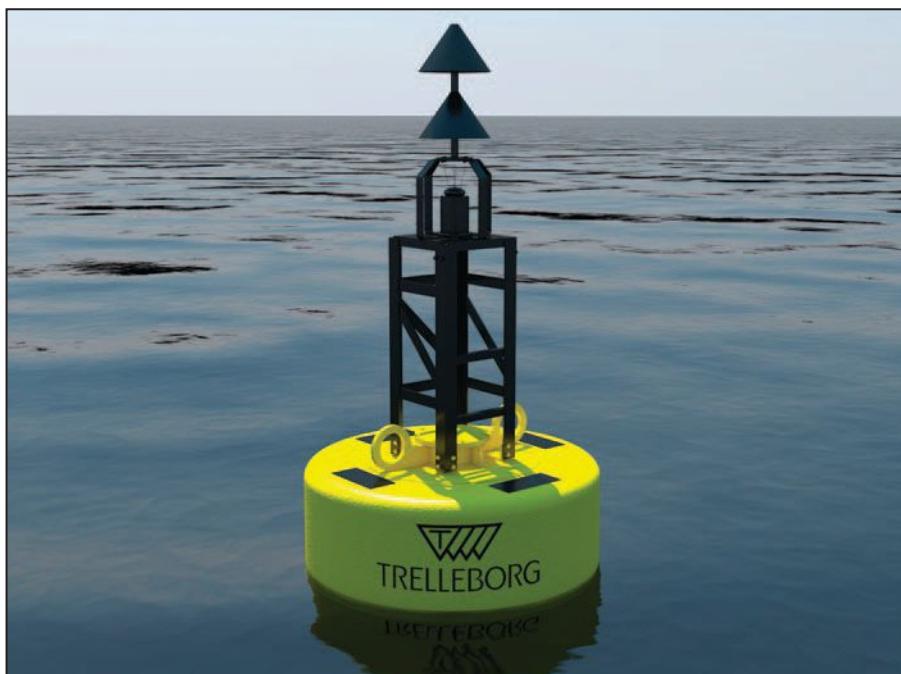
While budget restraints and cost cutting has effectively led to rotationally molded plastic buoys being purchased for use in conditions potentially beyond capability, more and more authorities are waking up to the importance of specifying products that offer whole life costs and performance.

Next Generation Solution

With this in mind, leading manufacturers have been striving to develop navigation buoys that combine the best of both worlds. Ones that take the advantages of the old and mix them with the new, to provide a new generation of navigation buoyancy aids that offer a more reliable solution and give the specifier significant total life cost savings.

Ranges from leading manufacturers now include navigation buoys combining a hull constructed in foam elastomer, a material that has been successfully used for more than 25 years in marine applications, with a marine grade aluminum superstructure. This results in a buoy that is much lighter than steel but has the same strength and durability.

The foam elastomer hull on these new buoys is thermolaminated around internal steelwork and encapsulated within a tough, abrasion resistant, polyurethane elastomer skin. This makes them low



maintenance and UV stable, offering excellent stability and all around impact damage resistance.

Innovative Technology

By using polyethylene for the core rather than the complete buoy, even if the skin is punctured, the buoy will not absorb water, so will not sink. This extends the lifespan of the buoy and significantly reduces maintenance costs. The material is also highly resistant to impact, making the buoys self-fendering and being self-colored, they do not attract marine growth.

Buoy diameters can range between 1.25m to 3m (49.21in. to 118.1in.) and are available in a selection of configurations and colors as well as a choice of power and mooring options to suit all possible applications. Leading ranges include lateral marks, cardinal marks, special marks, safe water, and isolated danger marks, as standard. In addition, ranges are fully IALA-compliant and cover the IALA Navigation Mark Scope.

The Best of Both

Working in one of the most demanding environments, navigation buoyancy technology must be able to offer authorities a practical and cost effective solution that is, perhaps most importantly, extremely reliable.

Thanks to recent advancements in material technology, leading manufacturers have been able to develop ranges of navigation aids that do away with the his-

toric issues of maintenance and difficult handling and replace heavy and cumbersome steel buoys, instead offering strong, reliable, and stable alternatives that offer total life cost savings in these difficult economic times.

Trelleborg Offshore and Trelleborg Group

Using advanced polymer material technology, Trelleborg Offshore provides high-integrity solutions for the harshest and most demanding offshore environments. As part of the Trelleborg Engineered Systems Business Area of Trelleborg Group, Trelleborg Offshore specializes in the development and production of polymer and syntactic foam-based seismic, marine, buoyancy, cable protection, and thermal insulation products, as well as rubber-based passive and active fire protection solutions for the offshore industry. Within its portfolio are some long-established and respected brands, including, CRP, OCP, Viking and Emerson & Cuming. Trelleborg Offshore has been providing innovative solutions to the industry for over 30 years and has the largest and most advanced syntactic foam manufacturing facility in the world.

For more information on Trelleborg Protective Products, contact, Chelsea Berndt, Direct: +1800-344-4458; email: chelsea.berndt@trelleborg.com or visit www.trelleborg.com/offshore.



Up to 20 million tons of debris from Japan's tsunami moving toward Hawaii

Some 5 to 20 million tons of debris, including furniture, fishing boats, refrigerators, and the like that were sucked into the Pacific Ocean in the wake of Japan's 11 March earthquake and tsunami are moving rapidly across the Pacific. Researchers from the University of Hawaii tracking the wreckage estimate it could approach the U.S. West Coast in the next 3 years.

China's largest global ocean expedition discovers 16 submarine hydrothermal deposits

Sixteen submarine hydrothermal deposits were discovered during China's largest global ocean expedition, researchers said. The expedition, the country's 22nd, launched from Guangzhou, capital of Guangdong province, on 8 December 2010. It spent 369 days in the Indian, Atlantic, and Pacific oceans, and was China's longest and most expansive ocean expedition. Over the course of the expedition, 218 experts from 32 institutions engaged in research. China has discovered 33 submarine hydrothermal deposits in the three oceans since the 19th expedition in 2007, comprising one tenth of the discovered submarine hydrothermal deposits in the last 3 decades.

Fugro awarded New Zealand airborne LiDAR bathymetry survey

Fugro has been awarded a contract for an airborne LiDAR bathymetry (ALB) survey in New Zealand by Land Information New Zealand (LINZ). Data will be collected to IHO Order 1a standard to enable the use of ALB technology to be evaluated as a suitable tool for hydrographic surveys for nautical charting. The survey areas include the Common Dataset for the Shallow Survey 2012 Conference in Wellington in the North Island and an area adjacent to the Abel Tasman National Park in the South Island. The data from these surveys will enable LINZ to compare ALB with traditional hydrographic survey methodologies and techniques, specifically in terms of achieving depth accuracies and target detection in varying water depths and environmental conditions.

Kongsberg to develop integrated environmental monitoring system

In order to reduce the environmental risks from oil and gas operations, a consortium consisting of KONGSBERG, IBM, and DNV will develop a real-time environmental monitoring solution together with their client Statoil. The 150 MNOK project is led by KONGSBERG and will use integrated technology to create a step change for the operators' access and operational usage of environmental data. On behalf of the consortium, KONGSBERG has been awarded a contract by Statoil Research and Development Center in Trondheim for developing an Integrated Environmental Monitoring System. The project value of 150 MNOK includes Statoil's project work and cash contribution and the consortium's contribution. The contract period is 3 years, ending with a solution ready for pilot implementation at an operational asset. The project is part of Statoil's "New Energy and HSE" R&D program.

Futuristic robots may be coming soon

Futuristic robots may be coming soon to an ocean near you. Sensorbots are spherical devices equipped with biogeochemical sensors that promise to open a new chapter in the notoriously challenging exploration of earth's largest ecosystem — the ocean.

The devices are being designed and developed in the laboratory of Professor Deirdre Meldrum, ASU Senior Scientist and Director of the Center for Biosignatures Discovery Automation at Arizona State University's Biodesign Institute.

Much of Meldrum's genomic research focuses on deep ocean environments and leverages her extensive technology development for human health and disease.

The current Sensorbots are fist-sized, transparent robotic orbs that communicate via brilliant blue flashes of light. The spheres house electronics and batteries, while their surfaces have 3 sensors for measuring pH, temperature, or oxygen. Sensorbots report surrounding environmental conditions to the inner electronics that convert the signal into flashes of light, providing a sort of visual Morse code.

A high-speed camera situated on the seafloor picks up the signals and stores them for later decoding aboard the ship. As Sensorbot technology develops, these orbs may blanket large areas of the ocean and transmit information regularly to a central data hub. Ultimately, Sensorbots will be capable of operating in semi-autonomous robotic swarms, moving under remote control in a 3D geometric formation through precisely controlled volumes of seawater.

Sensor swarms operating autonomously could function in complex, harsh, and remote environments. With appropriate microanalytical systems mounted on the Sensorbot platforms, these synthetic mariners could perform spatially and temporally indexed genomic analyses of microbial communities as well as observing a broad variety of macro events.

For more information, visit www.biodesign.asu.edu.

New web tool allows free public tracking of oil spills

A new oil spill, estimated to have released as much as 157,000 gallons per day into Brazil's Campos Basin, is the latest evidence of the dangers of offshore drilling.

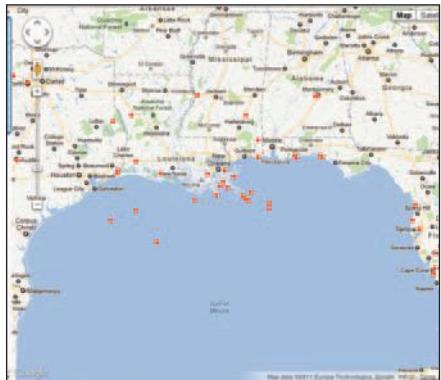
This accident is just one of many oil spills that occur each day, and often go unnoticed. Yet, they do extraordinary damage to marine ecosystems. Oceana, in partnership with SkyTruth, has posted a Web-based mapping tool to help inform policy-makers and the public about oil spills in U.S. waters. The tool is now accessible online at www.stopthedrill.org.

SkyTruth automatically compiles and publishes oil spill reports from the National Response Center (NRC), which are data self-reported by the oil industry, the public and the NOAA's incident news reports. Because most of the NRC spill reports are filed by the polluters themselves, the number and size of oil spills occurring each day may far exceed even those depicted on the map.

The map highlights spill locations, using satellite imagery to provide as many details as possible. For example, we can view the location of a well control line leak approximately 4,000 feet below the Gulf of Mexico surface, on a Chevron well.

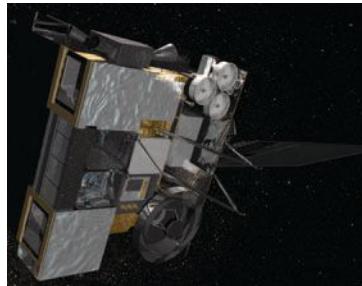


Like most, this spill has received little attention. From this map, viewers may link to a SkyTruth analysis to learn more about each individual spill.



NOAA activates GOES-15 satellite

For 12 years, GOES-11, one of NOAA's geostationary satellites, tracked weather and severe storms that impacted the U.S. West Coast, Hawaii, and the Pacific region. NOAA began the process to deactivate the satellite, which is approaching the end of its useful life, and replace it with a new, more advanced spacecraft.



The new geostationary satellite, GOES-15, has taken the place of GOES-11 and is now NOAA's GOES West spacecraft in a fixed orbit over the Pacific Ocean, midway between Hawaii and the West Coast and 22,300 miles above the equator. GOES-15 provides more data, with better resolution and image stability than GOES-11. GOES-15 joins NOAA's other operational geostationary satellite, GOES-13, which serves as the GOES East spacecraft. The GOES are not only used for weather applications, but also to track space weather, oceanographic changes, forest fires and other hazards as well as provide scientific data collection and information for search and rescue operations.

For more information, visit www.noaa.gov.

Arctic settles into new phase – warmer, greener, and less ice

An international team of scientists who monitor the rapid changes in the Earth's northern polar region say that the Arctic is entering a new state – one with warmer air and water temperatures, less summer sea ice and snow cover, and a changed ocean chemistry. This shift is also causing changes in the region's life, both on land and in the sea, including less habitat for polar bears and walruses, but increased access to feeding areas for whales.

Changes to the Arctic are chronicled annually in the Arctic Report Card. The report is prepared by an international team of scientists from 14 countries.

"This report, by a team of 121 scientists from around the globe, concludes that the Arctic region continues to warm, with less sea ice and greater green vegetation," said Monica Medina, NOAA principal deputy under secretary of commerce for oceans and atmosphere. "With a greener and warmer Arctic, more development is likely. Reports like this one help us to prepare for increasing demands on Arctic resources so that better decisions can be made about how to manage and protect these more valuable and increasingly available resources."

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Among the 2011 highlights are as follows:

- Atmosphere: In 2011, the average annual near-surface air temperatures over much of the Arctic Ocean were approximately 2.5 °F (1.5 °C) greater than the 1981-2010 baseline period.

- Sea ice: Minimum Arctic sea ice area in September 2011 was the second lowest recorded by satellite since 1979.

- Ocean: Arctic Ocean temperature and salinity may be stabilizing after a period of warming and freshening. Acidification of sea water ("ocean acidification") as a result of carbon dioxide absorption has also been documented in the Beaufort and Chukchi seas.

- Land: Arctic tundra vegetation continues to increase and is associated with higher air temperatures over most of the Arctic land mass.

In 2006, NOAA's Climate Program Office introduced the State of the Arctic Report, which established a baseline of conditions at the beginning of the 21st century. It is updated annually as the Arctic Report Card to monitor the often-quickly changing conditions in the Arctic. Peer-review of the scientific content of the report card was facilitated by the Arctic

Monitoring and Assessment Program.

The Report Card tracks the Arctic atmosphere, sea ice, biology, ocean, land, and Greenland. This year, new sections were added, including greenhouse gases, ozone and ultraviolet radiation, ocean acidification, Arctic Ocean primary productivity, and lake ice.

For more information, visit www.arctic.noaa.gov/reportcard.

Bluefin Spray Glider completes 2-month shallow op

Bluefin Robotics is pleased to announce that the Bluefin Spray Glider recently completed a 2-month deployment conducted by the Glider Research and Operations Center (GROC) at FAU's Harbor Branch Oceanographic Institute (HBOI). The Spray Glider operations took place at Puffy Ridge near the West Florida Shelf in approximately 60m water depth. It performed 3,200 dives over 100km distance. In addition to the Spray's high-quality conductivity, temperature, and depth payload, the system was equipped with optical scattering and chlorophyll sensors.

"The Spray Glider is an ideal platform for ocean monitoring over large areas and in diverse environments. This mission



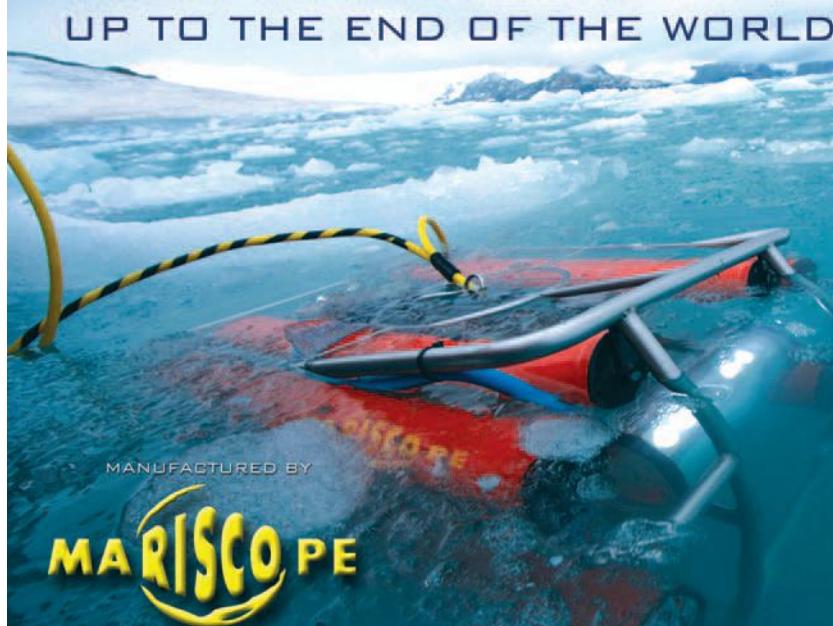
took place in shallow water; the next one will be in waters close to a mile deep. The Spray Glider's combination of endurance, depth-capability, reliability, and payload capacity fills the exact needs of oceanographic research and monitoring," said Fraser Dalgleish, Ph.D., director of the Ocean Visibility and Optics Lab at HBOI.

"The data acquired are providing valuable information about the large-scale distribution of plankton and larval populations, and the next mission will allow us to venture into much deeper waters with two Spray units to also determine background hydrocarbon levels around these deep coral reef ecosystems."

The deployment was in support of the Florida Shelf Edge Exploration (FLOSEE-II) expedition led by HBOI.

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The expedition objectives were to locate and characterize coral reefs that are so deep that natural light barely reaches them. The scientists focused on coral communities and commercial fish species on these reefs. They also collected data about the effectiveness of marine managed areas for ecosystem restoration and took samples to test for the presence of hydrocarbons.

Results of this cruise will be presented by HBOI researchers at The American Geophysical Union's Ocean Sciences Meeting in Salt Lake City, Utah in February 2012.

New underwater model to assess noise impact on marine life

HR Wallingford, the international hydraulic and environmental engineering consultancy, has formed a partnership with Loughborough University to develop a new underwater acoustic propagation and noise-impact model.

Designed to work with proven HR Wallingford ecological models, the new model is an important first step in assessing the impact of underwater noise on fish and sea mammal behavior. It can be applied in marine renewable energy, oil and gas extraction, dredging and other settings.

"Our new underwater noise-impact modeling tool is being designed to assist environmental impact assessment practitioners and developers," says HR Wallingford Environment Group manager, Nicola Clay. "In this topical and increasingly important area, our new tool will help them to apply the best available science to a wide range of situations."

The significant noise generated by marine construction and operation and its possible effects on marine life have come under increased scrutiny worldwide. Where activities take place in and near sensitive marine areas, there is particular concern.

Within the European Union, sound is now a recognized pollutant at both project and regional seas levels.

In the UK, construction has started of "Round 3" windfarms, some of the largest to be built in British waters, and there is an urgent need to understand their impact on marine life.

The model uses temporally and spatially varying parameters such as tidal water depth, flow velocity, salinity, temperature and bathymetry from HR Wallingford's hydrodynamic model simulations.



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ROVs and Aquaculture

By Christian Haag, Diplom Ozeanograph

The southern region of the south American Continent is normally known as Patagonia. It is possible to distinguish between two “Patagonias”, the Argentinean side, and the Chilean side. Due to the fact that the Andes is between the two sides, both regions have a completely different climatology. This new concept is based on the fact that the Argentinean part is mostly arid and the Chilean side has a template-humid climatology. Similar to Norway, this area has an immense amount of Fjords and channels. Hundreds of islands, including underwater Vulcans, make this region unique in and ideal for aquaculture activities. Due to the pristine water, the strong currents, the continuous water mass exchange and the proximity to fresh water reservoirs, an important salmon farming industry developed during the last 3 decades.

It started as a project in the early 1980s, with very small wooden cages. The results were so encouraging that a small industry followed. Up to the end of the 1990s, the salmon industry in Chile was growing fast. A lot of things changed from the beginning and the industry developed from a very artisanal one to a very modern harvesting industry. By 2007, Chile produced as much salmon as Norway, some 600,000t per year. As a consequence, the net cages became bigger and the moorings had to be according to the stress of wind, waves, and currents.

The difference in Chile is that the harvesting sites a far bigger than anywhere else in the world. With nets of 50m in diameter and up to 40 to 45m deep, the amount of salmon per cage reached 150 to 200t and more. The biggest production sites had up to 36 of such cages per module and sometimes three mod-



ules in parallel. These huge sites had to be moored with dead weights of up to 20t each, sometimes with more than 600 to 700t of weight for each site. The deep Fjords combined with strong currents and the action of waves made completely new mooring designs necessary. Problems arose, since often the more than 1km long mooring lines crossed each other during installation and suffered damage during the operation. Accidents with total or partial loss of harvesting sites and millions of dollars in fish loss resulted from a lack of inspection of the underwater environment and installations.

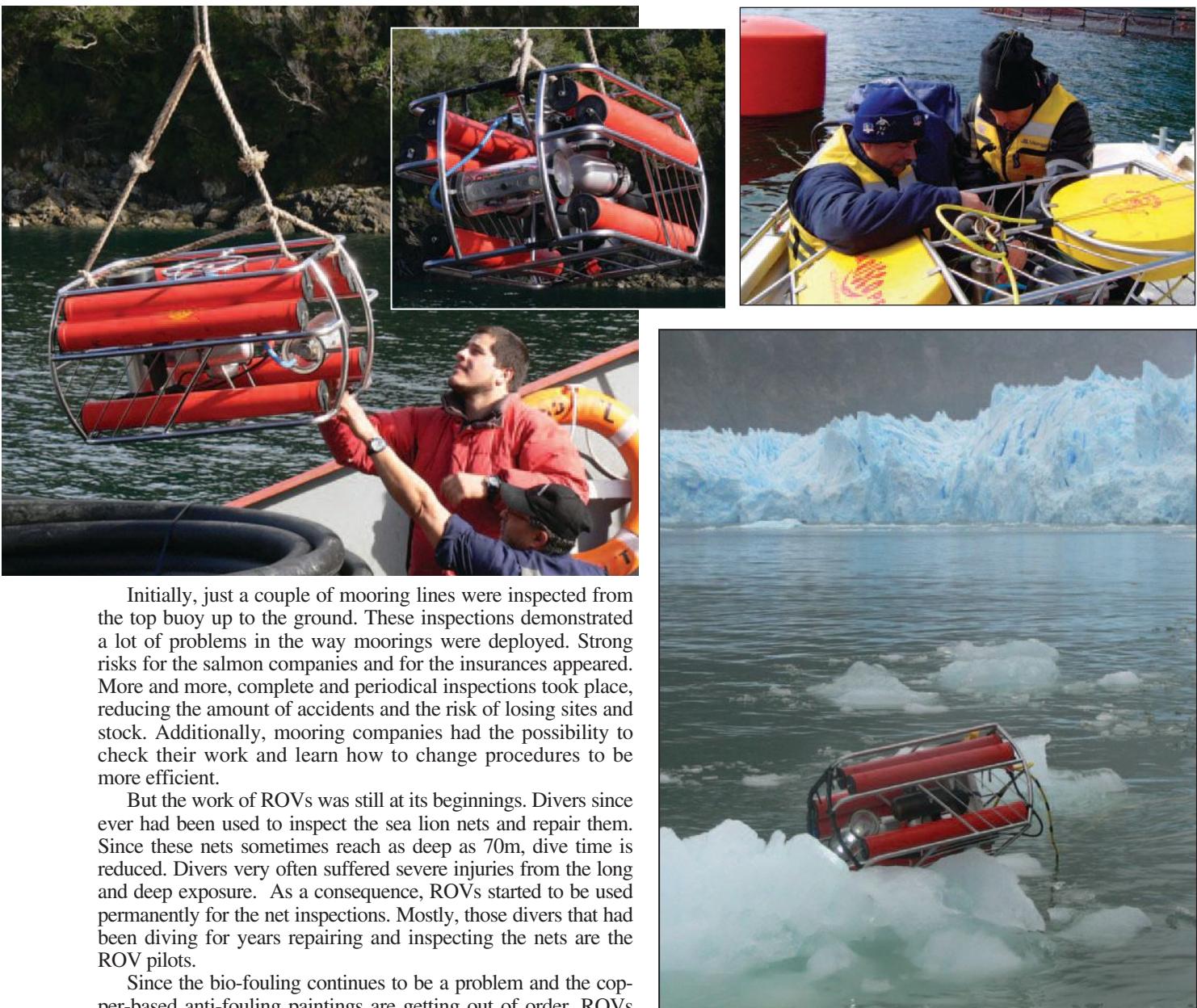
Since this happens in Patagonia, obviously there are some peculiarities related with this region at the world's end: in this case, the sea lions. These predators find it most interesting to attack the cages filled with salmon in order to complete their diet. Therefore, salmon farmers need to protect the net cages with special sea lion nets that involve the original nets.

To complete the image before we look at the ROVs in this context, a couple of other aspects have to be explained. The Harvesting sites are located in relatively protected inshore waters, not in the open Pacific Ocean. Nevertheless, these waters are all but calm. With currents of up to 5 knots and depth over 500m, salmon-producing companies have to fight day in and day out with the extreme area they are located in. In comparison, the maximum current velocity in Norway is around 0.5 knots in salmon-producing areas. Extreme weather conditions with very fast changing winds (there is a lot of ocean and very few land masses at these latitudes) are just another problem you have to deal with, if you decide to work in this area.

Insurances started to ask for a better control after the sites were moored and also during the operational time. Additional problems arose through heavy bio-fouling increasing the weight of the nets 4 to 5 times their original nets. This was the moment where ROVs appeared on the scene. Mariscope started with the first inspections for the insurance companies around 2002.



Light Work Class ROVs



Initially, just a couple of mooring lines were inspected from the top buoy up to the ground. These inspections demonstrated a lot of problems in the way moorings were deployed. Strong risks for the salmon companies and for the insurances appeared. More and more, complete and periodical inspections took place, reducing the amount of accidents and the risk of losing sites and stock. Additionally, mooring companies had the possibility to check their work and learn how to change procedures to be more efficient.

But the work of ROVs was still at its beginnings. Divers since ever had been used to inspect the sea lion nets and repair them. Since these nets sometimes reach as deep as 70m, dive time is reduced. Divers very often suffered severe injuries from the long and deep exposure. As a consequence, ROVs started to be used permanently for the net inspections. Mostly, those divers that had been diving for years repairing and inspecting the nets are the ROV pilots.

Since the bio-fouling continues to be a problem and the copper-based anti-fouling paintings are getting out of order, ROVs are used in some locations to clean the installed nets. Also, there have been some R&D efforts to develop ROVs for the extraction of mortality that remains on the bottom of the nets.

During the last couple of years, the industry suffered from several diseases, some of them as a result of over production and increased stock density. Additionally, there has been an accumulation of rubbish under the net cages. More and more, the ROVs are changing from purely inspection systems to light work class units that are able to pick up materials, carry instruments, or carry out cleaning tasks.

At Mariscope, system integration is the basis for new ROVs. These vehicles have a completely different concept from standard light work class ROVs. Normally, these types of vehicles are equipped with one or (at best) two manipulators, a tracking device, and some kind of sonar. If you have a couple of laser pointers and a HDTV camera on board, you are already at the top of the range. In the case of the new generation of light work class

ROVs, the vehicles are equipped with a wide range of oceanographic measuring devices. You can think of them as small underwater research vessels. Sensors like CO₂, H₂S, oil in water CTDs, turbidity, Chlorophyll just to name a few, are installed onboard and lowered under the cages, where other systems can not go. Here, under the cages, the sediments grow and are contaminated due to the activities on the surface and are the focus for new diseases. Measurements will help the producers take the correct decisions for the future of their sites.

But these underwater labs are also useful in other branches like offshore, research, pollution detection, salvage operation, and others. The more real data you have, the better you will be able to take operational decisions. Modern, high-efficient microprocessor-based ROV electronics, coupled with high-end sensors and measuring devices, are opening a new world of opportunities for light work class ROVs.

For more information, visit www.mariscope.de.

17 EU countries planning massive offshore wind power

Over 141 GW of offshore wind energy capacity is built, under construction, consented, or planned in Europe: enough to power 130 million average EU households. These wind farms — representing 35 times more capacity than the just under 4GW installed today — would provide 13.1% of Europe's total electricity production. The European Wind Energy Association (EWEA) published its latest report analysing all existing offshore wind power projects in 17 EU member states, mostly in north-western Europe. New offshore wind farms with a capacity of 5.6GW are currently under construction in the UK, Germany and Belgium.

Douglas-Westwood forecast €51 billion offshore wind spend

Over €51 billion is expected to be spent on new offshore wind installations over the next 5 years, according to a new report by international energy business advisors Douglas-Westwood. The World Offshore Wind Market Forecast 2012-2016 reveals that the world will see new installed capacity amounting to 15GW over the period, averaging 3GW per annum; up from 600MW per annum in the 5 years to 2011.

BOEM announces Dr. Alan D. Thornhill as first-ever chief environmental officer

Bureau of Ocean Energy Management (BOEM) Director Tommy P. Beaudreau announced the selection of Alan D. Thornhill, Ph.D., to serve as the bureau's chief environmental officer. The position was established in BOEM as part of the Interior Department's structural reform of offshore energy oversight and is designed to advance applied science in offshore energy and ensure decision-making is based on sound research and information. In this position, Dr. Thornhill is responsible for directing BOEM's programs for studying the offshore environmental issues necessary to support responsible decision-making about resource development, managing the National Environmental Policy Act (NEPA) review process, and developing national priorities for scientific research relating to the oceans.

Offshore renewables leader joins World Ocean Council

Energias de Portugal Renováveis SA (EDPR) has become the first World Ocean Council (WOC) member from the offshore renewable energy sector, and the first member from Portugal. EDPR is a world leader in renewable energy. The company is present in the U.S., Canada, Brazil, UK, Spain, France, Italy, Belgium, Romania, and Poland – in addition to Portugal. EDPR has over 7,000MW of installed renewable wind energy capacity and almost 30,000MW of development in the pipeline or prospective. Mrs. Ana Maria Fernandes, EDPR CEO, stated, "The use of ocean space is critical to renewable energy contributing to the world's growing energy needs. EDPR Renováveis is pleased to become a member of the World Ocean Council. This enables us to better work with the sustainability leaders in other sectors in ensuring the future of responsible ocean economic development, including for offshore renewable energy, in balance with environmental and social priorities."

First windfloat successfully deployed offshore

Energias de Portugal (EDP) and Principle Power, Inc. (Principle Power) are pleased to announce the successful offshore deployment of a full-scale 2MW WindFloat off the coast of Agucadoura, Portugal. This installation represents the beginning of a new sector in the offshore wind industry and is the result of continued hard work by all WindPlus JV partners, including EDP, Principle Power, A. Silva Matos (ASM), Vestas Wind Systems A/S, InovCapital, and Fundo de Apoio a Inovacao (FAI). In addition, over 60 other European vendors participated.

The project is the first offshore wind deployment worldwide that did not require the use of any heavy lift equipment offshore. All final assembly, installation, and pre-commissioning of the wind turbine occurred on land in a controlled environment. Further, this is the first offshore wind turbine in open Atlantic waters and the first deployment of a semi-submersible structure supporting a multi-megawatt wind turbine.

Following pre-commissioning of the system onshore at the Lisnave facility near Setubal, Portugal, the WindFloat was loaded-out using a dry-dock and towed offshore. The offshore tow consisted of some 350km in open Atlantic waters. The ability to tow in such conditions is attributable to the same WindFloat stability performance that permits the use of off-the-shelf commercial wind turbines from any manufacturer.

Over the next few weeks, a rigorous commissioning, testing, and startup procedure will be completed. This will include trial operations and a phased ramp-up in power production to full capacity. "This is an historic moment that takes your breath away," said Alla Weinstein, CEO of Principle Power. "In a way we are making a similar leap towards new energy resources as the oil and gas industry did in the 1970s when it began using floating structures. Further, we have proven the capabilities of the Portuguese maritime industry to adapt and provide the necessary resources to successfully fabricate and deploy an offshore structure of this scale. We [Principle Power] look forward to future business and success in this and global offshore wind markets with our innovative WindFloat."

"The [deep] ocean is the next big energy frontier," said Antonio Vidigal, CEO of EDP Inovacao. "Deep offshore wind technology, in particular the WindFloat, will allow us to harness stronger and more stable winds, and in the medium term deliver sustainable energy into our electrical system. Now is the time for extensive testing and validation, moving forward in the development of this promising technology. The WindFloat positions EDP on the leading edge of offshore wind exploration."

For more information, visit www.edp.pt/en.

Siemens increases stake in Marine Current Turbines

British tidal energy company, Marine Current Turbines Ltd, (MCT) announced that Siemens is increasing its share in the company to 45%.

MCT has evolved from a pioneer to a technology leader in horizontal axis marine current turbines and now has 25 employees. In February 2010, Siemens acquired a minor stake in the Bristol-based company and, thus, entered the marine tidal current market. Financial details of the announcement are not disclosed.

Ocean power is emerging with strong growth rates driven by global CO₂ reduction commitments. Until 2020, experts anticipate double-digit growth rates for the ocean power market. Based on further estimates the global potential for power generation using tidal power plants is 800TWh per annum. For comparison, that is equivalent to between 3% and 4% of power consumption worldwide.

MCT plans to present two Project Investment Prospectuses to the market within the next month for its 8MW Kyle

Rhea project in Scotland and its 10MW Anglesey Skerries project in Wales. For both projects, applications for leases from The Crown Estate have already been approved. The UK Government's recent ROCs Banding announcement (20 October) will support these projects with 5 ROCs per MWh proposed for tidal energy.

In addition, MCT is planning to deploy a tidal system into the FORCE facility in Canada's Bay of Fundy and has an approval for a lease from The Crown Estate to deploy a 100MW tidal farm off Brough Ness on the southern most tip of the Orkney Islands in Scotland.

MCT has already successfully implemented its first commercial-scale demonstrator project, SeaGen, in Northern Ireland's Strangford Lough. Since November 2008, SeaGen's two axial turbines, with a combined capacity of 1.2MW, have been feeding power into the grid to supply the equivalent of around 1500 homes. SeaGen has, to date, generated over 2.7GWh of electricity to the grid, the largest amount of electricity in the whole of the ocean power sector.



MCT is part of Siemens' Environmental Portfolio. In fiscal 2010, revenue from the Portfolio totaled about EUR28 billion, making Siemens the world's largest supplier of ecofriendly technologies. In the same period, Siemens' products and solutions enabled customers to reduce their carbon dioxide (CO₂) emissions by 270 million tons, an amount equal to the total annual CO₂ emissions of Hong Kong, London, New York, Tokyo, Delhi, and Singapore.

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Aquamarine Power leaves Oregon



Aquamarine Power, a Scottish wave energy company, closed its Newport office, saying a lack of certainty in the state was making it impossible to continue investing in Oregon, at least for now.

Aquamarine established a one-person office in Oregon last year with the intent of deploying its wave energy technology, a buoy that specializes in generating power in nearshore environments, off the Oregon Coast.

"We are, at present, unable to proceed until we are given some certainty over seabed leases pending completion of the Territorial Sea Plan process," said Martin McAdam, Aquamarine's CEO, in a statement.

But while Aquamarine's exit may be viewed as a blow to Oregon's nascent wave energy industry, Jason Busch, executive director of the state-funded Oregon Wave Energy Trust, doesn't think the state has seen the last of Aquamarine Power. Even so, he said that Aquamarine was being kept in limbo.

Of the wave energy companies active in Oregon, Busch said only two are at the stage of being ready to deploy buoys in the water. The first, Ocean Power Technologies, had the state approval of the first two phases of its wave energy project off the coast of Reedsport grandfathered in.

Aquamarine Power, on the other hand, got to Oregon after the state initiated the process, (begun in 2008), of developing a Territorial Sea Plan that will set aside chunks of the state's coastal waters deemed most suitable for wave energy development.

The process was slated to be completed in 2010. The latest estimates have it wrapping up sometime in the middle of 2012. In the mean time, the state is unable to offer any seabed leases for wave energy development other than for short-term testing sites.

In August Aquamarine Power announced it secured a \$100,000 matching grant from OWET, part of the trust's commercialization grant pro-

gram, to gather data on the wave energy potential off the Oregon Coast. But without any lease certainty, the company determined it was unwise to invest the \$100,000 of its own money necessary to move forward with the grant.

"We've got no security in Oregon. As a small startup company, we can't afford those kind of sums," said Neil Davidson, Aquamarine Power spokesman.

He added that the company remains interested in Oregon, but that it will widen its search for suitable offshore wave energy sites to California and Washington. Aquamarine Power has a stated goal of having a three-buoy demonstration project in the water off the U.S. West Coast by 2016. Davidson said a similar project off the coast of Scotland has resulted in about \$3 million in regional economic activity.

Busch said OWET is continuing with lease negotiations with the state on Aquamarine's behalf, but acknowledges that the risk was too high for a company.

For more information, visit www.aquamarinepower.com.

New Austal vessel to enhance wind farm support operations

Austal has confirmed a contract for a fourth wind farm support vessel for Turbine Transfers Limited. The order is the first for a new Austal design that will enable safer and more efficient offshore wind turbine service.

The new design combines the sea-keeping and fuel efficiency benefits of Austal's trimaran hull configuration with a small waterplane area at rest to deliver low vessel motions both in transit and when alongside turbines. This enables wind farm personnel to be successfully transferred in considerably higher sea states than is practical with catamarans of similar size.

Andrew Bellamy said the new design would improve the viability of offshore wind farms by overcoming the seakeeping limitations of the support vessels currently used in the industry.

"To date, most wind farms have been relatively close to the coast and serviceable with fairly basic boats. Now, as they move further offshore, there is a need for a second generation of vessels that can address the significant challenges this brings."

As well as minimizing seasickness among personnel and providing safer transfer conditions, the new design's enhanced seakeeping performance can improve the economics of offshore wind farms.

The new Turbine Transfers vessel is designed to operate in ocean areas of all European countries, including in the demanding conditions of the North, Irish and Baltic Seas. It is designed to operate in up to 3m significant wave height.



Welcoming the follow-up order from the UK-based company, Austal CEO, Andrew Bellamy, said the shipbuilder had continued to refine and enhance its Wind Express vessel range following its launch in mid-2010 as part of a strategy to pursue new commercial vessel markets.

The 27.4m long, 10.5m wide vessel will be operated by three crew and be able to transfer 12 wind farm technicians, their effects, and over 4 tonnes of deck cargo, stores, and miscellaneous equipment.

For more information, visit www.austal.com.

BOEM announces next steps for proposed Mid-Atlantic wind energy transmission line

The Bureau of Ocean Energy Management (BOEM) announced that it is taking the next steps in the review for a potential Mid-Atlantic Wind Energy Transmission Line. Atlantic Grid Holdings LLC has requested a right-of-way grant to develop the Atlantic Wind Connection, a proposed high-voltage direct current transmission line that would collect power generated by offshore wind facilities and deliver it to the regional high-voltage grid. The proposed electrical transmission system would enable up to 7,000MW of wind turbine capacity to be delivered to the grid.

The bureau is asking whether other developers are interested in constructing transmission facilities in this area. BOEM is also seeking comments on the potential environmental consequences of a renewable energy transmission line on the Outer Continental Shelf, off the coasts of New York, New Jersey, Delaware, Maryland, and Virginia.

"This proposal to build a 'backbone' for an offshore electrical transmission sys-

tem is an encouraging sign that there is significant interest in developing the infrastructure to support offshore wind development," said BOEM Director Tommy P. Beaudreau. "We will conduct the appropriate analyses to evaluate the potential environmental impacts of issuing renewable energy right-of-way grants."

The proposed transmission line would be constructed in phases to connect offshore wind power to the grid based on the company's anticipated timing of offshore wind generation. A right-of-way grant occupies a corridor 200 feet wide, centered on the cable. The right-of-way grant corridor is anticipated to extend approximately 820 statute miles and full construction would take approximately 10 years.

For more information, visit www.boem.gov.

German seaports buzzing in anticipation of offshore wind boom

As Germany prepares for a major expansion of offshore wind to replace nuclear power, companies like French giant Areva and U.S.-based General Electric (GE) have flocked to the German

coastlines. With wind parks planned for both the North Sea and Baltic Sea, the buildup can be felt in the country's seaports and hinterlands.

Germany's key seaports are transforming, thanks to multi-million dollar investments geared toward the offshore industry. With two of Europe's top four busiest ports located in Germany, companies have access to a well-developed infrastructure. Areva has just opened a full-load test bench in Bremerhaven to check its new 5MW wind turbines manufactured nearby. Other ports are bustling as well: BARD manages its projects from Emden, and Cuxhaven and Niedersachsen is investing in its infrastructure. Ports in Schleswig-Holstein have already developed a logistics concept for offshore wind, and Rostock and Wismar in Mecklenburg-Vorpommern can serve both Baltic Sea and North Sea projects through the Kiel Canal.

Germany has increased its infrastructure budget by EUR 1 billion to EUR 11 billion for 2012, partially in anticipation of the rapid expansion of offshore wind. A fifth lock between the North and Baltic Seas is planned for next year.

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New tool to improve siting practices for wind energy projects

The Cadmus Group, Inc. announced the release of a new online tool designed to help companies choose the most effective site for their wind energy project. The Distributed Wind Site Analysis Tool (DSAT) allows users to predict the energy output and environmental benefits of wind energy projects at sites across the U.S.

"DSAT represents a step forward for the wind industry. Now those considering the installation of a wind energy project have an objective and powerful tool to help them make an informed decision," said Keith Bennett, renewable energy project manager at the U.S. Department of Energy (DOE).

Cadmus, in partnership with the National Renewable Energy Laboratory (NREL) and Encraft, began development of DSAT in 2008, with funding from the DOE's Wind Powering America Program. Building upon the team's extensive experience in wind energy technologies and performance characteristics, DSAT is powered by an extensive array of data and proven algorithms. Cadmus utilized a variety of data sources, such as high resolution wind maps, wind tunnel testing, computational fluid dynamics (CFD) modeling, and real-world wind resource and turbine performance data, to predict the performance of distributed wind energy projects.

DSAT was built with a grant from the DOE and the standard version of the tool is free to use, with more advanced features available for a nominal account upgrade fee.

The tool can be found at www.dsat.cadmusgroup.com.

BP, Sempra to expand strategic wind business relationship

BP Wind Energy and Sempra U.S. Gas & Power announced plans to further expand their strategic relationship by jointly developing the Methoopany Wind Farm in Pennsylvania and the Flat Ridge 2 Wind Farm in Kansas, representing a combined investment of more than \$1 billion. Both wind farms are fully contracted under long-term agreements and are expected to be in commercial operation by year-end 2012. The wind farms will have a combined total output of 560MW and will each be the largest

ever built in their respective states.

The Methoopany Wind Farm will be located in Wyoming County, Pennsylvania and is expected to generate up to 141MW of energy. The power output from the wind farm has been sold under contract to Old Dominion Electric Cooperative and Southern Maryland Electric Cooperative Inc. The contracts were negotiated by the National Renewables Cooperative Organization.

For the most up to date and in-depth information on the Wind Generation market, visit PennEnergy's comprehensive Research area to access industry focused Reports.

Construction of the Methoopany Wind Farm site began in November 2011. The wind farm will utilize 88 GE 1.6MW wind turbines and will employ some 250 workers during peak construction. The construction contract has been awarded to Renewable Energy Systems Americas Inc.

The Flat Ridge 2 Wind farm will be located on a 66,000-acre site approximately 40 miles southwest of Wichita, Kansas. The wind farm will utilize 262 GE wind turbines each with a rated capacity of 1.6MW to generate 419MW of renewable power. The power output from the Flat Ridge 2 Wind Farm has been sold under contracts to Associated Electric Cooperative, Inc. and Southwestern Electric Power Company, a unit of American Electric Power. A third contract has been secured, but has yet to be announced.

The construction contract for the Flat Ridge 2 Wind Farm has been awarded to Blattner Energy and is expected to employ approximately 500 people onsite during the peak of construction.

For more information, visit www.bp.com/alternativenergy.

Major new green energy fund acquires stake in Aquamarine Power

A new green investment fund has acquired a significant shareholding in wave energy company Aquamarine Power. The deal sees the Environmental Energies Fund (EEF) acquire a portion of the shareholding previously held by SSE Ventures, the venture capital arm of SSE plc.

The £95 million secondaries fund has been formed to acquire and invest in a portfolio of innovative UK-based

green energy businesses originally backed by SSE plc.

The fund is managed by leading UK growth equity and venture capital firm Scottish Equity Partners (SEP) and will operate as a partnership between FTSE-100 listed SSE plc, one of the UK's largest energy companies, and four blue-chip institutional investors, headed by Lexington Partners, the world's largest manager of secondary private equity funds.

SSE retains a significant interest in the fund along with a number of substantial financial investors. EEF becomes one of Aquamarine Power's larger shareholders, along with SSE, multinational power and automation company ABB, and Scottish Enterprise (the Scottish Government's enterprise agency).

This follows the announcement in September 2011 that Aquamarine Power had secured £7 million of new funding and a commitment of further investment in the company from its existing shareholders over the next 2 years. Existing shareholders subsequently invested a further £4 million in November 2011.

New vessels for Fugro to be used for wind industry

In the first quarter 2013, Fugro will take delivery of a new-built vessel, M/V Fugro Pioneer, the first of Fugro's dedicated Offshore Survey Coastal Vessel series. The new vessel will operate in North-West European waters.

Designed to Fugro specifications and fitted with the latest survey equipment, these new vessels are the most advanced of their type. The new 1300 GT Pioneer will be able to carry out the full range of site and route survey tasks to obtain the high-resolution data necessary for safe, efficient, and cost-effective planning, design, and engineering activities for the installation of wind turbines as well as pipelines, platforms, manifolds, and other seabed structures. It is capable of carrying a 60t deck load and has a full range of cranes and winches and two moonpools.

The versatile, 52.9m Pioneer, designed for a cruising speed of 10kts and a maximum speed of 11.5kts, will include facilities for light geotechnical investigations (vibrocores, CPT) and will be dynamic positioned (DP) capable.

For more information, visit www.fugro.com.



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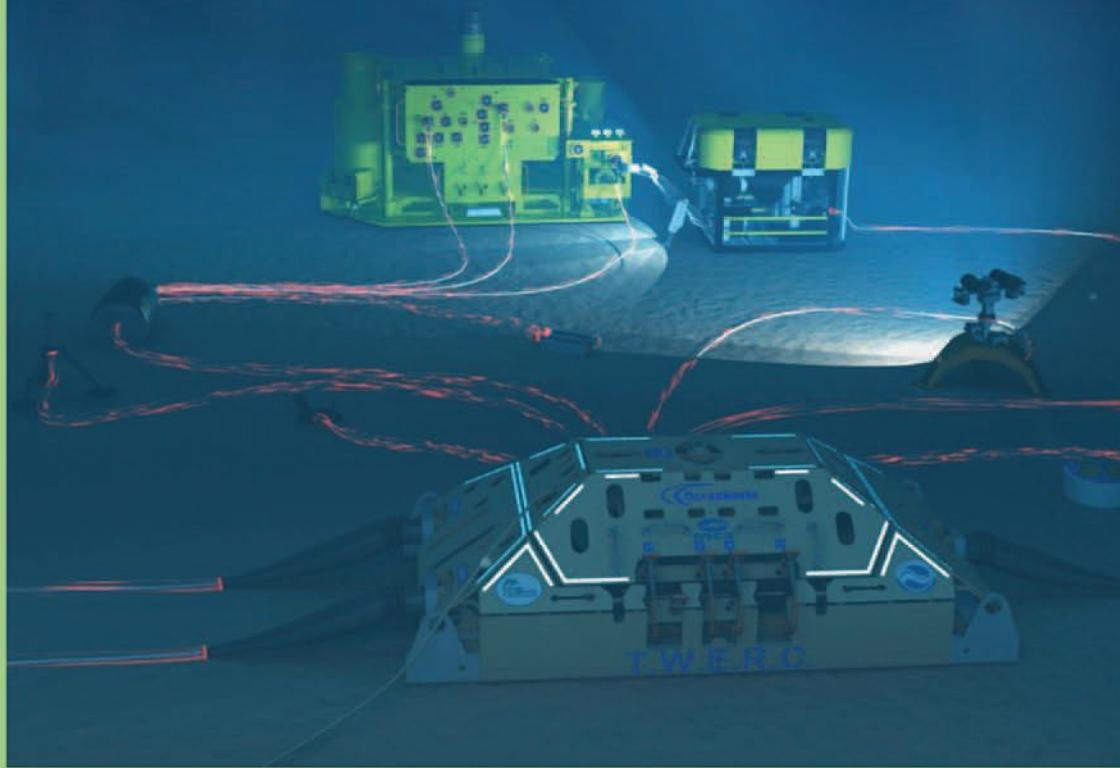
CSnet's Offshore Communications Backbone (OCB) is a network of power & fiber optic cables and sensor ports connected to a surface communications buoy.

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- Scientific ocean observing systems
- Tsunami and seismic warning systems
- Pipeline and infrastructure security monitoring

Bluefin to provide advanced UUVs to US Navy

Bluefin Robotics has been awarded a subcontract from General Dynamics Advanced Information Systems for engineering and manufacturing of the Surface Mine Countermeasure Unmanned Underwater Vehicle (SMCM UUV). As a critical part of the Littoral Combat Ship (LCS) Mine Warfare mission package, the SMCM UUV system will provide the fleet mine warfare commander and sailors with enhanced mine-hunting capability and address the Navy's need to reliably detect and identify buried mines in high-clutter environments (see ON&T Jan/Feb 2011, page 33). The SMCM UUV system will include two Bluefin-21 UUVs in addition to launch and recovery equipment, a support container, spare parts, and support equipment. The UUV will feature Bluefin's modular and flexible vehicle architecture, pressure-tolerant field-swappable subsea batteries, and low-noise propulsion technology. In addition, the vehicle will also include an advanced sonar payload developed by the General Dynamics Advanced Information Systems Team.

Norway study recommends keeping sub fleet

A study commissioned by the Ministry of Defense said that Norway's national defense capability would best be served by extending the life of its current submarine fleet or by acquiring a next generation sub. The study examined Norway's submarine needs after 2020 when the Ula-class fleet is due to be renewed. It determined that no other capabilities are suited to replace its subs, and the direct inference is that Norway should replace its submarines with a new generation of Artic-class stealth subs.

Metal Shark awarded \$192M Coast Guard contract
 ContractMetal Shark Boats has been awarded a contract to replace the U.S. Coast Guard's fleet of Response Boat - Small (RB-S) vessels. Up to 470 boats will be delivered across the Coast Guard fleet, with an additional 20 boats available to U.S. Customs and Border Protection, and another 10 slated for purchase by the U.S. Navy. The \$192 million contract is one of the largest boat buys of its kind for the Coast Guard and provides a significant economic boost to the state of Louisiana. To better manage the increase in manufacturing requirements, Metal Shark plans to expand its 65,000-square-foot manufacturing facility in Jeanerette while increasing its production team of skilled aluminum welders, rigging and electronics experts, and installation professionals from 80 to 120 employees over the next 6 months.

Swedish Defense Forces purchase two additional REMUS 100 AUVs

The Swedish Defence Material Administration (FMV) has purchased two Autonomous Underwater Vehicles (AUVs) from Hydroid, Inc., a subsidiary of Kongsberg Maritime and the leading manufacturer of AUVs. The REMUS 100 AUVs will be used to support Sweden's mine countermeasures program, especially in harbors and other confined or shallow waters. Sweden's previous purchase of two Hydroid AUVs in 2009 was highly successful, leading the Swedish Defense Forces to increase their AUV fleet to four REMUS 100 vehicles.

Austal launches second littoral combat ship Coronado

The roll-out marked Austal's second use of an innovative self-propelled modular transporter system to transfer the ship from the yard's final assembly bay onto a drydock for launch. This system was first used in September 2011, to successfully launch USNS Spearhead (JHSV 1). Austal and the U.S. Navy collaborated in the design of a new set of keel stands to support the ship during construction and facilitate the transition from the assembly bay. Austal's own self-propelled modular transporters (SPMTs) supplemented those of Berard Transportation of New Iberia, Louisiana, to provide a total of 3,800 tons lift capacity, on some 104 axle lines.

In a three-step process, SPMTs lifted the entire ship and keel stands lifted the Coronado almost 3 feet and moved the Littoral Combat Ship into the moored dry dock. Supporting close to 2,000t, the SPMT operators, aided by tug captains, the dock master and the Austal launch master, maneuvered Coronado aboard the dry dock in an incident-free operation.

A major improvement in safety and efficiency, the new roll-out method has shaved hours off the transfer process and serves as a capstone in Austal's effort to reduce cost and time required in future LCS deliveries.

The LCS and dry dock were then transported down river by tug to BAE Systems Southeast Shipyard, Mobile, Alabama where the ship was ultimately floated free of the keel stands, and was maneuvered from the drydock. The vessel was then towed back upriver to Austal's facility, where it will undergo final outfitting and activation before sea trials and delivery to the US Navy.

The 127m Austal trimaran seaframe is the platform for the LCS's mission and weapon systems. This seaframe provides superior seakeeping and aviation as a result of its long, slender central hull and smaller side hulls ("amahs"). The trimaran hullform provides a large internal mission deck with a high payload carrying capacity. Located above the mission bay is the enormous flight deck capable of conducting dual H-60 helicopter operations. The vertical location of the flight deck on the trimaran hull form provides the highest flight deck elevation on a combatant ship other than a major amphibious vessel or aircraft carrier.

The launch of Coronado (LCS 4) closely follows the christening of the 103-metre USNS Spearhead (JHSV 1) and the celebration of the keel laying ceremony for Choctaw County (JHSV 2). Modular construction has also begun on JHSV 3 and Jackson

(LCS 6) – the first of the 10-ship U.S. Navy contract awarded to Austal, as the prime contractor, a year ago — in Austal's 65,000 square meter Module Manufacturing Facility (MMF). Austal also has Montgomery (LCS 8) and JHSV 3 through JHSV 7 under contract.

For the LCS and JHSV programs, Austal is working in a partnership with General Dynamics Advanced Information Systems, a business unit of General Dynamics.

For more information, visit www.austal.com.

Lockheed Martin achieves critical reliability testing milestone on U.S. Navy minehunting system

Lockheed Martin completed 500 hours of reliability testing on the U.S. Navy's Remote Multi-Mission Vehicle (RMMV), marking a critical testing milestone. The system will provide mine reconnaissance capabilities to the Littoral Combat Ship.

RMMV is an unmanned, semi-submersible, semi-autonomous vehicle that tows a variable-depth sensor that can detect and identify undersea threats.



"RMMV is critical to the Navy's mine countermeasures," said Richard Holmberg, vice president of mission and unmanned systems at Lockheed Martin's Mission Systems & Sensors business. "As this testing demonstrates, we are making significant progress toward the system's operational use aboard the Littoral Combat Ship."

The testing, completed ahead of schedule, was conducted offshore near Palm Beach, Florida., and concludes the first of three planned development and testing cycles aimed to improve system reliability and operational availability for the Remote Minehunting System (RMS).

For more information, visit www.lockheedmartin.com.



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Ohio-class submarine replacement program receives “Milestone A” authority

The U.S. Navy's Ohio-class submarine replacement program achieved “Milestone A” and is approved to enter the Technology Development Phase of the Department of Defense life cycle management system.

Milestone A is the point at which a recommendation is made and approval sought regarding starting or continuing an acquisition program (i.e., proceeding to the next phase). Reaching the milestone allows the Ohio-class replacement program to move into the technology development phase. During this phase, the program will establish requirements and continue design and technology development efforts that will ultimately lead to a ship construction contract.

The milestone was met following the endorsement of the Defense Acquisition Board, chaired by under secretary of defense for acquisition, technology, and logistics, Dr. Ashton Carter.

“The Navy is committed to ensuring that an affordable replacement ballistic missile submarine is designed, built, and delivered on time with the right capabilities to sustain the most survivable leg of our triad for many decades to come,” said program executive officer for Submarines Rear Adm. Dave Johnson.

The Defense Acquisition Board endorsed replacing the current 14 Ohio-class ballistic-missile submarines as they reach the end of their service life with 12 Ohio replacement submarines, each comprising 16, 87-in. missile tubes, in a acquisition decision memorandum.

The acquisition decision memorandum validates the program’s technology development strategy and allows entry into the technology development phase during which warfighting requirements will be refined to meet operational and affordability goals.



Design, prototyping, and technology development efforts will continue to ensure sufficient technological maturity for lead ship procurement in 2019.

The 2010 Nuclear Posture Review revalidated the recapitalization of the nation’s sea-based strategic deterrent. This study followed the May 2009 Final Report of the Congressional Commission on the Strategic Posture of the United States, which recognized submarine-launched ballistic missiles as the most survivable and, therefore, most capable, of the three strategic deterrence legs of the U.S. nuclear triad. The Ohio replacement will leverage the successful Virginia-class acquisition program and carry the Trident II (D5) Life Extension missile, the nation’s most accurate and reliable strategic missile system with 134 consecutive successful flight tests.

Navy names first three mobile landing platform ships

The Department of the Navy’s three Mobile Landing Platform ships will be named the USNS Montford Point, the USNS John Glenn, and the USNS Lewis B. Puller, secretary of the Navy Ray Mabus, announced.

The USNS Montford Point honors the approximately 20,000 African American Marine Corps recruits who trained at the North Carolina facility from 1942 to 1949. Their exceptional service prompted President Truman to sign an executive order in 1948 ending segregation in the U.S. military services.

The USNS Montford Point will be the first-of-class ship. It is expected to deliver in fiscal 2013 and be operational in fiscal 2015.

The second MLP, the USNS John Glenn, honors Col. John Glenn, a decorated Marine Corps pilot, distinguished astronaut, Congressional Space Medal of Honor recipient, and U.S. Senator. During his time with the Marine Corps, Glenn flew 59 combat missions during WWII and a combined 90 missions over the course of two tours in the Korean War.

The final auxiliary support ship, the USNS Lewis B. Puller, is named in honor of Lt. Gen. Lewis “Chesty” Puller, the most decorated Marine in history and the only one to be awarded five Navy Crosses.

The MLP is a flexible platform that will provide capability for large-scale logistics movements such as the transfer of vehicles and equipment from sea to shore.

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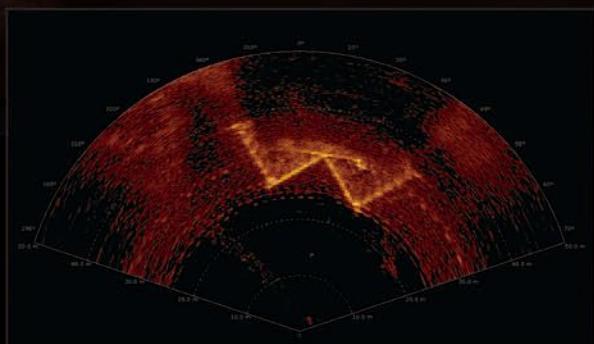


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Cathodic Protection of Marine Hardware

by Sacrificial Anodes

Robert E. Walsh, Senior Principle Engineer, Undersea Material and Process Section, Seapower Capability Center, Raytheon Company, Portsmouth, RI

Introduction

When the subject of sacrificial anodes comes up around yachtsmen, boaters, or marine engineers, one can invariably figure on two divergent responses: a cavalier group who say to just throw on a bunch of zinc and be done with it and those that need to make a science project out of it. For most applications, the best response lies somewhere in the middle. The purpose of this article is to help the reader make an informed decision on which approach to use.

Background

It is a fact of life that refined metals corrode in seawater (other electrolytes too, but we will concentrate on seawater for this paper). This is due to a strong atomic tendency for the metals to return to their original natural forms, (i.e. ores), and is governed by the second law of thermodynamics (increased entropy).

Generally, metals that require extraordinary amounts of energy to refine (e.g., aluminum) also exhibit the greatest and easiest tendency to revert to their lowest energy state. Conversely, metals that are found pure in nature (e.g., gold) exhibit great resistance to reversion. This activity is based on the atomic structure of each metallic element wherein the easily corrodible metals have few electrons in few orbital shells and the more stable ones have many electrons in many orbital shells.

Galvanic Potential

Many of our common metals/alloys have been tested against standard reference electrodes in seawater, resulting in a stable voltage reading called an open circuit potential. These potentials may be arranged in a list from the highest (most active, electronegative, or anodic) to the lowest (most stable/noble, electropositive, or cathodic), giving us the common galvanic potential series or tables that most of us have seen (next page). Along with the open circuit potential, we can also observe electrical relationships between various metals and alloys on the scale.

When we place two disparate metals in seawater and allow conduction between them, current will flow at a voltage approximately equal to the arithmetic difference of their open circuit potentials. Typically, at 1.5VDC or less, this is known as a galvanic couple and is the basis for the common wet cell battery. Higher voltages are possible, but generally occur only with metals uncommon to marine usage like the alkalis. The least noble of the two metals will give up ions (electron analogs) to complete the electrical circuit, thereby slowly eroding it away. As part of the electrochemistry, the anodic ions deposit onto the cathodic metal and protect it from any further corrosion so long as they are present. In the world of cathodic protection, it is said, they "sacrifice" themselves to protect the noble metal. In simplistic terms, when anodic ions completely flood the cathodic surface of a static or low flow system, a state of polarization will occur and the reaction will essentially cease.

As the sacrificial ions are exhausted, they are replenished from the anode source. In reality, polarization is a complex

process influenced by many things, including bio-film formation, current density, anode/cathode size ratio, and other kinetic interactions of the alloys. Under dynamic or high flow conditions, polarization is rarely achieved and the anode activity tends to continue unabated.

It can easily be seen that one can use the galvanic series to advantage in several ways. One is to initially choose alloys that are close to each other on the galvanic scale to have little electrical activity between them. Although risky, this approach could obviate the need for anode attachment. Realistically, a system is usually designed with a number of interconnected alloys that may have a 100mVDC (or more) potential difference between them, all requiring protection. The second use of the series would be to pick a less noble metal to purposely corrode in preference to the ones requiring preservation.

Anode Materials

Most often, marine designers choose corrosion-resistant alloys such as high molybdenum stainless steels, nickel alloys, copper nickels, and bronzes, that are preserved very well by attachment to zinc alloy anodes per Mil-A-18001. Other metals can be used as well; for example, carbon steel anodes are quite appropriately used to protect stainless steel structures, provided one can accept the visual spread of red rust oxide. Some applications, particularly those designed for military, air-deployed sensors, require aluminum alloys due to weight budgets. For these, we can take a cue from the recreational outboard/outdrive boating industry and use aluminum/indium/zinc (AIZ) alloy anodes per Mil-A-24779.

Although the galvanic difference between the two anodes is close – AIZ is slightly more electro-negative (0.440 volts 6061 aluminum to AIZ compared with 0.270 volts 6061 to zinc), at typical service temperatures, AIZ is a better conductor (higher current carrying capacity) than zinc, which results in a more electrically efficient anode (Wigg and Fleury, 2010). This translates into longer life/slower dissolution time. As the reaction proceeds more slowly, less hydrogen is evolved on the cathode half, reducing the opportunity for gas embrittlement and/or formation of strong hydroxyl compounds ($>\text{pH}10$) that may corrode aluminum components. The more efficient reaction can also mitigate, to some degree, cathodic disbondment of organic coatings and adhesives applied to the protected part.

Other interesting advantages also occur with AIZ. First, it is about half the mass of zinc, again important to air deployable systems or other weight-constrained designs. Second, zinc, as a rule, will develop a thick coating or calx of calcareous/oxidation/carbonaceous products when removed from seawater. This effectively inhibits protection when re-immersed in water, at least in the short term. This is not an issue with constant service applications but can be serious with systems that operate intermittently, as with trailerered outboard boats or short duration air-deployed systems. AIZ doesn't cake up to the same degree as zinc and, with the indium working as a galvanic trigger, protection resumes instantly on re-immersion, even after prolonged out times.

Anode Calculation

As can be seen, a lot of the work on anode development has been done, leaving the designer or engineer to figure out just how much is needed. Required anode size/mass can be calculated if the system area and activation/service time are known. This equation (Crundwell, 2003) has been used for a variety of marine sensor systems with good success:

$$W = ([AxCxL]/Z)/S$$

Where:

W = Weight of anode in kg

A = Area to be protected in m²

C = Polarization Maintenance Current Density in Amperes/ m² = .09

L = System usage = hrs/year

Z = Anode current density in Ampere hours per kg (@90% eff.)

Al/In/Zn = 2295

Zn= 729

S = Safety factor = X2 to ensure half anode mass left at scheduled replacement.

For example, for a 6.45 m² Aluminum Helicopter Deployed Array protected by AlZ anode and a 300 hrs/year prospective usage with a safety factor of two:

$W = ([6.45 \times .09 \times 300] / 2295)2 = .152\text{kg (5.4oz)}$ of AlZ is required

In most standard applications, zinc will work fine but there are some caveats: Use only a high quality, anode alloy - trace amounts of iron, even from cutting with a hacksaw can render the anode useless. Anodes shouldn't be painted as this will disable the activity – some anodes are even cast with this precaution imprinted on the surface. A good practice is to replace any anode when it is halfway consumed - one manufacturer of AlZ anodes has an integrated polymer indicator dot that is revealed at this point, serving as a visual cue. AlZ should be avoided in applications where strong scouring or impingement is frequent as aluminum is softer than zinc and dissolution under these conditions would be more rapid. Caution is also advised when using either zinc or AlZ in heated water. At temperatures above 55°C, both systems can change polarity to the other couple half – common with carbon steel, reversing the protection from the once noble metal to the sacrificial one.

Intermixing anode alloy types on the same structure, like AlZ and Zinc, should also be voided. The more active anode, AlZ in this case, would preferentially sacrifice to protect the more noble one (i.e. zinc), rendering it ineffective. Some protection to the structure could occur but the whole system efficacy would certainly be compromised.

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Crundwell, Bob, 2003, The Future for Sacrificial Anodes, The Journal of Corrosion Science and Engineering, Volume 4, Preprint 2, Cathodic Protection Conference UMIST, 10-11 Feb.

Robert Walsh is a Senior Principal Engineer at Raytheon Integrated Defense Systems, Seapower Capability Center. He primarily aids the mechanical and acoustic engineering functions in material selection for undersea hardware. He also conducts failure analysis on hardware when warranted.

Alloy	Volts Relative to SCE Reference (approximate)															
	+0.3	+0.2	+0.1	0	-0.1	-0.2	-0.3	-0.4	-0.5	-0.6	-0.7	-0.8	-0.9	-1	-1.05	-1.1
Graphite																
Titanium																
S31254 254SMO																
S31600 CRES passive																
S30200, S30400 CRES passive																
C71590 70/30 CuNi																
C70690 90/10CuNi																
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OFFSHORE INDUSTRY

Global energy demand to grow 30% by 2040: ExxonMobil Corp.

Demand for energy will rise through 2040 as global economic output doubles and prosperity expands across a world where population will grow to nearly 9 billion people, ExxonMobil Corp. states in its "The Outlook for Energy: A View to 2040." Extending its annual long-term energy forecast to 2040 for the first time, The Outlook projects that global energy demand in 2040 will be about 30% higher than it was in 2010, led by growth in developing regions such as China, India, Africa, and other emerging economies.

While oil will remain the most widely used fuel, overall energy demand will be reshaped by a continued shift toward less-carbon-intensive energy sources—such as natural gas—as well as steep improvements in energy efficiency in areas like transportation, where the expanded use of hybrid vehicles will help push average new-car fuel economy to nearly 50 miles per gallon by 2040.

As in previous editions of The Outlook for Energy, rising demand for electricity is identified as the single largest influence on energy trends. ExxonMobil projects that global electricity demand will rise by 80% through 2040 as economies and living standards improve and consumers switch to electricity from other sources such as oil, coal, or biomass. By 2040, 4 out of every 10 units of energy produced in the world will be going toward the production of electricity, according to the report.

Significant growth expected in shallow water rig construction

With offshore drilling demanding drilling capabilities in water depths exceeding the conventional limits of around 350ft and drilling in harsher environments, premium and ultra-premium jack-up rigs, capable of drilling into water depths up to 625ft will be in tremendous demand, according to Hydrocarbons Technology Reports. Moreover, the current scarcity for the premium and ultra-premium class jack-ups will continue to exist in the future as demand for premium-class jack-up rigs rises rapidly to 2015. It should be noted that premium and ultra-premium jack-ups have higher day rates than conventional standard duty jack-ups.

However, the cost per shallow water rig, which has declined by 15% to 20% from 2008 values by 2010, will continue to witness a decline until 2012. "With expectations that shallow water drilling activity will rise substantially, the business potential for harsh-environment and premium and ultra-premium jack-up rig construction companies is expected to be very strong in the future," according to the report.



Global exploration, production spending seen rising 9.3% in 2012

Global energy companies are expected to continue spending more for exploration and production this year, according to a survey by Dahlman Rose & Co., despite sluggish economic growth and concerns about European and U.S. sovereign debt.

Globally, capital spending is projected to rise 9.3% to a record \$595 billion. The growth comes as oil and gas companies increase outlays to tap unconventional shale resources as well as an increase in deepwater projects.

In the U.S., capital spending is expected to grow for a third straight year, driven mostly by horizontal drilling for oil and liquids-rich gas. The projected 11% increase represents the largest growth expected for any region in 2012.

Larger integrated and international companies such as Chevron Corp., ConocoPhillips, ExxonMobil Corp., and Total SA are investing substantial sums of money in U.S. shale plays, while spending increases by smaller independents are seen as more modest.

International exploration and production spending is forecast to increase 9% – a second consecutive year of growth – driven mostly by larger international oil companies.

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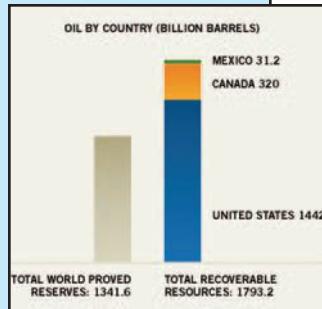
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IER report says U.S. sitting on wealth of energy resources

Abundant energy supplies in North America could provide enough power to supply the continent for generations, according to a recent study released by the Institute for Energy Research.

The analysis points to U.S. government conclusions that the country contains more than 1.4 trillion barrels of recoverable oil, even as the estimated amount of natural gas that can be harnessed nationwide has jumped to 2,744tcf. The U.S. currently consumes about 7bbl of oil and 24tcf of natural gas per year.

Add in coal (where there are an estimated 486.1 billion short tons that can be recovered), and the U.S.'s total energy picture for the U.S. looks pretty good, IER argues.



With the study, the industry-funded group is countering arguments by some energy analysts and policymakers that oil and natural gas supplies have already reached their peak. It also is using the analysis to argue for greater access to the fossil fuels lurking underground.

IER president, Thomas Pyle, said the study should "shatter the myth of energy security."

"Even as updated data show plentiful future supplies of domestic energy driven by new technologies," some are trying to undermine the "volume and availability of energy resources in and under our country," Pyle said. "The movement is coordinated, orchestrated, and well-funded to create the illusion of scarcity that empowers government to deny citizens access to affordable, reliable, and much-needed energy."

Pyle argues that lawmakers and activists are feeding on the skepticism about the abundance of natural gas, oil, and coal in North America to promote renewable power sources such as wind and solar.

Coast Guard comes up short on security screenings of facilities

Only about a third of platforms and other U.S. offshore energy facilities received security screenings from 2008 to 2010, according to a recent government report. However, the Coast Guard hopes to eventually inspect all at-risk facilities once every year.

Under possible threat are offshore oil and natural gas facilities that "may be an attractive target to terrorists," according to the Government Accountability Office.

"Because of their importance to the economy and national security, [Outer Continental Shelf] facilities and deep-water ports are possible targets for al Qaeda and other groups with malevolent intent," noted the GAO, Congress' investigative arm, in its report.

Many of the facilities are located in open waters of the U.S. Gulf of Mexico, miles away from Coast Guard assets and personnel, and platforms typically do not have personnel on board who are tasked with detecting or reporting unauthorized incursions.

Although there are about 3,900 oil and gas platforms, mobile drilling units, and other facilities on the Outer Continental Shelf, stepped-up federal security requirements only apply to those that have more than 150 people on board or that are producing at least 100,000 barrels of oil or more than 200mcf of natural gas per day.

In 2008, 2009, and 2010, about 57 facilities qualified for heightened scrutiny; they were required to have Coast Guard-approved security plans updated every 5 years. The Coast Guard's internal guidance requires annual security inspections of the same facilities, but according to GAO's analysis, the agency conducted about one-third of those screenings from 2008 through 2010. For instance, in 2008, the Coast Guard inspected just 7 of what was then 56 offshore energy facilities that qualified for heightened security reviews.

Shell sets world record for deepest subsea oil and gas well

Shell Oil Co. is now producing oil from the world's deepest subsea well at its Gulf of Mexico Perdido development, utilizing advanced technology to lead the way in increasing the company's ability to produce more domestic oil and gas resources, Shell said.

The well, at 9,627ft below the water's surface, is located in the Tobago Field 200mi southwest of Houston in the ultra-deep water. Tobago is jointly owned by operator Shell with a 32.5% stake, Chevron with 57.5%, and Nexen with



10.0% and is one of three fields producing through the Perdido drilling and production platform.

Tobago breaks the world water depth record for subsea production, previously held by another field in the Perdido development, the Silvertip field at 9,356ft of water.

Moored in about 8,000ft of water, the Perdido platform is jointly owned by Shell (33.34%), BP (33.33%), and Chevron (33.33%) and is the deepest drilling and production facility in the world with a capacity to handle 100,000 barrels of oil per day and 200mcf of gas per day. From Perdido, Shell accesses the Great White, Tobago, and Silvertip oil and gas fields through subsea wells directly below the facility and from wells

up to 7mi away. At its peak, Perdido can produce enough energy to meet the needs of more than two million households. Shell operates Perdido and its satellite fields on behalf of partners Chevron, Nexen, and BP.

This world-class project began with the 1996 lease sale when the technology to develop hydrocarbons at Perdido's water depth did not yet exist. By the time the final investment decision for commercial development was made in October 2006, Shell had pioneered several technological firsts that allowed the company to proceed with ultra-deepwater oil and gas production. Development drilling began in July 2007, 5 years after the discovery of hydrocarbons. Perdido produced its first oil and gas on 31 March 2010.

Draft EIS ready for Central and Western U.S. Gulf lease sales

BOEM has completed a draft environmental impact statement regarding multiple oil and gas lease sales tentatively scheduled between 2012 and 2017 in the Western and Central Gulf of Mexico planning areas offshore Texas, Louisiana,

Mississippi, and Alabama. The proposed Outer Continental Shelf Oil and Gas Leasing Program: 2012-2017 schedules five annual area-wide lease sales in the two U.S. Gulf regions.

"The draft environmental impact statement evaluates baseline conditions and potential environmental effects of oil and natural gas leasing, exploration, development, and production in the Western and Central Gulf," said BOEM director Tommy P. Beaudreau. "It is an important step toward implementing the Gulf of Mexico lease sales proposed in the next 5-year program, and I strongly encourage the public to provide input on this document."

The environmental impact statement is available for review online at <http://www.archives.gov/federal-register/public-inspection/index.html>. BOEM will begin accepting comments on the environmental impact statement following the publication date of the Notice of Availability in the Federal Register.

Public hearings on the draft EIS were scheduled for 10, 11, and 12 January in Houston, Texas, New Orleans, Louisiana, and Spanish Fort, Alabama, respectively.

Global M&A transactions last year totaled \$170B in 726 deals: report

Global merger and acquisitions activity for upstream oil and gas deals in 2011 totaled \$170 billion in 726 deals, according to information compiled by PLS, Inc., in conjunction with international partner Derrick Petroleum Services. The data comes directly from the Global M&A Transactions Database and includes all upstream oil and gas deals with values disclosed, the firms said.

The report shows that total deal value in 2011 dropped 19% from 2010 record levels, yet the number of deals increased 15% to a record of 726. The relative strength of WTI and Brent oil prices, which averaged \$95 and \$111 per barrel, respectively, provided good fundamentals for both buyers and sellers to execute the deals.

Activity in 2012 is expected to remain at a healthy pace as the industry continues to deploy large amounts of capital toward production development. Currently, the partners tally over \$100 billion of assets on the market.

The buyers are dominated by international interests seeking to shore up longer term supply by investing in both proven and conventional reserves worldwide. China's Sinopec has been the number one cash acquirer over the last 3 years, spending more than \$35 billion between 2009 and 2011 to build a truly global footprint.



Perdido platform

Hamworthy plc wins world's first newbuild FSRU regas orders

Hamworthy has secured a contract for the supply of regasification technology on board what are understood to be the world's first newbuild floating storage and regasification units (FSRUs).

Two 170,000cu.m storage capacity vessels, owned by Hoegh LNG, are being built at the world's largest shipbuilder, Hyundai Heavy Industries. Under the terms of the contract, Hamworthy will deliver systems to the Ulsan-based yard, one apiece in December 2012 and February 2013.

The floating regasification market is experiencing strong growth. On signing its letter of intent with HHI earlier this year, Hoegh projected annual growth in the liquified natural gas (LNG) market overall of 6% to 7% over the coming few years.

The two initial FSRU ships will feature Hamworthy's propane-seawater regasification system, which has already proven itself on board two Golar LNG carriers in operation, in Brazil and Dubai, that have been converted into FSRUs. The same system will also be delivered as part of two new projects under construction in Indonesia and Malaysia.

"We will deliver a complete regasification module for each FSRU, which



will have slightly less in capacity and pressure than was the case for the Golar Winter project," said Tore Lunde, Hamworthy gas systems' managing director. The units, which will weigh in at 550t and measure 20m by 18m by 10m, will be delivered in module form with all the necessary process equipment installed for ease of integration on board the vessels."

Once installed, Hamworthy will run all necessary mechanical and electrical tests within the module so that the number of connections can be limited and hook-up can be relatively fast.

"One of the main benefits of our modular design is that we can install in parallel with the building of the main ship," Lunde said.

said. From planning to implementation, the total project took approximately 5 years and included lifting the platform and remediating hydrocarbons and hydrogen sulfide on the recovered platform that had been trapped beneath 100ft of mud. The cleaning and remediation processes were completed by air from man lifts and subsequently the platform was deemed environmentally safe for recycling.

Exxon, Statoil settle dispute with U.S. government over Julia leases

ExxonMobil Corp. and the Norwegian oil producer Statoil reached an agreement with the U.S. Federal government that will allow the companies to continue developing what is believed to be among the largest discoveries in the Gulf of Mexico.

The government will get more money from ExxonMobil and Statoil as part of the agreement to settle Federal lawsuits over their leases in the oil field known as Julia, which is in the Walker Ridge area about 250mi southwest of New Orleans, Louisiana. The proposed settlement was filed in Federal court on 6 January 2012, but still had to be approved by a judge.

ExxonMobil said that the settlement would allow the company to develop the resource as quickly as possible. The initial phase of the project is expected to produce more than 175 million barrels of oil from six wells. However, Julia's total resource is said to be on par with Thunder Horse's 1 billion barrels, the largest single discovery ever in the U.S. Gulf, according to industry analysts.

ExxonMobil and Statoil have five leases that make up the field – three signed in 1998 and two in 2003. Each company owns 50% interest in the leases.

The dispute began in October 2008, when ExxonMobil applied to extend the leases but the government refused. It said the company didn't present a specific production plan. ExxonMobil and Statoil sued the government after losing several appeals.

Under the settlement, the two companies will develop their leases in phases as initially planned with the goal of starting initial production by June 2016. They also will pay more to the government in exchange for the lease extensions. For example, the companies will pay \$11.2 million each year until the three original leases reach at least 87.5 million barrels of total production. The agreement also raises the royalty rate on those three leases to 18.75% from 12.5%. And yearly rent on those three leases rose to \$11 per acre from \$7.50 per acre. The royalty rate for the other two leases is 12.5%.

North Sea decommissioning costs could exceed \$74.5B

A \$74.5 billion business opportunity is opening up for companies in decommissioning the North Sea's huge infrastructure of offshore oil and gas fields, according to new research to be published by Deloitte and Douglas-Westwood.

The firms said the next 30 years will see enormous demand building for the services of supply chain players, which will generate a large number of jobs in the regions under consideration in the report – UK, Denmark, The Netherlands, Norway, and Ireland.

The new North Sea Offshore Decommissioning Market Report highlights that the majority of decommissioning activity and related spending will occur between 2016 and 2031. The projected workload is expected to exceed the capacities of the existing heavy lift vessel fleet and onshore deconstruction facilities. The delivery of new specialized vessels is urgent, and more onshore yards are likely to be needed in order to meet the demand.

Coincidentally, the forecast peak period is also due to see a major increase in offshore wind projects, putting even more

pressure on the offshore industries supply chains. In the UK Continental Shelf (UKCS) alone, more than 470 offshore installations, 10,000km of pipelines, 15 onshore terminals and around 5,000 wells constitute part of the North Sea infrastructure that will eventually need to be decommissioned.

AMPOL finishes platform recovery project in U.S. Gulf of Mexico

American Pollution Control Corp. (AMPOL), an oil spill response and environmental solutions provider, has completed a platform recovery project in Amelia, Louisiana, CEO Kirk Headley



Offshore platform recovered by AMPOL

Subsea 7 gets order for newbuild pipelay vessel
 Petrobras has awarded Subsea 7 SA a 5-year contract to provide a dedicated deepwater flexible pipelay vessel for use offshore Brazil. The \$500-million contract means Subsea 7 will construct a newbuild vessel for \$350 million. The vessel will be 479ft long, 98ft of beam, and a Class-2 dynamic positioning system. Further, it will be equipped to transport and install flexible flowlines and umbilicals in 9,842ft water depths. Equipment is to include a tiltable lay system with top-tension 60t, two under-deck storage carousels, deck crane, and two ROVs. Delivery is scheduled for the second half of 2014.

Diamond Offshore wins Guyana drilling contract
 A Diamond Offshore Drilling subsidiary has received a drilling rig contract from Canada-based oil exploration company CGX Energy. The



Ocean Saratoga.

depth of 4,300m. The subsidiary will also drill the Jaguar-1 well, which will appraise the Turonian geologic formation to a depth of 6,500m.

Environmental monitoring contract awarded

Norway-based oil company Statoil has awarded a \$25 million contract to Kongsberg Oil & Gas Technologies to develop the first integrated environmental monitoring system for oil and gas activities. To monitor the environmental impact on the sea bottom, sensors will be attached to an installation to gather real-time physical, biological, and chemical data and to detect any deviations. Statoil will head a consortium that includes Kongsberg Maritime Subsea, IBM, and DNV to carry out the 3 year project, which is part of Statoil's New Energy and HSE R&D programme. The technology will be tested out by Kongsberg Maritime Subsea on the seabed of the harbor basin at Horten.

Nexans to help power subsea compression

Statoil has awarded Nexans a \$103.7 million contract for oil and gas fields in the Norwegian Sea. The Midgard and Mikkel fields, both subsea tiebacks, are losing the reservoir pressure needed to continue piping production to the Åsgard B production platform. Statoil plans to use a subsea gas compression system to help recover the remaining reserves from these fields. Nexans will design, manufacture, and supply 102mi of static and dynamic power umbilical and power cables and accessories. Nexans' manufacturing facilities in Halden, Rognan, and Namsos, Norway and in Charleroi, Belgium will be involved in the project.

ConocoPhillips is top gun in first lease sale held since U.S. Gulf of Mexico oil spill

ConocoPhillips emerged as the big winner in the first Federal Gulf of Mexico oil and gas lease sale held since the Deepwater Horizon tragedy in April 2010. The company captured 75 exploration blocks for \$157.9 million, nearly half of the \$337.7 million in total high bids submitted by the 20 companies that participated in Western Gulf Lease Sale 218.

Moreover, ConocoPhillips submitted the highest bid for a single block – an eye-popping \$103.2 million for Keathley Canyon Block 95. The block, which attracted the most bids (seven) of any of the 191 blocks receiving bids in the entire sale, is situated in a deepwater area of the U.S. Gulf that has

Western Gulf of Mexico Lease Sale 218

Top companies based on total number of high bids

Company	Total High Bids	Sum of High Bids
ConocoPhillips	75	\$157,816,740
ExxonMobil	50	\$63,293,750
Maersk Oil	12	\$36,010,792
BP E&P	11	\$27,458,809
Plains E&P	10	\$12,780,000
Anadarko	7	\$19,317,210
Ecopetrol America	7	\$6,000,000
Shell Offshore	3	\$4,951,858
Apache	3	\$1,693,927
Castex Offshore	2	\$4,200,000

yielded major discoveries such as Chevron's Buckskin and BP's Kaskida. In contrast to ConocoPhillips' sale-high \$103.2 million for a single block, the combined sum of the next nine highest bids for single blocks totaled just \$63.5 million, with the second highest bid block (Garden Banks 537) attracting \$8.6 million. That winning bid was submitted by Maersk Oil.



Green areas depict blocks under lease in the Western and Central Gulf of Mexico.

A western Gulf of Mexico lease sale was cancelled after the drilling rig Deepwater Horizon exploded, killing 11 workers and rupturing a well that caused the largest oil spill in U.S. history. The last lease sale for the area prior to Sale 218 held on 14 December 2011 in New Orleans was conducted in December 2009. High bids in Sale 210 were valued at \$111.4 million. Western Gulf Lease Sale 218, also held in New Orleans, drew a total of 241 bids, most of which were placed on deepwater and ultra-deepwater blocks located in water depths ranging from 800m to 1,600m and greater.

Gulf of Mexico

4 years of drilling confirms massive trend on U.S. Gulf shelf

Results from drilling activities over the past 4 years now strongly support McMoRan's model for a major new ultra-deep geologic trend spanning 200mi in the shallow waters of the Gulf of Mexico and onshore in the Gulf Coast area, the company said, adding that further drilling and flow testing still will be required to determine the "ultimate potential" of the massive trend.

To that end, field operator McMoRan is preparing the Davy Jones No. 1 discovery well on South Marsh Island Block 230 for a critical flow test. Completion activities are in an advanced stage, with installation of the central processing facility, production platform, and sales pipelines substantially completed. Moreover, the production tree, blow out preventer, and safety valve, rated for pressures of 25,000psi, are available for installation.

"A successful flow test would have important implications on potential future reserve additions at Davy Jones and McMoRan's other ultra-deep prospects," McMoRan said, noting that following a successful flow test, the company expects



first production from the well could be established shortly after the test.

The data from five wells, some permitted to drill below 30,000ft subsurface, indicate the presence below the salt weld of geologic formations, including Middle-Lower Miocene, Wilcox, Frio, Tuscaloosa, and Cretaceous carbonate, "which have been prolific onshore, in the deepwater Gulf and in international locations," McMoRan said.

Davy Jones alone involves a large ultra-deep structure encompassing four blocks totaling 20,000 acres. In addition to the initial discovery, an offset appraisal well has been drilled at Davy Jones. Also, offshore drilling is underway at Blackbeard East, Lafitte, and Blackbeard West No. 2, while operations have commenced at onshore Lineham Creek.

Petrobras, partners strike oil in deepwater Walker Ridge area

Brazil's Petrobras said oil was struck at the southeast end of its Walker Ridge lease area in the Gulf of Mexico. The Logan discovery, at Walker Ridge Block 969, is 250mi southeast of New Orleans, at a water depth of 7,750ft. New exploratory activities will determine the recoverable volumes and commerciality. Statoil is the operator with a 35% interest. Petrobras America Inc. holds 35%, while Ecopetrol America holds a 20% interest and OOGC a 10% stake.

U.S. extends deepwater oil drilling leases due to oil spill delays

The Obama administration has extended nearly 1,400 deepwater oil and gas drilling leases to make up for delays caused by the April 2010 Gulf of Mexico oil spill and a subsequent moratorium on some offshore exploration. The extensions of up to a year were aimed at compensating offshore energy companies for the 5-month deepwater drilling ban and giving them more time to meet new safety and environmental standards imposed on that work.

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Atwood Oceanics receives 2011 Shell 'Floater Rig of the Year' award

The semi-submersible drilling rig Atwood Falcon, owned by an Atwood Oceanics, Inc., subsidiary, was awarded the "Floater Rig of the Year" by Shell, recognizing it as the best performing floating rig for Shell worldwide in 2011.

Atwood president and CEO, Rob Saltiel, and Atwood Falcon operations manager, Marty Knowles, accepted the award on behalf of the entire Atwood Falcon team at Shell's annual rig supplier engagement event in Houston on 9 November 2011.

"This award exemplifies the value of our collaborative relationship with Shell in promoting a strong safety and performance culture on the Atwood Falcon," Saltiel said.

The Atwood Falcon has worked with Shell in the Philippines and Malaysia since 1998, with only brief periods of assignment to other operators.

The Atwood Falcon is currently working in Malaysia for Shell on the Gumusut development. Upon completion of this drilling program, the rig will undergo approximately 90 days of planned maintenance and contract preparation work prior to transiting to Australia to commence drilling operations for another client.

Hornbeck executes contracts for fifth OSV newbuild program

Hornbeck Offshore Services, Inc. executed definitive contracts for the construction of 16 high-specification offshore supply vessels (OSV) in connection with its latest newbuild construction program announced last November. This is the company's eighth newbuild vessel program since its inception in 1997 and its fifth newbuild program involving state-of-the-art, technologically advanced new generation OSVs.

The company has separately contracted with VT Halter Marine, Inc. of Pascagoula, Mississippi and with Eastern Shipbuilding Group, Inc. of Panama City, Florida for the construction at each yard of eight 300-class vessels with options to build additional vessels should future market conditions warrant.

The aggregate cost of the first 16 vessels under this program is expected to be approximately \$720 million, excluding construction period interest.

*Atwood Falcon.*

VT Halter Marine will construct eight vessels based on the Super 320 design that it developed for Hornbeck Offshore. These DP2 OSVs are designed to have 6,200 long tons of deadweight capacity, approximately 20,900 bbls of liquid mud carrying capability, 11,863 square feet of deck area, and a fire-fighting class notation.

The eight OSVs to be constructed by Eastern Shipbuilding Group will be DP-2 classed and consist of four vessels based on the STX Marine SV 300 design and four vessels based on the STX Marine SV 310 design. Features of the STX design include over 20,000 barrels of liquid mud carrying capacity and a fire-fighting class notation. In addition, the SV 300 design calls for 5,500 long tons of deadweight capacity and 10,976 square feet of deck space, while the SV 310 design calls for 6,144 long tons of deadweight capacity and 11,536 square feet of deck space.

EOCP signs interim agreement for North Sea FPSO study

Emas Offshore Construction and Production (EOCP) has entered an exclusive interim agreement for the engineering study of a floating production, storage and offloading vessel (FPSO) for the Perth field in the North Sea. The agreement was signed by the owners of the Perth field, comprising DEO Petroleum UK, Faroe Petroleum UK, and Atlantic Petroleum UK (the Perth Group).

EOCP is a 100%-owned subsidiary of EOC Ltd.. CEO Lim Kwee Keong said that the agreement with the Perth Group will aid the company's initiative effort into the North Sea, a major area of potential for the deployment of FPSOs.

Under the interim agreement, EOCP will carry out detailed engineering to further refine the concept established during the front-end engineering and design studies for the FPSO.

The vessel is to be deployed in the Perth field development in Block 15/21a of the UK Continental Shelf. The FPSO and its processing capabilities will be designed to accommodate the several phases of development drilling planned for the Perth field.

Pacific Drilling receives delivery of its ultra-deepwater drillship

Pacific Drilling S.A. has received delivery of its newest drillship, the Pacific Santa Ana. The drillship features the most advanced drilling technology in the offshore drilling industry, including dual load path capability and dual gradient drilling upgrades. The Pacific Santa Ana is capable of operating in water

*The drillship Pacific Santa Ana.*

depths of up to 12,000ft and drilling wells 40,000ft deep.

This drillship is said to incorporate the latest advances in offshore drilling technology and is the first ultra-deepwater rig equipped for dual gradient drilling, an innovation that is expected to provide significant benefits in drilling safety and efficiency. The delivery of the Pacific Santa Ana, the fourth rig in Pacific's fleet, completes the first phase of the company's growth strategy to become the industry's preferred ultra-deepwater drilling contractor.

It will also have extra capacity to handle the anticipated tiebacks from third-party stranded fields nearby. Furthermore, the parties have agreed commercial and other terms for the charter, which they plan to enter on satisfaction of certain conditions, including project sanction by the UK Department of Energy & Climate Change.

New drilling contracts awarded for Belford Dolphin and a newbuild

Dolphin Drilling Ltd., a subsidiary of Fred. Olsen Energy ASA, entered into contracts for the provision of the drillship Belford Dolphin and its newbuild drillship under construction by Hyundai Heavy Industries with Anadarko Petroleum Corp.

*Belford Dolphin.*

The contracts are each for 4 years and are expected to be in support of Anadarko's future long-term drilling programs offshore Mozambique.

The Belford Dolphin contract commenced on 1 January 2012 in direct continuation of its existing contract with Anadarko, which had previously been scheduled to continue to April 2013. The value for the Belford Dolphin contract is approximately \$701 million. The newbuild drillship contract value is approximately \$727 million, including a mobilization fee of \$15 million. In connection with the newbuild contract, it will be invested in a second BOP, estimated to \$35 million.



FPSO Usan under tow to Nigeria.

Usan floater in place off Nigeria; oil production first half of 2012

Development of the deepwater Usan field offshore Nigeria remains on track for first oil during the first half of 2012, according to partner Nexen Petroleum.

The FPSO has arrived at the field location and has been successfully moored. Also under way is the process of commissioning the FPSO and connecting the subsea wells to the facility; this should continue into the early part of this year, the company said.

At peak, the Total-operated project should deliver 180,000 boe/d.

Fairmount Marine's powerful tug Fairmount Glacier assisted in the installa-

Production

tion of the FPSO. For this operation Fairmount was contracted by Saipem Energies, which needed a 200t bollard pull tug for this job.

After almost 9 weeks of continuous heading control and other general assistance to the Usan, the FPSO was successfully installed and Fairmount Glacier was ordered to commence demobilization.

FPSO Usan is one of the largest of its kind: 320m long and 61m wide. The unit was built by Hyundai Heavy Industries in Korea.

The Usan oilfield was discovered about 10 years ago. The field is situated 100km south of Port Harcourt, with water depths up to 850m.

Production from the 'Who Dat' field launched and ramping up

LLOG Exploration successfully initiated production from the Who Dat development in Mississippi Canyon Blocks 503, 504, and 547 on 9 December 2011. LLOG said it was ramping up production and expected to achieve a rate of 20,000 bbl/d and 22 mcf/d of gas from the 3 existing wells. The development plan for

the field calls for the company to drill nine additional wells, which would fully utilize the 60,000 bbl/d and 150mcf/d of gas capacity of the floating production system. Meanwhile, LLOG said its Mandy project in Mississippi Canyon Block 199 and Goose project in Mississippi Canyon Block 751 are scheduled for startup in the first and second quarters of 2012.

Canada's West White Rose well pilot onstream: Husky Energy

Husky Energy has achieved first production from a two-well pilot program on the West White Rose field offshore eastern Canada. The program is designed to provide additional information in order to refine a full development plan for the West White Rose field.

According to partner Suncor Energy, completion of the first of the two pilot wells occurred this summer, with water injection support expected to come onstream later this year. At Husky's North Amethyst satellite development in the same region, production has reached the projected design target of 37,000 bbl/d of oil.

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Chevron scores gas discovery offshore Western Australia

Chevron Corp. said it made a natural gas discovery by its Australian subsidiary in the Exmouth Plateau area of the Carnarvon Basin, offshore Western Australia.

The Vos-1 well encountered approximately 453ft of net gas pay. Located in the WA-439-P permit area about 186 mi from Exmouth on the Western Australian coast, the well was drilled in 4,869ft of water to a depth of 12,461ft.

The find at Vos-1 represents Chevron's twelfth offshore discovery in Australia since mid-2009. Chevron's Australian subsidiary is the operator of WA-439-P and holds a 50% interest, with Shell Development (Australia) Pty Ltd. holding the remaining 50%.

Kosmos lands new exploration licenses offshore Suriname

Kosmos Energy has executed two production sharing contracts with Staatsolie Maatschappij Suriname N.V., the national oil company of Suriname, for Blocks 42 and 45 offshore Suriname. The addition of the acreage is a significant expansion of the company's exploration portfolio and represents Kosmos' first acreage acquisition outside of West Africa.

"The concept is an extension of the Upper Cretaceous stratigraphic play system that we unlocked on the West African side of the South Atlantic Transform Margin," said Paul Dailly, Kosmos' senior vice president of exploration.

Combined, the two blocks cover an area of nearly three million gross acres, in water depths of between 650 and 8,500ft. Block 42 is an area of over 1.5 million acres and Block 45 is approximately 1.3 million acres. Kosmos will be operator of both blocks, with a 100% working interest. Neither block has previously been drilled. In the initial exploration phase under each contract, Kosmos plans to acquire 3D seismic data. The company targets first drilling as early as 2014.

BP encounters elevated gas play in Brazilian deepwater well

BP has encountered elevated gas play in the Itaipu-2 pre-salt appraisal well, located in the deepwater sector of the Campos Basin, offshore Brazil. The well is part of the BM-C-32 block, which was lodged with the Brazilian National Petroleum Agency.

The well, drilled to a total depth of 4,877m in a water depth of 1,420m, encountered gas, gas wetness, and fluorescence within the cuttings. Further logging



Pre-salt appraisal well offshore Brazil extends reservoir limits

U.S.-based Anadarko Petroleum Corp. said the Itaipu-2 pre-salt appraisal well, located in block BM-C-32 in the Campos Basin offshore Brazil, is a success. The well was drilled to total depth of approximately 16,000ft in 4,660ft of water and encountered a gross petroleum column of about 58ft (net) in a pre-salt carbonate reservoir.

The well is an aggressive step-out from the Itaipu discovery well, which is located 4mi northwest. It established a fluid contact and appears to have successfully extended the accumulation 120m downdip from the discovery.

"Accordingly, the appraisal well significantly increases the areal extent of the vast Itaipu field, and we believe incorporating the data from both the appraisal well and the original discovery well will increase our previous resource estimates for the field," said Bob Daniels, Anadarko senior vice president of worldwide exploration.

Anadarko, through a wholly owned subsidiary, holds a 33.3% working interest in BM-C-32. BP operates the block with a 40% working interest, and Maersk Oil holds a 26.7% working interest.

operations are underway and will need to be integrated into the overall interpretation. BP is the operator of block and holds a 40% stake, while Anadarko Petroleum Corp. and Maersk Energia own 33.3% and 26.7% equity, respectively.

Total proves hydrocarbons close to Norne field in Norwegian Sea

Total E&P Norge has found oil and gas with a wildcat well in the Norwegian Sea. Well 6607/12-2 S was drilled by the Songa Delta semi-submersible in license PL127 in 1,210f. water depth, 4.9mi west of the Statoil-operated Norne field.

According to the Norwegian Petroleum Directorate (NPD), it proved oil and gas in both its targets – Middle and Lower Jurassic reservoir rocks (Fangst and Båt group) and Cretaceous reservoir rocks (Cromer Knoll group).

Initial estimates put the discovery in the range 3-16 MMcmoe recoverable oil equivalents. Development will be considered with other fields in the area.

Songa Delta now heads to a shipyard for its 30-year certification, before sailing to the North Sea to drill another wildcat for Det norske oljeselskap.

Vanco reports deepwater light oil discovery offshore Côte d'Ivoire

Vanco Côte d'Ivoire Ltd. has announced a discovery offshore Côte d'Ivoire Block CI-401 with the Independence 1X well. The well penetrated the targeted objective and found a series of good-quality sandstones containing light oil, said Vanco for partners Lukoil Overseas Côte d'Ivoire Ltd. and Petroci Holding.

Full analysis, including wireline logs, reservoir pressures, and fluid samples, confirms that the well penetrated 26ft of hydrocarbon pay in a good-quality Turonian-aged sand package. Hydrocarbon samples indicate 40 degrees API gravity.

The well will be temporarily abandoned at a total depth of 13,556ft. The Independence-1X was drilled in a water depth of 5,541ft, approximately 58mi south-southeast of Abidjan. It is one of the deepest water exploration wells drilled to date in the eastern offshore Ivorian basin, Vanco said, noting that the well was drilled by the Ocean Rig Olympia drillship. This is the second exploration well drilled in Block CI-401, which encompasses an area of 239 square miles in water depths ranging from 3,117 to 6,890ft.

Drilling is in progress on one more deepwater exploration well in CI-401, the Albacore-1X is 21mi east of Independence-1X on a similar large Turonian deepwater slope channel stratigraphic trap. Vanco, the operator, holds a 28.34% participating interest, with Lukoil holding a 56.66%. Petroci Holding, the state oil company, holds a 5% participating interest together with a 10% carried interest.

Exploration**Successful Leviathan appraisal results increase resource size**

The Leviathan No. 3 appraisal well in the Amit license offshore Israel, located more than 3mi east of the original Leviathan discovery, encountered about 290ft (net) of natural gas pay in multiple intervals, Noble Energy, Inc. said, adding that the reservoir thickness and quality were greater than anticipated and the gas-water contact was confirmed at the well location.

"The results of the appraisal well are very encouraging and validate our seismic modeling and petrophysical interpretation of this substantial resource," said Charles D. Davidson, Noble Energy's chairman and chief executive officer.

Davidson said the positive outcome has led to an increased gross mean resource estimate of 17 tcf with a range of 14 to 20 tcf. "We already have project teams in place identifying commercialization options and screening field development concepts," he added.

The Leviathan No. 3 well was drilled to a total depth of 17,146ft in about 5,480ft of water. The rig used to drill the well is returning to Tamar to finish development activities.

Noble Energy operates Leviathan with a 39.66% working interest. Other interest owners in the well are Delek Drilling and Avner Oil Exploration with 22.67% each and Ratio Oil Exploration with the remaining 15%.

Iran's Khazar Oil Co. identifies possible new Caspian gas giant

Khazar Oil Co. is reported to have discovered a potentially large gas field in the Iranian sector of the Caspian Sea. According to Iran's Minister of Petroleum Rostam Qasemi, in comments quoted by Iranian news service Shana, the discovery came in 2,296ft of water depth and at 7,874ft subsurface.

Previously, Iran's Caspian gas reserves were estimated at 11tcf. Qasemi added that preparatory work involved in this find was more complex than for Iran's other gas discoveries in the Persian Gulf and Oman Sea.

ATP completes Clipper No. 4 well, contracts pipelay barge for 2012

ATP Oil & Gas Corp. has completed the second Clipper well and tested it at 9,000 bbl/d of oil and 4.6 mcf/d of natural gas, the company reported. This is the No. 4 well in Green Canyon Block 300 in 3,450f. water depth. It logged 56ft of net oil pay. In July 2011, ATP completed and flow tested the first Clipper well, GC Block 300 No. 2 ST No.1, at a rate of

4,656 bbl/d and 45.6 mcf/d.

A pipeline lay barge is contracted for the third quarter of 2012 to tie in both the GC 300 No. 4 and No. 2 wells to the Murphy Oil-operated Front Runner production facility. ATP operates Clipper and presently owns a 100% interest.

Rockhopper Exploration extends Falkland offshore oil, gas corridor

Rockhopper Exploration reported two discoveries in the offshore North

Falkland basin. Exploration well 14/15-4 was drilled by the semi-submersible Ocean Guardian in license PL004b to test multiple reservoir targets in the Beverley, Casper South, and Casper structures and the proven Sea Lion Main Complex. The location is roughly 17.5mi southwest of the Sea Lion 14/10-2 discovery well. Rockhopper next plans to drill a short offset sidetrack 33ft from the main well bore to extract core from the Beverley, Casper South, and SLMC formations.

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FMC secures subsea equipment contract offshore Angola

FMC Technologies signed a contract with BP to manufacture and supply subsea equipment for its ongoing deepwater projects in offshore Angola. Under the contract, the company will supply four subsea trees, control systems, wellheads, tubing hangers, well jumpers, and subsea distribution systems. The equipment will be manufactured at FMC's Kongsberg, Norway and Dunfermline, Scotland facilities. Delivery of the equipment is scheduled in 2013.

Recently, FMC Technologies secured a contract from LLOG Exploration for the design, manufacture, and supply of subsea production systems to support a U.S. Gulf of Mexico project. Under the contract, worth approximately \$40 million, the company will supply seven subsea production trees and control systems for LLOG's Who Dat project.

Delivery of the equipment is expected to begin in 2012 from FMC's operation in Houston, Texas.

Subsea 7 wins GoM engineering, installation contracts from Shell

Norway's Subsea 7 was awarded two engineering and installation contracts for the Cardamom and West Boreas projects in the Gulf of Mexico. The contracts were secured from Shell. Subsea 7's scope of work on the West Boreas project includes the installation of a 6,096mi long umbilical as well as subsea distribution hardware for the field.

Installation will occur in water depths up to 959m in the Mississippi Canyon block area. The company will also install a 9,266m long umbilical plus subsea distribution hardware for the field. Installation for the Cardamom project will occur in depths of up to 914m in the Garden Banks area.

Eni contracts Xikomba FPSO for new offshore Angola development

Eni Angola has contracted Sonasing, OPS, and SBM Offshore for a 12-year lease, including operations of the FPSO Xikomba to develop Block 15/06 offshore Angola.

The development plan calls for relocation of the FPSO, which operated for ExxonMobil in Angola since 2003. The vessel is in Singapore for upgrades to meet the new project requirements. The Paenal yard in Angola also will conduct fabrication and integration work on the vessel.

First production is scheduled for 2014. Sonasing and OPS are joint venture companies of Sonangol.

Anadarko gets okay to develop Lucius field in deepwater Gulf

Anadarko Petroleum and its partners are pushing ahead with development of the Lucius field in deepwater Gulf of Mexico, calling it "among the most economic projects in our portfolio." Field operator Anadarko said it would begin drilling in 2012 to access an estimated 300 million boe in producible reserves.

The \$2 billion program is scheduled to produce its first oil in 2014, using Anadarko's largest operated truss spar floating production platform, now under construction in Finland by subsea equipment maker Technip.

The platform, scheduled to move into the U.S. Gulf by early 2014, will be anchored in 7,100ft of water. It has daily production capacity of more than 80,000 bbl and 450 mcf of natural gas.

"Lucius will establish important infrastructure in an emerging area of the Gulf of Mexico where we have identified additional prospects and opportunities," said Al Walker, Anadarko's president and chief operating officer, in a written statement. Lucius is in the Keathley Canyon area, 274mi southeast of Galveston, Texas. The unit includes portions of Blocks 874, 875, 918 and 919.

Initially, the platform will tie to six wells in the Lucius project and two in ExxonMobil Corp.'s Hadrian South project, a spokesman for Anadarko said. The company plans to continue exploration in the area.

"Because the reservoir quality is outstanding, we believe we can develop it with a minimum number of wells," he said. "There are a lot of efficiencies built into this project."

Anadarko is a 35% owner of Lucius, partnering with Plains Exploration & Production Co., ExxonMobil, Apache Deepwater, Petrobras, and Eni. Technip's operating center in Houston, Texas, will provide the overall project management. The 23,000t spar will be the fifteenth delivered by Technip (out of eighteen worldwide). Technip has already delivered six spars to Anadarko: Neptune, Nansen, Boomvang, Gunnison, Red Hawk and Constitution. The Lucius spar is 110ft in diameter. The platform measures 605ft in length and will carry an initial topsides payload of 15,000t.

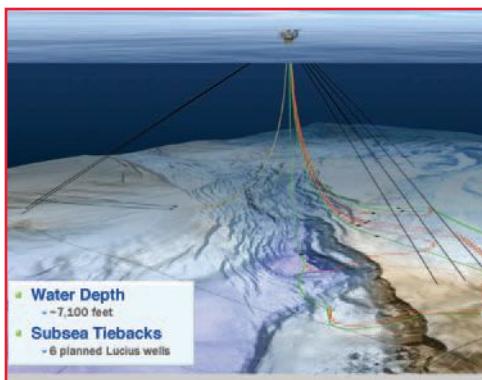
Meanwhile, Enterprise Products Partners L.P. and Genesis Energy, L.P. have executed crude oil transportation agreements with the six producers that will provide the necessary support for construction of a new crude oil gathering pipeline serving the Lucius development area in southern Keathley Canyon. The pipeline will be constructed and owned by Southeast Keathley Canyon Pipeline Company LLC (SEKCO), a 50/50 joint venture between Enterprise and Genesis. Enterprise will serve as construction manager and operator of the new pipeline, earning fees for both services.

The 149mi, 18in diameter SEKCO Oil Pipeline is being designed with a capacity of 115,000 bbl/d and would connect the Lucius-truss spar floating production platform to an existing junction platform at South Marsh Island Block 205 that is part of the Enterprise-operated Poseidon pipeline system. The SEKCO Oil Pipeline is expected to begin service by mid-2014.

In another development, FMC Technologies, Inc. signed an agreement with Anadarko to provide subsea systems and life-of-field services for the Lucius project. FMC's scope of supply includes five subsea production trees and two manifolds. Equipment deliveries are expected to begin in the fourth quarter of 2012.



Production spar



Lucius' conceptual subsea architecture.



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Weatherford captures the 'big picture' in offshore operations

International oilfield services company Weatherford is capturing photographs in challenging environments without the need for a "hot permit."

Always on the lookout for ways to improve offshore working processes, Weatherford was eager to find out more about CorDEX Instrument's ToughPIX 2300 XP Series of cameras, as they can be used safely in hazardous areas where traditional digital cameras are not permitted.

With traditional digital cameras, the battery is a source of ignition in a zone 1 or 2 area and the flash can set off the UV flame detectors, which could lead to fire and gas system activation, so a gas monitor must be carried at all times and the flash taped over. The ToughPIX 2303 XP is ATEX-certified, which cuts out all of this.

This latest version of the ToughPIX 2303 XP camera is more streamlined than its predecessor and includes still and moving images in AVI format of up to 10mp. Encased in aluminum with an ultra-bright display protected by armored glass, the revolutionary camera is custom designed for the harshest environments.

As one of the world's largest oilfield



services companies, Weatherford is only too aware that oilfield operations present unique challenges as the hazardous and remote conditions make it difficult to carry out daily operational tasks.

For further information, contact Gayle Nicol, senior account manager, telephone 01224 615019, e-mail gayle.nicol@bigpartnership.co.uk.

Schlumberger releases Avocet production operations software

Schlumberger has released the Avocet 2012 production operations software platform, saying the platform has been engineered to combine a complete and up-to-date picture of operations with engineering analysis capabilities to pinpoint the reasons for production shortfalls, enabling producing assets to hit production targets consistently.

The Avocet 2012 is a single, integrated platform that combines well operations and production data management systems from capturing and validating field data to production and equipment surveillance

Oilfield Equipment

and tracking of specialized oilfield operations. The Avocet platform supports production computations, visualization of production networks, and reporting of current and historical information.

Additional capabilities include component allocations, determination of artificial lift efficiency, AFE and workover performance tracking, and a tracking system to avoid costly well integrity problems and record well completion operations to meet regulatory requirements.

RODEC™ rotator engineered for extreme conditions: R&M Energy

R&M Energy Systems offers the RODEC™ High Temperature, High Pressure Tubing Rotator, a cost-effective solution for evenly distributing wear about the internal circumference of production tubing. Field usage shows that RODEC Tubing Rotators extend tubing life by 6 to 10 times, resulting in reduced operating costs and less downtime for maintenance.



Capable of operating in temperatures up to 650°F (343°C) and pressures to 5,000psi (35,000Kpa), the High Temperature, High Pressure Tubing Rotator easily adapts to severe application conditions. It's compatible with any wellhead configuration that complies with API 6A specifications. Additionally, the unit can rotate any size of production tubing with any API thread configuration.

The patented pressure sealing system in the RODEC™ High Temperature, High Pressure Tubing Rotator prevents any production fluids or pressure from coming in contact with the internal drive system components. It is also double sealed to prevent leakage to the atmosphere.

Additional features and benefits of the RODEC High Temperature, High Pressure Tubing Rotator include multiple drive options, maintenance-free patented sealing system, reduced costly well servicing, maximized production, and compatibility with reciprocating and progressing cavity pump systems.

For more information, visit the company website at www.rmenergy.com.

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Oilfield Equipment**Hippsco turns up pressure with investment in one-stop system**

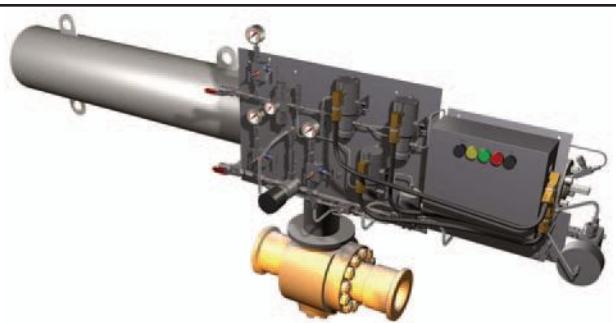
A new business has been launched to provide a one-stop design and manufacture service for High Integrity Pressure Protection Systems (HIPPS) for the oil and gas subsea and topside sectors.

Hippsco is a partnership with design and fabrication specialist, L&N Scotland, valve actuator and controls manufacturer, Paladon Systems, and safety system experts, HG Safety.

The three companies will collectively invest up to \$1.5 million in the partnership and are opening an office in Aberdeen to house an engineering design team. Manufacturing will take place at L&N Scotland's workshops, with specialist teams from Paladon and HG Safety working onsite in Aberdeen to provide their respective expertise.

A HIPPS system is an independent safety instrumented protective device, complying to IEC 61508, that acts as the

last line of defense for protecting downstream operations from over-pressurization and gives operators the most dependable pressure protection device available. The combined skills and 80 years of experience of the three partner firms



means they can offer the energy industry a single design and manufacturing facility for HIPPS.

Hippsco will design and manufacture turnkey projects under one roof and aims to cut delivery time by at least half on a typical build, to around 6 months from conception to completion.

The brain of the system is the SIL 3 logic solver. The two out of three voting

logic and choice of logic solver hardware guarantee better than a 2sec shutdown response time. Modern communication methods can be added so that each HIPPS can be monitored from the main distributed control system (DCS).

For more information, visit the website www.hippsco.com.

Fugro, SMD unveils deepwater jet trenching and cutting system

Fugro and Soil Machine Dynamics (SMD) have developed a modular jet trenching and mechanical cutting system for applications, including offshore and gas construction. The Q1400 is a tracked trenching system capable of free flying and operating in water depths of up to 9,842ft. It can perform jet trenching in soils of up to 100 kPa and mechanical chain cutting in soils of up to 250kPa.

It comprises a common trenching module and separate tracked jetting and mechanical cutting skids, with a launch and recovery system rated to Lloyd's sea state 6. A deck-transfer skidding system, claimed to be unique, enables mode changes safely at sea without the requirement for craneage. Q1400 will be operable from vessels within Fugro's fleet.

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EvoLogics - Continued Growth in Underwater Acoustics Communication and Positioning

EvoLogics GmbH has seen continuous growth of its underwater acoustics communication and positioning products. Established in 2000 by a group of leading international scientists and experts in maritime engineering, its goal was to develop innovative key technologies for the aerospace, maritime, and offshore industries. The initial focus of the company was the development of underwater acoustic modems for data transmission.

The result of years of research was the development of the patented Sweep Spread Carrier (S2C) technology, using similar principles to the communication of dolphins and whales. The goal was clear from the beginning: to achieve reliable communication in contrast to the available solutions at the time.

To get there, the technology had to prove itself in different environments, from tropical waters or shallow waters to noisy environments. The S2C systems have been developed specifically for harsh underwater environments with special algorithms for signal processing and data management.

What initially could only do acoustic data transmission has now transformed into a modular and flexible system for underwater information and communication technologies (ICT). A layer for advanced data management was developed to cope with high data volumes coming from seismographs for a tsu-

ni early warning system, while keeping the option to send high priority messages before everything else in case of a real alarm.

Taking advantage of the ultra-wideband sweep technology, the modems



continuously determine the signal propagation time and Doppler shift with high accuracy, which, at the same time, intrinsically provides the precise distance and relative velocity between modem pairs. Long and Short Base Line (LBL and SBL) positioning or tracking mobile systems (AUV, ROV, robots, etc.) become easy. EvoLogics provides its S2C modems in combination with a compact USBL module so that all measurements can be obtained by just one device capable of communicating with and tracking the remote station.

Additionally S2C modems can operate in network-mode, enabling transmission addressing modems individually, transfers over relay chains, broadcasting from one modem to multiple, or other adaptable geometries depending on the requirements.

Various sensors have been integrated to work seamlessly over the acoustic link, including ADCPs, CTDs, SVPs, Inertial Navigation Systems, sand monitors, motion sensors, and pressure sensors. Multiple sensors can be connected to a single modem, reducing the total energy consumption of complex systems.

Recently, years of developments and improvements have led to significant achievements. In an independent real-life test of multiple products, EvoLogics modems were selected from among the competitors for achieving the lowest energy consumption per bit transmitted reliably. Then, in turn, the modems have been deployed for the long-term European Seas Observatory NETwork (ESONET) using an acoustic wake-up

module to minimize energy consumption during idle periods to acquire sensor information and pictures.

There have been some remarkable demonstrations of the positioning capabilities of the S2C systems. For the calibration of the neutrino telescope in the Baikal sea in Russia, consisting of underwater strings of sensors up to 1,500m depth, the LBL configuration of the modems achieved a 5mm positioning accuracy over several hundred meters. And in a completely different environment, the position of a ROV for baffle bolt inspection was estimated to 0.07% of slant range.



Installation of the LBL calibration system at the Baikal neutrino telescope



AUV employing an EvoLogics USBL system for navigation

Combining the best from nature with leading edge engineering, the ICT Systems for deep water and harsh environments enable a higher degree of freedom, increased reliability, flexibility, and ease of use. EvoLogics' systems have become enabling technologies for deep water exploration and production with fully integrated solutions that reduce costs and risks. The development of extendable networks opens new frontiers for underwater communication, positioning and navigation, and monitoring applications.

For more information, visit www.evologics.de.

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- Depth: up to 7,000 m



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Cal Dive picks SAAB Seaeye Panther

To tackle the strong currents in Australia's offshore oil and gas fields, leading contracting company, Cal Dive International (Australia) Pty Limited, selected Saab Seaeye's powerful new Panther XT Plus ROV (zone rated and configured for operations in hazardous areas).

Although intended primarily for inspection work on oil and gas platforms, sub-sea completions and associated pipelines, Cal Dive says, "It has the muscle to do whatever needs to be done." Cal Dive points to the fact the Panther XT Plus has 10 powerful thrusters, 50% more power, and swims 30% faster than any other electric work ROV of its class.

Such thruster power means it can maintain position while working in the strong currents of Australian waters that would normally restrict the operations of other similar ROVs. The Panther's configuration, chosen by Cal Dive, includes a Seaeye wide-angle low-light black and white camera and a Kongsberg compact color zoom camera.

Also, a Tritech Super SeaKing sonar with dual frequency sonar head, and a Tritech altimeter with auto



altitude option are integrated on the ROBV. Fitted to the ROV are two Schilling Orion manipulators: starboard side, a seven function position feedback manipulator with 3.8in. gripper, and port side, a four function rate manipulator with 7.8in. gripper.

For debris clearance, the Panther comes with a rotary disc cutter and a 38mm anvil cutter. There is also a water jetting system, a cleaning brush assembly, and manipulator-held cleaning brush tool.

The ROV system includes a stainless steel framed tether management cage with 150m of tether cable, and its own Seaeye mini camera.

Also supplied through Saab Seaeye's West Australian distributor, Oceanvision, is a control container and a self-erecting launch and recovery A-frame with 1,100m umbilical cable capacity, a certified bullet assembly, and lock latch assembly with snubber rotator.

Cal Dive say that, although this is the first Saab Seaeye ROV for Cal Dive's Australian operation, the ROV team has had good previous experience with Saab Seaeye ROVs in other fields of operation. For more information, visit www.seaeye.com.

Technip selects SMD for SMART plough

Technip has reinforced its next generation subsea technology by selecting an SMD trencher for its renewables construction business known as the SMART plough.

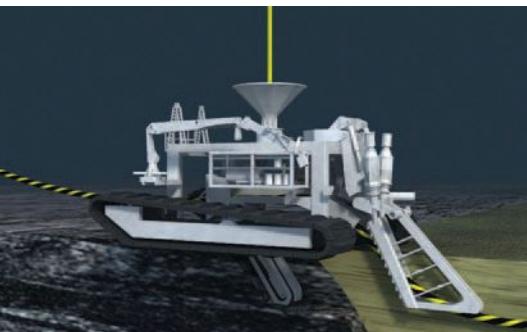
The trencher has the ability to automatically switch between trenching modes to suit changing soil conditions; from high pressure jetting to low pressure fluidisation, educting and mechanical cutting without the requirement to recover the unit and reconfigure systems. The mechanical chain cutter is designed to penetrate through 40mpa of rock and 1,000kpa of clay.

The SMART plough has a remote self-loading and unloading subsea capability, enabling cables to

be both safely and effectively deployed in water depths up to 1,000msw.

A 250kW variable nozzle 'in share' jetting feature enhances the plough's capabilities and reduces tow forces by an estimated 25%, resulting in faster burial speeds and lower vessel fuel costs.

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



SMD's ultra-compact Atom ROV begins production

The SMD Atom ROV goes into production with two systems ordered for early 2012. Both systems will be 100hp models and include Tether Management Systems (TMS), A-frame launch and recovery systems (LARS), and winches and control cabins.

The Atom is an ultra compact hydraulic vehicle available with either 60hp or 100hp of onboard power. It uses the latest versions of Curvetech components and DVECS II control system as used in the larger Quasar and Quantum vehicles. Despite its compact footprint, it comes with full-size, 7-function and 5-function manipulators.

SMD is the only work-class ROV manufacturer to design and build a full range of LARS and associated deck equipment, thus simplifying the ownership of a vehicle spread.

Training, spares and technical support are provided through SMD's Houston, Macae, Singapore and Newcastle facilities.

For more information, please visit www.smd.co.uk.



Forum announces ROV sales

Forum Energy Technologies, Inc. is pleased to announce the sale of five Perry XLX Heavy Work-Class ROV systems to Marine Platforms Limited (MPL). MPL offers diverse oil and gas services to the upstream sector of the oil and gas industry in West Africa from their Lagos and Onne Free Trade Zone locations.

These five TXLX ROV systems purchased by MPL will join their current ROV fleet, making a total of seven TXLXs and one 100hp Olympian ROV systems fully owned and operated by the Nigerian company. The TXLX ROV systems range from 150 to 200hp.

Forum is also pleased to announce the sale of a The Sub-Atlantic™ Mojave ROV to GeoTeam S.r.l. of Rome, Italy. GeoTeam is a solutions-based marine survey, construction support, and geotechnical contractor, with operations in the UK, Italy, and the United Arab Emirates.

The Sub-Atlantic™ Mojave ROV will be used in support of a contract in the Adriatic Sea using flooded member detection, close proximity and other non-destructive testing equipment.

For more information, visit www.f-e-t.com.

ECA Robotics announces delivery of Roving Bat ROVs



The Montpellier (France) division of ECA ROBOTICS announces the delivery of two Roving Bat ROVs to Noble Drilling Services Inc. for the inspection of their drill ships sea chests.

Roving Bat is a hybrid vehicle combining a free-flying ROV with a crawler. It is equipped with six thrusters, providing 100kg thrust, and two sets of motorized tracks. It can operate in 3kts currents and heavy swells.

It can reach its target in free-flying mode, completely tilt up and stick to the vertical surface, and then move along this surface in crawling mode to run a close inspection.

For more information, visit www.eca-robotics.com.

Chesapeake Technology announces high-resolution capability for SonarWiz 5

Chesapeake Technology, Inc. (CTI), the innovation leaders in sonar data acquisition and processing software, just announced a new high-resolution capability for SonarWiz 5 that doubles the resolution of the earlier version. The result for sidescan sonar data is crisper, sharper mosaics, waterfalls, and sonar contact images.

Surveyors in all types of industries can use high-resolution to resolve smaller features and see finer detail to improve productivity, security, and safety. For example, navy route surveys will better detect and classify mine like objects (MLOs). Fisheries researchers will better classify biological habitats. Archeologists will produce clearer images of shipwreck sites (such as the example at the right). And divers will

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Surveyors in all types of industries can use high-resolution to resolve smaller features and see finer detail to improve productivity, security, and safety.

The new high-resolution feature is the latest in an on-going stream of improvements, many of which are the result of customer requests. The new release of SonarWiz 5 is free to all customers who have an Extended Maintenance Agreement.

For more information, visit www.chesapeaketech.com.

Trelleborg Offshore delivers on SMD ROV buoyancy contract

Trelleborg Offshore was awarded a contract to supply underwater equipment manufacturer, SMD, with high-performance syntactic foam buoyancy modules for twenty new build work-class remotely operated vehicles (WROVs). SMD has delivered seventeen of these vehicles and work progresses on an additional 9 vehicles.

Trelleborg's field-proven modules are being used by SMD on its "QX Ultra"



WROVs manufactured for i-Tech (a division of Subsea 7), which operates one of the world's largest ROV fleets dedicated to the offshore exploration and production industry. The WROVs will be deployed for subsea intervention activity at oil and gas fields offshore Brazil.

The buoyancy modules are specified to work at depths ranging from 1,500 to 3,000 MSW (meters sea water) and consist of a syntactic foam composite core

coated in polyurethane (PU). To ensure the modules retain the required structural integrity in deepwater environments, a homogenous "hard shell" is incorporated into the outer layer of the PU elastomer skin.

Trelleborg's syntactic foam was developed to ensure the optimum strength to weight ratio for ROV operators. The specialist material provides safer operations through increased uplift, stability and buoyancy.

Guy Downie, sales manager, Trelleborg Offshore, said: "This contract enhances Trelleborg Offshore's position as the industry's leading manufacturer of buoyancy modules. We have an unrivalled track record with more than thirty years experience in the sector and our modules are installed on more than a thousand ROVs worldwide. Our expert material knowledge and extensive buoyancy product range means we can provide tailored solutions for every subsea environment."

For more information, visit www.trelleborg.com/en/offshore.

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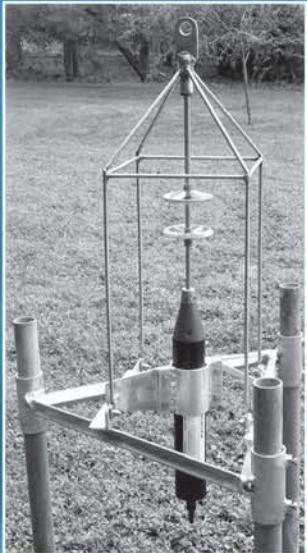
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MAVS-4SL	2000 m. Logging
MAVS-4DD	6000 m. Real Time
MAVS-4DL	6000 m. Logging
MAVS-4WTG	Directional Wave/Tide
MAVS-4LAB	.				.		For Flume or Lab Tank
MAVS-4Analog	4 Chan Analog Output



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Underwater Intervention

SeeByte & SMD come together to offer advanced control for work-class ROVs

SeeByte, the global leader in creating smart software technology for unmanned systems, and Soil Machine Dynamics Limited (SMD), one of the world's leading manufacturers of remote intervention equipment, have announced their intention to enter a partnership commencing in early 2012.

SeeByte and SMD will work together to develop advanced control algorithms for ROV systems, building on SMD's experience with its Distributed Vehicle Control System and drawing on SeeByte's expertise with products such as SeeTrack CoPilot. Having successfully worked together in the past to deliver the world's first mid-water DP application for rock-dumping on behalf of the Jan de Nul Group, the companies agreed to enter a partnership that will provide benefits for SMD customers, delivering enhanced vehicle control for ROV conducted subsea tasks. The partnership aims to push the boundaries for sophisticated autonomous and pilot-assisted systems for work-class opera-



tions in a range of environments.

For more information, visit www.seebyte.com.

BlueView secures integration agreement with Deep Ocean Engineering

BlueView Technologies, the world leader in compact acoustic imaging and measurement technology, and Deep Ocean Engineering, a well-established

brand with over 600 sophisticated ROVs in the field, signed a Systems Integrator Agreement that enables Deep Ocean Engineering to re-sell BlueView 2D and 3D products on Deep Ocean Engineering's ROVs. Deep Ocean Engineering recently moved to a new facility in San Jose, California where they are building, designing, and manufacturing the highest quality ROV systems in the world. BlueView's compact, multi-beam imaging sonar will expand Deep Ocean Engineering's real-time ROV navigation capabilities and operation in low and zero-visibility conditions.

For more information, visit www.blueview.com.

Forum announces 5 year agreement with Canyon Offshore

Forum Energy Technologies, Inc. is pleased to announce the signing of an exclusive 5 year supply agreement with Canyon Offshore (Canyon). Under the agreement, Forum will be the exclusive provider to Canyon of work-class ROVs and trenchers. This agreement was initiated with the award of two Perry XLX-200 work-class ROV systems, sched-

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uled for delivery in the second quarter of 2012, and immediate mobilization onboard Canyon's newest vessel, the Grand Canyon.

Under the agreement, Canyon, a member of the Helix Energy Solutions Group, expects to benefit from recent and future technical advances made in Forum's work-class ROVs. Forum expects to work closely with Canyon to provide the remote technology necessary to improve Canyon's deepwater operations and reduce risk.

For more information, visit www.f-e-t.com.

VideoRay completes delivery of Mini-ROV fleet to Dutch Navy

VideoRay LLC of Phoenixville, PA, along with Dutch partner Nautikaris BV of IJmuiden, The Netherlands, completed the site acceptance test of four VideoRay Pro 4 submersible systems with spare parts, accessories, and custom modifications. Training for operators and repair personnel was completed in January 2012.

The highly competitive contract was awarded to VideoRay in mid-2011, with a mandatory rapid turnaround. Among other things, the missions required by the winning system included ship hull inspections, harbor wall and warf piling inspections, bottom surveys, and small object recovery.

Objects of interest are primarily small objects such as limpet mines, sea mines, ammunition as well as contraband and drowning victims.

VideoRay has recently won contracts or sold multiple units to the U.S. Coast Guard, U.S. Navy, New York Police Department, Saudi Border Guard, Norwegian Navy, and several other governments and agencies.

For more information, visit www.videoray.com.



Ten more Falcons to Russia

Ten more Saab Seaeye Falcon ROVs have been ordered by Russia's JSC Tetis Pro, bringing the total sold into the Russian Federation to 24 – and more are planned.

Most of the 10 ordered will be used for civil defence emergencies and dealing with the consequences of natural disasters.

They will be installed aboard search and rescue vessels, ready to survey

for objects using multi-beam sonar. Two will also go to EMERCOM – the Russian Centre of Preparation to be deployed aboard a Russian Naval vessel.

Half of the Falcons ordered by Tetis this time round are the Falcon DR, deep rated to 1,000m, and others are standard, 300m rated Falcon.

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GMN launches RedPort Global satellite VoIP services

Global Marine Networks (GMN), the leaders in advancing satellite data speed and services, announced a distribution agreement with Vobal Technologies. Global Marine Networks will make Voice Over IP (VoIP) services available to maritime customers by incorporating Vobal technology as an integrated part of GMN's RedPort Global maritime services. Satellite VoIP services will offer up to 20min of talk time per MB with excellent voice quality. In addition to satellite VoIP, RedPort Global offers a complete suite of satellite network management solutions for maritime and ship-to-shore communications. The RedPort wXa routers are Inmarsat-certified for use with Inmarsat VLA accounts for FleetBroadband service. With RedPort Global, VSAT, FleetBroadband, and other IP-based data, users can save up to 80% on their satellite airtime usage while accelerating data throughput an average of 3 to 5 times while generating new revenue streams through a host of features. As an independent solutions provider, GMN works directly with Iridium and Inmarsat service providers and distribution providers to help them offer their customers best-in-class voice and data services. RedPort Global services are also available to VSAT providers looking to improve service quality and speeds for their customers.

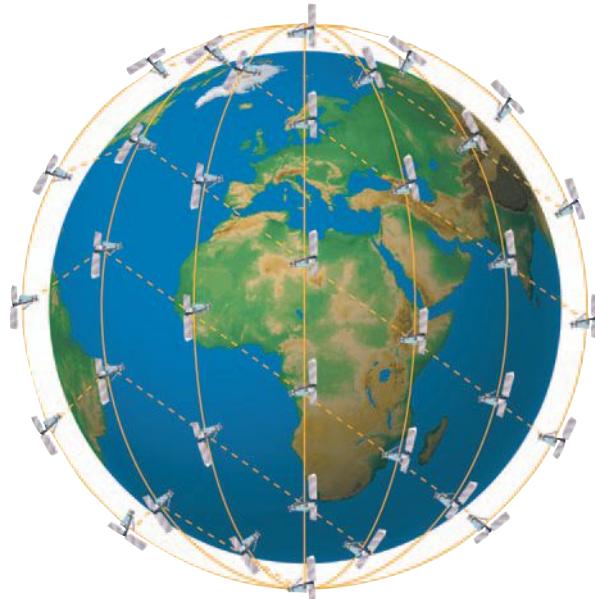
Boatracs announces new products

Boatracs Inc. has launched two new products -- a fleet management software platform called Boatracs BTConnect™ and its next generation tri-mode data communications system from Qualcomm, the Mobile Computing Platform 200 Series or MCP200. BTConnect is a web-based solution that integrates messaging and mapping functionality, providing access to fleet-wide data from anywhere on any device. With features such as route planning, custom landmarks, and global map layers, BTConnect ties together the critical functions of visually managing a fleet with two-way messaging to improve dispatching, accelerate invoicing, and increase operational efficiencies. The MCP200 is a multi-mode data communications system that delivers two-way messaging and positioning through satellite, cellular, and Wi-Fi. Featuring a compact design that uses either a slide-out keyboard or a color touch screen, the MCP200 can be used for free-form or structured messaging and has multiple data ports to connect peripherals, such as a compact scanner, to send critical documents to shore. The MCP200 offers higher output at faster speeds for the same cost-effective price as previous versions of Qualcomm's narrowband satellite data communications systems.

ITC Global completes successful acquisition of Broadpoint's satellite division

ITC Global has successfully completed the acquisition of the satellite operations of Broadpoint LLC, an established provider of communications services to the oil and gas sector in the Gulf of Mexico. The acquisition unites Broadpoint's industry experience and established customer base with ITC's global coverage and resources to create a comprehensive VSAT communications solution for the oil and gas market.

The acquisition firmly establishes ITC as one of the world's leading satellite service providers in the oil and gas industry. The company manages a global VSAT network across more than 25 satellite beams and nine teleport, covering every geography in which oil and gas companies operate. Broadpoint's customers will be able to access ITC's worldwide service, technology advisors, and managed support. Broadpoint will retain its core cellular telecommunications business, which operates the only ubiquitous cellular voice and data network in the Gulf of Mexico.

Iridium, KVH team to provide seamless global broadband

Iridium Communications Inc. and KVH Industries, Inc., announced an agreement to offer the first, fully global, seamless broadband satellite communications service for the maritime market. Under the agreement, KVH will offer an integrated service package that combines its mini-VSAT Broadband® service and the Iridium OpenPort® broadband service. The combined offering will deliver the maritime industry the first seamless, truly global, broadband connectivity, helping mariners connect in ways never before thought possible.

The integrated shipboard system will use common below-deck user interface equipment for voice and data connections, combining the Iridium OpenPort and KVH TracPhone® V3 or V7 terminals. KVH's CommBox™ shipboard network management tool automatically selects the mini-VSAT Broadband service or the Iridium OpenPort service using intelligent least-cost routing software. If mini-VSAT Broadband service is ever unavailable, the system immediately switches over to the Iridium OpenPort service without operator intervention. The Iridium OpenPort connection can also serve as a means to access the mini-VSAT Broadband terminal remotely as well as other shipboard maintenance and calibration equipment.

KVH's breakthrough TracPhone V3 and V7 platforms, based on KVH's RingFire™ technology, offer robust and reliable download speeds up to 2Mbps and clear voice connections through the world's smallest stabilized VSAT antenna. Combined with Iridium OpenPort's proven reliability and global coverage, it delivers a best-in-class communications solution.

For more information, visit www.iridium.com or www.kvh.com.

Maersk, Ericsson bring mobile connectivity to the oceans

The oceans are the last “white spot” for the mobile communication industry to connect. The world’s largest shipping company, Maersk Line, has appointed Ericsson to address this by introducing end-to-end systems integration and deployment of mobile and satellite communication to its entire vessel fleet.

The Maersk Line fleet comprises more than 500 container vessels. Over the next 2 years, Maersk Line will outfit 400 of these vessels with Ericsson antennas and GSM base stations, with upgrades to be made to the remaining vessels soon after. As part of the agreement, Ericsson will provide 7 years of global managed services support, including 24/7 network monitoring, and onboard maintenance services in a large number of ports across all major regions.

For the shipping industry, mobile communication provides the opportunity to employ new and efficient ways of addressing fleet management, managing delivery times, improving interaction with vessels, enabling proactive issue resolution and prompt information sharing with customers, and even improving energy efficiency.

Until now, Maersk Line’s high-tech modern container ships have been equipped with satellite connectivity primarily intended to support communication for vital shipboard functions. Ericsson’s integrated maritime mobile and very-small-aperture terminal (VSAT) satellite solution will bring extended connectivity to the entire fleet, allowing for new ways of communicating and contributing to efficiency, reliability, and cost reduction. It also paves the way for immediate access to remote expertise, resulting in extended access to information and, in turn, improved efficiency in the vessels’ daily operations.

For more information, visit www.ericsson.com or www.maerskline.com.

New agreement set to revolutionize the maritime broadband market

Thrane & Thrane has signed an agreement with Ericsson for the delivery of at least 290 units of the new SAILOR 900 VSAT. The agreement represents the largest single maritime VSAT order, with a contract value of at least DKK 60 million and the inclusion of global service, support, and training. The majority of the delivery will take place over the next 12 months, with a service agreement lasting the next 7 years.

For Thrane & Thrane, the order marks a technological and commercial breakthrough in the maritime VSAT market. The newly developed SAILOR 900 VSAT sets a new standard for communications at sea with a number of innovative features and usage possibilities.

Complex procurement, installation, and operation has, until now, been a limiting factor to the wider adoption of maritime VSAT. Furthermore, many different satellite operators provide broadband connections based on Ku-band, which has to some extent limited the deployment of VSAT because of the great demands made on the interaction between modem, network, and antenna.

The innovative technology of Thrane & Thrane’s SAILOR 900 VSAT solves several of these problems. The system dispenses with troublesome and time-consuming testing, balancing, and configuration of satellite antennas onboard vessels, as Thrane & Thrane performs such necessary processes prior to delivery. That makes the system fast and simple to install as well as more reliable. In addition, the SAILOR 900 VSAT is compatible with all Ku-band satellite systems globally.

For more information, visit www.thrane.com.



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MTN Satellite Communications inks VSAT deal

MTN Satellite Communications (MTN) announced that it will provide Costa Cruises' new flagship, Costa Fascinosa, with Very Small Aperture Terminal (VSAT) services by leveraging its global satellite network that so many cruise ships have come to rely on for delivering crew and passenger data anywhere in the world. For the past 2 decades, MTN has proven that it is the de-facto VSAT standard within the cruise industry, and this selection by Costa Cruises, the largest Italian travel group and the number-one cruise company in Europe, demonstrates the company's growing foothold within the European market.

MTN operates a worldwide footprint of VSAT satellite connectivity with more than 35 satellite footprints. MTN's secure network infrastructure consists of 10 teleport gateways and 13 points of presence, strategically located across the globe. Each of these facilities is interconnected through an extensive redundant terrestrial network backbone offering numerous connectivity options to meet partners' important business

and communications requirements. This infrastructure is critical to ensure communications are 100% operational, no matter the weather condition or location of the vessel.

Through MTN's exceptionally reliable VSAT solutions, a comprehensive portfolio of onboard revenue opportunities is offered to cruise line partners. The products and services, which add to the overall cruising experience, include remote access for Internet, fixed and mobile phones, fax, MTN Worldwide TV, OceanPhone® crew calling, a payroll solution for crew, and other enterprise solutions.

For more information, visit www.mtnsat.com.

Inmarsat selects Intellian for Global Xpress maritime antennas

Inmarsat announced the selection of Intellian Technologies for the production of marine stabilized antennas for its forthcoming Global Xpress™ (GX) service.

Intellian, a leader in antenna systems for the maritime market, will design and manufacture a 60cm Ka-band GX antenna and a 1m Ku-band antenna that can be converted to Global Xpress when the

service starts in 2013. Both antennas will incorporate the GX core module currently under development by iDirect.

The world's first global Ka-band network, Global Xpress will deliver a high-performance, high-quality, cost-competitive service. Capable of providing up to 50Mbps, GX will operate alongside Inmarsat's existing L-band maritime services to offer an unrivalled combination of power, reliability, and global coverage for the world's shipping fleets.

For more information, visit www.inmarsat.com or www.intelliantech.com.

KVH Industries' TracPhone V3 receives honors for innovative technology

The TracPhone(R) V3 from KVH Industries, Inc. created a stir in the maritime communications market when it was introduced in February 2011 due to its small size, fast data rates, and affordable service. Now, it's been honored with two prestigious awards for those same features – the product was chosen for the "Spotlight on New Technology" at the Louisiana Gulf Coast Oil

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Expedition (LAGCOE) and it received the Providence Business News' 2011 Innovation of the Year award at a ceremony in Rhode Island.

KVH is known for its innovative approach to technology, especially in the maritime market. The mini-VSAT Broadband's popularity with commercial mariners, like those who work in the oil and gas industry and attended KVH's Spotlight on Technology presentation at LAGCOE, is based on a long history of reliability and quality in all of KVH's products, from digital compasses to satellite TV systems to its global satellite communications service. That reputation has been good for business worldwide and for the economy in Rhode Island, where KVH got its start and where its world headquarters is located.

The TracPhone V3 is licensed by the U.S. Federal Communications Commission (FCC) and includes a fully stabilized, 14.5in. (37cm) antenna that weighs just 25lbs, a powerful ViaSat ArcLight(R) spread spectrum modem, and a sleek antenna control unit that are all fully integrated and configured for

easy installation. ArcLight spread spectrum technology enables very small antennas like KVH's TracPhone V3 to receive satellite transmissions with the speed and reliability of older, 1m VSAT antennas that use the TDMA transmission schemes originally designed for terrestrial use. KVH's high-efficiency RingFire™ antenna design and dielectric feed rod technology combine to help the TracPhone V3 offer great performance, even in poor weather, and its rugged, lightweight design is perfect for use on leisure and commercial vessels as small as 30ft.

With more than 1,500 antenna systems shipped and global coverage, KVH's mini-VSAT Broadband™ network is the world's largest and fastest growing maritime Ku-band satellite communications network. A managed airtime network solution, it equips vessels with true broadband connections as well as Voice over IP (VoIP) telephone lines with optimized service and prioritization of applications.

For more information, visit www.kvh.com.

Telemar unveils a new paradigm in global maritime broadband

Telemar, in partnership with ORBIT Communication Systems and Milano Teleport announced the launch of iCGlobal, a new paradigm in maritime satellite communications. This flexible and future-proof solution combines the benefits of robust, all-weather global coverage of C-Band and cost-efficient scalable airtime packages with the easy-to-install and revolutionary compact OrBand VSAT system.

A key component of the iCGlobal solution is OrBand, a compact C-Band maritime VSAT system that was built specifically to overcome the limitations of traditional C-Band terminals. OrBand takes up 40% less deck space than industry-standard systems and is over 30% lighter. Small enough to be shipped as a single, fully assembled and tested unit in a standard 20ft. container, OrBand drastically lowers deployment costs and can be installed in a matter of hours.

For more information, visit www.telemargroup.com.



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NKT lands wind farm cable project

NKT Cables has signed a contract with E.ON Climate & Renewables Central Europe GmbH at a value of around €20 million for the Amrumbank West offshore wind farm. For NKT Cables, Amrumbank West will be the latest project for its armored 33kV submarine cables. The cable will be manufactured at the production facilities in Cologne. The Amrumbank West will be situated in the North Sea, north of Helgoland and west of Amrum. The offshore wind farm consists of 80 wind turbines of 3.6MW each. The inner park array cabling shall be realized in 12 lines that are connected to 33kV medium voltage switchgear on offshore substations. The offshore substation will transform the voltage to the level of 155kV and transmit the power of up to 288MW to the high voltage cable termination point on this substation.

ABB to invest in expansion of cable production capacity

ABB will invest over \$400 million to double the capacity of its high-voltage cables manufacturing facility in Karlskrona, Sweden to meet growing demand for sub-sea cables. The investment plan includes construction of new buildings and installation of additional manufacturing lines at the existing plant. The expansion will be carried out in a phased manner and is expected to be completed by 2015. This move follows an investment of about \$90 million announced last year to build a new cable factory in the U.S. for land cables used in alternating current (AC) and direct current (DC) applications. A major upgrade of ABB's Karlskrona facility has already been completed earlier this year. The new investment will further strengthen ABB's leading position in the high-voltage cables market.

NSW wins award for Borkum Riffgrund 1

Norddeutsche Seekabelwerke GmbH (NSW) has been awarded a contract for the connection of the Borkum Riffgrund 1 offshore wind farm with the DolWin Alpha offshore converter platform via two parallel 155kV AC submarine cable systems. The contract was awarded by TenneT TSO GmbH and calls for the supply and installation of 26km of 155kV AC submarine power cable systems. DolWin Alpha is located approximately 75km from the German coast and is the offshore converter station for the grid connection project DolWin1. The Borkum Riffgrund 1 offshore wind farm will be connected to this converter station. From there, a high voltage DC transmission of 800MW will transport the energy generated from several offshore wind farms to the supergrid in Dörpen, located 165km away.

Laying of Maldives cable system begins

Dhiraagu, the Maldives business of Cable & Wireless Communications, has commenced laying a new fiber optic submarine cable network system that will run from the north to the south of the island nation. The Dhiraagu Domestic Submarine Cable Network (DDSCN) is a 1,253km long fiber optic submarine cable that first came ashore on the island of Kulhudhuffushi, capital of the Haa Dhaalu Atoll in the north of the Maldives. The DDSCN project will enable Dhiraagu to offer high-quality, high-speed broadband Internet services that will also facilitate services such as e-health, telemedicine, e-government, and other online services in the Maldives. The DDSCN Submarine Cable laying operation was inaugurated by the President of the Maldives, His Excellency President Mohamed Nasheed, who participated in the landing of the cable at the first landing station in the North. The network, which is being constructed under contract by the NEC Corporation, will become operational during 2012.

Tata Global Network-Gulf cable system goes live

Tata Communications and Omani carrier Nawras have announced the launch of the Oman to India TGN-Gulf cable. The undersea cable will be used to instantaneously route voice and data traffic from Oman to Mumbai (India) and onwards to the rest of the world via the Tata Global Network (TGN).

The new cable link offers enormous capacity for broadband and high-quality voice services, enabling Nawras to meet the growing demand for international voice and data services from its customers – be it in the form of calls or Internet surfing.

The development forms part of the strategic TGN-Gulf cable project, which will connect the Gulf region to the rest of the world via the Tata Global Network, providing reliable high-speed bandwidth to all the key cities in the world. The TGN-Gulf Cable System, acting as a gateway to the TGN, will provide a new dimension to the infrastructure and unique service capabilities of each partner. Using its own cable stations, each party will have access to a new high-speed global route, adding much needed resilience and diversity to the infrastructure in each country. The capacity will also help to support the continued expansion of broadband penetration, Internet usage, and enterprise applications in each market.

The launch forms part of a strategic roll out plan to support the development of an extended portfolio of advanced telecommunications services that are suited to support both local and global enterprises, which are very active in this rapidly expanding emerging market region.

The TGN-Gulf project landing parties are Nawras (Sultanate of Oman), Etisalat (United Arab Emirates), Qatar Telecom (Qatar), Bahrain Internet Exchange (Kingdom of Bahrain), and Mobily (Kingdom of Saudi Arabia).

For more information, visit www.tatacommunications.com.

Hibernia Atlantic, Huawei complete first 100Gbps transatlantic trial

Hibernia Atlantic, Huawei, and Huawei Marine have successfully completed the first 100G transatlantic connection between Halifax, Nova Scotia, Canada to Southport, England. This test was historic in nature; this is the highest capacity connection ever transmitted across the Atlantic Ocean. The success of this trial is allowing the companies to move forward on their aggressive deployment schedule,

Subsea Telecom

including 100Gbps connections between Halifax and Montreal and between Amsterdam and London by first quarter 2012, followed by other key routes later in the year.

The trial involved Huawei's latest 100Gbps single wavelength coherent technology. This Optical Interoperability Forum (OIF) standards compliant technology utilizes innovative Digital Signal Processing (DSP) algorithms and next generation Forward Error Correction (FEC), enabling high-capacity transport across transatlantic distances. In addition to performing across distances greater than 5,000km, the trial has successfully demonstrated long-term, error-free transmission at 100Gbps. Additionally, transmission with existing Huawei 40Gbps wavelengths at 50GHz spacing was achieved, allowing for a smooth and seamless bandwidth upgrade. Huawei also successfully demonstrated co-propagation of 100Gbps wavelengths at 50GHz spacing, which enables future upgrades of subsea capacities up to 5Tbps.

This 100Gbps technology is available on Huawei's OptiX product series, which is a next generation, intelligent, Optical Transport Network (OTN) platform scalable to over 6Tbps of switching capacity. Hibernia Atlantic is using this equipment to upgrade their existing secure and diverse cable system.

Both companies have a long history of partnering together for successful industry-first milestones. From providing the first 40Gbps capacity over a subsea span to offering commercially native 40Gbps wavelengths between Europe and North America, the two organizations are committed to presenting clients with cutting-edge advancements. Additionally, the companies were the first to offer 10Gbps Ethernet LAN-PHY capacity across the Atlantic Ocean as early as 2006. The companies look to continue their history of cutting-edge, industry firsts through the deployment of Project Express in 2013.

For more information, visit www.hiberniaatlantic.com

Columbus Networks picks Xtera for ARCOS-1 upgrade

Xtera Communications, Inc. announced that Columbus Networks has upgraded the ARCOS-1 cable system with its recently-introduced regional repeatered Submarine Line Terminal Equipment (SLTE). The 8,600km submarine cable network connects the Caribbean, Central, and South America to the U.S. using 2 repeatered and 22 unrepeatered links.

Xtera Communications first deployed its technology on the 22 unrepeatered segments of ARCOS-1 in 2008. Since that time, Xtera has been responsible for the capacity upgrades of the unrepeatered segments. This is the first time the company has been called upon to increase capacity of the ARCOS-1 repeatered segments. To meet the demand, Xtera deployed its regional repeatered submarine system.

This solution uses a compact, cost-effective SLTE for repeatered links covering distances of 500 to 3,000km. Xtera's regional repeatered and unrepeatered segments are monitored by the same network management system.

Columbus Networks is the largest subsea fiber optic communications company connecting the U.S., Mexico, Central America, South America, and the Caribbean. The company's undersea fiber

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optic networks span more than 18,000km of cable routes, including Americas Region Caribbean Optical-ring System (ARCOS-1), Colombia–Florida Express (CFX), EC-Link cable system, Fibralink, and Maya. Columbus Networks is a wholly owned subsidiary of Columbus Communications based in Bridgetown, Barbados. Columbus Networks is based in North Miami, Florida.

For more information, visit www.columbus-networks.com

NEC wins APG supply contract

NEC Corporation has announced the signing of a multi-million dollar supply contract with the global consortium of communications companies, including NTT Communications (NTT Com), KT, Chunghwa Telecom, and others, to construct the Asia Pacific Gateway (APG) system, a high-bandwidth optical submarine cable system that will link nine countries and territories in Asia.

The APG system is designed for a transmission speed of 40Gbps per wavelength, utilizing the latest digital coherent



ent detection and OADM (Optical Add-Drop Multiplexing) technologies. Total length is expected to be 10,400km, linking China Mainland, Hong Kong, Japan, South Korea, Malaysia, Taiwan, Thailand, Vietnam, and Singapore. APG is expected to meet the demand for intra-Asia connectivity between South East Asia and North Asia.

APG is scheduled to be launched by June 2014, with a total design capacity of 54.8Tbps. The contract will become effective by March 2012. The network initially will use the latest 40Gbps wavelength technology and is designed to accommodate 100Gbps wavelength technology for increasing efficiency and high-capacity.

For more information, visit www.nec.com.

Sea Fibre Networks begins laying CeltixConnect

Sea Fibre Networks (SFN) has launched construction of the CeltixConnect submarine fiber optic cable system between Ireland and the UK. It is the first major European sub-sea cable for 11 years.

The 450ft ship Cable Innovator has arrived in Dublin, Ireland to commence the much awaited subsea lay. SFN notes that 98% of Internet traffic is carried on subsea cables. The critical infrastructure will support the infinite growth of data driven by cloud computing, online gaming, social media, and mobile data devices. CeltixConnect, as the shortest route, will accelerate the growth of the latency sensitive digital services industry, addressing many of the issues that have been facing FDI technology and financial organizations as well as providing the infrastructure to drive Ireland and the Welsh smart economy.

For more information, visit www.celtixconnect.com.

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Subsea Telecom

TE SubCom, GBI announce completion of cable system

Gulf Bridge International (GBI), the Middle East's first privately owned submarine cable operator, and TE SubCom, a TE Connectivity Ltd. Company and an industry pioneer in undersea communications technology, have announced the completion of works of the GBI cable system segments within the Gulf, the Gulf to India, the Gulf to Egypt, across Egypt and across the Mediterranean to Italy. GBI and TE SubCom are working together to achieve a final Ready for Service across the whole network within the coming few weeks.

With a capacity of at least 5.18Tbps, the GBI cable system will enable real-time communications for telecommunications operators and other major industries, while encouraging a greater sophistication of service offerings. It is the first system of its kind to be installed in the region in more than a decade.

For more information, visit www.subcom.com or www.gbiinc.com.

Southern Cross supports broadband with Ciena upgrade

Southern Cross Cable Network has announced the selection of Ciena Corporation to expand capacity as part of its upgrade of its subsea cable network. To meet growing demand for high-bandwidth services and applications like video and cloud computing, which is now pushing its needs beyond 10Gbps wavelengths, Southern Cross Cables will increase capacity on all of its network segments between Australia, New Zealand, and the U.S., including one that spans more than 8,000km, with Ciena's industry-leading 40G+ coherent optical solutions. Southern Cross Cable will also enhance its network's survivability, efficiency, and intelligence with advanced bandwidth management and operations afforded by Ciena's multi-protocol switching platform to future proof the network.

Building on its existing coherent 40G terrestrial deployments with Ciena's 6500 Packet-Optical Platform, Southern Cross will augment its existing network with additional 6500 platforms equipped with 40G and 100G submarine-grade coherent line interfaces, which are designed to sig-

nificantly and cost-effectively increase submarine network capacity without disrupting existing customer traffic or adding significant complexity to the network.

Using Ciena's WaveLogic coherent technology, the network expansion will involve a 400Gbps capacity upgrade on each of Southern Cross' seven segments, taking lit capacity on each cable to 1Tbps and total capacity on the network to 2Tbps. Southern Cross will also utilize Ciena's 5430 and 5410 Reconfigurable Switching Systems, which offer 3.6Tbps and 1.2Tbps of OTN-based intelligent control plane-enabled switching capacity for bandwidth aggregation and management.

In addition, Southern Cross is deploying Ciena's OneControl Unified Management System for end-to-end management across Layers 0 and 1 on both the 6500 and 5400 platforms. This will provide Southern Cross Cable with a comprehensive solution to manage their mission critical networks, including multi-layer intelligence for rapid service turn-up, unsurpassed visibility through protocol layers for troubleshooting, and efficient use of assets and bandwidth.

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Nexans to supply unrepeated cable for Ireland-UK link

Nexans has been awarded a contract to supply 130km of URC-1 (underwater repeaterless cable) to Emerald Bridge Fibres Ltd. Emerald Bridge is a joint venture between UK fiber network provider Geo Networks Ltd. and Ireland's leading telecom provider ESB Telecoms Ltd to lay the most recent submarine optical fiber between Ireland and the UK.

The URC-1 cable will be supplied in two separate designs, both single and double-armored, to ensure the highest level of reliability. By using the latest technology, the cable will be made up of 96 fibers, the highest capacity available for UJ qualification. This will allow for plenty of flexibility to grow beyond current capacity requirements. The cable is currently being manufactured at Nexans' Rognan factory in Norway and will be ready for delivery to Emerald Bridge in time for the marine installation.

Emerald Bridge was formed to proceed with the construction and operation of the shortest highest quality and

most modern subsea cable system linking Wales in the UK to Dublin in the Republic of Ireland. With over 20 years of collective experience in the design and planning of telecommunications networks and solutions, Emerald Bridge will benefit greatly from the expertise and support of both of its shareholding partners. The new cable system named Emerald Bridge 1 (EB1) is expected to be commissioned at the beginning of 2012 while commitments to purchase dark fiber on the new system have already been received from two major anchor customers.

For more information, visit www.geo-uk.net or www.nexans.com.

New venture announces Africa-Europe-Americas cable

WASACE Cable Company Worldwide Holding has announced plans to build a submarine fiber optic cable system linking the major markets of four continents – Africa, South America, North America, and Europe.

It is the largest such project ever mounted in the Atlantic Ocean. The projects' total fiber length is seven times the

circumference of the earth. If the fibers were connected end-to-end, they would stretch three quarters of the way to the moon, the company said in a statement.

WASACE will deploy the next-generation 100G technology, with 10 times the capacity of previous systems. The cable system represents a total investment of billions of U.S. dollars from investors on four continents, including the international private equity investment firm VIP Must and the African Development Bank as well as Brazilian and other investors.

The project is headed by WASACE Cable Company Worldwide Holding, a multinational development company. Project development will be managed by the David Ross Group.

The project will provide a heretofore unavailable quantity of affordable Internet communication capacity, linking the fast-growing markets of Africa and Latin America with the major commercial markets of North America and Europe.

For more information, visit www.wasace.com.

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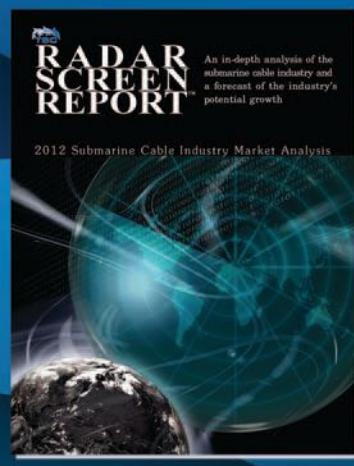
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Subsea Telecom

NTT Com's PC-1 transpacific cable to go to 100G

NTT Communications Corporation (NTT Com) announced that following the world's first successful trial of 100Gbps optical transmission on its PC-1 transpacific submarine cable system, which was announced in October, the company has confirmed the commercial viability of digital coherent transmission, a next-generation optical transmission technology, and has formally decided to incorporate the technology in the PC-1 by the middle of 2013. The upgrade will boost the PC-1's transmission capacity to 10Tbps, more than triple its current capacity of 3.2Tbps.

Digital coherent transmission is a next-generation transmission technology that improves spectral efficiency through multi-level modulation such as phase modulation and polarization multiplexing. It greatly enhances receiver sensitivity by combining coherent detection and digital signal processing.

PC Landing Corp., an NTT Com group company and operator of the PC-1, succeeded in a trial 100Gbps optical communication transmission using digital coherent technology in October. The trial, conducted over more than 9,500km of PC-1 fiber, was supported by the PC-1's optically optimized architecture, including efficiently placed optical repeaters and optical fiber layout.

The PC-1 transpacific network, measuring 21,000km in total and with current capacity of 3.2Tbps, is a ring topology network consisting of four fiber-pairs organized in four segments connecting landing stations near major metropolitan areas in the U.S. and Japan: Ajigaura (near Tokyo); Shima (near Osaka and Nagoya); Harbour Pointe, Washington (near Seattle); and Grover Beach, California (between San Francisco and Los Angeles).

For more information, visit www.ntt.com.

ASE construction begins

The Philippine Long Distance Telephone Company (PLDT) announced that marine construction work has started on the \$300 million Asia Submarine-cable Express (ASE), which when completed in the third quarter of 2012 will more than double PLDT's existing international bandwidth capacity.

The 7,200km undersea cable network project is being undertaken by

PLDT, NTT Com of Japan, and StarHub of Singapore, in partnership with NEC Corp. and Fujitsu Ltd.

The start of cable laying work was marked by a ceremony in Daet, Camarines Norte, where PLDT's cable landing station is being built. This is PLDT's third landing station, after those in Nasugbu, Batangas and Bauang, La Union.

With the ASE, new bandwidth

heavy broadband applications requiring international access, such as IP-based data, external video content, and other external multimedia services, can be offered by the PLDT Group and easily accessed by its customers. ASE will further enhance and fortify the resiliency of PLDT's international network.

For more information, visit www.pldt.com.ph.

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ABB wins order from Statoil

ABB has won an order worth an estimated \$270 million from the international energy company Statoil to supply an electric drive system for two new pre-compression units to improve production capacity and extend the lifespan of the world's largest natural gas platform in the North Sea.



The Troll A concrete deep water structure is located 70km from the west coast of Norway. It is the tallest structure ever to be moved by mankind. As gas is extracted from the field, reservoir pressure falls and production declines. ABB's delivery provides a clean and energy efficient source of power to help the platform improve production capacity.

The scope of supply for the project includes two compressor drive systems, each consisting of one 50MW/66kV high-voltage motor, which will be used to boost the gas pipeline flow. ABB will also deliver two high-voltage direct current (HVDC) power transmission systems, including HVDC converters and subsea direct current cables to provide reliable power to the offshore equipment from the shore.

In 2005, Statoil inaugurated the first HVDC Light power-from-shore system for the first phase of the pre-compression program on the Troll A platform, connecting it with the converter station at the onshore facility.

This is ABB's sixth order for offshore applications of HVDC Light, showing that the technology is robust and withstands the harsh environment offshore. Besides power-from-shore installations, HVDC Light is also used to connect remote offshore wind generation to the mainland grid.

For more information, visit www.abb.com.

Mitsubishi enters offshore transmission operation business

Mitsubishi Corporation (MC), through its wholly owned special purpose company and its UK-based subsidiary, has acquired a 50% share of the Walney 1 offshore transmission assets. The acquisition was made from Macquarie Capital Group Limited (UK Branch) and represents the first time for a Japanese company to be involved in operation of offshore undersea transmission cable business overseas.

Macquarie, following a tender for the license to operate the transmission cable run by Ofgem, which the UK energy regulator commenced in July 2009 has owned the right to operate the Walney 1 offshore undersea transmission cable together with a Fund managed by Barclays Infrastructure Funds Management (BIFM). After the transaction between Macquarie and MC, MC and The BIFM Fund now each own 50% of Walney 1.

Walney 1's assets are approximately 105.4 euros. MC and BIFM will maintain and operate the undersea transmission cable, approximately 50km, which connects the offshore wind farm located in the East Irish Sea to the Lancaster Coast and its transformers facilities. The two companies have a license to operate the project for 20 years.

Infrastructure business is a strategic focus area for MC, as highlighted in its Midterm Corporate Strategy 2012, announced in July 2010. MC will continue to expand its presence in the cable operation business, paying particular attention to new projects in the UK.

For more information, visit www.mitsushicorp.com.

Nexans wins power umbilical contract from Chevron

Nexans has been awarded a contract by Chevron U.S.A. Inc. to design, manufacture and supply a total of 138,000ft (42km) of power umbilicals and terminations for the Jack and St. Malo fields in the Deepwater Gulf of Mexico. The umbilicals shall be loaded out from the new long-term storage carousel in Mobile, Alabama dedicated to providing enhanced logistical support for customers in the Gulf of Mexico region.

The Jack and St. Malo fields are located within 25mi (40km) of each other approximately 280mi (450km) south of New Orleans, Louisiana in water depths of 7,000ft (2,100m). The project will comprise three subsea centers tied back to a hub production facil-

ty with a capacity of 170,000bbl/d and 42.5mcf/d of natural gas.

Nexans' specialized cable manufacturing facilities in Halden, Norway will design and manufacture the power umbilical for the Jack and St. Malo fields in two separate lengths, together with the associated umbilical termination heads (UTHs). On completion, the power umbilicals will be delivered to the newly constructed carousel at the Theodore Industrial Port in Mobile, Alabama in 2013, where they will be held in storage until called-off by Chevron for installation.



The power umbilical is a cable product pioneered by Nexans that integrates the functions of power cables and umbilicals in a single cable, enabling a high-voltage supply to be provided for deepwater projects. A power umbilical includes a number of steel tubes as well as fiber optic elements and signal cables for control and monitoring purposes. By eliminating the need to transport and install separate power and control umbilical the power umbilical significantly reduces transportation and installation costs.

For more information, visit www.nexans.com.

Global Marine announces the creation of energy unit

The Global Marine Group, has legally incorporated its Energy business unit, which was formerly a division of Global Marine Systems Ltd., into a new company named Global Marine Systems Energy Ltd.

Global Marine Systems Ltd, part of the Global Marine Group and wholly owned by Bridgehouse Marine, is a leader in the installation and mainte-

nance of subsea cables for the telecommunications industry. The new energy business, will focus on the rapidly expanding market for offshore power cable installation around the world.

Along with the creation of the new business itself, Mark Leggett has been announced as the managing director for Global Marine Systems Energy Ltd. and brings with him over 30 years of experience focused in the energy, renewable energy, and oil and gas sectors. Specifically, he has served as CEO at Simon Carves Limited, president and CEO at Aker Kvaerner Engineering Services Limited, and sat on the main board of the UK Nuclear Decommissioning Authority as commercial director.

Vessels and equipment, which have been purpose-built for power cable installation, will become part of Global Marine Systems Energy Ltd., with the Global Marine fleet—the largest offshore cable installation and maintenance fleet in the world, available to the entire Global Marine Group.

Global Marine has recently made a major investment in its vessel, CS Sovereign, with the addition of two 2,300t capacity turntables, creating a multi-purpose cornerstone of the fleet. CS Sovereign is one of the most versatile and proven offshore cable installation vessels in the world. The vessel is one of the leading telecommunications installation cable vessels and has worked on over 17 offshore power cable installation projects in recent years.

In addition, Global Marine is well-advanced in the construction of a purpose-built vessel, to be named Cable Enterprise that will enter the market in 2012 to specifically address the needs of export power cable installation, offering the capability to carry 4000t of cable in a single length and to undertake installation from the beach to the offshore installation, whether that is a wind-turbine or an offshore oil production platform. The vessel will be the third Cable Enterprise to enter the Global Marine fleet, with the original vessel serving the needs of telegraph customers from 1882.

For more information, visit www.globalmarinesystems.com.

ABB commissions power link between Sweden and Finland

ABB has successfully commissioned a power link between Finland and Sweden. The HVDC Fennovoima 2 link is a cable-based power transmission system that enables the exchange of an additional 800MW of power between the two countries, mitigating transmission bottle-necks in the region. The Fennovoima link is owned and operated by Fingrid and Svenska Kraftnät.

The installation includes two converter stations, one situated in Rauma, on the Finnish side, and the other in Finnböle, Sweden. The control system of the original link will also be upgraded. The newly commissioned link will run in parallel with Fennovoima 1, delivered by ABB in 1989, providing a bipolar link to enhance the capacity for power trading and improve the security of supply in the region. On the Swedish side, the converter stations for Fennovoima 1 and 2 are located 70km from each other, due to AC grid constraints. This challenge is overcome with the latest control and communication technologies combined with an innovative circuit solution, which enables an integrated bipolar despite the geographical separation.

For more information, visit www.abb.com.

TenneT asks for discussion on connection of offshore wind farms in Germany

Transmission system operator TenneT is making exceptional efforts in the connection of offshore wind farms in Germany. The company is, therefore, making a considerable and very important contribution to the transition to a sustainable energy



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supply, having made unprecedented investments of several billion Euros in Europe. Currently, there are nine projects to connect wind farms in the German North Sea in preparation.

TenneT has now written to the German Federal Chancellery, the Federal Ministry of Economics, and the Federal Environment Ministry informing them that the construction of connecting cables for offshore wind farms in the North Sea is no longer advisable and possible under current conditions and in the current speed. The limits of both the Offshore Partners and TenneT to establish connections have been reached. Reasons include lack of human, material, and financial resources of all the parties involved, both suppliers and TenneT.

TenneT said it will carry out the already authorized connection projects, unchanged. The commissioning of further DC power connections is not possible under current conditions and speed, however. If additional offshore wind farms are to be connected, general conditions must be improved. Furthermore, the speed of new onshore lines, which is lagging, should keep track with offshore

developments. Fundamental changes in the regulatory framework are necessary for this. TenneT has, therefore, asked the German Federal Government for a broad discussion of the necessary adjustments to the regulatory framework and connection procedures with all offshore partners and the Federal Network Agency.

For more information, visit www.tennet.org.

OMM launches maintenance service for marine renewables sector

Offshore Marine Management (OMM) has announced the launch of a new maintenance support service for offshore renewables operators.

With little existing guidance and no legislation currently in place, operators may not be conducting the maintenance they need in order to guarantee the integrity of their assets – or they might be spending too much on completing unnecessary routine servicing. OMM's new Inspection, Maintenance and Repair (IMR) service can give operators the confidence they need in every aspect of their installation.

By studying best practice approaches to maintenance that exist in other markets, including the oil and gas industry, and building in a stage where maintenance plans are verified by a third party, OMM believes it has identified an approach that can be applied to any installation, regardless of size or age.

OMM is currently in discussions with a number of renewables operators regarding IMR, and is now looking for further opportunities with companies around the world, including those developing wind farms in the North Sea and off the coast of northern Germany.

For more information, visit www.offshoremm.com.

Nexans awarded contract for Åsgard field

Nexans has been awarded a 75 million euro contract by Statoil to design, manufacture, and supply a total of 165km of static and dynamic power umbilical and power cables, as well as necessary accessories, for the Åsgard oil and gas field in the Norwegian Sea.

Nexans's specialized manufacturing

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Power Cables

facilities in Norway (Halden, Rognan, and Namsos) as well as Charleroi in Belgium will be involved in the completion of this complex subsea project. Nexans will supply four lengths of power cable and power umbilical, each 40km long, two lengths of dynamic power umbilical, and 2.3km of standard service umbilical cable.

The Åsgard oil and gas field is located in the Norwegian Sea approximately 200km off the coast of mid-Norway, and delivers around 28Bcm of gas and 14 million barrels of condensate, which is equal to 220mboe.

OMS completes cable storage task

Offshore Marine Services (OMS), the German arm of UK-based Offshore Marine Management (OMM), has successfully completed its first cable storage task for the consortium Siemens Energy and Prysmian Powerlink, the companies responsible for the BorWin 2 and HelWin 1 export cable systems, including offshore substations.

Making use of OMS's dedicated cable storage facility at Nordenham, the company has safely stored 15 drums of cable for

the consortium. The cable, along with joint kits, piece parts, and hang-off kits that are also being stored at Nordenham, will be taken out of storage in 2012 when the two planned projects commence installation.

OMS's Nordenham plant opened in March 2011 as part of a phased agreement with European logistics specialists, Rhenus Group. The facility, which is actively being developed in close cooperation with key potential users, currently offers renewables operators an immediate capability to store cables on reels and, in the future, will include a carousel and several cable cages.

For more information, visit www.offshoreomm.com.

OMM secures TenneT win

Offshore Marine Management (OMM) has won a 4-year contract with TenneT, the electricity grid operator based in Germany, to provide support for their offshore wind farm connection work. OMM will provide project management and strategic consultancy as well as client representative support and guard vessels.

OMM was successful in following a highly competitive EU tender process, where the company was up against a considerable number of other organizations. The EU tender process demanded that companies adhere to strict regulations and provide detailed case studies and examples of management procedures.

OMM will provide project management and strategic consultancy to TenneT prior to the offshore work on several wind farm interconnectors commencing in 2012. The contract will continue throughout these projects, where OMM will provide client representatives and guard vessels during the installation phase as well as expert offshore project management.

With Germany moving away from nuclear energy, the German government considers wind energy a key technology for a future carbon-free energy mix. There are several large grid connection projects due to start work in the next year, and OMM will be working closely with TenneT to provide the connection for a multitude of offshore wind farms.

For more information, visit www.offshoreomm.com.

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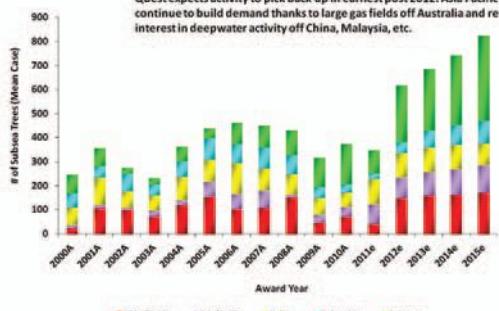
Offshore At-A-Glance

Quest Offshore Activity Report

Global Subsea Tree Forecast

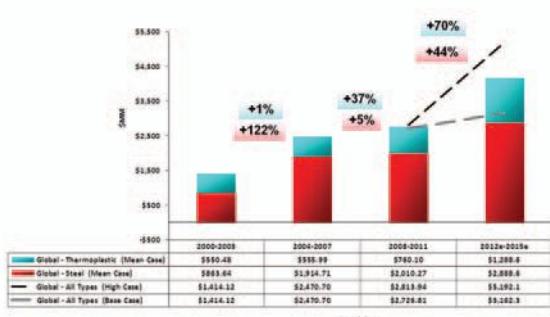
Quest Global Subsea Tree Forecast Awards Mean Case 2000A to 2015e

South America, namely Brazil and Africa, will continue to carry the lion's share of demand in the forecast period. After the moratorium in the US GoM, Quest expects activity to pick back up in earnest post 2012. Asia Pacific will continue to build demand thanks to large gas fields off Australia and renewed interest in deepwater activity off China, Malaysia, etc.



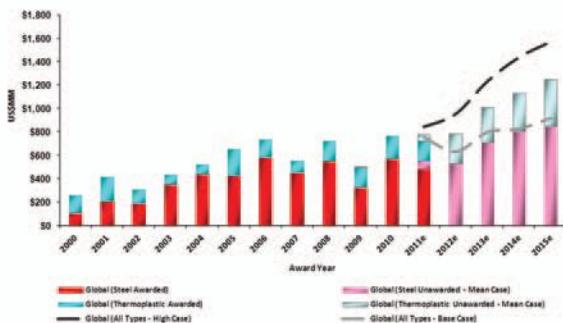
Global SPU Activity Trends

Global SPU Activity Trends Four Year Comparison (\$ MM Awards)



Global SPU Demand

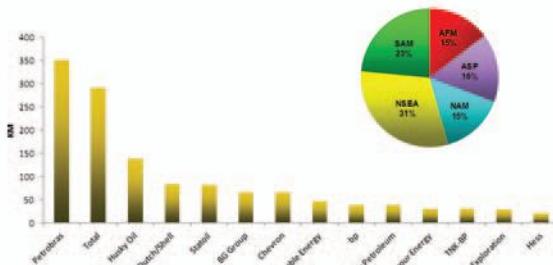
SPU Demand – Global Base, Mean and High Case SPU Awards



Operator Awards Forecast

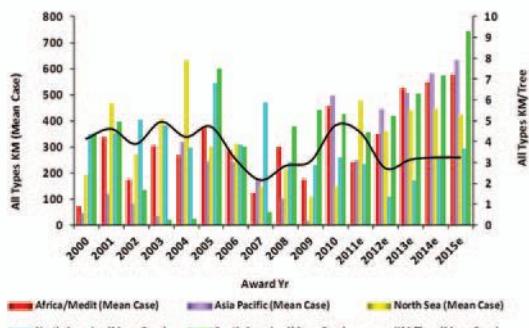
2011 Operator Forecast Awards (All Types) - KM

Top 14 Operators Awards 1,310/1,554 KM Mean Case



Worldwide SPU Demand

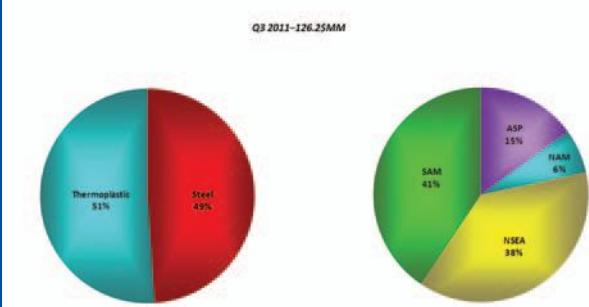
SPU Demand All Types- Worldwide Mean Case



Global SPU Market Share

Global SPU Type & Hemisphere Market Share

Q3 2011 SPUs MM

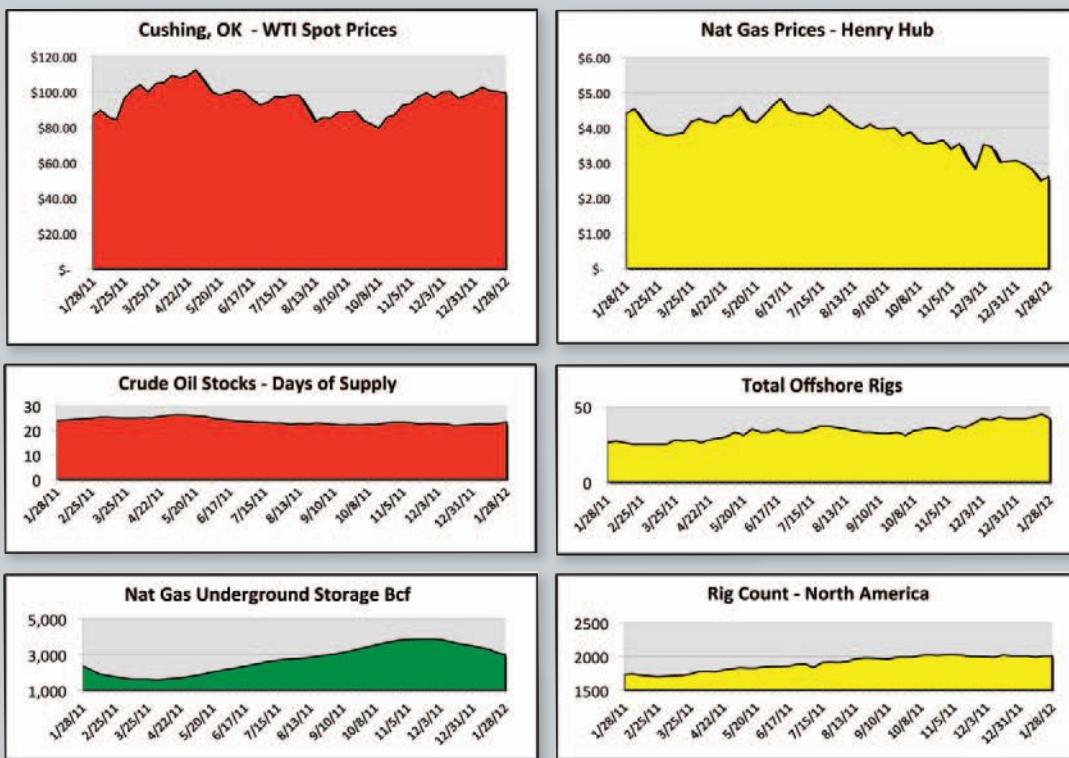


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positive trend at least 3 weeks

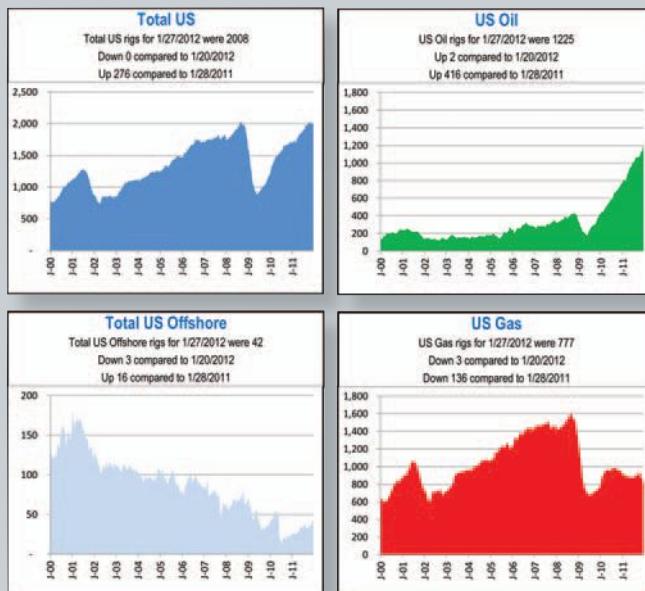
changing trend < 3 weeks

negative trend at least 3 weeks

Baker Hughes Rig Report

North American Rig Report January 27, 2012

Location	Week of 1/27	Week Ago	Year Ago	
	+/−	+/−	+/−	
Land	1949	2	1947	260
Inland Waters	17	1	16	0
Offshore	42	-3	45	16
U.S. Total	2008	0	2008	276
Gulf of Mexico	42	-3	45	16
Canada	682	28	654	45
N. America	2690	28	2662	321
				2369



Gulf of Mexico Data

Current Deepwater Activity

Operator	OCS Area/ Block	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	G17561	H&P 205	Great White	7,823
Shell Gulf of Mexico Inc.	MC 348	G19939	T.O. DEEPWATER NAUTILUS	Appomattox #2	7,257
Union Oil Co. of California	WR 677	G18753	T.O. DISCOVERER INSPIRATION	Saint Malo	7,040
Chevron USA Inc.	WR 758	G17015	T.O. DISCOVERER CLEAR LEADER	Jack	6,965
BP Exploration & Production Inc.	GC 743	G15607	T.O. DEVELOPMENT DRILLER II	Atlantis	6,834
LLOG Exploration Offshore, LLC	MC 431	G22877	NOBLE AMOS RUNNER		6,425
BHP Billiton Petroleum (GOM)	AT 617	G08037	T.O. DEVELOPMENT DRILLER I	Neptune at 574	6,171
Noble Energy, Inc.	MC 948	G28030	ENSCO 8501	Bob	6,060
BP Exploration & Production inc.	MC 778	G14658	THUNDER HORSE PDQ	Thunder Horse South	6,036
BP Exploration & Production inc.	KC 292	G25792	SEADRILL WEST SIRIUS	Kaskida	6,031
Cobalt International Energy, LP	GC 814	G32534	ENSCO 8503		5,837
Eni US Operating Co. Inc.	MC 772	G16647	T.O. DEEPWATER PATHFINDER	Triton	5,639
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
ATP Oil & Gas Corp.	MC 941	G16661	NABORS 202	Mirage	4,000
Shell Offshore Inc.	MC 940	G31534	NOBLE DANNY ADKINS		3,978
Shell Offshore Inc.	MC 935	G07976	NOBLE DRILLER	Europa	3,797
Anadarko Petroleum Corp.	EB 602	G14205	ENSCO 8500	Nansen	3,681
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
Murphy E&P Co.	GC 338	G21790	NABORS MODS 200	Front Runner	3,325
Statoil USA E&P Inc.	GC 404	G28076	MAERSK DEVELOPER		3,146
Shell Offshore Inc.	MC 762	G24112	NOBLE JIM DAY	Deimos	3,144
Shell Offshore Inc.	GC 158	G07998	H&P 202	Brutus	2,985
Shell Offshore Inc.	MC 807	G07963	H&P 201	Mars B	2,945
Shell Offshore Inc.	GB 426	G08241	AUGER	Auger	2,862
Chevron USA Inc.	GC 205	G05911	NABORS 85 (MAYRONNE 162)	Genesis	2,590
Shell Offshore Inc.	GC 116	G05904	NOBLE JIM THOMPSON	Popeye	2,046
Hess Corp.	GB 260	G07462	NABORS S.D. XVI	Baldpate	1,648
Walter Oil & Gas Corp.	EW 834	G27982	DIAMOND OCEAN VICTORY	Hummingbird	1,183
Union Oil Co. of California	EB 159	G02646	COIL TUBING UNIT (L.J. DIST)	Ligera	924

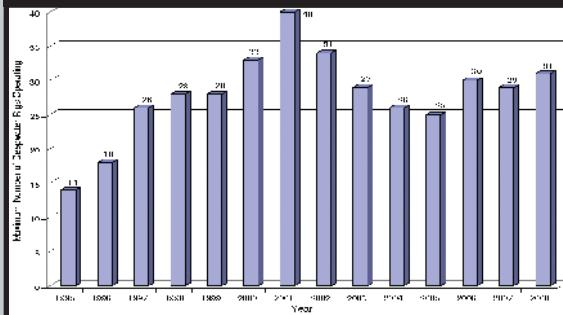
Deepwater prospects with drilling and workover activity: 37

Current Deepwater Activity as of Monday, January 23, 2012

Activity by Water Depth

Water Depth in Meters	Active Leases	Approved Applications	Active
0 to 200	1,787	34,020	2,983
201 to 400	121	1,111	20
401 to 800	280	837	10
801 to 1,000	388	522	8
1,000 & above	3,238	1,693	26

Rig activity by year



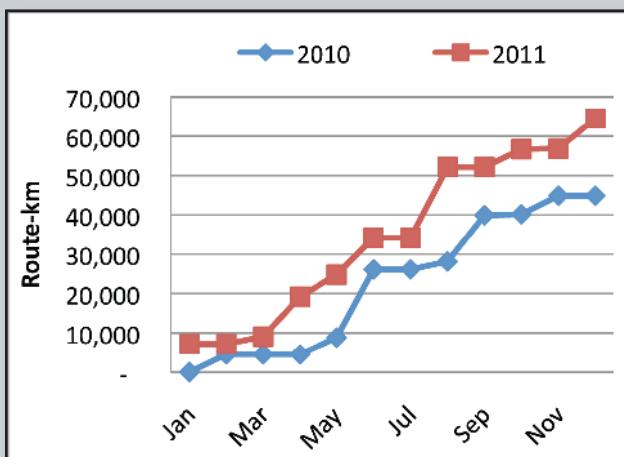
Activity by water depth Information current as of Monday, January 23, 2012

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.

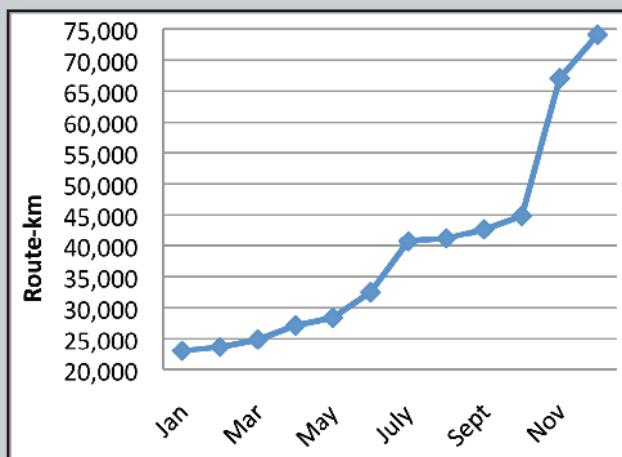
Information provided courtesy of the U.S. Bureau of Ocean Energy Management

Subsea Telcom & Power Cable Data

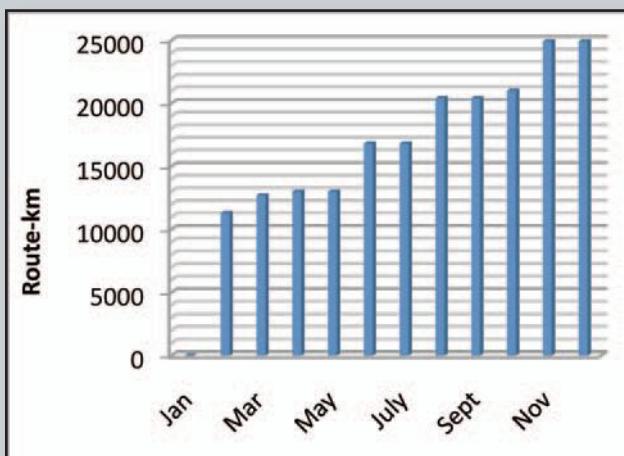
FO Cable Awards by month



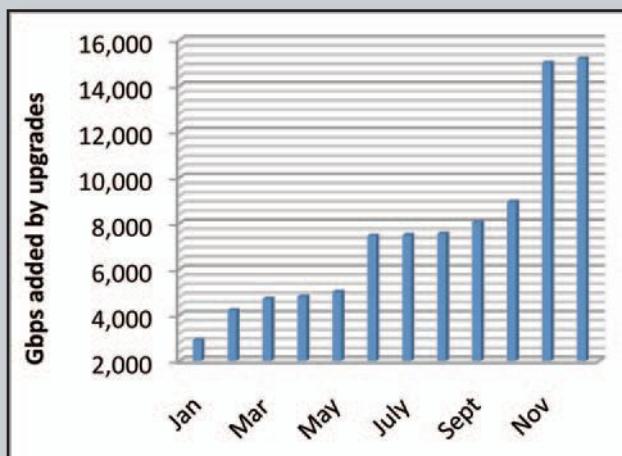
FO Cable Announcements 2011



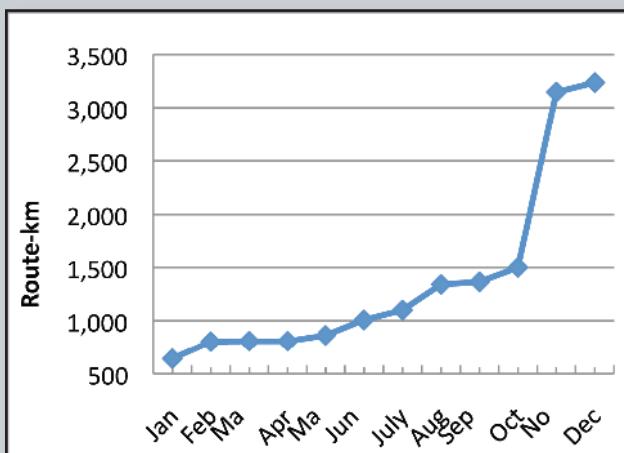
Submarine FO Cables Entering Service 2011 in route-km



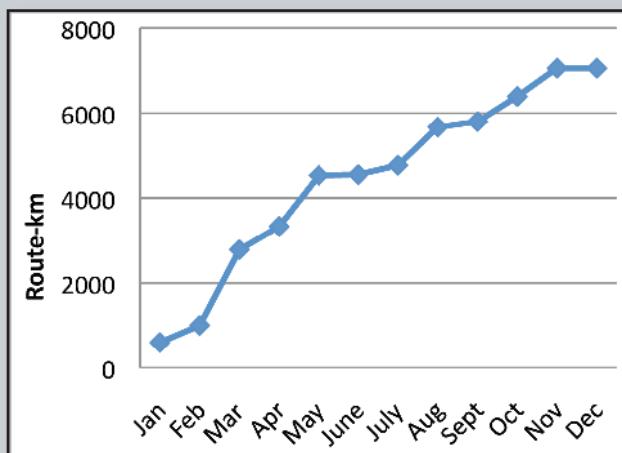
Upgrades of Existing Cable Systems in Gbps



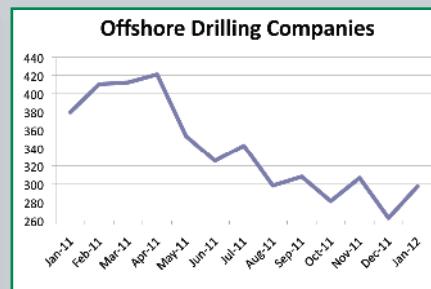
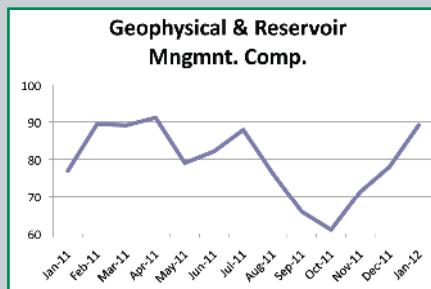
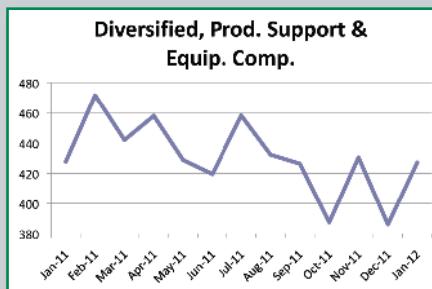
Submarine Power Cable Awards 2011 in route-km



Submarine Power Cable Announcements 2011 in route-km



Monthly Stock Figures & Composite Index



Industry Company Name	Symbol	Close Mid-January	Close Mid-December	Change	Change %	High 52 week	Low
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Diversified, Production Support and Equipment Companies

Baker Hughes, Inc.	BHI	49.73	44.82	4.91	11%	81.00	41.91
Cameron Intl. Corp.	CAM	54.42	44.86	9.56	21.3%	63.16	38.77
Drill-Quip, Inc.	DRQ	67.12	64.16	2.96	4.6%	82.49	47.40
Halliburton Company	HAL	34.66	31.76	2.90	9.1%	57.77	27.21
Tenaris SA	TS	40.42	34.95	5.47	15.7%	51.07	23.29
Newpark Resources, Inc.	NR	9.54	8.28	1.26	15.2%	10.36	5.19
Schlumberger Ltd.	SLB	72.48	66.91	5.57	8.3%	95.64	54.79
Superior Energy Services, Inc.	SPN	28.36	27.33	1.03	3.8%	42.87	22.19
Weatherford International, Inc.	WFT	16.70	13.51	3.19	23.6%	26.25	10.85
Deep Down, Inc.	DPDW	0.05	0.05	-	0.0%	0.29	0.05
FMC Technologies	FTI	53.63	49.41	4.22	8.5%	52.52	34.46
Total Diversified, Production, Support and Equipment.....		427.11	386.04	41.07	10.6%	563.42	306.11

Geophysical / Reservoir Management

Dawson Geophysical Company	DWSN	39.08	36.74	2.34	6.4%	50.81	21.57
Mitcham Industries, Inc.	MIND	23.36	20.00	3.36	16.8%	24.26	9.52
Compagnie Gnrale de Gophysique-Veritas	CGV	26.68	21.23	5.45	25.7%	38.12	15.08
Total Geophysical / Reservoir Management.....		89.12	77.97	11.15	14.3%	113.19	46.17

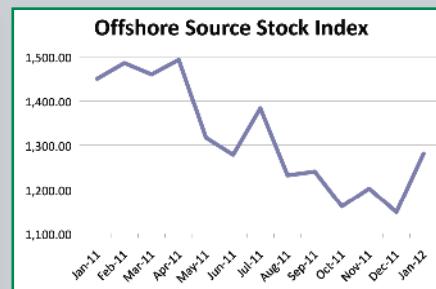
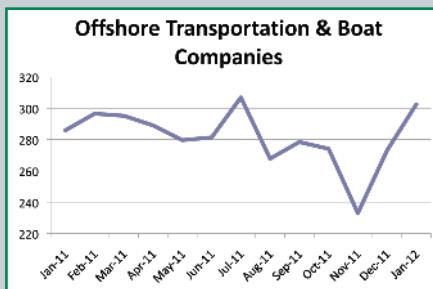
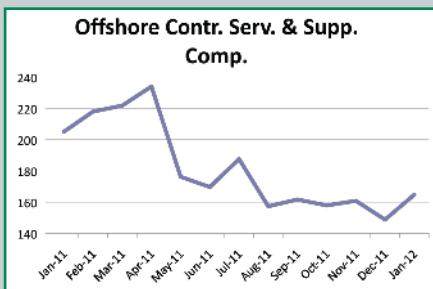
Offshore Drilling Companies

Atwood Oceanics, Inc.	ATW	44.62	38.23	6.39	16.7%	48.84	30.64
Diamond Offshore Drilling, Inc.	DO	62.12	54.29	7.83	14.4%	81.19	51.16
ENSCO International, Inc.	ESV	52.38	46.23	6.15	13.3%	60.31	37.39
Nabors Industries, Inc.	NBR	17.20	16.74	0.46	2.7%	32.47	11.05
Noble Drilling Corp.	NE	34.54	30.60	3.94	12.9%	46.72	27.33
Parker Drilling Company	PKD	6.47	7.00	-0.53	-7.6%	7.45	3.60
Rowan Companies, Inc.	RDC	35.12	29.87	5.25	17.6%	44.83	28.13
Transocean Offshore, Inc.	RIG	45.15	39.83	5.32	13.4%	85.98	38.21
Total Offshore Drilling.....		297.60	262.79	34.81	13.2%	407.79	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-January	Close Mid-December	Change	Change %	High 52 week	Low
Offshore Contractors, Services and Support Companies							
Cal Dive International, Inc.	DVR	3.06	2.05	1.01	49.3%	8.19	1.50
Helix Energy Solutions Group, Inc.	HLX	16.18	15.44	0.74	4.8%	21.65	10.92
Gulf Island Fabrication	GIFI	31.34	27.46	3.88	14.1%	36.00	19.55
McDermott International, Inc.	MDR	12.67	10.29	2.38	23.1%	26.14	9.34
Oceaneering International	OII	48.74	45.63	3.11	6.8%	49.26	31.77
Subsea 7 SA	SUBCY.PK	20.49	17.58	2.91	16.6%	27.52	16.82
Technip ADS	TKPPY.PK	22.71	21.77	0.94	4.3%	28.35	17.52
Tetra Technologies, Inc.	TTI	9.54	8.51	1.03	12.1%	16.00	6.77
Total Offshore Contractors, Service and Support.....		164.73	148.73	16.00	10.8%	213.11	114.19
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	93.89	86.60	7.29	8.4%	113.20	75.04
Gulfmark Offshore, Inc.	GLF	46.74	40.13	6.61	16.5%	49.95	32.34
Bristow Group	BRS	47.92	45.89	2.03	4.4%	52.89	37.98
PHI, Inc.	PHII	23.50	21.85	1.65	7.6%	26.36	16.95
Tidewater, Inc.	TDW	54.50	47.10	7.40	15.7%	63.55	38.80
Trico Marine Services, Inc.	TRMAQ.PK	0.03	0.02	0.01	50.0%	0.19	0.01
Hornbeck Offshore	HOS	35.95	31.50	4.45	14.1%	32.64	19.80
Total Offshore Transportation and Boat		302.53	273.09	29.44	10.8%	338.78	220.92
Total Diversified, Production, Support and Equipment		427.11	386.04	41.07	10.6%	563.42	306.11
Total Geophysical / Reservoir Management		89.12	77.97	11.15	14.3%	113.19	46.17
Total Offshore Drilling		297.60	262.79	34.81	13.2%	407.79	227.51
Total Offshore Contractors, Service and Support		164.73	148.73	16.00	10.8%	213.11	114.19
Total Offshore Transportation and Boat		302.53	273.09	29.44	10.8%	338.78	220.92
Total Offshore Source Index...		1,281.09	1,148.62	132.47	11.5%	1,636.29	914.90

Kongsberg unveils 3D sonar profiling capability

Kongsberg Mesotech Ltd. unveiled the latest release of MS 1000 software for MS 1071 and MS 1171 Digital Scanning Sonar. This version provides stunning high-resolution underwater records when combined with Kongsberg MS 1171 Profiling Sonar and precision rotators.

These added capabilities greatly extend the usefulness of MS 1071 and MS 1171 Profiling Sonar and will be of particular interest to service companies engaged in underwater inspection and surveys of underwater infrastructure.

The Kongsberg Underwater Inspection System (Profiling Sonar, Precision Rotator and Release 4.6 software) will produce much more detailed and precise underwater 3D data than the point cloud data typically seen. Data is post-processed using one of a number of commercially available post processing packages, including Trimble RealWorks and Leica Cyclone.

The capability to produce detailed underwater 3D surveys was demonstrated by VRT of Finland's recent engineering survey of bridges combining data from Kongsberg Underwater Inspection Systems and above-water laser data.

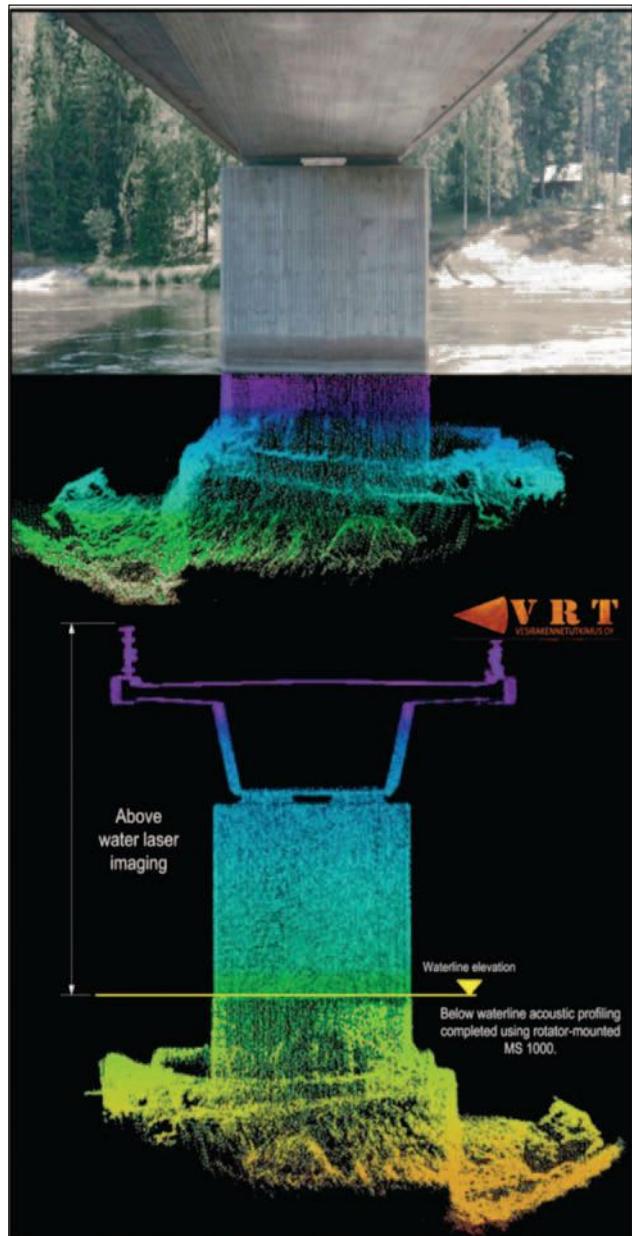
Version 4.6 is also fully compatible with Microsoft® Windows 7 Pro Edition, Microsoft® Windows 7 Ultimate Edition, and earlier Microsoft® Windows versions, notably Microsoft® Windows XP Pro. Kongsberg Mesotech Ltd.'s commitment to keeping pace with developing standards minimizes computer compatibility issues for our customers.

Also recently added to the MS 1000 software are user interfaces in both German and Mandarin in response to user demand.

Microsoft® Windows 64bit USB Driver, Valeport Midas BathyPack, and 32/64 bit Serial Interface have also been added.

These interfaces and drivers have been added to expand the usefulness of Kongsberg Scanning Sonar and keep pace with developments in 64bit operating systems. Certified USB drivers can be obtained from either the MS 1000 Installation directory or from the Microsoft® Update website. The addition of the Valeport Midas BathyPack telemetry capability to the ROV hub was in response to ROV operators wanting to combine this data with sonar data.

For more information, visit www.kongsberg.com.



Scorpion Oceanics 'SubElectra' connectors

Scorpion Oceanics has recently supplied a large number of "SubElectra" Miniature 50Ohm coaxial cable plugs and mating flanged bulkhead receptacles. The connectors were designed in house and form part of the growing "SubElectra" range of underwater electrical connectors. These connectors were designed to complement the existing Birns and Souriau connectors that Scorpion also supplies.

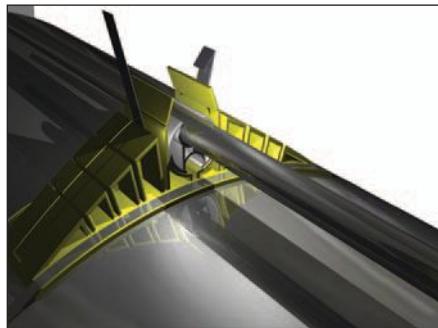
The cable plug is manufactured from PEEK with a naval brass coupling nut. A polyurethane overmoulding onto PUR jacketed RG174 completes the cable mounted half of the assembly. PEEK was selected to prevent any potential problems of delamination between the overmoulding and metal shell.

The flanged bulkhead receptacle is produced in 316 Stainless Steel and incorporates a high-integrity glass to metal seal. The coupling nut only measures 16.0mm diameter and is the smallest in its class. The square flange measures only 20.0mm across flats but could be further reduced in size if supplied in a threaded bulkhead form. The receptacle can be supplied with or without an RG174 coaxial cable tail.

A mated pair of connectors measures less than 70.0mm from face of flange to end of molding. These connectors can also be supplied in 75Ohm format and other materials are available on request. Visit www.scorpionoceanics.co.uk.



McDermott and Trelleborg develop innovative new clamp to improve diver safety



Trelleborg Offshore has revealed a new diver-friendly piggyback clamp designed to improve safety during installation. Trelleborg developed the clamp at the request of leading offshore construction company McDermott in collaboration with Trelleborg Offshore UAE distributor Unique Maritime Group.

The Trelleborg system includes the use of edge-treated banding and a new fastening system that eliminates sharp edges, reducing the risk of cuts to the diver. The innovative design, which negates the need to pass the band around the carrier pipe to secure the piggyback line, reduces handling and improves installation efficiency and time, enabling significant cost savings while increasing diver safety.

Sean Brunton, operations manager, McDermott Diving Division, commented: "Improving diver safety is something that is of paramount importance to us, and the Trelleborg piggyback clamp has been central to our Zero Hand Injury Campaign."

Manufactured from marine-grade polypropylene, the piggyback saddle can fit carrier pipelines from 20inch to 42inch and line sizes from 1-1/4inch to 3-1/2inch. The one-size-fits-all design of the clamp can streamline purchasing, enabling zero-waste bulk ordering.

For more information, please visit us at www.trelleborg.com/offshore.

Voith Marine expands its product portfolio to include propulsors for semi-submersible platforms

For over 30 years, Voith has been gaining experience with propulsion systems in the natural gas pipelay vessel Castoro Sei. This vessel is a semi-submersible platform that has been used for several decades to build subsea pipelines – most recently the new Baltic Sea pipeline. Semi-submersible platforms are currently in demand all over the

world; The new development of oil and gas fields such as those off the coast of Brazil or in the South China Sea require reliable platform propulsion and positioning systems. In 2011 alone, companies have invested approx. USD\$8 billion in oil and gas projects at Korean shipyards.

The new Voith Radial Propeller is designated as VRP 38-45, which stands for a diameter of 3.80m and an input power of 4,500kW. With its compact design, the latest Voith propulsor targets the drilling vessel market (i.e., vessels equipped with a drilling tower or floating platforms with six or eight propulsion units). A dynamic positioning system on these vessels allows work to be carried out on the platform under almost any weather conditions – a requirement for which the VRP has been developed.

Voith has already successfully introduced its VRP 42-55 into the market. With its propeller diameter of 4.20m, it was developed for an input power of approx. 5,500kW. To date, five of these propulsion systems have been delivered. They will be used in a special offshore wind farm installation vessel and have been designed for an input power of 5,750kW.

VRP are fully pivotable vessel propulsion systems with a fixed-pitch propeller in a nozzle. The engine is arranged vertically above the drive shaft in an L-shape. Both the installation as well as the maintenance of VRPs can be done with the vessel afloat.

For more information, please visit www.voithturbo.com/marine.

All-new Lidar rectification software for the Lynx Mobile Mapper

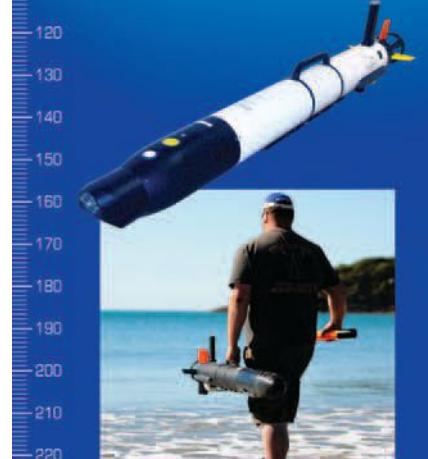
Optech LMS offers Lynx clients an all-new workflow designed specifically for high-volume production processing. Incorporating a fully-automated batch-mode capability, Optech LMS enables simultaneous processing of multi-mission data collections, and includes multi-threaded and distributed processing capabilities to further increase processing efficiency.

"We are extremely pleased to offer such a capability to our clients," says Daina Morgan, Optech's Lynx Mobile Mapper Product Manager. "Optech LMS Standard includes all the capabilities our clients are used to, with the added feature of comprehensive coordinate conversion. No extensive retraining is required, so it's a simple and easy transition."

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

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Sea Chest covers for deepwater platforms



Seanic has developed and recently delivered 12 innovative Sea Chest Covers that focus on safety and integrity when performing deep-water platform maintenance and repair missions. These Sea Chest Covers can easily be installed with an ROV due to the unique dual latching system design.

The Sea Chest Cover design also offers redundant barriers for a definite

secure seal and is equipped with a distinct security cable that is connected directly to the ROV, eliminating any potential of dropping the cover in open water. The simplified design can be easily placed, installed, and safely operated with an ROV. To date, Seanic has designed and delivered sizes ranging from 4in all the way up to 48in.

Matt York, engineering manager, said, "Our Sea Chest Covers provide the highest quality and safety you would expect and are another example of Seanic's commitment to creative engineering solutions to the challenges of deep-water activities. We are proud to play a role in the safety and integrity management of deep water operations."

For more information, please visit us at www.seanicusa.com.

Teledyne TSS MK31 INS system passes MilStd testing

World leaders in marine navigation, Teledyne TSS is delighted to announce that its world renowned MK31 INS Ring Gyro Laser System has recently passed

the U.S. Department of Defense Test Method Standard (MilStd) testing for Shock (MIL-STD-810G0, Vibration (MIL-STD-167-1A) and EMC (MIL-STD-461F).

Speaking at the Company's head Quarters in the UK, Martyn Grange said, "We are proud of the longevity of the MK31 Inertial Reference System, and now that it is fully tested to MilSpec, we are looking forward to growing sales to our already established military customers."

The MK31 INS is easy to install, configure, and use. With a settling time of less than 30minutes at sea and less than 15minutes at dockside, the unit can provide highly accurate heave, pitch, roll, and heading data in even the most extreme sea conditions.

It can handle rates of turn of up to 250/second in any orientation due to a strapdown INS algorithm. The entire system is built on solid-state technology, so no maintenance is needed to keep the MK31 fully operational.

For more information, please visit www.teledyne-tss.com.

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Tritech's StarFish range proves a sales success

StarFish Seabed Imaging Systems, the shallow water side-scan sonar system from Tritech International, has proved a market success since its launch in 2007.

Sales of the range have continued to rise since the launch of the original StarFish 450F. StarFish applications have included search and rescue (SAR) operations as well as recognized applications for port and harbor surveys and wreck diving expeditions.

For 2011, Tritech introduced new features, enhancements, and accessories to the range, including a re-engineered top box electronics module with improved noise immunity, thermal and operational reliability, and improvements to the sonar connector.

Mike Broadbent, Tritech business development manager, comments, "The market response to our latest releases has been positive, and this is evident in increased sales and enquiries. The new high-resolution models bring StarFish technology to many new applications, including SAR operations, where rescuers have a need to quickly carry out large-area, high-resolution underwater searches."

StarFish systems offer three key features: advanced design, high-performance, and simple operation. All systems built with the signature three-fin hydro-dynamic design offer high-performance shallow water surveys through the applications of Compressed High Intensity Radar Pulse (CHIRP) and digital-signal processing (DSP) techniques, able to identify small, closely spaced targets at far greater distances than conventional style frequency monotonic systems. StarFish systems are also operated with ease, offering true plug-and-play technology powered by user-friendly StarFish Scanline software. A software development kit (SDK) is also available from the StarFish website to allow ease of integration into your own software package.

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

Teledyne RD Instruments Explorer Doppler Velocity Log provides precision navigation on VideoRay ROV

VideoRay LLC, the leading manufacturer of Inspection ROVs, and Teledyne RD instruments, the leading manufacturer of acoustic Doppler navigation products, are pleased to announce that collaborative efforts to integrate Teledyne RDI's Doppler Velocity Log (DVL) onboard VideoRay's Pro 4 have proven successful.

Through extensive system integration and software development provided by several leading software and integration companies, the Teledyne RDI Explorer was demonstrated in October at VIPS 2011, VideoRay's annual user conference. Working on the Teledyne RDI DVL project, in addition to VideoRay and Teledyne RDI, were Seavision Underwater Solutions of Little Compton, Rhode Island, SeeByte Ltd of Edinburgh, Scotland; and Studio Ing. Banfi SAS of Rome, Italy.

DVLs provide highly accurate velocity information, which is used to provide precision navigation data onboard subsea vehicles. Historically, the use of DVLs has been limited to larger vehicles that possess the payload capacity and data bandwidth required to support the sensor. To meet market demand for today's smaller, lighter weight vehicles, Teledyne RDI offers the Explorer DVL, which has been designed to meet the stringent size, weight, and power constraints required for a wide array of smaller platforms. Both a self-contained and a remote-head version of the Explorer DVL are available and utilize a phased array transducer, which provides a level of precision comparable to Teledyne RDI's larger, industry standard Workhorse Navigator DVL. The Explorer, however, resides in a manageable 4-1/2inch x 10inch. housing for the self-contained system, and an even smaller 4.8inch. x 4.8inch. remote head format with remote electronics that can be integrated inside the vehicle.

For more information, visit www.rdinstruments.com.

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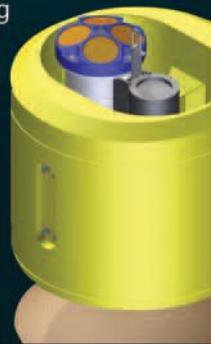
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EvoLogics USBL positioning system estimates a ROV's coordinates with 0.07% slant range accuracy

EvoLogics S2C USBL (Ultra-Short BaseLine) underwater positioning system demonstrated a highly accurate performance in a recent series of pool tests, estimating the position of an ROV for baffle bolt inspection in nuclear power plants.

The Submarine System for Inspection (SUSI) ROV, which was developed by AREVA, is a device used for ultrasonic inspection of nuclear reactor vessel baffle bolts. The ROV's positioning system is required to document time and exact location of each measurement taken as the ROV examines numerous bolts that hold the baffle plates together. Such positioning system must deliver an accurate performance without obstructing or slowing down the inspection procedure.

In December 2011, EvoLogics USBL system was tested in a tracking scenario that emulates the baffle bolts testing procedure. These trials were conducted in a test pool, as such a positioning system must deliver accurate results in a confined space where noise and

multipath challenge the performance of underwater acoustic devices.

An S2C USBL is a combined underwater communication and positioning device that provides both tracking of remote targets and data transmissions. The system implements the S2C (Sweep Spread Carrier) technology, ensuring reliable performance even in noisy environments.

An S2C USBL device with a conical transducer beam pattern served as a transceiver and was mounted at the side of the test pool. An S2C underwater acoustic modem, mounted on the ROV with the transducer pointing vertically upwards, was used as a transponder. The ROV was located at the bottom of the pool within the transceiver's transducer beam.

The S2C USBL system estimated the distance to the ROV with a highly accurate result: the RMS deviation comprised 0.04° at 2.1m distance. This result corresponds to a 0.07% 1drms slant range accuracy.

To verify the results, the ROV was moved across a vertical 85mm x 100mm testing grid with reference points that represented the actual baffle bolts. The system demonstrated consis-

tent results and the 0.07% slant range accuracy was confirmed.

BlueView expands real-time detection range with new P450

BlueView Technologies, the world leader in compact acoustic imaging and measurement technology, has answered the call for a long range imaging sonar with a wide field-of-view - the all new P450 Series now with S2 electronics is available in five new models, including two deepwater options. Each model has a maximum detection range of 250m (820ft), while delivering crisp, real-time imagery at medium to long ranges. These forward-looking systems are engineered to allow operators to detect, track, monitor, and navigate across extended distances, dramatically improving situational awareness and reducing reaction time. The P450 Series is available in three different field-of-view options, including the ultra-wide 130° for the largest detection area available from a compact, portable system.

"The new P450 Series is a multi-beam imaging sonar game changer, the real-time feedback coupled with the expanded detection range exceeds any-



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thing out there," stated Jason Seawall, BlueView COO. Seawall added, "these new systems are perfect for work-class ROVs; operators will now be able to navigate, detect, track, and monitor targets in real-time over a very large area."

For more information, visit www.blueview.com.

L-3 Klein Associates announces all-new UUV-3500 side-scan sonar for UUVs

L-3 Klein Associates is excited to announce the launch of the all-new UUV-3500 Side-Scan Sonar (SSS) for all Unmanned Underwater Vehicles (UUV) at Oceanology International 2012. The UUV-3500 is a true gamechanger for UUV SSS, effectively doubling traditional range scales while maintaining the highest possible resolution. Klein will also be



debuting the extremely portable and powerful new HydroScan Search and Recovery SSS. The HydroScan is the most powerful dual frequency (455/900kHz, simultaneous) shallow-water SSS available.

Also on display will be the ground-breaking HydroChart 5000 Bathymetry System complete with Multibeam SSS and the famed Klein 5000 v2 Multibeam SSS.

For more information, please visit www.l-3klein.com

Mariscope Meerestechnik introduces new underwater camera with multicolor illumination

Following the requirements of the European armed forces, Mariscope Meerestechnik, located in Kiel (Germany), introduced the first system that allows the variation of underwater camera illumination.

For certain kinds of appliances, especially for the Explosive Ordnance Disposal, it is necessary to illuminate objects with a system that does not only emit white light. In the past, underwater illumination standards were used and filters had to be added to the cameras to achieve this objective.

Mariscope Meerestechnik however developed a new system of underwater illumination that adds to the line of their professional underwater cameras.

The system allows controlling the variation of colors of the underwater light from the surface. Starting with the colors red, green, blue and white, it is possible to mix any color in the visible range to obtain extraordinary results, especially for under-

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Product News



water film making.

The system is based on advanced technology of high output LEDs, developed recently by the company in Germany.

For more information, visit www.mariscope.de.

Law enforcement captures under-water search equipment

Police departments and sheriff's offices around the country are adding underwater search equipment to ensure their dive teams have the proper equipment to safely and effectively do their jobs. The two high-tech tools in greatest demand are the side-scan sonar and ROV. Sonar is one of most effective tools for underwater search and recovery (SAR) because it can scan large areas quickly and "see" what's on the bottom, regardless of water clarity.

Saratoga County Sheriff's Dept. in New York is one of the many agencies that have made the leap into this new technology. Last year, Saratoga acquired JW Fishers SeaLion-2 ROV. This compact underwater vehicle can easily be deployed by one officer. The system controls and a 15in flat screen monitor are built into a rugged waterproof case. The operator commands the ROV's four powerful thrusters, two 100W headlights, rear-facing high-intensity LED light ring, and the pan and tilt on both cameras using a hand-held PS-2 controller.

The ROV assists in searching for drowning victims, locating evidence such as a weapon thrown into a waterway and inspecting sites before deploy-

ing a diver. The high-resolution video cameras are also useful in filming underwater crime scenes. Recently, the department upgraded the system's capability by adding a scanning sonar; a manipulator arm; and on-screen display of time, date, GPS, depth, and compass heading. The scanning sonar allows the ROV operator to "see" far beyond the range of the video cameras. The sonar produces detailed images of underwater objects up to 100ft from the ROV. It can scan a path directly in front of the vehicle or a complete circle around it. Dive team leader Lt. Harry Siebert reports the ROV is used almost weekly in their SAR operations.

A number of other departments have added Fishers side-scan sonars to their team's list of equipment, including Otter Tail County Sheriff's Office in Minnesota and the New Bedford Police Department in Massachusetts. The sheriff's department chose the single frequency SSS-600K side scan as this sonar gave them the high-resolution images needed to find small targets like drowning victims and weapons and has the ability to scan a swath up to 400ft wide—very helpful when searching for bigger targets like submerged vehicles or capsized pleasure craft.

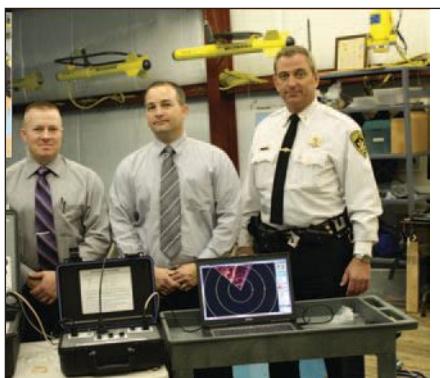
For more information, visit www.jwfishers.com.

Seaflex flexible buoyancy

Seaflex, which is owned by Unique Maritime Group, combines the strength of their proven Standard Range Inflatable Buoyancy Units with the advantage of a single point attachment in the Seaflex Mono Buoyancy Unit (MBU). The MBU is designed specifically for pipe laying applications.

The single point attachment allows the bag to operate at any reasonable angle to the load, which is particularly useful during lay downs or ship to shore pipe pulls. The elimination of external rigging dramatically reduces the risk of damage, and the single swivel eye makes rigging a simple "one shackle job".

Two 3/4" penetrators mounted on the top of the canopy are used for inflation and deflation, while two 2psi pressure release valves are located on the bottom of the canopy and can be used to signal the point of full working pressure and lift. The bottom swivel eye avoids rotational forces being placed on the attachment point, while the top eye bolt is of a large diameter to simplify recovery. In short, the Seaflex MBU offers the user a massively simplified





product, based on the proven Seaflex Standard Range that has been in use worldwide for nearly 2 decades.

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

Custom-designed shackle load cells for offshore mooring tension application

As well as providing a comprehensive range of standard load cells, LCM Systems has highly experienced in-house design engineers who, time and time again, have demonstrated their ability to meet both the commercial and technical requirements of clients. For one offshore engineering systems integrator, LCM Systems provided a complete shackle load cell solution designed to match stringent criteria, complete with full American Bureau of Shipping (ABS) traceability.

The enquiry was made by a long-term client of LCM Systems, who had previously bought load pins from LCM to be installed into shackle and pin assemblies already on site. This project was to provide a complete shackle load cell solution for measuring mooring tension, but there were some important criteria that needed to be met.



Firstly, the load cell had to be a shackle type, designed to fit into an existing link plate and the pin had to be manufactured from 17-4PH stainless and withstand full submersion to 500psi. Secondly, material and proof load certificates were required for the shackle, with the load pin requiring full traceability to pass inspection by the ABS. Additionally, all cables had to be robust and protected.

The result was the LCM3064 150te subsea submersible D-type shackle load cell that answered all the criteria. The load cell was designed using a GN Rope H11 shackle rated to 150te, with the pin manufactured from 17-4PH stainless steel. It also featured a mating 10m subsea molded connector cable assembly, protected by heavy duty, steel-reinforced hydraulic hose and a special anti-rotation bracket to loop back the hose for the correct cable path. In order to ensure the load cell would fit into the existing assembly, loose spacers were supplied for added flexibility when it was installed into the widely tolerated link plate.

LCM Systems offer a wide range of standard shackle load

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cells and have an extensive selection of custom design versions, which could also be used to satisfy other applications. Many of these products are also supplied with LCM Systems' TR150 hand-held battery powered indicator, with built-in analog signal conditioning, digital outputs, or wireless telemetry. Customers are also able to specify a particular shackle that they wish to use, including the renowned GN Rope, Crosby and Greenpin and LCM will either supply the complete solution or design a load pin to suit the specified shackle.

Full specifications and details are available on LCM Systems' website with an interactive 3D PDF model at <http://tiny.cc/5o9p7>.

Nautronix secures first multimillion pound order with American BOP supplier

Nautronix have been awarded an order worth around \$4million from a well-known American BOP supplier to supply their NASeBOP (Nautronix Emergency BOP Acoustic Control



System) to be used on the four new ultra-deepwater drillships for Noble Corporation. This order comes just after their recent success in securing an order to supply the drillships with their NASDrill RS925 Hydro-acoustic positioning system from a Norwegian DP supplier.

Mark Patterson, CEO, comments; "We are thrilled with these orders; Noble

is the first company to order the new NASeBOP system from us, and I am delighted that such a well-known company like Noble Corporation is supporting our products. We have invested over £1M in Research and Development last year, with a significant amount in the area of our NASCOM product family supporting acoustic switches for BOPs."

An advertisement for the MCE Deepwater Development conference. The background features a clear blue sky and the Eiffel Tower. The text includes:

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With the important emphasis placed on safety in the drilling industry, Nautronix reviewed its existing acoustic BOP switch product line and developed NASeBOP. This product expanded on the existing EBOP product, which provided high integrity control and monitoring of BOP critical functions, both as primary or secondary control in conjunction with the standard BOP umbilical.

Top-side, NASeBOP offers unprecedented redundancy in the form of two portable EBOP control systems that are strategically located onboard the drilling unit, typically at either set of lifeboats. Additionally, a portable Emergency Response Unit (ERS), "Red Box", is supplied with the NASeBOP system; this is typically kept at an onshore facility where it can be easily transported to the rig or vessel if the need arose.

The Red Box has full command and control functionality and can execute an EDS (Emergency Disconnect Sequence) or interrogate the BOP to find out essential information.

Subsea, NASeBOP offers dual redundant Subsea Control Units, with the ability to control up to 16 functions with corresponding solenoid read-backs. Up to eight analogue sensors can be interfaced, providing critical information on system condition. All connectors and end-caps have fully testable dual O-Ring seals (testable to full operating depth of 4,000m), enabling NASeBOP to be the only fully compliant acoustic BOP switch with all the relevant requirements of API16D and 17E.

For more information, visit www.nautronix.com.

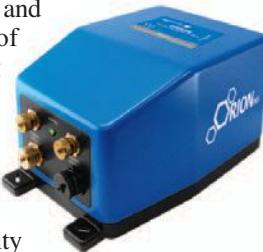
Teledyne TSS launches new version of Orion internal navigation system

A new version of the successful Orion INS (Inertial Navigation System) has been launched by Teledyne TSS Ltd. The OrionPLUS aims to meet the needs of marine users and those in the hydrographic survey, offshore subsea construction, and ROV operating industries who need a dependable and competitively priced reference system. It can provide precise attitude, heading and heave data, and is suitable for a wide range of applications such as supporting multi-beam sonar surveys or the construction of major seabed installations.

Customers are also expected to welcome the convenience that comes from the ability of OrionPLUS to process log speed from several different types of instruments using NMEA 0183 VBW.

Heave data are available with the OrionPLUS and are accurate to 5cm or 5% over ranges to 99m. The performance of the Orion's components and software means that users will benefit from headings accurate to 0.1° sec lat, roll and pitch measurements to within 0.005° through a range of ± 90°.

The OrionPLUS incorporates the many years of technical expertise in motion sensor technology achieved by the Watford, UK based company. Dependability has been



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Product News

built-in by Teledyne TSS, with the painstaking selection of components and software developed to meet the demands and expectations of its users.

The software and algorithms used have been refined over many years by Teledyne TSS and they process data generated by three ring laser gyros (RLG) and accelerometers chosen for their dependability and accuracy. They can be used at operating temperatures ranging from -15°C to +55°C and require a settling time of less than 15minutes (in AHRS mode). The accelerometers employed within the OrionPlus are equally highly regarded and are built into it at the company's advanced UK workshops where quality control is maintained to the highest standards possible. The OrionPLUS consequently offers a calculated MTBF (Mean Time Between Failure) of 30,000hours while its key individual components are rated at 300,000hours MTBF. A subsea version is also available rated to 3000m while the surface model can be used in the most extreme sea conditions to provide users with the valuable benefit of minimal downtime. The OrionPLUS has been designed to meet the demanding IEC 60945 and IEC 61162 standards. The new OrionPLUS INS is backed by Teledyne TSS' global support network and the company's own engineers in Watford, Aberdeen and Houston, Texas.

For more information, visit www.teledyne-tss.com.

New tools and functions for the DELPH 2.9 release

iXBlue is introducing a new version of the DELPH geo-physical software suite. This major 2.9 release features a number of new tools and functions to simplify survey acquisition operations and boost side-scan sonar, seismic, sub bottom profiler, and magnetic data processing and analysis.

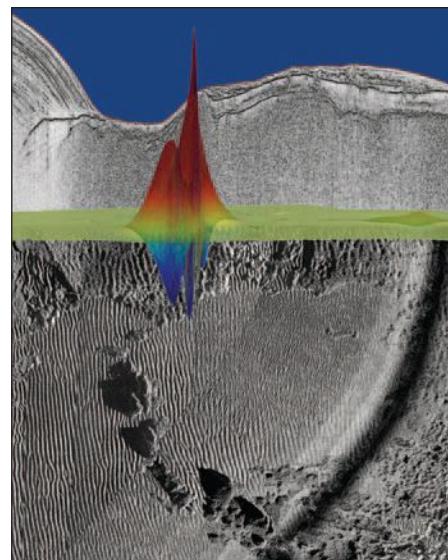
While already the most productive data processing solution, DELPH has now reached a new step by offering complete batch processing capabilities: optimal processing parameters can be defined and used for processing a number of profiles at the same time within minutes, making them ready for quality control (QC), interpretation, and mapping.

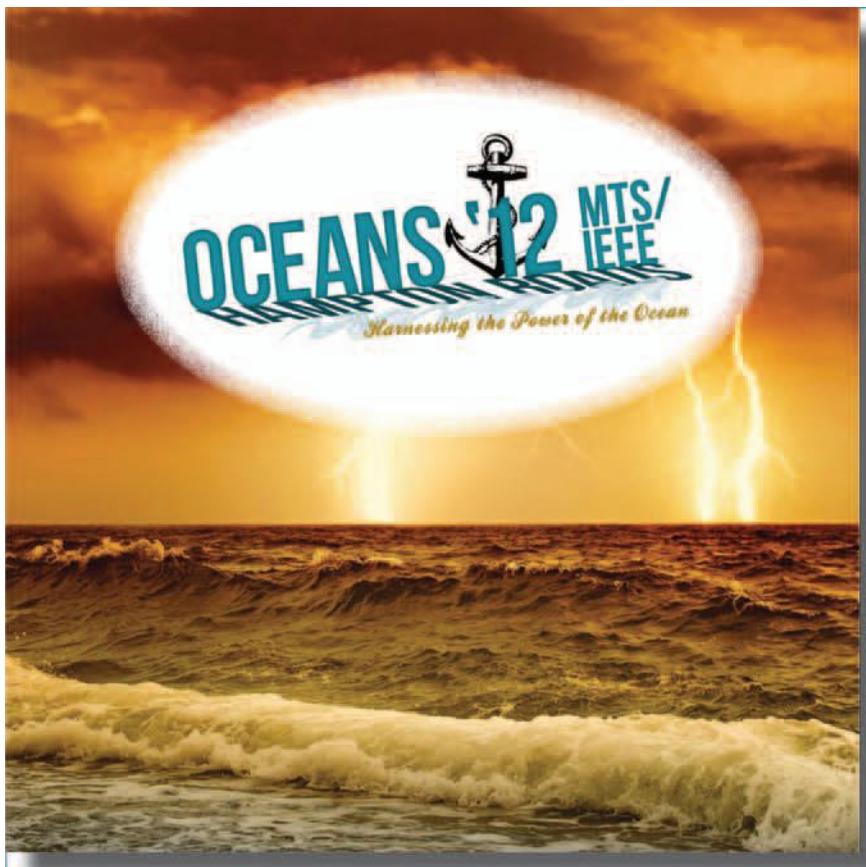
DELPH Interpretation, in its very logical work-flow, offers every level of detail to QC. It produces high-quality results from collected survey data in a very short time:

- DELPH Acquisition is a simplified acquisition software that focuses on raw data QA/QC from most analog and digital sensors.
- DELPH Interpretation dedicates a complete geo-referenced work environment for processing, interpreting, and mapping all data. Global viewers replace the time-consuming waterfalls and scrolling displays, offering an interactive view of the records, from the overview to the finest details.

The coupled 3D geographic visualization component integrates all complementary survey data (side-scan sonar, sub bottom, magnetometer, and bathymetry), interpreted features, and any geographic data layers to provide at all stages the global scale QC that is required in multi-sensor surveys.

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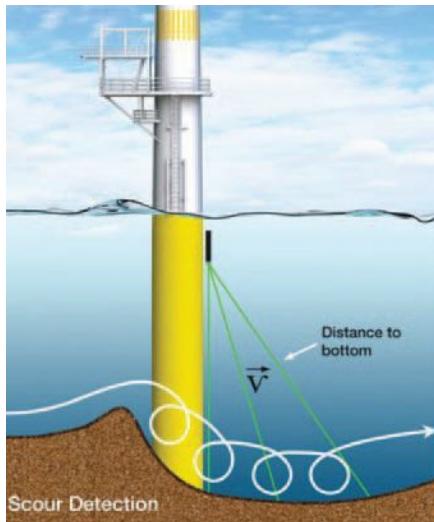
Existing customers in the warranty period or having a maintenance agreement will automatically receive this new product version. Other customers are welcome to contact iXBlue to apply for an Extended Maintenance Agreement which provide users with the latest service packs and major software releases, bringing them all the new features and 24/7 priority support with worldwide coverage.

A complete list of new features can be accessed on the DELPH website: <http://delph.ixsea.com/news/>.

Nortek scour monitor

Nortek have launched a Scour Monitor for offshore wind farms, jack-up rigs, jetty walls and underwater pier foundations.

The instrument comprises four downward looking narrow acoustic beams, which continuously monitor the seabed profile at the base of the structure. User selected time series datasets are collected and recorded internally



and/or can be output in real-time, using RS 232 or RS 422 formats.

The four beams fan out in a single axial plane, normally orientated perpendicular to the face of the structure. Changes in seabed levels adjacent to the structure are recorded and relayed back from the field in real-time. Scour and subsequent depositional events which might happen during storm periods, can thus be identified and fully quantified.

The Nortek Scour Monitor provides invaluable information for modellers or project operators, trying to assess whether scour protection is required.

The Nortek Scour Monitor is manufactured in two frequencies 2MHz and 1MHz, offering vertical ranges of 10m and 30m respectively. Depending on beam slant angle, the measurement accuracy of these instruments is around 20cm.

Nortek appreciates the importance of being able to deploy and recover their scour monitor without the need for divers and we are therefore working on



a unique deployment system, which should allow diver-less deployments to be carried out. Full details of the Nortek Scour Monitor, together with details of our diver-less deployment system, will be on display at Oceanology International 2012.

For more information, visit www.nortekuk.co.uk/.

Unique Marine Group offers saturation systems

Unique Maritime Group, one of the world's leading integrated turnkey subsea and offshore solution providers, provides 3 different saturation systems along with various other types of diving equipment.

The HS Series of Portable systems are fixed configuration system with limited flexibility. They are designed as entry level deck mounted, moon-pool configurations.

The HF Series of Portable systems are multi-configurable system with excellent flexibility in mobilization options. They are designed for moon-pool and over-the-side configurations.

The HD Series of Modular systems are dive systems designed to fit onboard Deep Submergence Vehicles (DSVs). The HDS 15 man unit provides a completely tested and approved diving package which is ready to be installed onboard the purpose built DSV.

The HDSE 12 man unit is a fully enclosed dive system which lifts as three lifts and is mounted on the moon-pool of the working deck of a DSV. This modular approach makes it an excellent selection for multi-role vessels.

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Media Reviews

Into the Lion's Mouth

The Story of the Wildrake Diving Accident

Written by former deep-sea diver Michael Smart, *Into the Lion's Mouth, the Story of Wildrake Diving Accident* is the culmination of 8 years of research to solve the haunting mystery behind the dual fatality and the discovery that it was not a "pure" accident, but rather the result of a cascade of failures and criminal negligence that were responsible for one of the most awful scenarios ever imagined.

On 7 August 1979, Richard Walker was in one of his melancholy moods. Married and the father of a 15 month-old daughter, he was thousands of miles away inside a saturation chamber onboard the diving ship Wildrake in the middle of the North Sea. Lying on his bunk just before what turned

out to be his last dive, he began a note in his diary: *7 August - On location at Thistle. The boat heaves a lot. Roger says there are conger eels all over. We will find out today. Poor topside management. Two guys in here are both nuts (ungood nuts) and dear god, I want out...* Soon after writing in his diary, Richard and his partner, Skip Guiel, climbed into the Wildrake bell on a routine dive to 524ft for British National Oil Corporation. Within a matter of hours they were fighting for their lives on the bottom of the sea. In the same genre as *Into Thin Air* and *In the Heart of the Sea*, *Into the Lion's Mouth* is the true story of the most notorious "lost bell" diving accident in North Sea history. It covers Walker and Guiel's entry into the little-known world of saturation diving, how they came to be trapped on the bottom of the sea, the dramatic rescue bid to save their lives, why it failed, and the nearly decade-long struggle by the relatives to achieve justice for their deaths.

ISBN 978-0-615-52838-0, Softcover, 445 pages, Index Illustrations: 35 halftones and line drawings; 43 color
Price: \$30.00 plus shipping and handling. The book can be ordered at www.lionsmouthpublishing.com

Into the Lion's Mouth

The Story of the Wildrake Diving Accident



Michael Smart

out to be his last dive, he began a note in his diary: *7 August - On location at Thistle. The boat heaves a lot. Roger says there are conger eels all over. We will find out today. Poor topside management. Two guys in here are both nuts (ungood nuts) and dear god, I want out...* Soon after writing in his diary, Richard and his partner, Skip Guiel, climbed into the Wildrake bell on a routine dive to 524ft for British National Oil Corporation. Within a matter of hours they were fighting for their lives on the bottom of the sea. In the same genre as *Into Thin Air* and *In the Heart of the Sea*, *Into the Lion's Mouth* is the true story of the most notorious "lost bell" diving accident in North Sea history. It covers Walker and Guiel's entry into the little-known world of saturation diving, how they came to be trapped on the bottom of the sea, the dramatic rescue bid to save their lives, why it failed, and the nearly decade-long struggle by the relatives to achieve justice for their deaths.

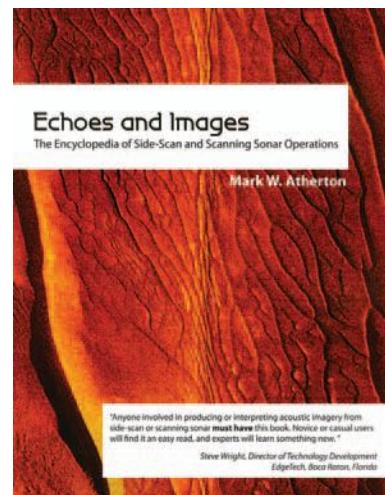
ISBN 978-0-615-52838-0, Softcover, 445 pages, Index Illustrations: 35 halftones and line drawings; 43 color
Price: \$30.00 plus shipping and handling. The book can be ordered at www.lionsmouthpublishing.com

Echoes and Images

The Encyclopedia of Side-scan and Scanning Sonar Operations

This long-awaited book by Mark Atherton, *Echoes and Images, The Encyclopedia of Side-Scan and Scanning Sonar Operations*, is the how-to guide for side-scan and scanning sonar operations. At its finish, you will know what these instruments are capable of locating and imaging – and what cannot be resolved by this equipment. The text is divided into application-specific chapters detailing how to best approach and complete underwater search, survey, and visualization programs. It demonstrates, step-by-step, how to produce the best possible side-scan and scanning sonar data that conditions allow. This book covers the seven major contributors that define success or failure in side-scan and scanning sonar programs.

- Equipment design
- System settings
- System deployment
- Acoustic geometry
- Operator experience
- Data interpretation
- Acoustic limitations



Echoes and Images

The Encyclopedia of Side-Scan and Scanning Sonar Operations

Mark W. Atherton

"Anyone involved in producing or interpreting acoustic imagery from side-scan or scanning sonar must have this book. Novice or casual users will find it an easy read, and experts will learn something new."

Steve Wright, Director of Technology Development
EdgeTech, Boca Raton, Florida

Supporting the text are 315 drawings – each focused at showing the reader how to interpret the data, deploy the equipment, ensure the search or survey area has been covered, and how to prosecute a target. Acoustic mathematics is explained in easy-to-understand terms. Concepts of transducer and system design are likewise presented so that the user is able to comprehend how they affect resolution, accuracy, and more importantly, target detection. Interspersed in the chapters are Author's Notes and Tricks of the Trade. These provide actual case histories, sidebar information, and invaluable pointers on how to get the job done and done right! It is written by a sonar operator for a sonar operator – and everyone using the data from these two systems or interested in locating something underwater.

ISBN 978-0-9869034-0-3, \$179.00. To order a copy of this book go to www.echoesandimages.com.

Calendar

February 20-24, 2012:
ASLO 2012 Ocean Sciences Meeting
Salt Lake City, UT
www.sqmeet.com/osm2012/

February 22-23, 2012:
Great Lakes Waterways Conference
Cleveland, OH
www.greatlakeswaterwaysconference.com

March 5-9, 2012:
ONR/MTS Buoy Workshop, Victoria, BC, Canada
www.whoi.edu/buoyworkshop

March 6-8, 2012:
Subsea Tieback, Galveston, TX
www.subseatiebackforum.com

March 13-15, 2012:
Oceanology 2012, London, UK
www.oceanologyinternational.com

March 11-15, 2012:
NACE, Salt Lake City, UT
www.events.nace.org/conferences/c2012

March 15-16, 2012
4th Annual Decommissioning & Abandonment Summit, Houston, TX
www.allconferences.com/conferences/2012

March 20-22, 2012:
Offshore Mediterranean Conf. & Exhib., Italy
www.infield.com/exhibitions/omc-offshore-mediterranean

March 26-28, 2012:
Deepwater Development 2012, Paris, France
www.mceed.com

April 15-18, 2012:
Navy League Sea-Air-Space, National Harbor, MD
www.seairspace.org

April 24-26, 2012:
Global Marine Renewable Energy Conference
Washington DC

People & Company News

Charlie Williams, Shell's chief scientist of well engineering and production, took the reins of the 22-member board at the new Center for Offshore Safety created in the wake of the 2010 Deepwater Horizon disaster. Established by the American Petroleum Institute, the center aims to help oil and gas companies share information about ways to boost the safety of offshore drilling. The center also is expected to offer third-party auditing of companies' Federally mandated safety and environmental management systems, which are meant to help identify and mitigate human and operational risks. In heading the center's governing board, Williams is continuing high-profile work on offshore safety issues.

International learning and skills specialist Atlas appointed a new product development manager to spearhead the continued growth of the company's expanding range of products for the oil and gas and other safety-critical industries worldwide. **Stewart Buchanan** will lead strategic new product development, from



Williams

assessment of concepts through to execution and launch, in order to deliver long-term value for the energy sector and help Atlas meet its target of doubling sales in the next 3 years.

Swift Worldwide Resources, a leading specialist supplier of manpower resources to the global oil and gas industry, appointed **Steve Marse** as the regional manager – Gulf of Mexico. Marse will focus on the overall growth of the company's New Orleans office and Gulf of Mexico region for both contract and direct hire.

Energy services company Senergy reinforced its growing Norwegian footprint by opening new business premises in Oslo. The company also appointed **Frode Linge** to head its new regional office as project-asset manager. The announcement came just months after Senergy opened major new business and training premises in Stavanger to meet the increasing demand for its technical solutions and wells expertise in Norway.

FMC Technologies, Inc. has made changes to its executive leadership team. **Bill Schumann**, executive vice president and chief financial officer, chose to retire from FMC after 30 years of service with the company, effective 31 August 2012.

In addition, he was to step down as chief financial officer on 30 November 2011, to focus on strategic activities for FMC. **Maryann Seaman**, current vice president, treasurer and deputy chief financial officer, was to succeed Schumann as senior vice president and chief financial officer, effective Dec. 1, 2011. Seaman has been with FMC for over 25 years and was appointed to her current role in April 2010. **Halet Murphy** was to replace Seaman as treasurer, effective Nov. 7, 2011. Murphy most recently was vice president and treasurer at Hawker Beechcraft. He has over 15 years of financial knowledge and experience gained from engineering and manufacturing industries.

Kevin Fitzgerald was promoted to executive vice president of Murphy Oil Corp. and will continue to serve as the company's chief financial officer. Fitzgerald joined Murphy in 1982 as assistant treasurer of the company's contract drilling subsidiary in New Orleans. **John Eckart** was promoted to senior vice president and will continue to serve as the company's controller.

As an instrumentation specialist, **Ashtead Technology** provides rental equipment and product sales for industrial

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applications involving environmental monitoring, remote visual inspection (RVI), non-destructive testing (NDT) and continuous emissions monitoring systems (CEMS). The company has a global network of facilities, including 15 in North America, and has recently invested in a new location between Round Rock and downtown Austin, Texas. Regional General Manager Tori Foerste believes that there is a strong demand for rental equipment in the area, adding: "The Texas Commission on Environmental Quality (TCEQ) is located in Austin and as a result some of the most prominent environmental consulting firms have established offices in the area in order to make interfacing with the regulating officials more convenient.

BlueView Technologies a leader in compact acoustic imaging and measurement technology has added **Roper Resources, Ltd.** as an authorized commercial sales representative in Canada. Roper Resources has a long history of serving the Canadian marine industry providing a wide range of equipment including Remote Operated Vehicles (ROVs), Autonomous Underwater Vehicles (AUVs), robotics, underwater sensors, and accessories.

Ocean Specialists, Inc. (OSI) is pleased to announce the addition of **David Willoughby** as Director of Submarine Cable Systems Development. In this role, David will support OSI's project management, project consulting and advisory services with a focus on full life cycle development of submarine cable system projects in the commercial submarine telecommunications, offshore oil and gas and submarine telecommunications markets.

Michael M. Sayler has joined Hydroid, Inc., a Pocasset-based manufacturer of Autonomous Underwater Vehicles (AUVs), as Quality Assurance Manager. Sayler has extensive experience in developing and improving quality management systems, with a focus on team collaboration and performance excellence. Most recently, Sayler consulted with a wide range of companies, implementing formal management systems for quality, environmental, health and safety.

MTN Satellite Communications (MTN), the global provider of communications, connectivity and content services to remote locations around the world, announced that its Board of Directors has appointed **Errol Olivier** to the position of President and Chief Executive Officer (CEO). Mr. Olivier most recently served as the company's President and Chief Operating Officer (COO).

The MacArtney Group's longest established subsidiary, **MacArtney Norge** in Stavanger, Norway, has officially opened its doors to their newly completed, purposed built building. At 2500m², more than double the size of their previous base, the new facility houses servicing areas, workshops and office space.

Bjørn Jalving has been appointed as Executive Vice President of Kongsberg Maritime's Subsea division and a member of the Kongsberg Maritime management group, effective 1st January 2012. Jalving succeeds Rolf Arne Klepaker, who is moving to a role working with strategic projects in Kongsberg Maritime.

Unique Maritime Group, a leading integrated turnkey subsea and offshore solution providers, announces the official launch of its office in St. Petersburg, Russia. The establishment of the facilities comes as part of a planned international expansion strategy, as the company is looking to further develop its presence across Europe.

Bowtech Products are delighted to announce the continued expansion of their distribution network with the appointment of Neotek SA, as their exclusive agents in France. This increases the worldwide representation of Bowtech's expanding product range to 18 countries.

Dan Gibson has joined SuperPort Marine - McGregor GeoScience Limited (Nova Scotia, Canada) as Vice President of Marketing and Project Development. Gibson, with over 25 years of industry experience in the marine technology sector, will focus

on global business development activities for the company's fleet of offshore survey/research vessels.

Remote Ocean Systems has announced the opening of a new office in Aberdeen, Scotland. According to ROS President, Bob Acks: "Remote Ocean Systems, Ltd. will provide real time communication and sales support for our many customers in Europe." **Kathleen Robertson** has been named Office Manager for the new office and **Barrie Hay** is the resident Sales Agent.

President and CEO Kevin Ruelas today announced the acquisition of Channel Technologies Group (CTG) by Blue Wolf Capital, effective 29 December 2011. CTG is comprised of three divisions: Channel Industries, ITC and Sonatech, and a wholly owned subsidiary company, Electro-Optical Industries (EOI).

Oceaneering International, Inc. announced that its Board of Directors has elected **David K. Lawrence** as Vice President, General Counsel and Secretary of Oceaneering, effective January 1, 2012. Mr. Lawrence joined Oceaneering in June 2005 as Assistant General Counsel and has served as Associate General Counsel since January 2011. He has over 25 years of experience as an attorney.

OceanWorks welcomed **Keith La Rose** to the position of Business Development Manager – Military in their Vancouver office. Acting as Business Development Manager for the military industry, Keith's primary function will be to expand OceanWorks' penetration of the military market by further raising awareness of the company's proven custom engineering, standard products, and service capabilities.

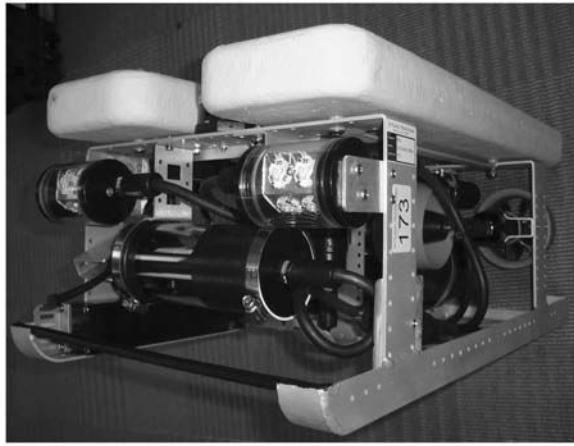
OceanSaver, a leading global provider of class-approved, high capacity ballast water treatment (BWT) systems, has appointed **Houtan Houshangi** as interim Chief Executive Officer, effective immediately.



OUTLAND TECHNOLOGY

UNDERWATER IMAGING SYSTEMS

CAMERAS ROV LIGHTS SYSTEMS



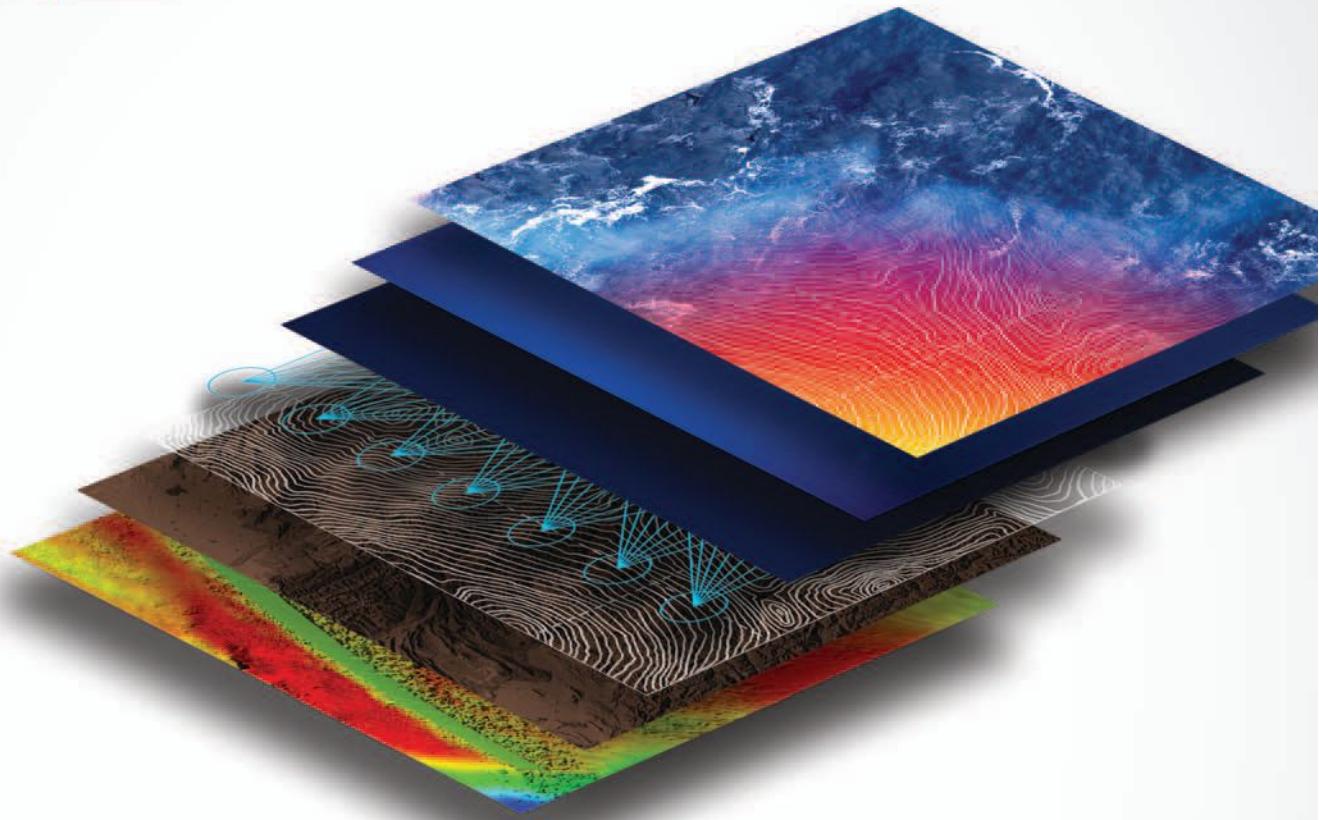
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Ocean News & Technology

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: Offshore Wind, AUVs & Gliders, UW Imaging & Processing

Distribution: UDT Europe • Anti-Submarine Warfare • OceanTech Expo • AWEA Offshore Wind

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 • AUFSI

Deadline: June 15th

Product Focus: Tracking & Positioning Systems, Seismic Monitoring

August

Editorial: Ocean Mapping & Survey, Subsea Telecom, Deepwater Pipeline Repair & Maintenance

Distribution: Mast Europe

Deadline: July 15th

Product Focus: Multibeam & Side Scan Sonars

September

Editorial: Coastal Engineering, Aquaculture & Marine Resources, Environmental Assessment & Monitoring

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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Contact: Eric Birns

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Website: www.birnsaquamate.com
Contact: Eli Bar-Hai

Birns Aquamate design and manufacture underwater electrical connectors, cable assemblies, and cable terminations. The company produces a wide range of standard industry connectors such as the 5500 Series, SC, MC, LP, FAWL/FAWM, Rubber Molded, and NANO. BIRNS Aquamate is the only underwater connector producer that guarantees compatibility with other manufacturers. Birns also excels in fast turn-around for custom design of special connector solutions. Stocking dealers in the UK (Scorpion Oceanics) South Africa (Marine Solutions) Holland (Nautikaris and Seascape) as well as dealers in Italy, Russia, China, Brazil and across the USA.



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 Website: www.teledyne-tss.com
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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 compliments the brokerage side of the business. MaRE also provides Consultancy on all aspects of remote underwater technology.

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BlueView Technologies, Inc.

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Website: www.blueview.com
Contact: Beto Campos - Director, Global Commercial Sales

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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ROVs



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UNDERWATER VIDEO EQUIPMENT



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Contact: Jim Honey

Since 1984 Shark Marine Technologies, has been manufacturing Remotely Operated Vehicles and accessories, Winches, Handling & Control Systems, Underwater Cameras and Diver Held Sonar Systems, for operations including surveying, oil and gas, security and defence, search and recovery and archaeological investigations. We also provide on-site operations and consultation, software development and custom manufacturing.

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