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July 2013

THE REALM OF CHIRP TECHNOLOGY
Compressed High Intensity Radar Pulse

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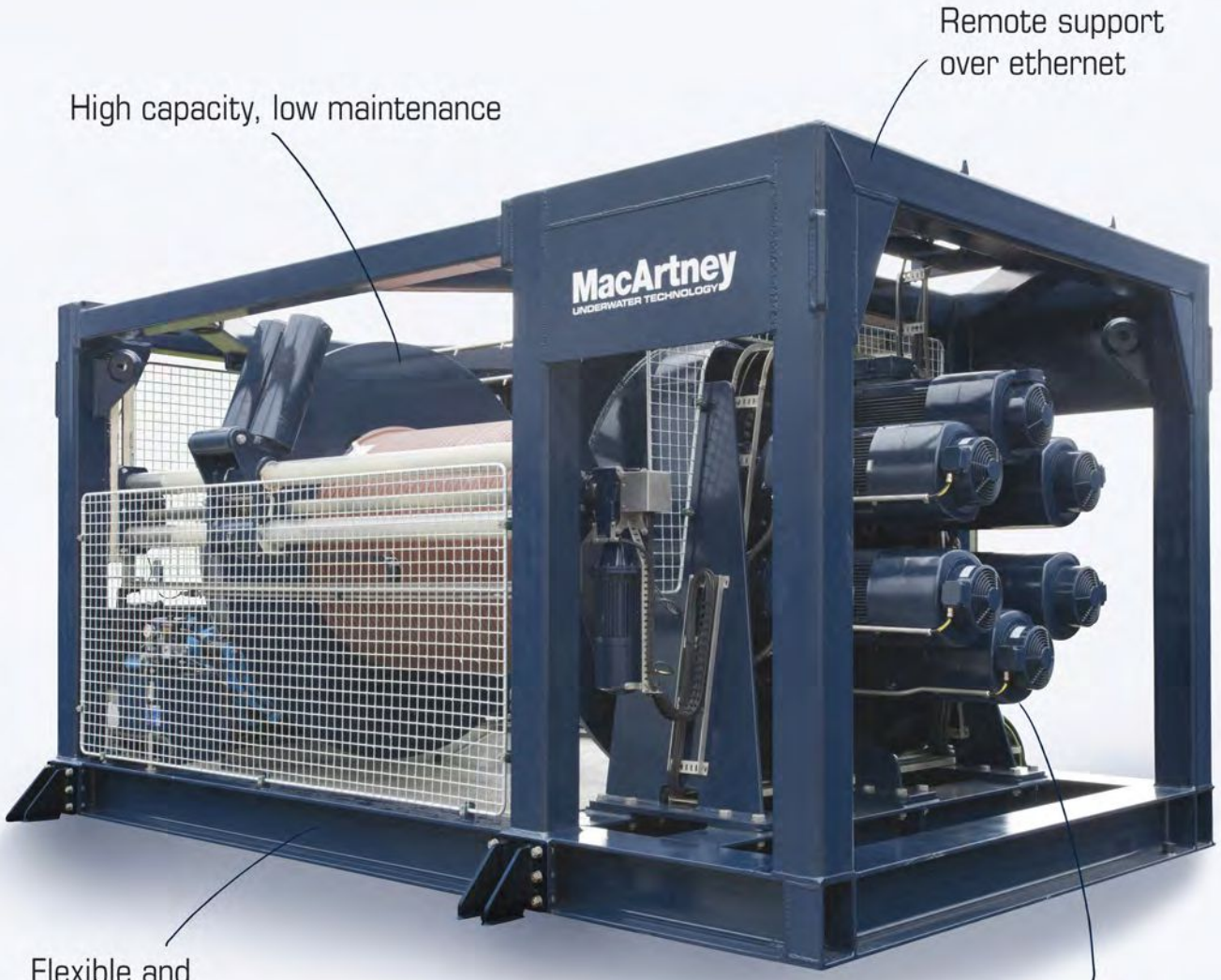

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Launching the University of Delaware's REMUS 600 AUV configured with the EK 60 scientific echo sounder (fisheries sonar), manufactured by Simrad (a Kongsberg Company).

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More News, More Technology, More Data

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- Multibeam & Side Scan Sonars

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Ocean News & Technology ISSN# 1082-6106 is published 11 times a year by Technology Systems Corporation, 8502 SW Kansas Avenue, Stuart, FL 34997, telephone 772-221-7720.

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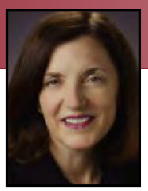

By: Annell R. Bay

Technology Leads to Abundant Energy

To understand the energy supply revolution our country is experiencing, look no further than the oil and gas industry's best and brightest technical minds attending this year's Offshore Technology Conference (OTC) in Houston, Texas.

Many of the advancements that have led to recent discoveries in the Gulf of Mexico and elsewhere have emanated from the annual OTC. The energy resources are out there. Our charge, as an industry, is to continue to create ways to find, develop, and produce them safely and responsibly.

Without question, technology is the enabling factor that has led to the abundant onshore supply opportunities in places like the Eagle Ford shale in south Texas, the Bakken shale in North Dakota, and other "unconventional" plays. Advances in horizontal drilling and hydraulic fracturing have helped to unlock massive new supplies of oil and natural gas that previously were inaccessible.

We're also making enormous strides offshore, as evidenced by the upward trend in the volume of new oil reserves coming from deepwater since the 1990s. On the exploration side, seismic acquisition and imaging have both advanced rapidly in recent years and with significant impact.

Consider this: In the Gulf of Mexico, technological improvements in 3D and 4D seismic technology have helped increase government estimates of offshore resources from 9.5 Bbbl of oil in 1987 to 48.4 Bbbl in 2011, a fivefold increase, the American Petroleum Institute noted in this year's State of American Energy report.

A good indicator of the industry's ongoing interest in the Gulf of Mexico was the oil and gas lease sale for the Central Gulf held in March. A total of 52 energy companies submitted more than 400 bids on tracts covering 1.7 million acres. The sale drew more than $1.2 billion in high bids, building on the success of other recent sales held by the U.S. Department of the Interior.

This is an optimum time to be in the oil and gas business. We have the ability to create tens of thousands of new jobs, both within our industry and in those that support our operations as well as make other significant, positive contributions in the communities where we operate.

However, to realize the full potential, and full benefits, of these vast new resources for the long term, we all — operators and service companies alike — must make an unwavering commitment to safe and responsible operations. We must be stellar corporate neighbors and never lose sight of the fact that we'll be judged by our individual and collective behaviors. We've made great progress, but there's still much work to be done.

We also must keep an eye to the future, and that includes recognizing that our success as an industry hinges largely on creating well-paying, long-term jobs with a focus on developing and deploying advanced technologies. To meet the challenges ahead, companies across our sector will require an abundant pool of qualified individuals, particularly those with strong foundations in science, technology, engineering, and math.

To that end, it's incumbent upon us to encourage and support programs like one under way in the Houston Independent School District, which recently announced plans to create a magnet high school dedicated to energy, petroleum, and technology careers.

As an advisor to the Independent Petroleum Association of America's Education Center, I'm pleased that our organization is involved with this and other efforts to steer students toward STEM (science, technology, engineering, and math) programs.

It wasn't long ago that America looked mainly with pessimism to our future as it related to oil and natural gas. These days, thanks to extraordinary innovation and the development and application of new technologies, the prospects are bright. I've been working in this business for more than 30 years and never has the energy future of America been more promising.

Annell R. Bay is vice president of global exploration for Marathon Oil Corp. In 2012, she was named in the 100 Women Leaders in Science, Technology, Engineering, and Math (STEM) through www.STEMconnector.org.

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The Realm of CHIRP Technology

Compressed High Intensity Radar Pulse

By: Regan Lipinski

Marine Sonic Technology, Ltd. (MSTL) is pleased to introduce the Sea Scan ARC Explorer, the newest addition to its line of side-scan sonar systems. The ARC (Adaptive Resolution CHIRP) model line is a new direction for Marine Sonic Technology, moving it into the realm of CHIRP (Compressed High Intensity Radar Pulse) technology. The first system in the ARC line is the Explorer model.

CHIRP technology is not new. Also known as "pulse compression," it was developed in 1954 by Sydney Darlington for use in digital communication and later applied to radar systems to increase the signal-to-noise ratio (SNR) while increasing the resolution of the radar pulse. CHIRP was adapted for use with sonar in the late 1990s and has made revolutionary changes to the field of acoustic imaging; however, there is still a lot of room for improvement.

MSTL waited to introduce CHIRP signal processing until it could produce an enhanced technology and is now introducing a proprietary "Adaptive CHIRP." Using Adaptive CHIRP, MSTL started from scratch and engineered its new system from the ground up, adding many features not found in other systems.

Pulsed continuous-wave (CW) sonar systems, which utilize a short, single-frequency burst, have been the norm for quite some time. In these systems, the pulse length controls the range resolution. When pulse length is reduced, range resolution is increased. However, shortening the pulse length produces the unwanted side effect of lowering SNR and, as a result, the useful range is limited. In order to raise the SNR, the pulse must be lengthened, which in turn lowers the bandwidth and reduces the range resolution proportionally. The important thing to note is that bandwidth and pulse length are inseparable and are inversely proportional — which is the conundrum of a CW sonar. A compromise must be made between range and resolution when choosing the pulse characteristics for the particular task at hand. However, with CHIRP sonar, the bandwidth is independent of the pulse length, thus solving the CW problem. A CHIRP pulse sweeps from one frequency to another and is generally centered around the quoted frequency of the sonar system. The bandwidth, in simple terms, is the difference in the start and end frequency of the CHIRP sweep. For example, a 900-kHz transducer with a 100-kHz bandwidth will generally start its sweep at 850 kHz and end at 950 kHz. The sweep is 100 kHz centered around 900 kHz, with the total bandwidth being 100 kHz. This swept-frequency pulse, which can be quite long, is processed by a Digital Signal Processor in the sonar receiver circuitry and compressed to a very short pulse. The result of this process is an improved range resolution and much better SNR, which greatly increases the useful range of the system.

MSTL's proprietary Adaptive CHIRP technology allows the system to adjust to the operating environment based on multiple parameters such as ping frequency, range, speed over ground, temperature, etc. Based on these parameters, the system adjusts transmit power, ping rate, pulse bandwidth, and other parameters to ensure optimal resolution and power consumption over the entire operating range.

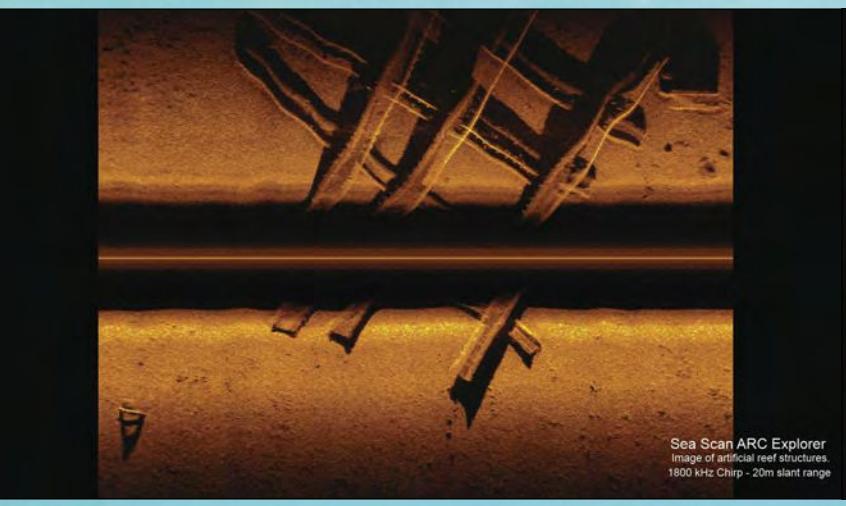
During the development of the new Adaptive CHIRP sonar technology, MSTL had an opportunity to work with users to improve the physical characteristics of the system and to make its use in the field simpler and more productive. "We listened to our customers and created a wish list of attributes that make the ARC Explorer easier to handle, more rugged, and faster to deploy. The system provides the ability to change transducers on location within a matter of minutes to minimize down time and allows the user to have every frequency available without having to buy multiple towfish. Along with the integrated variable angle bracket, billet aluminum body, and wet-mate cable connections, this is by far the most versatile tow fish on the market today. It's perfect for any mission or harsh conditions you can throw at it," says John De Mille from MSTL.

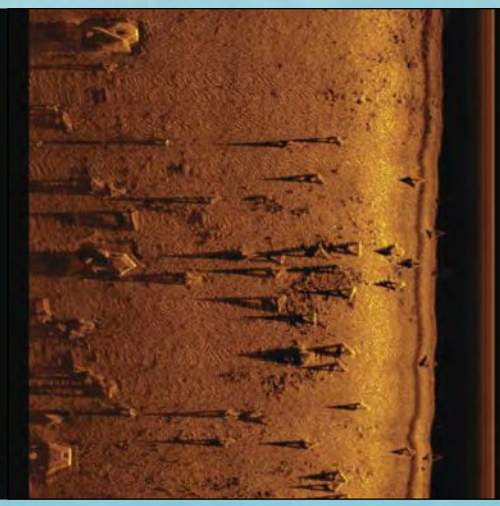
MSTL started out with strength. The towfish is carved out of a single piece of billet aluminum. This provides a solid platform that is highly resistant to damage. The towcable features a kevlar strength member for enhanced flexibility and a tough polymer outer jacket for abrasion resistance. In addition, the cable is equipped with a wet-mate connector and is routed along the towfish body, creating less drag and decreasing the chances of a snag. The wet-mate connector and a carabiner tow cable attachment point ensure a fast and tool-free setup and deployment.

The overall design is modular and interchangeable. The system provides modular electronics, modular transducers, removable tailfins (the fin assembly supports different configurations of fin sizes and shapes for better adaptation to survey conditions), field changeable transducers, multiple transducer configurations with a single towfish body, and easily upgradeable components. The system also incorporates built-in expansion ports for future additions. The ARC Explorer features the very first built-in variable-angle bracket (VAB) design, one of the most requested features. The VAB allows users to change the angle of the towfish body to scan ship hulls and vertical structures, increasing the flexibility of the high-resolution side-scan sonar system. The VAB simplifies use as the towrail itself is the VAB and lets the user change the angle quickly while in the field.

The topside control unit (TCU) is housed in a sealed, water-resistant, rugged polypropylene case and features a modular, upgradable design. It connects to a standard PC using Ethernet or USB — users have the option of choosing. Other features include an auxiliary port and front panel system status indicator lights. The power input accepts DC power or AC power with the included AC to DC adaptor.

The Sea Scan ARC Explorer system comes standard with MSTL's Sea Scan Survey data collection and review software. The software has been upgraded and is truly simple to use. If users can operate a DVR, they can operate this software. The DVR-style software works like a video player, with fast forward, rewind, stop, and jump-to buttons. It is tailored to function and work like common, everyday technology with which users are familiar, including widgets like marker management; length, height, and area measuring tools; a layback feature; and much more. Sea Scan Survey is extremely intuitive, with real-time reviewable data and a customizable interface with dockable windows that let users customize the appearance to their specific needs. The system displays the data seamlessly as one large dataset that can easily be indexed, segmented, and identified using marker events. The data are also adjustable after they are recorded. Unlike other software, MSTL's design stores the raw data first then displays the user alterations without changing the raw data. So, no longer will users lose that perfect image because an accidental mouse click changed the gain. The MSTL system also features high dynamic range 24-bit analog to digital conversion, which gives MSTL the fidelity to have software-based time varying gain (TVG) and to do almost all of its signal processing in the digital domain.





The ARC Explorer system hardware architecture is based on Software Defined Sonar technology. This architecture enables the user to update the system without a hardware upgrade as new sonar signal processing techniques are developed.

All of this is in one rugged, compact, easy-to-use package. No longer do users need hours upon hours of training and years of experience to get that perfect image. So, the question needs to be asked...What's on your cable? Will it be the new Sea Scan ARC Explorer?

For more information please contact Marine Sonic Technology, Ltd. at www.marinesonic.com.

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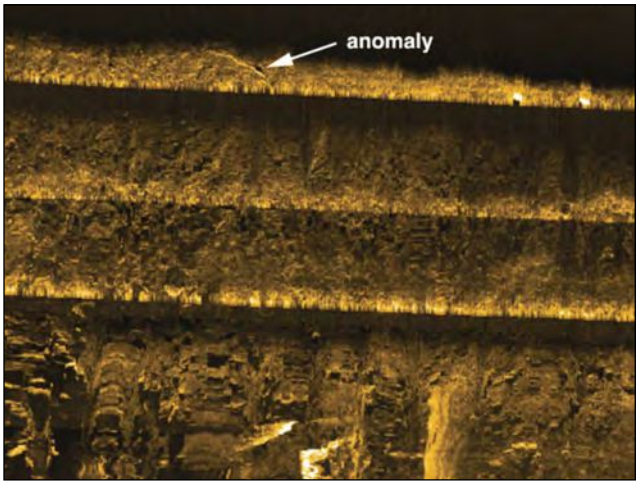
in this section

Sonar image may show Amelia Earhart's Lockheed Electra

According to the The International Group For Historic Aircraft Recovery (TIGHAR) website, researchers have found an anomaly in sonar data that they hope could be the Lockheed Electra flown by Amelia Earhart. TIGHAR, using an Autonomous Underwater Vehicle (AUV), acquired side-scan sonar data along roughly 1.3 nmi of shoreline off the west end of Nikumaroro. The reef slope was surveyed from depths of about 100 m (328 ft) down to 1,200 m (3,937 ft).



It's exciting. It's frustrating. It's maddening. There is a sonar image in the data collected during last summer's Niku VII expedition that could be the wreckage of Amelia Earhart's Lockheed Electra. It looks unlike anything else in the sonar data; it's the right size; it's the right shape; and it's in the right place.

A unique feature of the anomaly is the sonar "tail" that extends uphill and northward behind the more prominent portion of the target that is casting a large shadow. The initial assumption is that this was a ground scar. However, a higher-resolution copy of the image captured from the raw sonar data reveals details that appear to be a break in the prominent part of the anomaly, corroborated by a break in the shadow. Also, some of the tail is casting a low shadow, so it must have some elevation. Something that is always striking about Electra wrecks or repair shops where Electras are being restored or rebuilt is the incredible amount of "junk" that comes out of the airplane. Rather than a ground scar, a more likely hypothesis is that the tail is a debris field of fuselage wreckage, internal components, cables, crushed fuel tanks, etc. strewn behind the eviscerated center section.

The better a piece of evidence looks, the harder you have to try to disqualify it. So far, the harder TIGHAR has looked at this anomaly, the better it looks. Maybe the anomaly is a coral feature that just happens to give a sonar return unlike any other coral feature on the entire reef slope. Maybe it's a sunken fishing boat that isn't mentioned in any of the historical literature. Maybe it's pure coincidence that it's the right size and shape to be the Electra wreckage — the Electra that so much other evidence suggests should be in that location.

The senior data processor at Oceanic Imaging Consultants, Inc. of Honolulu, Hawai'i, recently examined the raw sonar data and provided TIGHAR with some bad news and some good news.

The bad news is that the data collection performed by the search contractor during last year's Niku VII expedition was much less complete than they were led to believe. Consequently, the imagery initially derived from that data was somewhat misleading. The good news is that, when corrected, the imagery of the anomaly — although less complete — looks even more interesting than it did in the initial distorted version.

For more information, visit www.tighar.org.

UTEC acquires Star Net Geomatics

Leading independent survey contractor UTEC has announced the acquisition of Star Net Geomatics Limited. UTEC — with a global footprint comprising 11 offices around the world, including Aberdeen, Scotland — has acquired Star Net Geomatics Limited (Star Net), which has its headquarters in Livingston, Scotland (UK) and an operational office in Milton Keynes, England (UK). The move capitalizes on a natural and highly complementary fit between the two companies and provides a unique opportunity to enhance and increase the range of laser scanning, dimensional control, and 3D asset management services available through the iSite portal to UTEC's global offshore and onshore clients. Star Net is a UK-based international company that provides a wide range of surveying, inspection, and design services worldwide to the oil and gas, telecommunication, renewables, civil engineering, and nuclear sectors. Star Net offers a "world first" turnkey model for telecommunication and broadcast infrastructure site development, maintenance, and upgrade and is a pioneer in the use of laser scanning technology as an innovative 3D virtual asset management solution that is now offered to the offshore energy sector.

NOAA report examines national oil pollution threat from shipwrecks

NOAA presented to the U.S. Coast Guard a new report that finds that 36 sunken vessels scattered across the U.S. seafloor could pose an oil pollution threat to the nation's coastal marine resources. Of those, 17 were recommended for further assessment and potential removal of both fuel oil and oil cargo. The sunken vessels are a legacy of more than a century of U.S. commerce and warfare. They include a barge lost in rough seas in 1936; two motor-powered ships that sank in separate collisions in 1947 and 1952; and a tanker that exploded and sank in 1984. The remaining sites are 13 merchant marine ships lost during World War II, primarily along the Atlantic Seaboard and Gulf of Mexico. The report, part of NOAA's Remediation of Underwater Legacy Environmental Threats (RULET) project, identifies the location and nature of potential sources of oil pollution from sunken vessels. Knowing where these vessels are helps oil response planning efforts and may help in the investigation of reported mystery spills — sightings of oil where a source is not immediately known or suspected. For a list of ships and their locations, visit http://sanctuaries.noaa.gov/protect/ppw.

Greenpeace urges protection for the "Grand Canyons of the Sea"

Greenpeace and a number of other environmental groups converged in Juneau, Alaska to urge the North Pacific Fishery Management Council (NPFMC) to protect Alaska's Bering Sea, a unique ecosystem currently threatened by a billion dollar fishing industry. Greenpeace also flew its thermal airship over Juneau with a 75-ft whale-themed banner urging Alaska residents to help protect the "Grand Canyons of the Sea."

"The Bering Sea is home to one of the most remarkable places in the world, 'the Grand Canyons of the Sea,'" Greenpeace oceans campaigner Jackie Dragon said. "Tragically, this ecosystem is under threat from industrial fishing fleets that carve up the fragile corals and sponges on the seafloor. The science is clear, and the people have spoken: it is time to protect these spectacular canyons."

Greenpeace is just one of many groups who have been asking the body that oversees the fisheries in the Bering Sea, the NPFMC, to protect the canyons from industrial fishing fleets. They're coming together just as the NPFMC is preparing to decide the canyon's fate this week. A review just published by the Alaska Fisheries Science Center concluded that the canyons likely contain over a third of the Bering Sea's coral habitat and they are at high risk of impact from industrial fishing.

For more information, visit www.greenpeace.org.

EdgeTech announces $2.5 M IDIQ contract award from NOAA

EdgeTech, the leader in high resolution sonar imaging systems and underwater technology, was awarded an IDIQ contract from NOAA with a ceiling of $2.5 million over 5 years.

The contract to provide acoustic release transponders and associated equipment was awarded to EdgeTech by the NOAA Pacific Marine Environmental Laboratory (PMEL). NOAA PMEL deploys hundreds of underwater moorings with valuable oceanographic equipment and sensors every year. EdgeTech provides reliable and robust acoustic releases that are used by NOAA and many other oceanographic, research, and military organizations around the globe. The EdgeTech 8242 acoustic releases, strategic equipment provided as part of this contract, are a valuable part of many long-term underwater deployment packages.

For more information, visit www.edgetech.com.

ADCI president Mike Brown appointed to National Offshore Safety Advisory Committee

The ADCI announced the formal appointment of Mr. Mike Brown to the National Offshore Safety Advisory Committee (NOSAC). Mr. Brown will represent the view point of offshore diving services. He will serve for a term of 3 years. Mr. Brown replaces Mr. Bill Crowley, who successfully served on the committee for two terms.

Mr. Brown has been in the industry for over 35 years. He is the vice present and general manager of EPIC Divers and Marine, a subsidiary company of TETRA Technologies, Inc. He is also the president of the Association of Diving Contractors International (ADCI), co-chairman of the International Association of Oil and Gas Producers (OGP) Commercial Diving Sub-Committee and co-chairman of Underwater Intervention. Mr. Brown is a veteran who served honorably in the U.S. Navy.

12th International Submarine Races held at Naval Surface Warfare Center

The Foundation for Undersea Research and Education (FURE) and Naval Surface Warfare Center Carderock Division (NSWCCD) recently hosted the 12th International Submarine Races (ISR), a biennial engineering design competition, over the week of 2 June 2013.

"The Carderock Division are proud to host the 2013 ISR at our David Taylor Model Basin facility," said Carderock Division Commander Capt. Heidemarie Stefanyshyn-Piper. We are thrilled to be a part of such an exciting event that puts engineering skills learned in the classroom and in the lab to a practical test. Our nation's highest educational priority is to inspire current and future generations of young people to pursue careers in science, technology, engineering, and mathematics (STEM) fields, and this event completely supports that goal."

One- and two-person teams from high schools, colleges, universities, and private groups were invited to participate in this weeklong contest. The ISR has been in existence since 1989 and has been conducted at the U.S. Navy's test tank at Carderock since 1995. This biennial event features races that test the creative skills of young engineering students throughout the world. Teams, wearing scuba gear, contend their submarine-designed vessels along an underwater 100-m measured course in Carderock's model basin. More than 20 submarines participated in the race.

"The purpose of the sub races is to provide an educational opportunity for aspiring young engineers. Their participation in the design, construction, and operation of a human-powered submarine offers real-time application of theoretical knowledge, hands-on creativity, problem solving, and teamwork skill opportunities," said Hussey. "The sub race engineering design competition is an investment in the future of our young people, not only to help them compete in the global technology economy, but to provide a better trained and experienced resource pool of bright and industrious students to help the defense industry and the government fill future national needs.

The 2013 Platinum ISR sponsor to date is the Oceanic Engineering Society of the Institute of Electrical and Electronics Engineers. The Marine Technology Society is a Gold sponsor.

For more information, visit www.issubrace.org.

The MTS ROV Committee announces winners of its 2013 annual scholarships

Grace Anne Young, Andrew Augustyn, Blake Hoover, and Goh Han Hwee have been selected as recipients of the Marine Technology Society (MTS) 2013 ROV Committee Scholarships. In addition, Christopher Konstad, Kip Hacking, Anne Crago, and Christian Welch received MTS ROV Committee MATE (Marine Advanced Technology Education) Center Scholarships.

Grace Young was awarded $8,000 and attends MIT, majoring in Ocean Engineering. Andrew Augustyn was awarded $6,000 and attends Alpena Community College where he is pursuing an Associates Degree in ROV Technology. Blake Hoover received $4,000 and attends BYU, majoring in Technology and Engineering. Goh Han Hwee attends Newcastle University, majoring in Naval Architecture, and received $2,000.

A winner of the MTS ROV Committee MATE Center Scholarships, Christopher Konstad was awarded $8,000, and will attend UCLA. Kip Hacking was awarded $6,000 and attends BYU, pursuing a degree in Electrical Engineering. Anne Crago received $4,000 and attends Texas A&M Corpus Christi, majoring in Mechanical Engineering. Christian Welch received $2,000 and is pursuing degree in Mechanical and Ocean Engineering at MIT.

For more information, visit www.rov.org.

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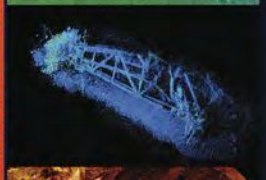
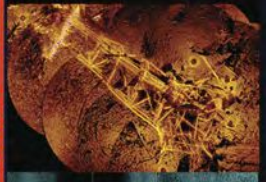


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Small AUV with Side-Scan Sonar/PDBS Bathymetric and Magnetometer Payloads Prove Capable in Littoral Zone

By Garry Kozak, EdgeTech

Surveying in shallow nearshore littoral zones has been problematic, requiring small vessels with shallow drafts. Small vessels are heavily influenced by surface wave conditions, and the collection of side-scan sonar, bathymetry or magnetometer datasets is degraded as wave height increases from vessel heave and surge. Autonomous Underwater Vehicles (AUVs) have the advantage of decoupling the sensors from the surface vessel, resulting in higher quality constant altitude datasets. The introduction of small, low-cost AUVs is attractive; however, it has been challenging to install sonar and magnetometer payloads that could actually fit on the small AUVs and produce the quality of data needed for Navy mine countermeasure (MCM) bottom characterization and mine-like object (MLO) target detection missions. The introduction of the new EdgeTech 2205 combined very high-frequency side-scan sonar with interferometric bathymetry, and Marine Magnetics' Explorer magnetometer has solved the payload size and power restrictions on small AUVs while producing data quality that exceeds all previously available systems. A proof of concept trial to demonstrate new commercial technologies was staged in San Diego during May 2013 under the direction of the Naval Underwater Warfare Center (NUWC), Rhode Island. Water depths in the trial area varied between 10 and 20 m.

AUV and Payloads

The small AUV selected for the trial was an Ocean Server IVER 2. The IVER 2 is one of the smallest and lightest weight AUVs on the market today, making it ideal for hand deployment from small, rigid hull inflatable boats (RHIBs) or direct beach launching. The AUV has a standard depth rating of 100 m with an 8- to 14-hr endurance, depending on battery capacity options selected. The AUV uses Global Positioning System (GPS) for surface navigation. For subsurface navigation, it uses Doppler Velocity Log (DVL) and dead reckoning with compass, depth sensors, and vehicle speed tables. The sonar payload was the newly introduced EdgeTech 2205, which combines side-scan sonar with an interferometric phase differencing bathymetry system (PDBS). The side-scan sonar is a dual simultaneous 600/1600 kHz while the interferometric bathymetry operates at 600 kHz. The 2205 system is state-of-the-art and designed for both low volume and low power, making it ideal for all AUVs right down to the smallest as used during the Navy trial. The sonar system is built with active arrays, significantly cutting down on noise and extending the range performance of the sonar when installed on AUVs. Integrated to the IVER 2 was also an Explorer magnetometer from Marine Magnetics. The mission goal was to collect three fully co-registered datasets of side-scan sonar, bathymetry, and magnetometer together. The magnetometer was streamed a short distance behind the vehicle so that its high sensitivity would not be degraded by the influence of the AUV. Figure 1 shows the complete AUV with installed payloads.

Fig. 1. IVER 2 AUV with EdgeTech 600/1600 kHz side-scan sonar, phase differencing bathymetry system, and an Explorer magnetometer.

Side-scan Sonar and Interferometric Bathymetry Performance

The EdgeTech 2205 side-scan sonar data quality was of very high resolution and fidelity. The active arrays improvement of reducing noise and extending range was clearly evident. Area mapping and target detection were performed using a 75-m range scale (150-m swath). The EdgeTech swath interferometric bathymetric sonar (PDBS) is the only system on the market that produces bathymetry data with no nadir gap. This is significant because it means extra survey lines do not need to be run in order to cover the nadir gap area, thus saving time and survey costs. Figure 2 shows the bathymetry results of the EdgeTech PDBS system nadir advantage compared to another PDBS system and a typical multi-beam bathymetric system used on the trial.

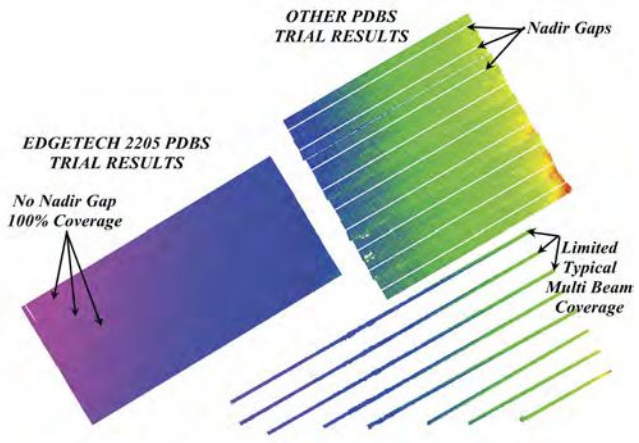

Fig. 2. PDBS system nadir coverage comparison and the poor multi-beam bathymetric coverage in shallow water zones.

The other PDBS system trialed had significant missed data in the nadir zone, and the multi-beam system used during the trial had very narrow swath coverage in the shallow water depths. The 2205 bathymetric data were processed in Hypack® software, and the low-profile anchors and chain as imaged by the side-scan sonar are detected in the high-resolution bathymetric data. Figure 3 shows an example of the side-scan sonar data processed in SonarWiz software to generate a geo-referenced mosaic of the area with three anchors on the seafloor along with the co-registered bathymetric data of the same area. The anchors and chain are clearly seen in both datasets. MLOs were easily detected, and target positions were logged to be used later in very high-resolution classification missions. The high-resolution classification images of MLOs exceeded all expectations participating in the trial. The resulting MLO images are shown in Figure 4.

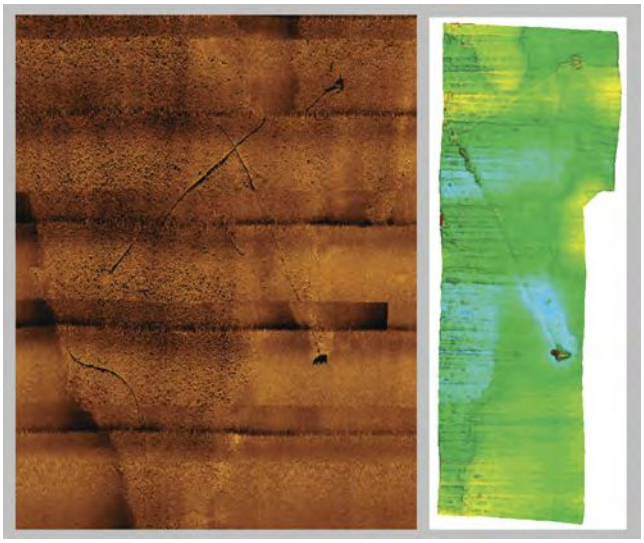

Fig. 3 Sidescan Sonar Mosaic (left) and Bathymetry (right) of Area with 3 Anchors

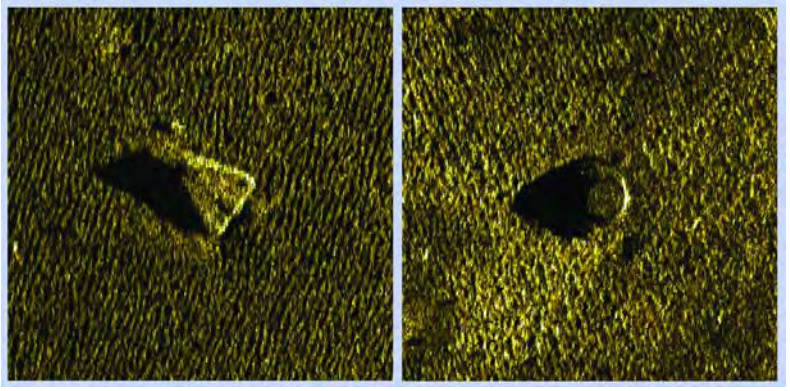

Fig. 4 Side-scan sonar images of two different MLO types, dimensions less than 1 m.

Magnetometer Results

The Marine Magnetics' Explorer magnetometer is a small, lightweight, high-sensitivity unit that should not impact the ability of the small Iver 2 to navigate nor influence vehicle stability. The field results confirmed that the AUV was fully capable of towing the magnetometer sensor and that it had virtually no influence on the AUV performance. The magnetometer data were processed in SonarWiz and put into a contour map. Then, both the side-scan sonar and bathymetry data were added as background layers for visual analysis. The advantage of having the three co-registered datasets merged into one workspace results is easier and more efficient data analysis. Figure 5 shows the contoured processed magnetometer data layered onto the co-registered bathymetric data as well as a color contoured map showing very clearly the three magnetic anomalies resulting from the anchors on the seafloor

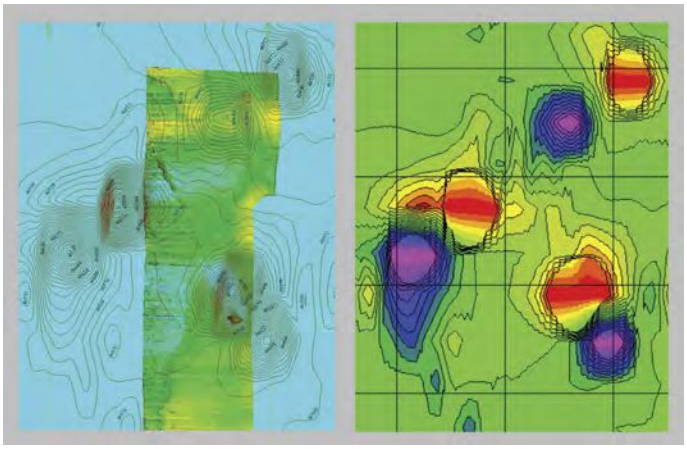

Fig. 5 Magnetometer Contour Data layered on Bathy (left) and Color Magnetometer Contour Map (right) showing the magnetic anomalies from the 3 Anchors.

Target Position CEP

Target position uncertainty was one of the metrics that was of high importance. Targets were selected, and the positions were compiled from several runs and missions to calculate a CEP. The example in Figure 6 shows an average CEP of ±6 m on an MLO.

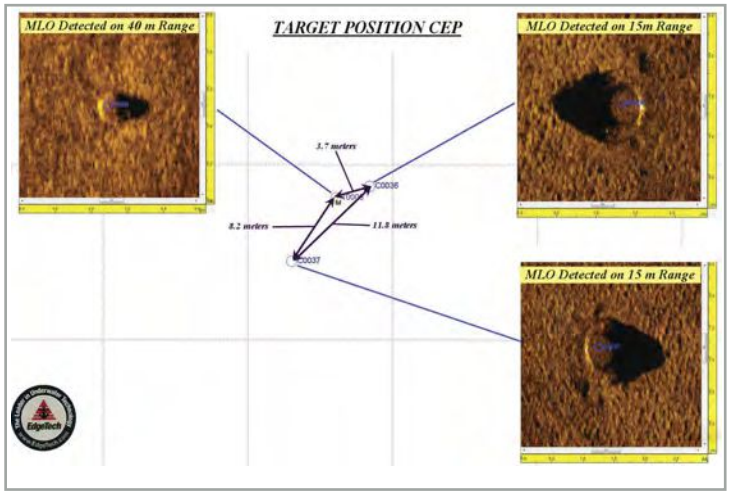

Fig. 6. Target position CEP

Conclusion

The week of trials in San Diego confirmed that small AUVs can be equipped with multiple high-performance sensors and that they are capable of collecting data of very high quality in the littoral arena. The ability to collect three co-registered datasets is a distinct advantage for the mission analyst to better assess bottom conditions and in locating targets of interest. Navies and others who work in shallow coastal waters now have a cost-effective solution that is compact, lightweight, and delivers data quality of the highest order.

ABS releases ship energy efficiency measures advisory
ABS, a leading provider of maritime classification services, has released the ABS Ship Energy Efficiency Measures Advisory to provide guidance on the wide range of options available to improve vessel efficiency, reduce fuel consumption, and lower emissions. The Advisory assists owners, operators, and other stakeholders in conducting the techno-economic analysis needed to meet the challenges of rising fuel costs and increasing environmental regulatory requirements. As the shipping industry works to comply with environmental laws and adapt to an operating landscape of higher fuel costs, it is embracing new design concepts and looking for ways to optimize existing tonnage. The Advisory gives decision-makers the tools to make informed choices about the available options for improving vessel efficiency, reducing fuel consumption, and lowering emissions and guidelines for applying the technologies to their assets. "Energy efficiency measures are probably the number one topic for owners constructing new vessels or seeking to optimize existing tonnage," says ABS vice president for operational and environmental performance (OEP) Howard Fireman. "The potential to achieve greater efficiency is not in doubt, but owners and operators need support in evaluating which options are most suitable for their vessels." The Advisory has been produced by the ABS Technology department and the ABS OEP team. OEP was formed in January 2013 to expand upon the previous work of the ABS Environmental Solutions Group. The expanded team provides additional resources to assist the marine and offshore industries in assessing the energy efficiency and operational performance of new and existing assets.

DNV urges increased safety focus in shipping
Serious accident trends — for example, penetration of hull and immobilization of the main engine — have worsened over the last decade. During these years, the frequency of serious accidents has, in average, been almost twice as high as it was at the start of this millennium. On the positive side, the number of lives lost has not followed that trend, but stayed quite constant over time if we look at all ship types. Another issue is the safety variations between various ship segments. Offshore supply vessels are among the most technically advanced vessels and are often used for some of the most complicated operations. Nevertheless, the safety performance of offshore supply vessels is better than that of any other ship segment. "The achievements within the offshore segment are good. Through a technology-focused proactive risk management and barrier approach, safety has been improved step by step," says Mr. Svensen. "Learning through experience exchange between ship segments is essential to improve overall safety. Together, DNV and GL will be in a better position to share and develop knowledge to the benefit of the whole shipping industry."

Genscape completes acquisition of Vesseltracker.com
Genscape, the company that pioneered the placement of thousands of patented, in-the-field energy monitors to measure market fundamentals in real-time, announced the acquisition of Vesseltracker.com GmbH. This acquisition significantly expands Genscape's network of proprietary real-time energy monitors to deliver the next era in ocean-going fleet analytics and customized reporting. Vesseltracker uses sophisticated algorithms to synthesize data from its over 800 AIS antenna stations located worldwide along with the world's largest AIS satellite data feed — and now Genscape's land-based oil storage and pipeline data. This new combination delivers the industry's largest breadth of geographical coverage coupled with exceptional data quality. "This acquisition unites Vesseltracker's marine-based oil fleet monitoring with Genscape's land-based oil storage and pipeline data," says Matthew Burkley, CEO of Genscape. "For the first time, oil market participants will have direct access to combined real-time land and sea oil market fundamentals." "I can see a lot of potential in combining Genscape and Vesseltracker's proprietary networks to deliver unique and high quality data to energy traders," says Carsten Bullemer, CEO of Vesseltracker. "Both companies share the same entrepreneurial culture. I'm very happy to be part of Genscape." Genscape is providing free trial access for a limited time and, in response to early adopter demand requests, will customize land and/or sea oil monitoring for select clients.

Royal Caribbean signs contract with Meyer Werft for third Quantum-class cruise ship

Royal Caribbean Cruises Ltd. announced that it has signed a contract with the Meyer Werft shipyard to construct a third Quantum-class cruise ship for delivery in mid-2016. The price and terms of the new ship are similar to the price and terms of the first two Quantum-class ships, and the contract is subject to financing conditions.

The company recently unveiled details of this new class of ship and was gratified by the public response to the design innovations. It also said that the new design included an advantageous configuration that includes a greater proportion of higher priced staterooms and that it achieves some of the greatest energy efficiencies at sea.

The yet-unnamed Quantum-class vessel will join the Royal Caribbean International fleet, alongside Quantum of the Seas, which will make its maiden voyage in 2014, and Anthem of the Seas, scheduled to debut in 2015.

Including this contract and existing ship orders, projected capital expenditures for 2013, 2014, 2015, and 2016 are $700 million, $1.2 billion, $1.2 billion, and $2.1 billion, respectively. Including Quantum III, the company's capacity growth rate from 2012 to 2017 will be approximately 4% per annum.

Quantum ships span 16 decks, encompass 167,800 gross registered tons, carry 4,180 guests at double occupancy and feature 2,090 staterooms. Quantum cruising will dazzle guests with never-before onboard features, such as a skydiving experience, a thrilling adventure that transports guests more than 300 ft in the air on a breathtaking journey; cutting-edge transformative venues, including the largest indoor sports and entertainment complex at sea with bumper cars, roller skating, and more; and the cruise line's largest and most advanced staterooms. These new, larger staterooms enable innovation in design, storage, and comfort, including the industry's first interior staterooms with Virtual Balconies, ensuring that every stateroom on Quantum of the Seas will have a view.

For more information, visit www.meyerwerft.de.

New R&D project to help enhance maritime safety

A new 3 year European Research Project, part funded by the EU, has been launched to help increase safety onboard vessels. CASCADe, (model-based Co-operative and Adaptive Ship-based Context Aware Design) aims to address the lack of symbiosis that exists between current bridge design, operational procedures, and the end user.

In the maritime environment, there is a proliferation of increasingly complex technology. Studies have shown that the use of instruments with a range of different user interfaces or the provision of too much information can lead to errors and a reduction in performance. This unsatisfactory situation has the potential to create accidents and incidents that may translate into significant remedial and compensation costs. It is vital that a holistic approach is taken when developing ship bridge design, factoring in the required operational procedures and subsequent end user interaction.

CASCADe will develop an adaptive bridge system that will recognize, prevent, and recover from human errors by

improving the interaction between crew and machines on the bridge. The main outcome will be a new human-centered design methodology to support the analysis of agent interactions at early design development stages.

Under the coordination of OFFIS (Oldenburg Research and Development Institute for Information Technology Tools and Systems), a consortium of seven project partners from five EU countries will collaborate, including BMT Group Ltd, Raytheon Anschuetz GmbH, Mastermind Shipmanagement Ltd, the University of Cardiff, Marimatech AS, and Symbio Concepts & Products SPRL.

Four further associated partners, including the Maritime Cluster Northern Germany, Nautilus International, NSB Niederelbe Schiffahrtsgesellschaft mbH & Co. KG, and the University of Tasmania, will also provide support.

For more information, visit www.cascadeproject.eu.

Northrop Grumman to upgrade container vessel navigation systems with VisionMaster

Northrop Grumman Corporation has been selected by Arklow Shipping to upgrade 12 container vessels with VisionMaster FT Electronic Chart Display and Information Systems (ECDIS) to enable paperless navigation.

Northrop Grumman's Sperry Marine business unit will install all of the systems by the end of 2014. The VisionMaster FT ECDIS will replace existing NaviECDIS that utilizes the Voyage Management System supplied by Sperry Marine.

The VisionMaster FT system flexibility has been designed to meet customer specifications, with information from all navigation sensors brought together and merged into multifunction workstations. In addition to paperless navigation, the new ECDIS will reduce maintenance costs and provide the Integrated Bridge System with the latest technology and features.

Arklow Shipping operates a fleet of 44 ships that transport project cargos, grain, and both general and bulk commodities. The 12 ships being upgraded

are multipurpose vessels ranging in capacity from 3,000 to 5,000 gross tonnage.

For more information, visit www.northropgrumman.com.

Bollinger receives the Shipyard Council of America Award of Excellence in Safety

Bollinger Shipyards, Inc. was awarded the 2012 Award for Excellence in Safety by the Shipbuilders Council of America for the eighth consecutive year.

The Shipbuilders Council of America (SCA) presented the Award for Excellence in Safety to Bollinger Shipyards, Inc. during the association's Spring General Membership Meeting in Washington, DC. The Award for Excellence in Safety is given to member companies with the lowest Total Recordable Incident Rates (TRIR) based on a quarterly injury and illness survey conducted by the association.

Crowley honored with Marine Environmental Business of the Year Award

Crowley Maritime Corp. was recently honored with the Marine Environmental Business of the Year Award during the 62nd Annual Maritime Festival Luncheon in Seattle. Crowley's Gordon Brink, administrative assistant, harbor ship assist and tanker escort services, accepted the award from the Port of Seattle's CEO Tay Yoshitani on behalf of the company.

Each year, the award is granted to a company that demonstrates environmental initiative and leadership through its commitment to helping the Port of Seattle maintain a low-carbon footprint. Crowley received the award for demonstrating a strong culture of environmental stewardship through its initiatives to keep Puget Sound and other bodies of water clean.

Port of Houston gets new Captain of the Port

A new commander of Coast Guard units in the Houston-Galveston area and Captain of the Port in those areas has relieved his predecessor during a change-of-command ceremony in Clear Lake.

Capt. Brian Penoyer relieved Capt. James Whitehead, who is retiring from the Coast Guard after 26 years of service.

As the commanding officer of Sector Houston-Galveston, Penoyer will oversee multi-mission operations, from maritime homeland security to maritime environmental response.

Prior to assuming command of Sector Houston-Galveston, Penoyer was a U.S. Coast Guard fellow at the Center for Strategic and International Studies. A specialist in coastal operations and a designated Coast Guard marine safety professional, he was also assigned as acting chief of congressional and governmental affairs, where he was responsible for all Coast Guard engagement with Congress and with State, tribal, and local elected officials.

For more information, visit www.uscgnews.com.

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How AUVs are Uncovering the Secrets of Deep-Diving Whales

By: Graham Lester, Director of Hydroid Europe

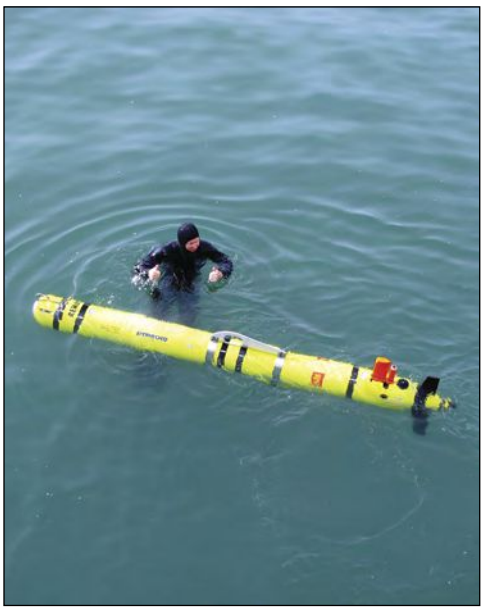
Deep in the underwater canyons off the coast of California's Channel Islands, a battle is raging between two ancient predators: squid and toothed whales. Despite the enormity of this clash, we still don't know much about how and where beaked whales and sperm whales hunt squid because it usually happens at depths of over 1,000 m. Oceanographers Kelly Benoit-Bird and Mark Moline are determined to find out more.

They're on a quest to understand exactly how squid are grouped throughout the deep-water canyons surrounding the Channel Islands and how their habits affect the whale populations. The information is not only important to better understand these predator-prey interactions, but to help the U.S. Navy and other organizations better protect these marine mammals.

How are Moline and Benoit-Bird collecting data on behavior that happens more than half a mile beneath the waves? With the help of a specially modified Autonomous Underwater Vehicle (AUV).

Benoit-Bird, the lead investigator for this study, is an associate professor at the Oregon State College of Earth, Ocean, and Atmospheric Sciences. She has been studying squid for more than a decade and began her collaboration with Moline, the Director of the School of Marine Science and Policy at the University of Delaware, in 2006. Benoit-Bird uses sonar to gather information about squid habits the same way submarines use sonar to detect foreign objects. This fall, they will begin their most ambitious experiments to date—they're partnering with a whale-tagging project to conduct two separate 2-week experiments off the coast of San Diego, California.

Up until this point, marine biologists were forced to project sound signals from a slow-moving boat. This method has two distinct drawbacks. First, the sound frequencies of interest only penetrate to approximately 600 m, cutting off any information below that depth while whales routinely dive to depths of 1,000 to 1,200 m to forage on the squid that reside there. Secondly, the ship engines and bubbles from the ship wake introduce a great deal of ambient noise into the equation.



In order to better understand the interactions between whales and squid, a new tool needed to be developed to extend the depth range of the data collection to a relevant depth of 1,000 to 1,200 m. Moline had been operating the Hydroid REMUS 100 AUV for more than a decade for coastal oceanographic mapping and, in 2009, obtained a REMUS 600 AUV capable of operating at 600 m for an extended period of time. Combined with the acoustic sensors typically deployed on a ship, the AUV was the perfect tool for this application. For the last 3 years, Benoit-Bird and Moline have developed the plans, integrated the acoustic sensors into REMUS 600, and conducted the first deep-water tests.

Taking advantage of the modular design of the REMUS, Benoit-Bird and Moline designed their own modules: a transducer bay and an electronics bay that together can detect sonar waves returning from depths of more than 1,000 m. They are even able to conduct on-board processing of the sonar data, route the data to the AUV's navigation system in real-time, and program the vehicle to adjust its route based on target acquisition. In other words, if the REMUS spots a squid or whale, it can automatically circle back to collect more information.

"We worked directly with Hydroid to build our module from the ground up," said Benoit-Bird. "One of our transducers is twice the diameter of the normal REMUS body, but Hydroid did an exceptional job helping us create a 'one-of-a-kind' modification, which is never easy."

Though the modifications hit occasional snags, the physical integration of the new module was straightforward once Benoit-Bird and Moline figured out how to miniaturize their electronics sufficiently and to make the system run without a human operator. This new AUV configuration can be operated from a ship or from shore and collect large amounts of low-noise acoustic backscatter data. The REMUS will travel by itself for long periods of time, returning with a wealth of information collected at these depths unreachable by boat-mounted sonar.

"The mobility and utility of an AUV removes a lot of the labor and expense from our experiments," Benoit-Bird continued. "The REMUS goes places where boats can't go, and it collects high-resolution data for a long period of time by itself."

Tests conducted off Massachusetts and recently off California in April were very promising; the 4.9-m (16-ft) long vehicle operated well with the new transducer module. The data collected on these short missions in shallow and deep water showed that the background noise was well below ship-based measurements. The new AUV configuration was also able to detect fish schools, diving birds, plankton, and the target group, squid. These preliminary tests demonstrated full functionality and readiness for the fall experiment.

Benoit-Bird and Moline are noticeably eager to put their customized REMUS to work this fall. Although they won't say what they expect to find, their experiments may uncover completely new revelations about some of the world's most fascinating creatures. The interaction between sperm whale and squid is the stuff of legends, but these animals are also a key part of an ecosystem that's both highly travelled by human beings and crucial to protect. The squid study (2013-2014) is surely not the last that Benoit-Bird and Moline will perform. The team sees many opportunities to use this new AUV configuration to understand the ecology of the ocean.

When asked whether her experiment could potentially uncover a never-before-seen leviathan of some kind, Benoit-Bird laughs it off. She's a scientist, after all, and her focus is on hard data. That's why the AUV has been such a monumental introduction to her and Moline's work. High data volume and authenticity are the most important ingredients for great scientific research, and the REMUS 600's reliable versatility enables Benoit-Bird and Moline to collect data about squid and deep-diving whales that has never been possible before. In late 2013, we'll find out what they learn.

NOAA releases draft proposal to expand Thunder Bay National Marine Sanctuary
NOAA has released for public comment a Draft Environmental Impact Statement (DEIS) and proposed rule for expanding the boundaries of Thunder Bay National Marine Sanctuary in Lake Huron from its current 448 sq. mi to 4,300 sq. mi. The proposed expansion is based on several years of research by NOAA and its scientific partners as well as public input and would include protection of an additional 47 known historic shipwrecks. During the process to review the Sanctuary's management plan in 2006, NOAA received comments expressing interest in expanding the Sanctuary's boundary to include the waters adjacent to Alcona and Presque Isle Counties in Michigan. Specifically, several local government and non-government organizations passed resolutions or submitted written letters of support for boundary expansion. Additionally, in 2007, the Thunder Bay Sanctuary Advisory Council adopted a resolution supporting expanded boundaries. NOAA held three public scoping meetings on this topic in April 2012. The Sanctuary's Great Lakes Visitor Center has become a major tourist destination and economic stimulant in the region. According to a 2005 study on total visitor spending in the region, the sanctuary impacts $92 million in sales, $35.8 million in personal income to residents, and 1,704 jobs. The DEIS and proposed rule are available for download at http://thunderbay.noaa.gov.

Shark ecotourism could double in the next two decades
According to a new global analysis led by researchers at the University of British Columbia and other scientists, shark watching is a major economic driver for dozens of countries, generating $314 million annually. Citing the study's projections that shark-related tourism could more than double within 20 years, generating over $780 million annually, The Pew Charitable Trusts is calling for greater protections for sharks through the designation of sanctuaries around the world. Shark-related tourism is a growing business worldwide, with established operations in at least 83 locations in 29 countries. Although places such as South Africa, the United States, and Australia have typically dominated this industry, shark ecotourism is becoming an economic boon to countries across the Indian Ocean and Pacific Ocean regions. The study finds that shark watching attracts 590,000 tourists and supports more than 10,000 jobs each year. The increase in shark ecotourism and its economic value can lead to interest in establishing sanctuaries for sharks, which play a critical role in the health of marine systems. In recent years, nine countries — Palau, the Maldives, Honduras, Tokelau, The Bahamas, the Marshall Islands, the Cook Islands, French Polynesia, and New Caledonia — have created sanctuaries by prohibiting commercial shark fishing to protect the animals in their waters. In contrast to the growing ecotourism industry, the value of global shark catches has been declining, largely as a result of overfishing. Approximately 100 million sharks are killed every year primarily for their fins, which are used to make shark fin soup, a popular dish in Asia.

CSA holds Ocean Sciences Innovations Workshop
CSA Ocean Sciences Inc. (CSA) successfully completed the recent Ocean Sciences Innovations Workshop co-sponsored by CSA and its Brazilian office, CSA Ciências Oceânicas Ltd. (CSACO). New services and products in ocean technology for application in Brazil and the rest of South America were presented at an all-day workshop in Rio de Janeiro, Brazil on 4 June 2013. CSA and representatives from CSA's various affiliates were on hand to reveal numerous solutions for both immediate and upcoming needs related to balancing industry needs, economic growth, and protection of ecosystem services. Participants and presenters exchanged information on emerging issues and strategic and technological solutions for a variety of energy industry and coastal management needs. An important topic, ocean sound, was discussed, including marine mammal detection, classification, and location systems. Real-time ocean observatory development for security and mitigation applications and deep ocean fiber optic network projects for offshore and long-haul communications systems were described. Tool development was showcased throughout the day, including new autonomous surface and underwater vehicles for survey, security, and ship maintenance as well as a suite of new custom-designed ROV tools. For more information, visit www.csaocean.com

Alvin on way to west coast for Navy certification tests

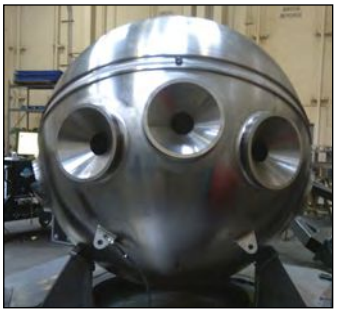
Upgraded HOV Alvin was loaded onto R/V Atlantis at the WHOI dockon 13 May 2013 (Tom Kleindinst, Woods Hole Oceanographic Institution)

The R/V Atlantis left Woods Hole Oceanographic Institution (WHOI) carrying the newly upgraded submersible Alvin, marking a major milestone in the sub's $41 million redesign. Both ship and sub are owned by the U.S. Navy and operated by WHOI for the benefit of the entire U.S. ocean science community. They are expected to reach Astoria, Oregon on 20 June.

In September, Alvin will undergo the Navy certification process, making a series of progressively deeper dives off Monterey, California. Once certified, the sub will be put through its paces in a science verification cruise in November to ensure all of its scientific systems are operational. Alvin is scheduled to return to service in December 2013.

Funded by the National Science Foundation (NSF) and WHOI, the planning process for the sub's upgrade began over a decade ago. In 2005, work was begun by Southwest Research Institute to design and forge a new titanium personnel sphere, one of the biggest technical challenges in the Alvin upgrade project.

The sphere, which holds a pilot and two scientists, is designed to descend to 6,500 m (21,000 ft or 4 mi) — depths that generate nearly 10,000 psi of pressure on the sphere. Construction of the sphere, which has 3-in. thick walls, required more than 40,000 lbs of titanium. Identical hemispheres were forged and then welded together with an electron beam. Its interior diameter is 4.6 in. wider than Alvin's previous sphere, increasing the interior volume from 144 to 171 cu. ft. With five viewports, it also has improved and overlapping fields of view for the pilot and scientists, allowing for better observations and collaboration in selecting sampling sites.



The upgraded HOV Alvin sphere (Tom Kleindinst, Woods Hole Oceanographic Institution)

Although the new sphere is rated to depths of 6,500 m, the sub's dives will be limited to 4,500 m until a second phase of the upgrade can be completed. Phase Two hinges on the development of improved lithium ion battery technology and funding.

For more information, visit www.whoi.edu.

Researchers discover a new way fish camouflage themselves

Fish can hide in the open ocean by manipulating how light reflects off their skin, according to researchers at The University of Texas at Austin. The discovery could someday lead to the development of new camouflage materials for use in the ocean, and it overturns 40 years of conventional wisdom about fish camouflage.

The researchers found that lookdown fish camouflage themselves through a complex manipulation of polarized light after it strikes the fishes' skin. In laboratory studies, they showed that this kind of camouflage outperforms the "mirror" strategy that was previously thought to be state-of-the-art in fish camouflage by up to 80%.

The study was published in the Proceedings of the National Academy of Sciences. The research was funded by the U.S. Navy, which has an interest both in developing better ocean camouflage technologies and in being able to detect such strategies if developed by others.

For the past few decades, the assumption has been that the optimal camouflage strategy for open ocean fish is to reflect sunlight like a mirror. Many fish, including the lookdown, have reflective skin elements that can act like mirrors.

The lookdown's "polaro-cryptic" mirror skin functions by selectively reducing the degree of polarization and transforming the angle of polarization of the reflected light depending on the conditions.

The researchers' next task is to understand how the fish are accomplishing this feat.

For more information, visit www.utexas.edu.

Brazil's first 'home grown' buoy system

RDSEA International assisted Ambidados and the Oceanographic Institute, University of Sao Paulo with the deployment of Brazil's first "homegrown" buoy system (ATLAS-B) in the Atlantic. A successful deployment was conducted from R/V Alpha Crusis (formerly Moana Wave of the University of Hawaii). RDSEA president Rick Cole was on board the Alpha Crusis to oversee the deployment and

to make the inductive connection between the 10 subsurface sensors (SBE MicroCats) mounted on the mooring line and the buoy controller. Averaged data are transmitted daily back to laboratories for post processing and dissemination. A 100% data stream was achieved with data now flowing from the 28ºS to 42ºW region of the western Atlantic. Full meteorology is also incorporated into the buoy's dataset. These data will enhance the ongoing PIRATA Program and other ocean and climate research being conducted in the southeastern Brazilian Bight region.

For more information, visit www.rdsea.com.

Warm ocean drives most Antarctic ice shelf loss

Ocean waters melting the undersides of Antarctic ice shelves, not icebergs calving into the sea, are responsible for most of the continent's ice loss, a study by UC Irvine and others has found.

The first comprehensive survey of all Antarctic ice shelves discovered that basal melt, or ice dissolving from underneath, accounted for 55% of shelf loss from 2003 to 2008 — a rate much higher than previously thought. Ice shelves, floating extensions of glaciers, fringe 75% of the vast, frozen continent.

The findings, to be published in an issue of Science, will help scientists improve projections of how Antarctica, which holds about 60% of the planet's fresh water locked in its massive ice sheet, will respond to a warming ocean and contribute to sea level rise.

"We find that iceberg calving is not the dominant process of ice removal. In fact, ice shelves mostly melt from the bottom before they even form icebergs," said lead author Eric Rignot, a UC Irvine professor who is also a researcher with NASA's Jet Propulsion Laboratory in Pasadena.

Ice shelves grow through a combination of land ice flowing to the sea and snow falling on their surfaces. The researchers combined a regional snow accumulation model and a new map of Antarctica's bedrock with ice shelf thickness, elevation, and velocity data captured by Operation IceBridge — an ongoing NASA aerial survey of Greenland and the South Pole.

The three giant ice shelves of Ross, Filchner and Ronne, which make up two-thirds of Antarctica's ice shelves, accounted for only 15% of the melting. Meanwhile, less than a dozen small ice shelves floating on relatively warm waters produced half of the total meltwater during the same period.

The researchers also compared the rates at which the ice shelves are shedding ice with the speed at which the continent itself is losing mass and found that, on average, the shelves lost mass twice as fast as the Antarctic ice sheet did.

Other authors are Jeremie Mouginot and Bernd Scheuchl of UC Irvine and Stanley Jacobs of Columbia University. Funding was provided by NASA, the National Science Foundation, and the National Oceanic & Atmospheric Administration.

For more information, visit www.uci.edu.

Submarine springs reveal how coral reefs respond to ocean acidification

Ocean acidification due to rising carbon dioxide levels will reduce the density of coral skeletons, making coral reefs more vulnerable to disruption and erosion, according to a new study of corals growing where submarine springs naturally lower the pH of seawater.

The study, led by researchers at the University of California, Santa Cruz and published in the Proceedings of the National Academy of Sciences, is the first to show that corals are not able to fully acclimate to low pH conditions in nature.

"People have seen similar effects in laboratory experiments," said coauthor Adina Paytan, a research scientist in the Institute of Marine Sciences at UC Santa Cruz. "We looked in places where the corals are exposed to low pH for their entire life span. The good news is that they don't just die. They are able to grow and calcify, but they are not producing robust structures."

Paytan's team studied coral reefs along the Caribbean coastline of Mexico's Yucatan Peninsula where submarine springs lower the pH of the surrounding seawater in a localized, natural setting. The effect is similar to the widespread ocean acidification that is occurring as the oceans absorb increasing amounts of carbon dioxide from the atmosphere.

Led by first author Elizabeth Crook, a graduate student in Paytan's lab, the researchers deployed instruments to monitor seawater chemistry around the springs and removed skeletal cores from colonies of *Porites astreoides*, an important Caribbean reef-building coral. They performed CT scans of the core samples to measure their densities and determine annual calcification rates in the laboratory of coauthor Anne Cohen at Woods Hole Oceanographic Institution.

The results showed that coral calcification rates decrease significantly along a natural gradient in seawater pH. Ocean acidification lowers the concentration of carbonate ions in seawater, making it more difficult for corals to build their calcium-carbonate skeletons.

In addition to Crook, Cohen, and Paytan, the coauthors of the paper include Mario Rebolledo-Vieyra and Laura Hernandez of the Centro de Investigacion Cientifica de Yucatan. This research was funded by the National Science Foundation and UC-MEXUS.

For more information, visit www.ucsc.edu.

Tracking planktonic spiny lobster larvae

The commercial value of spiny lobster in the Caribbean reaches $1 billion annually, thus making it one of the most valuable fisheries in the region. In a new study of this iconic species, Ph.D. candidate Andrew Kough and Dr. Claire Paris of the Biophysical Interactions Lab at the University of Miami Rosenstiel School of Marine & Atmospheric Science, in collaboration with Dr. Mark Butler from Old Dominion University, studied the larval dispersal of this species in the Caribbean. The goal of the study was to describe the sources, sinks, and routes connecting the Caribbean spiny lobster metapopulation. The results led the team to propose marine resource management strategies that incorporate larval connectivity and "larval lobster credits" to sustain and rebuild exploited marine populations.

The study, which appears in the journal PLOS ONE, synthesizes empirical data from laboratory studies, mail surveys, and published works to parameterize an individual-based model of lobster larval connectivity, the Connectivity Modeling System (CMS), developed by Paris. Results were then verified using two independent studies, separated by over 500 km, giving validation to the model's performance — something never before achieved for spiny lobster or other pelagic larvae over such large scales.

"Spiny lobster have extraordinary larvae with a prolonged planktonic existence that can last from 5 months to nearly a year, which confer them with high dispersal potential and complex pelagic pathways. Despite such challenges in documenting their pathways in the open ocean, just like hurricane models that help to reduce the 'cone of uncertainty,' in this case we are improving settlement predictions by simulating large numbers of spawning events and tracking virtual larvae undergoing deep vertical migrations," says Paris.

Contrary to the established belief, the team's results suggest that powerful currents entrain and push larvae out of the system, acting like a "Highway to Hell." The larvae that ultimately settle in the simulation spend little time within these strong currents. By moving to deeper depths as they age, spiny lobster larvae seem to increase their odds of settlement.

For more information, visit www.rsmas.miami.edu.

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Interior announces first offshore renewable energy lease sale
As part of the Obama Administration's all-of-the-above energy strategy to continue to expand domestic energy production, Secretary of the Interior Sally Jewell and Bureau of Ocean Energy Management (BOEM) Director Tommy P. Beaudreau announced that BOEM will hold the first-ever competitive lease sale for renewable energy on the U.S. Outer Continental Shelf (OCS). The auction will offer 164,750 acres offshore Rhode Island and Massachusetts for commercial wind energy leasing. In February 2011, former Secretary of the Interior Ken Salazar and former Secretary of Energy Steven Chu unveiled a coordinated strategic plan to accelerate the development of offshore wind resources. As part of the 'Smart from the Start' program for expediting commercial-scale wind energy on the federal OCS that was announced in November 2010, DOI has identified Wind Energy Areas to spur responsible development of this abundant renewable resource. These efforts are part of a series of Administration actions to speed renewable energy development offshore by improving coordination with state, local and federal partners. The Wind Energy Area offshore Rhode Island and Massachusetts covers about 164,750 acres and is located 9.2 nmi south of the Rhode Island coastline. BOEM will auction the area as two leases, referred to as the North Lease Area (Lease OCS-A0486) and the South Lease Area (Lease OCS-A0487). The North Lease Area consists of about 97,500 acres and the South Lease Area covers about 67,250 acres. According to a report recently released by the Department of Energy National Renewable Energy Laboratory, the North Lease Area has the potential for installed capacity of 1,955 MW, and the South Lease Area, 1,440 MW. Together, these areas could support enough electricity to power more than 1 million homes, a significant increase over what BOEM had originally estimated last year.

Scira Offshore Energy appoints new power plant manager
Scira Offshore Energy, the operator of the 88 turbine Sheringham Shoal Offshore Wind Farm, announced the appointment of their new power plant manager, Jason Halsey. Jason will succeed Einar Strømsvåg who will return to Stavanger to take on new challenges in parent company Statoil, after his successful 4 year secondment to Scira. Jason, who is based in Lincolnshire, holds a Master's degree in Business Administration and comes with a wealth of engineering experience. Currently Head of Operations in the UK for DONG Energy, and responsible for the operations and maintenance at all DONG Energy UK offshore wind farms, Jason also has valuable experience from his previous position as Site Manager at Robin Rigg Offshore Wind Farm. Jason will join Scira on 1st July, and will formally take on the full responsibility for Scira from 15th July after a two week handover period with Einar. Jason will head up the Scira team based at Wind Farm Place, the purpose-built Operation and Maintenance office and warehouse facility three miles south of Wells-next-the-Sea. Sheringham Shoal is owned equally by Statoil and Statkraft through joint venture company Scira Offshore Energy.

Spindrift Energy begins production of prototype
Spindrift Energy, innovator of the wave-powered Spindrift Energy System and recipient of a highly selective and prestigious Energy Innovation Small Grant (EISG) from the California Energy Commission (CEC) is pleased to announce it has begun machining components for its first power-generating prototype. In fulfillment of the EISG grant, Spindrift Energy will construct and deploy a prototype device in the ocean waters off Southern California this year. Additionally, a comprehensive report evaluating the prototype's sea test for the EISG and CEC will be produced at the conclusion of the grant period in December. Spindrift's prototype will generate electricity for measurement and analysis purposes only; however, we are confident this prototype and our participation in the grant program will serve as an important catalyst for the near-term installation of large-scale Spindrift devices capable of transmitting electricity to consumers throughout California and the world. Please examine our website (www.spindriftenergy.com) or look us up on Facebook for more detailed information about the Spindrift Energy System.

Aquamarine Power secures full consent for 40MW Lewis wave energy farm

Wave energy developer Aquamarine Power, has received full consent from the Scottish Government for a 40MW wave farm off the north-west coast of Lewis, Scotland – making it the world's largest fully-permitted ocean energy site.

The announcement was made by the Scottish Government's Minister for Energy, Enterprise and Tourism Fergus Ewing at the All Energy conference in Aberdeen.

The green light from the government and its regulator Marine Scotland, along with onshore planning which was approved last September, means the Edinburgh firm, through its wholly owned subsidiary Lewis Wave Power Limited, will be able to begin installing their near-shore Oyster wave energy machines at the site in the next few years – once the necessary grid infrastructure has been put in place.

This will ultimately see the deployment of between 40 and 50 Oyster devices along the coast at Lag na Greine, near to Fivepenny Borve, in one of the best wave energy locations in Europe. Once complete, the farm will have the capacity to power nearly 30,000 homes.

Last year the local council, Comhairle nan Eilean Siar (Western Isles Council), approved planning for the onshore hydroelectric power plant which will be connected to the Oyster wave energy farm.

Aquamarine Power are currently testing their second full scale wave machine, known as the Oyster 800, at the European Marine Energy Centre (EMEC) in Orkney, and are now producing electrical power to the grid.

"This is a significant milestone for our company," says Aquamarine Power Chief Executive Officer Martin McAdam. "The goal of our industry is to become commercial, and to do this we need two things – reliable technologies and a route to market. Our engineers are currently working hard on getting the technology right and we now have a site where we can install our first small farm, with a larger-scale commercial build out in the years ahead.

"We have worked in close consultation with the people and businesses of Lewis in the development of our proposals and would like to express our gratitude for their ongoing support. We were delighted with the turnout at the series of public exhibitions we held on Lewis last March, and we also commend government regulator Marine Scotland and the Western Isles Council for their positive approach.

For more information, visit www.aquamarinepower.com.

Sustainable Marine Energy to deploy Schottel turbines on new generation tidal platform

Sustainable Marine Energy (SME) announced that will to build and test a new generation systems integration platform aimed at enabling tidal energy to become a cost-effective green source of energy.

The technology development company will be using its unique PLAT-O platform together with STG 50 tidal turbines it is purchasing from propulsion experts SCHOTTEL GmbH for trials off the Isle of Wight.

The trials will be used to develop and prove the ways SME's new platform can drive down the costs and risks of device installation and maintenance and help enable tidal energy to become genuinely viable.

At the same time, the Isle of Wight-based company will be developing its system to be easily scalable — from a small unit supplying power to an individual community up to utility-scale deployments providing megawatt capability.

PLAT-O is a flexible and turbine agnostic systems integration platform. Its innovative design uses a taut mooring system to position the device subsea to ensure it can be deployed in a wide range of water depths and seabed types without the need for heavy lift vessels for installation or maintenance.

PLAT-O has undergone successful tank testing at both the University of Newcastle upon Tyne and L'Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER)'s flume tank in Boulogne sur Mer.

The development of the 100-kW demonstrator is being supported by the Department of Energy & Climate Change under its Energy Entrepreneurs scheme.

The STG 50 from SCHOTTEL GmbH is equally innovative, combining a highly efficient design with lightweight yet robust components with low acquisition and maintenance costs.

The STG 50 turbine produces 50 kw of electricity in environments from rivers to offshore and its modular format means powerful arrays can be deployed quickly, easily, and inexpensively on a variety of platforms.

The unit is the result of SCHOTTEL's in-depth expertise in marine propulsion, hydrodynamics, and electronics and represents the cutting edge in tidal energy generation.

For more information, visit www.sustainablemarine.com.

FoundOcean to pile grout the world's largest wind turbine

FoundOcean has been awarded a contract by Graham Construction to pile grout the foundation for the world's largest offshore wind turbine, developed by Samsung Heavy Industries, in Fife, Scotland. This will be the first 7-MW turbine to be installed. Each blade measures over 80 m, longer than the wingspan of an Airbus A380, making them the longest ever installed to date. The project is part of the Fife Energy Park development.

FoundOcean will complete the project in two phases using the Exagrout material Masterflow® 9500 from BASF. FoundOcean will first grout four piles into approximately 30-m deep predrilled rock sockets. The second stage involves grouting the annuli between the jacket's stab in legs and piles, forming the connection.

A walkway is being constructed

from the shore to the turbine foundation; FoundOcean will also grout this into place using conventional pile grouting techniques.

FoundOcean will be using its new Super Pan Mixer, which has been proven to double the current output rate of all other high-strength grout mixers on the market, allowing for faster project completion. All grout mixing will take place onshore with grout pumped directly to the jacket's primary input 35 m offshore.

For more information, visit www.foundocean.com.

Atkins secures £2 million contract with DONG Energy

Atkins has secured a contract worth £2 million with DONG Energy Wind Power to extend one of their existing wind farms.

The Walney Offshore Wind Farm consists of 102 turbines, each with a capacity of 3.6 MW, making it one of the biggest of its kind in the world. The extension, which was awarded in 2010, will cover an area of 145 km^2 and is fully owned by DONG Energy.

Located approximately 15 km off Walney Island, Cumbria in the UK's Irish Sea, the farm provides clean electricity for approximately 320,000 UK households. Atkins' role in this extension program, which will run until 2016, will involve the concept design, detailed design, support during fabrication, and final installation of two offshore substations (including both the jackets and topsides).

Atkins' technical expertise and experience in offshore engineering factored heavily in securing this contract.

For more information, visit www.atkinsglobal.com.

Ocean Thermal Energy Plc and DCNS sign MOU

Ocean Thermal Energy Plc (OTEplc) and DCNS have signed a memorandum of understanding (MOU) to jointly develop and build ocean thermal energy conversion (OTEC), sea water district cooling (SDC), and sea water air conditioning (SWAC) systems in selected markets.

OTEC is a process that generates green, renewable, constant, and secure electricity from ocean water with the ability to produce that energy at a large scope and scale in the future. Potable clean water can also be generated from the OTEC process, which can be used for sustainable food production and human consumption. SDC replaces conventional air conditioning and cooling systems with a green renewable cold sea water-based cooling system that dramatically reduces the energy consumption of conventional fossil fuel-based cooling systems.

OTEplc is a UK-based company that will serve as the developer that will build, own, and operate OTEC and SDC systems as well as procur the financing. DCNS will be the EPC (Engineering,

Procurement, Construction) contractor for the OTEC and SDC systems that will be jointly pursued under this MOU.

Two initial projects have been selected by both companies. The first project is for land-based OTEC and SDC systems for the U.S. Virgin Islands. A second project is a floating OTEC system for Asia.

Both OTEplc and DCNS have ongoing projects and MOUs in a number of countries in the Caribbean for OTEC and SDC. The U.S. Virgin Islands project will be a combined OTEC and SDC system, producing electricity and clean water, cooling, and sustainable food production in the form of aquaculture and agriculture.

The second project is for large floating OTEC system for a major Asian country that was selected on the basis of ongoing interaction with local officials on the need for OTEC. Ongoing OTEC design studies show a very significant potential for the use of OTEC systems in this country to provide clean, renewable, and secure energy in large quantities. Ongoing projects in other Asian areas provide a strong basis for expanding that established cooperation into the development of additional OTEC systems.

For more information, visit www.dcnsgroup.com.

Leasing round to accelerate testing of emerging offshore wind technologies

The Crown Estate has announced a new leasing program to encourage further investment in a range of offshore wind test and demonstration projects, including a leasing round for floating offshore wind technology.

Other components will include calls for interest in non-grid connected projects and variations to existing projects.

The plans were announced at the RUK offshore wind conference and are designed to build on the success of existing test and demonstration program. By showcasing new technological advancements and driving further cost reduction, the plans also aim to increase market confidence and encourage investment in the industry. This is in line with the recommendations of the Offshore Wind Cost Reduction Taskforce and feedback received from industry consultation.

A specific leasing round for testing and demonstration of emerging offshore wind technologies, including floating turbines, will be important in establishing commercial viability of new cost reducing measures and will yield benefits beyond 2020. The Crown Estate invites industry to propose sites for the development of floating wind farms; the process is expected take to up 9 months, allowing time for essential early stakeholder engagement. This timetable will facilitate an early deployment of projects and may allow some projects to commence construction as soon as 2017. Successful projects will include arrays of up to 15 machines, utilizing floating foundations and producing less than 100 MW. The technologies involved must not have been previously deployed commercially and the projects must be used solely for test and demonstration purposes.

The introduction of a call for project variations aims to make the most of existing sites by granting rights holders the flexibility to invest in test and demonstration projects alongside existing schemes.

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

L-3 Communications awarded $10M+
L-3 Communications MariPro Inc., has been awarded a $10,195,466 modification to a previously awarded firm-fixed-price contract (N66604-12-C-2838) to exercise two options for design and installation services for an undersea warfare training range (USWTR) off the coast of Jacksonville, Florida; training and support services follow delivery of the USWTR, and spares. Work will be performed in Goleta, California (85%); Newington, New Hampshire (10%); and Mayport, Florida (5%) and is expected to be completed in May 2019.

Ultra Electronics awarded contract for submarine towed arrays
Ultra Electronics Maritime Systems, Inc. (UEMS) announced a contract award by Public Works and Government Services Canada to manufacture four Submarine Towed Array Sonar System (SubTASS) arrays for the Royal Canadian Navy's Victoria-class submarines. The SubTASS arrays were developed by UEMS and are manufactured in its facilities in Dartmouth, Nova Scotia. UEMS' SubTASS arrays are an essential component of the Victoria-class sensor suite and allow the submarines to covertly detect and track surface and sub-surface contacts. Ken Walker, president of UEMS, states "The award of this contract is significant on several fronts. Not only does it allow us to continue to recruit and retain the best and brightest minds out there, but it also reinforces the fact that a company like Ultra Electronics can design, develop, and produce world-beating technology right here in Canada. We, as a company, are looking forward and are honored to have the RCN as a customer."

General Dynamics, Ingalls Shipbuilding win U.S Navy contract to build DDG 51 destroyers
The U.S. Navy has awarded General Dynamics Bath Iron Works a contract valued at $2.8 billion for the construction of four Arleigh Burke-class destroyers, with an option for a fifth ship. The option for the fifth ship, if exercised, would bring the total value of the contract to approximately $3.5 billion. There are currently two DDG 51 destroyers in production at Bath Iron Works: Rafael Peralta (DDG 115) and Thomas Hudner (DDG 116). The shipyard began fabrication on DDG 115 in November 2011, and delivery to the Navy is scheduled for 2016. Fabrication on DDG 116 began in November 2012, and that ship is scheduled to be delivered to the Navy in 2017. The Arleigh Burke-class destroyer is a multi-mission combatant that offers defense against a wide range of threats, including ballistic missiles. It operates in support of carrier battle groups, surface action groups, amphibious groups, and replenishment groups, providing a complete array of anti-submarine (ASW), anti-air (AAW), and anti-surface (SuW) capabilities. Designed for survivability, the ships incorporate all-steel construction and have gas turbine propulsion. The combination of the ships' AEGIS combat system, the Vertical Launching System, an advanced ASW system, two embarked SH-60 helicopters, advanced anti-aircraft missiles, and Tomahawk anti-ship and land-attack missiles make the Arleigh Burke class the most powerful surface combatant ever put to sea. Huntington Ingalls Industries' Ingalls Shipbuilding division has been awarded a fixed-price incentive, multi-year contract for construction of five Arleigh Burke-class destroyers (DDG 51s) for the U.S. Navy. The contract has a total value of $3.33 billion and includes options for engineering change proposals, design budgeting requirements, and post-delivery availabilities, which, if exercised, would bring the cumulative value of the contract to approximately $3.39 billion. The multi-year procurement allows Ingalls to build ships more efficiently by buying bulk material and moving the skilled workforce from ship to ship. It also ensures that Ingalls will be building DDGs over the next decade. Ingalls has delivered 28 DDG 51 destroyers to the Navy and currently has two more under construction. Ingalls started construction on John Finn (DDG 113) in September 2012 and will begin construction on Ralph Johnson (DDG 114) this summer. The company's 28th destroyer, William P. Lawrence (DDG 110), was commissioned on 4 June 2011, in Mobile, Alabama. The ship was the most complete DDG at the time of its sea trials in the history of the program at Ingalls. Lessons learned from previous DDGs allowed Ingalls to deliver William P. Lawrence in less time and with fewer man-hours compared to several of the ships that immediately preceded it.

Ingalls Shipbuilding awarded $76.8M advance procurement contract

Huntington Ingalls Industries' (NYSE:HII) Ingalls Shipbuilding division received a $76.8 million fixed-price contract from the U.S. Coast Guard to purchase long-lead materials for Kimball (WMSL 756), the company's seventh National Security Cutter (NSC). Construction and delivery will be performed at the company's Pascagoula facility.

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

Ingalls has delivered three NSCs, designed to replace the 378–ft Hamilton-class High-Endurance Cutters that entered service during the 1960s. Ingalls' fourth NSC, Hamilton (WMSL 753), will launch later this year and be christened on 26 October. The keel was recently laid on the fifth cutter, James (WMSL 754), and construction will begin on the company's sixth cutter, Munro (WMSL 755), later this year.

Ingalls will continue to work with Lockheed Martin, which provides the command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities.

NSCs, the flagship of the Coast Guard's cutter fleet, are 418 ft long with a 54-ft beam and displace 4,500 tons with a full load. They have a top speed of 28 kts, a range of 12,000 mi, an endurance of 60 days, and a crew of 110.

The Legend-class NSC is capable of meeting all maritime security mission needs required of the High-Endurance Cutter. The cutter includes an aft launch and recovery area for two rigid hull inflatable boats and a flight deck to accommodate a range of manned and unmanned rotary wing aircraft. It is the largest and most technologically advanced class of cutter in the U.S. Coast Guard, with robust capabilities for maritime homeland security, law enforcement, marine safety, environmental protection, and national defense missions. This class of cutters plays an important role in enhancing the Coast Guard's operational readiness, capacity, and effectiveness at a time when the demand for their services has never been greater.

For more information, visit www.huntingtoningalls.com.

GoAGT Ltd. Maritime Training Center achieves DNV accreditation

GoAGT Ltd., a world-leading maritime security company: providing one in every five armed security teams operating in the Indian Ocean, has once again lifted the benchmark by achieving Det Norske Veritas (DNV) accreditation for its maritime training center located in Galle, Sri-Lanka.

The center, one of the first to be accredited globally, can train up to 20 personnel at any one time in a variety of maritime security disciplines, including use of force and medical training. GoAGT has been delivering in-house training at the center to its deployed teams since 2010, maintaining its role as an innovative market leader.

The GoAGT Training Center will be running its pilot MSO course later this month. The new level 3 city and guilds qualification is set to become a core requirement for compliance with the new industry standard for armed maritime security provision, ISO/PAS 28007. Having successfully achieved ISO9001 certification in 2012, GoAGT is currently working closely with LRQA to become one of the first companies to be accredited to the new standard due to be launched in June.

The certification recognizes compliance with DNV standard 3.402, the standard required of maritime training centers to be endorsed by the leading classification and verification society, and reflects the high professional standards embodied within the center.

For more information, visit www.goagt.org.

Imtech Marine receives multi-year contract for modernization of submarines

Imtech Marine signed a contract to be involved in the execution of the capability upkeep program Walrus-class submarines (IP-W) of the Royal Netherlands Navy. The Dutch Defence Materiel Organisation granted Imtech Marine Netherlands the assignment to carry out the mechanical, engineering ,and electrical upgrade works on board the submarines. The assignment will be carried out at the Naval base in Den Helder and will run from 2013 until 2020. IP-W includes a large number of modifications, such as disassembly, assembly, and installation of a variety of equipment and systems. This will ensure that the submarines will remain effectively operational in service until at least 2025. The complex project is based on the intensive cooperation between the Royal Netherlands Navy, the Dutch industry, and research institutes, with an important role for Imtech Marine.

Apart from extensive conservation work, the program also contains replacement of the sonar installation, replacement of the periscope system by an optronic mast, replacement of the Combat Management System and Internal Communication system, modification of a number of platform systems and the complete redesign of the central radio cabin and electronic cabin. Imtech Marine also plays a role in the installation of the SATCOM systems and the delivery of new consoles for the redesigned combat information center.

Imtech Marine starts in the second half of 2013 with works on board the HNLMS Zeeleeuw. After that, the HNLMS Dolfijn, HNLMS Bruinvis, and HNLMS Walrus will follow. The fourth, and last, submarine will be ready in 2020.

For more information, visit www.imtech.com.

19th CARAT Malaysia begins

The 19th annual Cooperation Afloat Readiness and Training (CARAT) exercise between the U.S. Navy, U.S. Marine Corps, and the Malaysian Armed Forces commenced with the arrival of a U.S. Navy task group to Kuantan Naval Base.

The task group includes the guided missile destroyer USS Curtis Wilbur (DDG 54) with embarked Destroyer Squadron 7 staff, the dock landing ship USS Tortuga (LSD 46) with embarked USMC Landing Force, the diving and salvage ship USNS Safeguard (T-ARS 50), and, making her debut as a CARAT particiapnt, the littoral combat ship USS Freedom (LCS 1).

CARAT Malaysia 2013 consists of 10 days of shore-based and at-sea training events designed to address shared maritime security concerns, develop relationships, and enhance interoperability among participating forces.

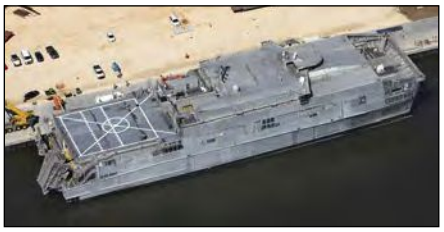
CARAT is a series of bilateral naval exercises between the U.S. Navy and the armed forces of Bangladesh, Brunei, Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Timor-Leste. CARAT Malaysia is also one of the key exercises that Freedom will participate in with regional navies and other U.S. Navy units during her maiden deployment to Southeast Asia.

As a littoral combat ship, Freedom's size and capabilities are comparable with ships operated by many regional navies. Fast, agile, and mission-focused, littoral combat ships are designed to operate in near-shore environments and employ modular mission packages that can be configured for surface warfare, mine countermeasures, or anti-submarine warfare.

For more information, visit www.navy.mil.

Austal delivers USNS Choctaw County (JHSV 2)

The second Austal-built Joint High Speed Vessel (JHSV), USNS Choctaw County (JHSV 2), was officially delivered to the U.S. Navy on 6 June exactly 6 months following the delivery of USNS Spearhead (JHSV 1) on 6 December 2012. The USNS Choctaw County successfully completed Acceptance Trials in May and will sail away later this summer.

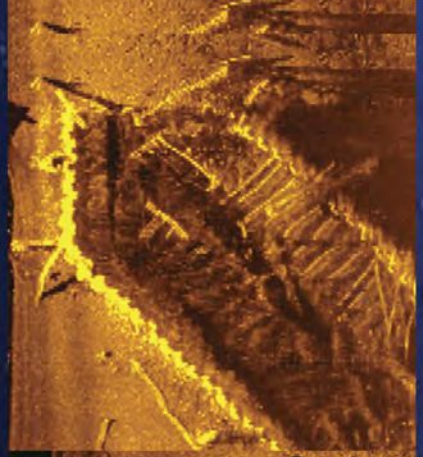


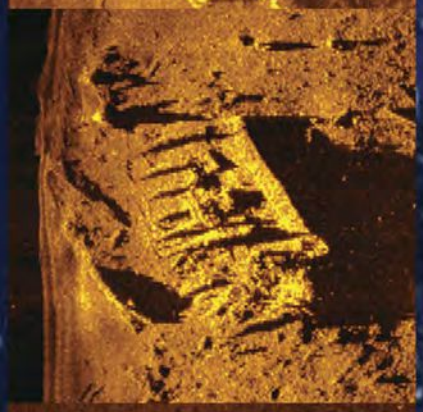
The 103-m (338-ft) long aluminum catamarans are designed to be fast, flexible, and maneuverable even in shallow waters, making them ideal for transporting troops and equipment quickly within a theater of operations. The ship has the ability to support a variety of operations, supporting the warfighter through traditional logistics missions, humanitarian support projects, and disaster response or by supporting maritime law enforcement activities.

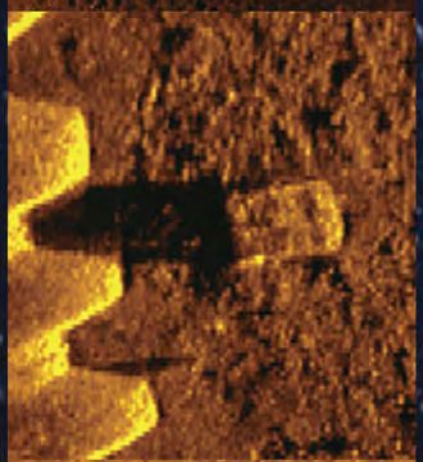
With the delivery of JHSV 2, Austal is currently under contract with the U.S. Navy to build eight 103-m JHSVs under a 10-ship, $1.6 billion contract and seven 127-m Independence-variant Littoral Combat Ship class vessels, six of which are a part of a 10-ship, $3.5 billion contract for which Austal is the prime.

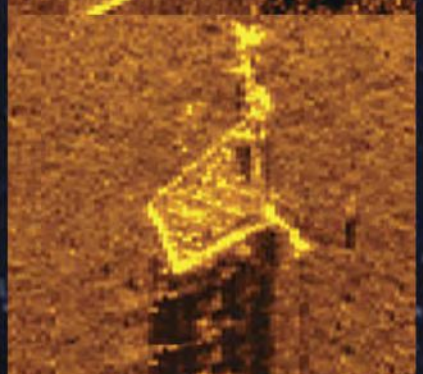
For more information, visit www.austal.com.

WHATS ON YOUR CABLE ?









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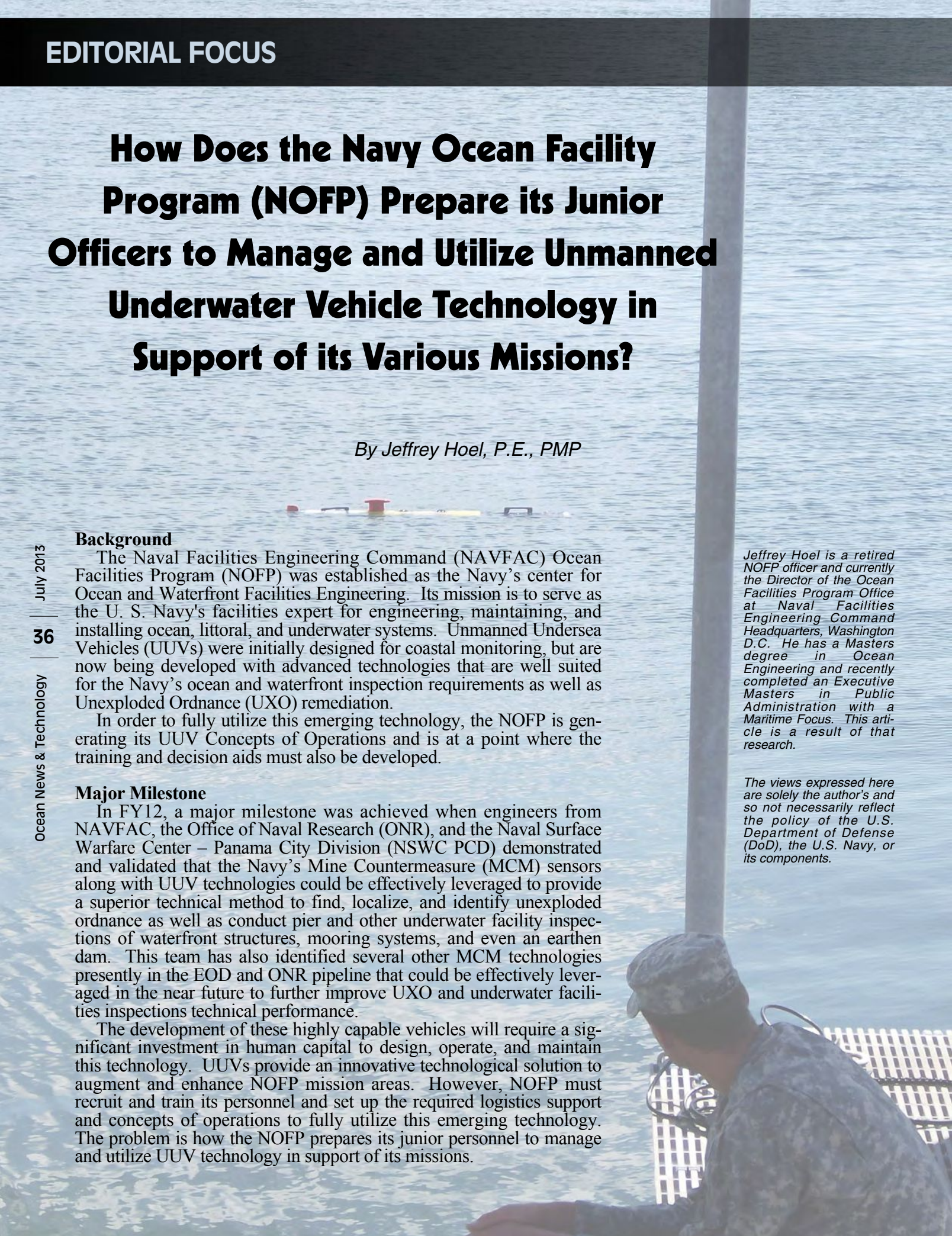
How Does the Navy Ocean Facility Program (NOFP) Prepare its Junior Officers to Manage and Utilize Unmanned Underwater Vehicle Technology in Support of its Various Missions?

By Jeffrey Hoel, P.E., PMP



Background

The Naval Facilities Engineering Command (NAVFAC) Ocean Facilities Program (NOFP) was established as the Navy's center for Ocean and Waterfront Facilities Engineering. Its mission is to serve as the U. S. Navy's facilities expert for engineering, maintaining, and installing ocean, littoral, and underwater systems. Unmanned Undersea Vehicles (UUVs) were initially designed for coastal monitoring, but are now being developed with advanced technologies that are well suited for the Navy's ocean and waterfront inspection requirements as well as Unexploded Ordnance (UXO) remediation.

In order to fully utilize this emerging technology, the NOFP is generating its UUV Concepts of Operations and is at a point where the training and decision aids must also be developed.

Major Milestone

In FY12, a major milestone was achieved when engineers from NAVFAC, the Office of Naval Research (ONR), and the Naval Surface Warfare Center – Panama City Division (NSWC PCD) demonstrated and validated that the Navy's Mine Countermeasure (MCM) sensors along with UUV technologies could be effectively leveraged to provide a superior technical method to find, localize, and identify unexploded ordnance as well as conduct pier and other underwater facility inspections of waterfront structures, mooring systems, and even an earthen dam. This team has also identified several other MCM technologies presently in the EOD and ONR pipeline that could be effectively leveraged in the near future to further improve UXO and underwater facilities inspections technical performance.

The development of these highly capable vehicles will require a significant investment in human capital to design, operate, and maintain this technology. UUVs provide an innovative technological solution to augment and enhance NOFP mission areas. However, NOFP must recruit and train its personnel and set up the required logistics support and concepts of operations to fully utilize this emerging technology. The problem is how the NOFP prepares its junior personnel to manage and utilize UUV technology in support of its missions.

Jeffrey Hoel is a retired NOFP officer and currently the Director of the Ocean Facilities Program Office at Naval Facilities Engineering Command Headquarters, Washington D.C. He has a Masters degree in Ocean Engineering and recently completed an Executive Masters in Public Administration with a Maritime Focus. This article is a result of that research.

The views expressed here are solely the author's and so not necessarily reflect the policy of the U.S. Department of Defense (DoD), the U.S. Navy, or its components.

The Trigger Event

It all began last summer with a question during a UUV sensor class— "What is an INS?" We told the group of junior officers that INS is the inertial navigation system that measures the motion or acceleration of the UUV in three axes: up/down, left/right, and forward/backward.

This question was unexpected because this group of future NOFP officers was less than a week away from graduating from the U.S. Navy Marine Engineer Dive Officers (MEDO) course. The NOFP is a small subset of the Navy's Civil Engineer Corps and is the Navy's facilities experts for engineering, maintaining, inspecting, and installing ocean, littoral, and underwater systems. The NOFP officers' training pipeline consists of 18 months of graduate school toward a master's in ocean engineering, followed by Navy Dive School and the Marine Engineer Dive Officer course at the Navy Diving and Salvage Training Command. Many of these junior officers were about to report to their next assignment, which would require an understanding of UUVs and their capabilities. Once we learned none of these officers had any training or experience with UUVs, not even in graduate school, the NOFP had to develop a training pipeline to address this technical shortfall.

MEDO students and Mobile Diving and Salvage Unit (MDSU) ONE instructors launch the Hull Unmanned Underwater Vehicle Localization System (HULS) in June at the Naval Diving and Salvage Training Center's training pool. HULS is an advanced unmanned underwater vehicle (UUV) that can maneuver in very tight and complex areas and was an ideal tool for the training.

Several solutions to correct operational training deficiencies have been attempted throughout the various arms of the Navy. These solutions have ranged from on the job training (OJT) to vendor-provided courses. All of these attempts are very specific to the vehicle manufacturers, and the OJT varies widely between units. However, there was a lack of a comprehensive method to prepare junior Navy personnel for a very technical and rapidly evolving career field.

Plan Forward:

In order to train junior officers to effectively operate in the unmanned automated maritime environment and to increase NAVFAC's reliance on unmanned automated technology, we must establish an effective method to prepare these NOFP officers. The first step will be to identify prospective thesis or research topics for junior officers attending graduate schools for ocean engineering. By working with these universities, we can identify research topics that utilize unmanned automated maritime technologies and lay the groundwork for understanding these capabilities.

The next step is to develop a UUV field operations course to be incorporated into the MEDO curriculum. When these officers graduate from the Navy's Dive School, they will have a solid grasp of UUV mission types, capabilities, and limitations as well as a solid understanding of the time, equipment, and manpower required for UUV operations. Once they have reported to their first NOFP assignments, the officers will be sent to the short, 1-week UUV course offered at Penn State. This week-long course provides a broad but comprehensive introduction to many important topics in UUV technology. The course is a real-world, scenario-driven curriculum that includes technology briefings, mission planning, hardware demonstration, and hands-on interaction to provide a thorough introduction to UUV systems engineering.

MEDO students conduct Post Mission Analysis (PMA) training from the morning's bridge piling inspection utilizing the REMUS 100 in the foreground.

To culminate this training pipeline, the NOFP is fostering relationships with others in the UUV community to provide opportunities for these officers to observe and participate in real-world UUV missions and operations in order to fully appreciate the capabilities.

Conclusion

It will take years to effectively raise the knowledge level and expertise of NOFP officers and to get NAFVAC to effectively utilize UUV technology as a standard business practice. This proposed training and education pipeline will provide these junior officers with an academic background during graduate school, an operational overview during the MEDO course in Panama City, and a comprehensive systems understanding during the Penn State Undersea Technology short course. In addition, this training is completed with real-world operational experience at one of the Navy's warfare laboratories. This pathway will provide a broad-brush but comprehensive training pipeline for NAVFAC's OFP officers.

Acknowledgement:

The author gratefully acknowledges NAVFAC's, Steve Hurff and Brian Wallace, who supported this research project, as well as the UXO system development. Also recognized is the support of the Naval Diving and Salvage Training Center's Lt. Dave Hallam and Naval Surface Warfare Center – Panama City Division, Robert Gibson in establishing the UUV Field Operations curriculum and Dr. Jim Galambos from Penn State Applied Research Laboratory in overseeing the development of the comprehensive Undersea Technology short course.

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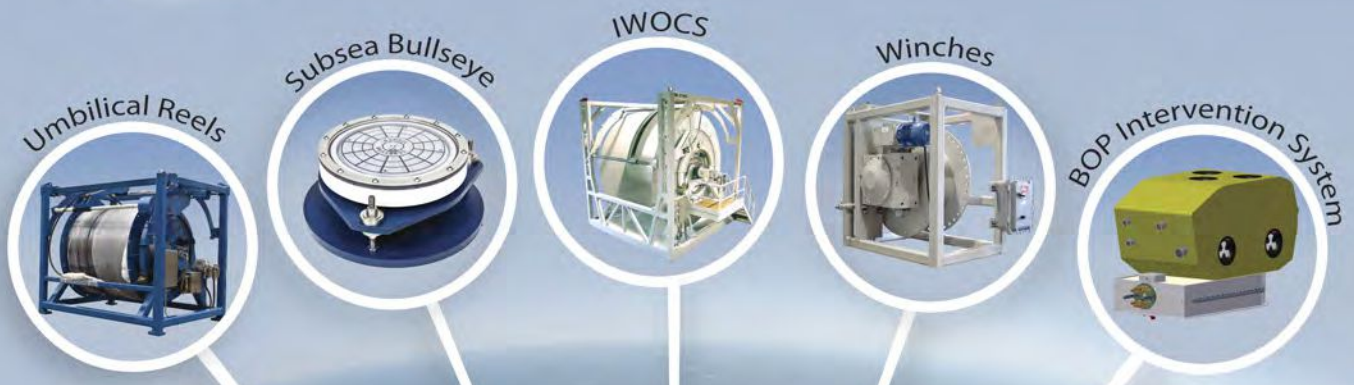

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OFFSHORE INDUSTRY

in this section

Ernest Moniz gets Senate okay to lead U.S. Energy Department

The U.S. Senate overwhelmingly approved nuclear physicist Ernest Moniz's nomination to lead the Energy Department. The Massachusetts Institute of Technology (MIT) professor will take the helm of the department poised to issue a series of decisions on the future of U.S. natural gas exports and to guide the country's energy investments.

Moniz previously served as the associate director for science in the office of science and technology policy in the executive office of President Bill Clinton from 1995 to 1997 and in the U.S. Department of Energy, serving as under secretary of energy, from 1997 to 2001.

Moniz is one of the founding members of The Cyprus Institute and the Cecil and Ida Green Professor of Physics and Engineering Systems, director of the Energy Initiative, and director of the Laboratory for Energy and the Environment at the MIT. Moniz, born in 1944, attended Boston College, where he received his bachelor of science in physics in 1966. He later received his Ph.D in theoretical physics from Stanford University in 1972. On 4 March 2013, Moniz was nominated by President Obama to replace outgoing Energy Secretary Steven Chu for his second term. His nomination was approved on 16 May.

Ernest Moniz

Infield Services' report projects strong subsea market to 2017

High oil prices, new technology, and the push to offset declining production from mature, shallow-water basins is driving operations into deepwater and ultra-deepwater — and that increases the number of subsea developments, according to Infield Systems' "Global Perspectives Subsea Market Report to 2017."

Ultra-deepwater developments are expected to capture 48% of capital expenditures and 23% of tree installations in 2013-2017, in contrast to 37% of capital expenditures and 15% of installations in 2008-2012, the report says. This comes as operators are cost-effectively targeting reservoirs over a wider area and tying back subsea wells both to fixed platforms in shallow waters and to floating infrastructure in deeper waters.

Latin America and West Africa will account for more than half of the subsea capital expenditures expected to be spent between 2013 and 2017. This is driven by large deepwater and ultra-deepwater discoveries offshore Brazil, particularly in the presalt basins, and offshore Angola and the Gulf of Guinea.

In the United States, the shift from shallow-water developments towards large oil and gas discoveries further offshore is well under way. The deepwater Gulf of Mexico is expected to host many new floating platform developments, combined with the tieback of subsea satellite fields later in the forecast period.

UK trade group reports record growth in well services sector

Oil and Gas UK, the trade association for UK offshore oil and gas industry, in a survey has reported that the well services sector in the industry registered record growth in 2012. In the survey, the association reported that the companies involved in the drilling, completion, testing, and maintenance for oil and gas wells have generated gross revenue of $3.05 billion in 2012, which is the highest since records began in 1996.

With growing oil and gas activity on the UK Continental Shelf, the total number of technicians and graduate engineers hired by well services contractors has also increased. In addition, the well services sector has increased its investment on equipment and technology by around 5% , from $178 million to $186 million.

Oil & Gas UK operations director Oonagh Werngren said the well services contractors have yet again recorded positive growth and contributed to the economy and innovation while creating new jobs.

"The higher than expected rise in gross revenue could be attributed to a number of factors ranging from increased exploration and production activities since 2011 to the growing number of technically complex wells that require the specialist knowledge of well services contractors," Werngren added.

Report: Cyber security becoming top concern for energy industry

Cyberattacks and other IT security issues have become a top industry concern for the first time in the history of Ernst & Young's recurring survey of energy executives, ranking ninth on the list of most important industry concerns of 2013.

IT security, particularly the threat to companies' operations and energy infrastructure, was a new entrant this year in the list of Top 10 risks to the oil and gas industry. The highest concern remained "the risk of a health, safety, or environmental incident," as it was in the last survey.

"The oil and gas industry is undergoing an intense focus on safety and environmental risk preparedness and mitigation," Dale Nijoka, Ernst & Young's global oil and gas leader. "In light of corporate social responsibilities, economic challenges, and regulatory pressures, it has become increasingly clear that managing these risks is vital for long-term sustainability."

The results come from a sample survey of more than 100 industry executives from 90 companies in 21 countries, according to Ernst & Young. Previous survey results were released in 2011, 2010, 2009, and 2008, according to the firm.

Also ranked among the oil and gas industry's top risks: price volatility, access to reserves and markets, cost escalation, and uncertain energy policy.

The industry's ability to meet project budgets and timing goals has come under more scrutiny, as the size of projects has rapidly grown, according to Ernst &Young. Increasing project scale and complexity was ranked the tenth concern for 2013.

The report also ranked leading opportunities. Increasing demand from emerging economies like China surged to the top of the list this year, moving up three places since the 2011 report.

Exporting domestic natural gas will create U.S. jobs: Harris poll

Approximately 71% of Americans agree that exporting domestic natural gas will help create U.S. jobs, and 66% believe that exporting natural gas will be good for the U.S. economy, according to a recent poll conducted by Harris Interactive for American Petroleum Institute's (API) the "What America is Thinking on Energy Issues" series.

"American voters know that exporting more of America's domestic energy would lead to more jobs, help the economy, and reduce the nation's trade deficit," said API chief economist John Felmy. "The United States has the opportunity to get it right and use its abundant supplies of clean-burning natural gas resources to meet the President's goal for doubling U.S. exports by 2015."

The telephone poll of 1,006 registered American voters found that in addition to supporting the U.S. economy and job creation, more U.S. natural gas exports would help reduce the U.S. trade deficit (63%), helps keep energy dollars here in the United States rather than being sent to other regions of the world (66%), and increases the nation's energy security (64%).

Positive support for exporting U.S. natural gas by a majority of American voters is reinforced by facts reported in a recent study produced by ICF International. The study finds that U.S. LNG exports could spur strong domestic economic and job growth.

"Industry advancements in hydraulic fracturing and horizontal drilling have led to a dramatic increase in the estimated recoverable shale gas resources here in the U.S.," said Felmy. "The American people get it. The United States can be a global energy superpower as long as our leaders pursue smart energy policy. We are also the global leaders on clean air. Technological advances that have enabled us to reach natural gas from shale have also helped the United States lower its carbon dioxide to 1994 levels."

EIA sees increase in storm-related oil, gas disruptions in U.S. Gulf

The Federal Energy Information Administration's median estimates of storm-related production disruptions in the U.S. Gulf of Mexico during the 2013 hurricane season are 19.3 MMbbl of oil and 46.4 bcf of natural gas.

EIA's analysis shows a 58% probability of production shut-in volumes being equal to or larger than the production shut in during the 2012 hurricane

season, which totaled 14.3 MMbbl of oil and 32.1 bcf of natural gas.

The EIA estimates, contained in the agency's "Short-Term Energy Outlook Supplement: 2013 Outlook for Gulf of Mexico Hurricane-related Production Outages" report, are based on the National Oceanic and Atmospheric Administration's "Atlantic Hurricane Season Outlook," which predicted that the Atlantic Basin likely will experience above-normal tropical weather during the 2013 hurricane season, which began June 1 and runs through November 30.

NOAA estimated a 70% probability that 13 to 20 named storms will form within the Atlantic Basin over the 6 months, including 7 to 11 hurricanes, of which 3 to 6 will be intense. Tropical Storm Andrea, the first named storm of the season, appeared in early June, although typically the first storm develops in July.

However, the EIA cautions that forecasting storm damage is difficult because a lot depends on how strong the storm is (Categories 1 to 5) and the path it takes.

Australian megaprojects are fueling optimism, but costs are a concern

Australian megaprojects are providing a significant source of optimism among oil and gas professionals in the Asia-Pacific region, according to research from industry technical advisor, GL Noble Denton.

Australia is listed as the world's third most attractive investment destination by professionals questioned in the report "Seismic Shifts: The outlook for the oil and gas industry in 2013." No other country in the Asia- Pacific region appeared in the report's shortlist of leading investment destinations for the oil and gas industry.

Seismic Shifts is an annual litmus test for industry sentiment in the year ahead. It was produced with input from a survey of more than 400 senior oil and gas professionals and in-depth interviews with 20 industry executives.

According to the study, multi-billion dollar projects in Australia are fueling optimism in the oil and gas industry, with 72% of respondents in the Asia-Pacific region saying they were highly or somewhat confident for the outlook of their business in 2013.

Among these ventures is Shell's $12 billion Prelude project situated in offshore Australia, which is expected to be the first regional development to implement floating liquefied natural gas technology. The facility is expected to begin operations in 2016.

With a raft of new technologies being developed to operate in increasingly challenging environments, it is not surprising that 37% of respondents to GL Noble Denton's research expect to increase their spending in research and development in 2013.

As Australia's oil and gas projects become more complex and the levels of investment in them rise, the expectation of a viable return becomes more pronounced. More than half of all respondents (53%) from Asia-Pacific believe that rising operating costs are the biggest barrier to growth, well above the global average of 38%.

Shell's Prelude production facility

"Australia remains a robust market within the Asia-Pacific region, despite challenges posed by the global operating climate. Our research reaffirms that the country's megaprojects are drawing huge inward investment to the country," said Richard Bailey, GL Noble Denton's executive vice president for Asia-Pacific. "However, there are fears that as these projects grow, operational costs will increase substantially. As many Australian megaprojects reach a critical phase in their development, any change in costs could be crucial to future progress. Careful forward planning and effective implementation of work is now more important than ever to ensure these concerns are not realized."

Download a copy of Seismic Shifts from at www.gl-nobledenton.com.

Scientists gain insight on gas hydrates in Gulf of Mexico

Scientists have returned from a 2-week research expedition in the northern Gulf of Mexico with what is said to be the best high-resolution seismic data and imagery ever obtained of sediments with high gas hydrate saturations. Gas hydrates are ice-like substances formed when certain gases combine with water at specific pressures and temperatures.

The expedition, aimed at gaining additional information on this possible future energy source, resulted from long-standing cooperation between the U.S. Geological Survey (USGS), Bureau of Ocean Energy Management (BOEM), and the U.S. Department of Energy.

The data were collected at two locations in the U.S. Gulf where the three federal agencies partnered with an industry consortium to conduct a drilling expedition in 2009. That expedition discovered gas hydrate filling between 50% and 90% of the available pore space between sediment grains in sandy layers in the subsurface. These reservoirs are expected to be representative of the 6,700 tcf of gas that BOEM estimates is housed in gas hydrates in sand-rich reservoirs in the northern Gulf.

The new data are being used to refine estimates of the nature, distribution, and concentration of gas hydrate in the vicinity of the 2009 drillsites. This will help assess how useful specialized seismic data may be to estimating hydrate saturations in deepwater sediments. The data also provide information about how much gas hydrate exists in a much broader area than can be determined from using standard industry seismic data, which is typically designed to image much deeper geologic units.

"This expedition represents a significant milestone," said Brenda Pierce, USGS energy resources program coordinator. "The data and imagery provide insight into the entire petroleum system at each location, including the source of gas, the migration pathways for the gas, the distribution of hydrate-bearing sediments, and the traps that hold the hydrate and free gas in place. The USGS has a globally recognized research effort studying gas hydrates in settings around the world, and this project combines our unique expertise with that of other agencies to advance research on this potential future energy resource."

In coming years, the three agencies plan to continue their collaborative investigation of gas hydrates in the northern Gulf and other locations across the world.

USCG, BSEE to regulate mobile offshore drilling units

The U.S. Bureau of Safety and Environmental Enforcement (BSEE) and the U.S. Coast Guard (USCG) will be joining hands to regulate mobile offshore drilling units (MODU) on the Outer Continental Shelf (OCS).

Under a Memorandum of Agreement, signed between BSEE director James Watson and USCG Rear Admiral Joseph Servidio, both agencies will collaborate to identify and coordinate responsibilities for the inspection and oversight of MODUs.

As part of the current regulatory system, the USCG and BSEE share jurisdiction over the regulation of MODU activities on the OCS.

The latest agreement will clearly define the responsibilities of each agency for inspection and oversight of the systems and sub-systems associated with MODUs engaged in offshore drilling operations. Both agencies will use the agreement to better align policies and procedures, while also collaborating on future regulatory projects.

BSEE director James Watson said the agreement would serve as a milestone in achieving coordinated oversight of MODUs while continuing the joint effort of agencies to improve offshore safety.

"MODUs are unique and dynamic vessels that are an important part of the offshore oil and gas industry's exploration efforts, but, as we learned from the Deepwater Horizon tragedy, these highly complex drilling units with their state-of-the-art equipment and ultra-deepwater drilling capabilities must be closely monitored," Watson said.

RSI begins 100-well North Sea study aimed at 'de-risking' prospects

Following the success of the 79-well Barents Sea and the 61-well Mid-Norway rock physics studies, there is now sufficient support from Norway-based exploration companies to justify the commencement of a 100-well North Sea rock physics study and atlas of seismic expression, said RSI, an independent geoscience consulting firm.

"It is anticipated that the study will be a fundamental component of any prospect de-risking process in the region," said Richard Cooper, RSI chairman and chief executive officer.

As with RSI's previous studies, he added, the main goals of the study will be to condition the log data for quantitative interpretation purposes and to examine the response of seismic data, and optionally electromagnetic data, to changes in fluid saturation.

"With strong exploration growth in a mature area spurred on by significant recent discoveries such as Johan Sverdrup and King Lear, the need to fully understand seismic and CSEM data through a rigorous rock physics analysis has never been more important," RSI president Gareth Taylor said.

He said the 100-well study will include representative wells from 25 "classic" fields such as Troll, Statfjord, Ekofisk, and Gukllfaks; 50 wells considered being of general interest; and 25 wells provided by "early participants" in the study.

U.S. crude oil output exceeds imports for first time in 16 years

U.S. domestic crude oil production exceeded imports for the first time in 16 years, a government report shows. Output was 32,000 b/d higher than imports in the seven days ending 31 May according to weekly data from the Energy Information Administration (EIA), the Energy Department's statistical arm. Production had been lower than international purchases since January 1997.

A combination of horizontal drilling and hydraulic fracturing, or fracking, has unlocked supplies trapped in shale formations in states, including North Dakota, Oklahoma, and Texas. The surge in oil and gas production helped the U.S. meet 88% of its own energy needs in February, the highest monthly rate since April 1986, EIA data show. Crude inventories climbed to the highest level in 82 years in the week ending May 24.

Production climbed 42% over the past 5 years and reached a 21-year high of 7.37 MMb/d in the week ended May 3, EIA data shows.

Cal Dive awarded Pemex contracts worth $188M

Cal Dive International, Inc. was awarded two additional contracts from Mexico's Pemex that are expected to generate combined total revenues of about $188 million. The first contract is for the procurement, installation, and commissioning of 47 km of 20-in. subsea pipeline and associated tie-ins to an existing platform. This contract is expected to generate revenues of about $129 million and will utilize two of the company's vessels as well as a third-party vessel. The offshore construction is expected to commence in the third quarter 2013 with a portion of the work expected to be performed during the first quarter 2014. The second contract is for the procurement, installation and commissioning of 9 km of two medium-diameter subsea pipelines and associated tie-ins to existing platforms. This contract is expected to generate revenues of about $59 million and will utilize a third-party vessel and a company dive support vessel. The offshore construction for this contract is expected to commence in the fourth quarter of 2013 and is expected to be completed by the end of the second quarter of 2014.

Technip to replace Norne riser in Norwegian Sea

Technip received an engineering, procurement, construction, and installation contract from Statoil for the Norne field development in the Norwegian Sea. The value of the contract was not disclosed. Technip's project scope will include the engineering and fabrication of two flexible smoothbore gas export risers. One will be used to replace an existing roughbore riser connecting the Norne floating production storage and offloading (FPSO) unit with the gas export pipeline, and the other will be placed on a reel for Statoil to use as a spare. Riser fabrication will take place in Technip's Flexi France plant in Le Trait. Offshore installation will be performed with the company's Normand Progress vessel and is scheduled to be completed in the second half of 2014. The Norne development is in water depths of about 1,247 ft.

Keppel Offshore & Marine secures rig contract

Singapore-based Keppel Offshore & Marine has secured a contract worth about $800 million from a subsidiary of the State Oil Co. of Azerbaijan Republic (SOCAR) to construct a semi-submersible drilling rig. The contract with SOCAR's subsidiary, Caspian Drilling Co. Ltd, came through Keppel's subsidiaries, Caspian Rigbuilders and Caspian Shipyard Co. (CSC). Under the contract, which also includes owner-furnished equipment, Keppel will build the rig based on FELS' proprietary DSSTM 38M design, which has been specially designed to meet the Caspian Sea's tough environmental conditions. The DSSTM 38M design, which has been jointly developed and is jointly owned by Keppel's Deepwater Technology Group and Marine Structure Consultants, is an advanced design of the DSSTM 38 rigs that are currently operating in Brazil. Scheduled to be delivered in the fourth quarter of 2016, the DSSTM 38M will be designed for a drilling depth of up to 40,000 ft and for operations in 1,000 m water depths. The rig will be equipped with an 800 m self-contained eight-point mooring system to meet high wind speeds in the tough Caspian environment.

MWCC introduces 10k psi capping stack for U.S. Gulf

Marine Well Containment Co.'s 10k psi capping stack

Marine Well Containment Co.'s (MWCC's) 10k psi capping stack for use in deepwater U.S. Gulf of Mexico is now available, the company said. The completion of the capping stack, which stands 25 ft tall, including the necessary lifting gear, and weighs about 50 tons, marks another step in MWCC's commitment to advancing well containment capabilities in the deepwater U.S. Gulf of Mexico.

The capping stack, which can handle up to 10k psi, is an addition to the company's containment system first made available in February 2011. It is the smaller of two capping stacks available with MWCC's system that, with support from MWCC, provides operators more options to customize a containment plan based on the specifics of the wells being drilled.

"The 10k psi capping stack is a result of feedback we received from member companies who operate facilities with wells closer together that are not as easily accessed by our larger capping stack," said Marty Massey, chief executive officer of MWCC. "The addition of the 10k psi capping stack is the latest example of ongoing system enhancements and our efforts to keep pace with members' needs in the deepwater U.S. Gulf of Mexico."

In support of MWCC, Shell agreed to lead the design and construction efforts for the 10k psi capping stack. With a footprint of 9 ft by 9 ft, the 10k psi capping stack is easier to maneuver in areas where wellheads and riser systems are closely spaced, such as tension leg platform (TLP) applications where wells are beneath a floating production facility. The new dual ram capping stack can cap a well in depths up to 10,000ft.

The 10k psi capping stack is an addition to the 15k psi capping stack — the centerpiece of MWCC's interim containment system. In July 2012, the 15k psi capping stack was successfully deployed offshore in the U.S. Gulf to a simulated well site where MWCC validated its ability to respond to a deepwater well control incident. At the request of regulators, MWCC mobilized and lowered the capping stack 6,900 ft subsea where all necessary functions were completed and pressure testing confirmed the ability to control a well.

MWCC is an independent organization focused on enhancing response capabilities for containing a deepwater well control incident in the U.S. Gulf of Mexico. The company is not in the business of making a profit, and membership is open to all oil and gas operators in the U.S. Gulf.

Tata Steel unreels line pipe in U.S. Gulf

Tata Steel supplies gas pipe for $150M Discovery project in GoM

Tata Steel recently completed a $150 million project to provide pipe for the Discovery Producer Services LLC (Discovery) gas pipeline in Keathley Canyon, Gulf of Mexico. Discovery is a 60/40 joint venture between Williams Partners LP and DCP Midstream Partners.

Tata Steel supplied Discovery's Keathley Canyon Connector™ with 214 m of 20-in. diameter submerged arc welded line pipe, weighing more than 110,000 tons, which was manufactured at the company's 42-in. mill in Hartlepool, UK. The pipe was laid at water depths of up to 7,380 ft and is designed to meet the required specification for deepwater conditions, the company said.

Tata Steel produces high frequency induction (HFI) welded pipe for reel lay projects, which offers a consistently shorter procurement schedule, superior ovality, and wall thickness tolerance to that of seamless line pipe. This leads to reduced costs at the design, welding, and installation stages, while maintaining exceptional product integrity.

Tata Steel demonstrated its ability to deliver pipeline solutions to some of the world's most challenging and complex projects at this year's Offshore Technology Conference.

GE signs $84M agreement with Pemex for deepwater exploration

GE Oil & Gas has signed an $84 million agreement with Mexico's Pemex Exploration and Production to supply and to install subsea wellheads for Pemex's deepwater and ultra-deepwater drilling projects in the Gulf of Mexico. This marks GE's largest agreement with Pemex for the supply of subsea high capacity wellheads. The Gulf of Mexico is a strategic zone for the hydrocarbon industry, as it is estimated to hold more than 50% of Mexico's potential or prospective resources. However, such reserves are located in deepwater and ultra-deepwater sites and advanced technology is needed to extract those resources for the benefit of the country.

GE Oil & Gas has become a strategic partner both for Pemex and Mexico in the search of new hydrocarbon reserves. By designing high-technology subsea wellheads that provide a larger load, pressure capacity, and a full-bore design unique in the market, GE is helping drillers reach greater depths. For the latest Pemex project, GE will supply SMS800 and DWHC 700 high-capacity wellheads. Similar GE technology has been previously installed at several other Mexican oil fields, including Perdido, Lakach, and Kunah.

ABB to supply pipelay vessel with power, propulsion systems

ABB recently won a $12 million order to supply electrical power and propulsion systems for a deepwater pipe laying vessel. The vessel, tentatively named Derrick Lay Vessel 2000 (DLV2000), will be constructed at Keppel Singmarine in Singapore and delivered in 2015 to Hydro Marine Services, Inc., a subsidiary of McDermott International, Inc.

Developed by Keppel's ship design arm, Marine Technology Development (MTD), DLV2000 is equipped to support advanced deepwater pipe laying operations that will allow pipelines to be installed at depths of up to 10,000 ft. It is also capable of achieving efficient pipe lay rates for long trunk lines, operating in severe weather conditions, and providing significant thrust output and power distribution. An economical vessel transit speed is expected to be 12 kts with a top speed of 14 kts. On completion, the vessel will be able to accommodate up to 400 personnel.

"Being selected as the main supplier of power and diesel electric systems for this unique vessel shows the customer's faith in our ability to execute complex projects and deliver reliable solutions that contribute to increased energy efficiency and optimized performance," said Heikki Soljama, head of marine and cranes business at ABB. "ABB has a successful history of helping to efficiently power such highly specialized ships to keep them at the cutting edge of the marine industry."

Artist's impression of future DLV2000

ABB will supply an advanced complete power and diesel electric system package, consisting of medium voltage switchboards, generators, diesel generator monitoring systems, transformers, frequency converters, motors, and remote diagnostic system. The systems will provide reliable and fuel-efficient propulsion for the ships, the company said.

Diamond awards $775M contract to HHI for new semi-submersible rig

U.S.-based contract drilling services provider Diamond Offshore Drilling has awarded a contract worth about $755 million to Hyundai Heavy Industries (HHI) to build a new Moss CS60E-design harsh environment semi-submersible drilling rig.

HHI said the drilling rig, which will measure 123 m in length and 96 m in width, can operate in waters 3,000 m deep, with a drilling range of 12.2 km from the sea's surface.

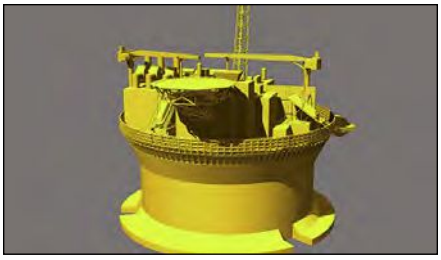
As part of the contract, which will also include spares, commissioning, and shipyard supervision, HHI will deliver the rig by November 2015.

Meanwhile, Diamond Offshore has also signed a 3-year drilling contract with a subsidiary of BP to use the rig for initial operations off the coast of South Australia. Under the deal, the BP unit will use the rig by paying $585,000 per day as an initial operating dayrate and is subject to upward adjustment for certain increased operating costs and modifications.

Dana Petroleum lays keel for $400M oil production vessel

Aberdeen-based Dana Petroleum has laid the keel for a new $400 million oil production vessel that will produce and store up to 40,000 b/d of oil from the North Sea by 2015. The keel laying of the floating, production, storage, and offloading vessel (FPSO) marks a major milestone for Dana's Western Isles project.

Dana and its partner Cieco are investing $1.6 billion in a nine-well development of two oil fields called Harris and Barra in the Northern North Sea, 160 km east of the Shetlands and 12 km west of the Tern field.



Artist's impression of the FPSO

"This is a major milestone for Dana and the Western Isles project. We aim to significantly grow our production over the next 5 years, and this project is vital to helping us achieve that goal," said Marcus Richards, Dana's group chief executive.

The vessel will displace around 26,000 tons and can safely store up to 400,000 bbl of oil. The hull and topsides of the FPSO are being constructed in China. The project has around 70% UK content overall. The vessel will then be transported to the North Sea where it will begin operations in late 2015.

Aker Arctic brings heavy duty Oblique Ice Breaker to market

With construction underway on the first ever Oblique Icebreaker, research specialist Aker Arctic Technology has unveiled a new version of the vessel type that will bring ice management and pollution control in thick, first year ice to a new level, the company said.

The first ARC 100 is due for delivery to the Russian Ministry of Transport in early 2014, after a collaborative build involving Kaliningrad's OJSC Yantar and Helsinki's Arctech yards. The resulting newbuilding is a breakthrough in asymmetric three-thruster conceptual design, which will bring new capability in terminal operations, ice management, and oil spill response in freezing seas.

The 76-m long vessel, with her oblique ice-breaking action, is a game changer in year-round oil spill response. Additionally, a single Oblique Icebreaker cuts channels through ice for cargo ships to follow as wide as two equivalent conventional icebreakers moving ahead side by side. Aker Arctic has followed up with a "Heavy Duty" ARC 100 HD version of the design — a 98 m long and 26 m across the beam vessel. The vessel will draw on 24,000 kw of engine power and 19,500 kw of propulsion power to offer 190 tons of bollard pull in open water.

The first ARC 100 is due delivery in 2014

Norway's Statoil finds oil directly north of North Sea's Grane field

Norway's multinational oil and gas company Statoil, along with its partners, has discovered oil in an area near the Grane field in the North Sea. The company and its partners are currently in the process of completing drilling in exploration well 25/11-27 in the Grane Unit.

Statoil used the Songa Trym rig to drill the well, which proved an oil column of 20 m in the Heimdal formation and is estimated to contain recoverable oil in the range of 18 to 33 MMbbl. Grane oil field has been developed with an integrated accommodation, processing, and drilling platform, with a fixed steel frame construction resting on the sea bed.

Located about 185 km west of Haugesund, where the sea depth is 127 m, the oil platform was discovered by Hydro in 1991 and came on stream on 23 September 2003. The oil from the platform is shifted by pipeline to the Sture terminal, where it is stored in large rock caverns in the mountainside before being shipped to the global market. According to Statoil, when the Grane field came on stream, its recoverable reserves were estimated to total 700 MMbbl of oil.

The oil discovery is situated directly north of the Grane field and can be developed effectively, the company said.

"Near-field exploration is an important contribution in Statoil's exploration portfolio on the NCS," said Tore Løseth, Statoil's North Sea exploration vice president.

Noble Energy confirms fifth large natural gas find offshore Israel

U.S.-based Noble Energy confirms that its well on the Karish prospect offshore Israel has discovered gas. Karish 1 was drilled in the Alon C license, 46.6mi northwest of the Haifa coast in 5,700 ft of water and 20 mi northeast of the recently onstream Tamar field.

It was drilled to a TD of 15,783 ft and encountered 184 ft of net natural gas pay in good-quality lower Miocene sands. Noble estimates resources at Karish and those in an adjacent fault block on the license in the 1.6 to 2 tcf range. This was Noble's fifth discovery in the offshore Levantine basin with potential resources above 1 tcf. It lifts total discovered reserves by the company and its partners to around 38 tcf. Co-owners of the Alon C license are Avner Oil and Delek Drilling.

CNOOC teams with Eykon Energy to explore Arctic oil and gas

China National Offshore Oil Corporation (CNOOC) has teamed with Eykon Energy to apply for a license to explore and produce oil and gas in Arctic waters, offshore Iceland. If CNOOC's application is accepted and a license is awarded, it would be the Chinese company's first venture into offshore Arctic oil drilling, reported The Wall Street Journal.

The company said it has been invited by the Government of Iceland and Eykon Energy to participate in its offshore oil and gas exploration project, which is currently under negotiation.

CNOOC and other Chinese oil companies held meetings with Russia's state-controlled OAO Rosneft head, Igor Sechin, during his visit to China at the beginning of 2013 about potential offshore projects in the Russian Arctic.

Earlier in 2013, Iceland awarded two licenses from its first round to sell acreage in the Dreki area, northeast of Iceland and neighboring coastal waters in oil-producing Norway. Iceland's National Energy Authority said that Eykon Energy applied for a license in the tender round, but needed a partner to proceed further.

The Atlantic coast of Ireland

Ireland approves seismic survey to determine Atlantic prospects

The Irish Government has decided to undertake an 18,000-km seismic survey of the country's Atlantic coast in order to attract oil and gas exploration companies.

According to the Department of Communications, Energy and Natural Resources, it is expected to be the largest regional seismic study in offshore Ireland and will also serve as a scientific study for the broader research industry.

Italy-based multinational oil and gas company Eni's subsidiary, Eni Ireland, which is involved in several exploration licenses in the Irish offshore area, will perform the survey jointly with the Department in the Atlantic waters of the Irish-designated continental shelf.

The Department will bear nearly 20% of the survey cost, which will come through a research fund generated by income from the industry and contributed to through license obligations. Eni will bear the remaining cost for the survey, while the State will retain the rights to all data collected during the process.

Study revives exploration interest in areas offshore Nova Scotia

Beicip-Franlab has used basin modeling technologies developed by IFP Energies nouvelles (IFPEN) to reassess Nova Scotia's offshore hydrocarbon potential. Partly as a result of the study, the company says that Shell and BP acquired exploration blocks in the area and have committed $1 billion each to their programs. Exploration drilling in the Atlantic offshore Nova Scotia previously brought patchy results.

In 2010 to 2011, Beicip-Franlab, an IFPEN subsidiary specializing in consultancy and geoscientific software marketing, performed a study of the region on behalf of the Canadian authorities. Its findings revealed an oil potential in a region previously considered a gas province.

The company based its assessment partly on new seismic, geological, and geochemical interpretations using the latest versions of TemisFlow and Dionisos software that it developed with IFPEN. TemisFlow can help understand and model the evolution of petroleum systems in time and space (genesis, expulsion, migration, and trapping of hydrocarbons). Using Dionisos software, it is possible to model sedimentary filling on a basin scale.

HRT subsidiary drills Murombe-1 well in Walvis basin off Namibia

HRT Walvis Petroleum, a subsidiary of Brazil-based oil and gas company HRT Participações em Petróleo, has commenced drilling at the Murombe-1 well on the Murombe prospect in the Walvis basin, offshore of Namibia. HRT Walvis is drilling the well to target the Murombe Prospect located in the Petroleum Exploration License 23 (PEL-23). The well is situated 220 km northwest of Walvis Bay in 1,391 m water depth and about 15 km east of HRT's first well on PEL-23. HRT had plans to spud the well in about 72 days to a projected total depth of 5,360 m using the semi-submersible Transocean Marianas. The well will test a basin floor fan on a way4-dip closure.

Rigs extend field life of Oseberg, Gullfaks

The license partners of Gullfaks and Oseberg Area Unit in the North Sea have acquired two new category J jack-up rigs that will contribute to increased recovery and extended field life. Samsung Heavy Industries Co. Ltd. and operator KCA Deutag Drilling Norway AS have been awarded the contracts for construction and operation of the two rigs. The rigs will be owned by the licenses, and operation start is expected in 2016-2017.

The operations contract, valued at about $900 million, is for an initial period of 8 years with the option to extend.

The category J rig intake is part of Statoil's long-term rig category strategy to rejuvenate its rig fleet, secure long-term rig capacity, and reduce drilling costs to improve NCS recovery rates. The license ownership model has been developed in close cooperation with license partner Petoro.

Drilling of more wells is the single most important measure to increase recovery from the fields and to meet Statoil's ambitious target of an average of 60% recovery from the NCS assets.

"This is an important milestone for both Oseberg and Gullfaks. The awards will secure vital rig capacity for both licenses at very competitive prices. Reduced drilling costs are important to increase recovery and to maintain production in Oseberg Area Unit and Gullfaks for decades," said Øystein Håland, head of operations west in Statoil. Both Gullfaks and Oseberg have a long-term rig demand, and it is premised that the new rigs will operate at these fields for a long period. The drilling costs will be significantly reduced as a result of the ownership model, and this will improve robustness of drilling targets or even add targets that would not otherwise be profitable.

The new category J jack-up rig

"The market response to the ownership model has proven to be very competitive. This will give us rigs at right cost and well suited for the operation on these two licenses," said Statoil chief procurement officer Jon Arnt Jacobsen.

The new category J rigs will be able to operate in harsh environments at water depths from 70 to 140 m and drill wells with lengths up to 10,000 m. The rigs are based on proven technology, but optimized to allow for more efficient drilling and completion of subsea wells compared to the existing jack-up fleet. The primary use will be drilling and completion of production wells.

The rigs will be owned by the Gullfaks and Oseberg licenses, but will be operated by a drilling contractor.

"Statoil is continuously working to secure a rig fleet with the right capacities and capabilities to suit our needs. We are, therefore, taking steps to rejuvenate the rig fleet and ensure that the right rigs meet the right requirements," Jacobsen said.

"The new, long-term operation contracts secure predictability for the licenses and for the drilling contractor. The drilling contractor will perform drilling services and maintenance. Hence, the operating and manning model is similar to the model used for leased rigs. As a long-term industrial player on the NCS, we cooperate with the suppliers to develop new and cost-effective solutions."

Partners at Gullfaks are Statoil and Petoro, while the partners at Oseberg are Statoil, Petoro, Total E&P, and ConocoPhillips.

Afren plans more development in Ebok area offshore Nigeria

Afren has started front-end engineering design and fabrication planning for a new wellhead platform and production unit for the Okoro field extension offshore Nigeria. Elsewhere off Nigeria, Afren plans to drill a further three production wells and a water injector at the Ebok field for development of the Central Fault Block extension. The wells will target the LD1A and LD1B reservoirs containing 2P reserves of 38 MMbbl.

Following last year's discovery at the Ebok North Fault block, the partners are considering development options. They will likely drill the development wells from an extended West Fault Block platform and route production through to the existing mobile offshore production unit.

During the first quarter of 2013, the company completed the offshore Okwok-11 side track well after encountering 95 ft of net oil pay in the D2 reservoir. The newly acquired data, along with results of the Okwok-10 well and subsequent side track well, will be used to update the volumetric and optimized field development plan prior to submission to the Nigerian authorities later this year.

In Afren's Tanga block offshore Tanzania, a 239-sq. mi 3D seismic survey was completed early this year. The focus of the data processing is on the deeper water prospectivity — Afren aims to optimize prospect selection ahead of planned exploration drilling. It expects to have the first fully processed 3D seismic cube in July.

BP orders deepwater sampling kit for offshore Angola fields

BP has contracted Proserv to design and manufacture a subsea sampling system for the PSVM multi-field deepwater development offshore Angola. The system will be designed to work at a maximum water depth of 8,202 ft as well as interfacing with two- and four-slot subsea manifolds. It will be fully compliant with NACE and API standards.

The equipment will interface with the PSVM subsea production system to support monitoring of PVT properties in the production fluid as there is potential for flow assurance issues such as scale build-up. Proserv's manufacturing center close to Aberdeen will produce cylinders for the sampling system, which will be manufactured and assembled at the company's Birchmoss facility in Aberdeenshire, Scotland.

Iran details development capex for South Pars field in Persian Gulf

Measures to speed development of the South Pars gas-condensate field could reach $30 billion over the next 10 months, according to a report by Iranian news service Shana. Ahmad Qalebani, managing director of National Iranian Oil Co. (NIOC), expects all current development phases to proceed on schedule. By next March, the start of phases 12, 15, and 16 will help increase the country's gas production capacity by 3.5 bcf a day, he added. Additionally, production of oil from South Pars' oil layer should start shortly.

Husky Energy gets go-ahead on White Rose field development plan

Husky Energy has received regulatory approval on an amended South White Rose field development plan, the third satellite extension at the White Rose field in the Atlantic Region.

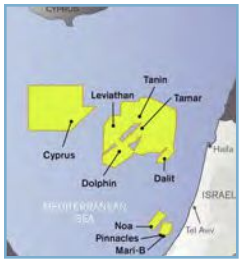
Husky is targeting approximately 20 MMbbl of oil from South White Rose, and the amendment allows access an additional estimated 6.5 MMbbl of incremental production from the South Avalon Terrace on the southern tip of the main White Rose field.

South White Rose, 217 mi offshore Newfoundland and Labrador, will be developed via subsea tie-back to the SeaRose FPSO vessel. Development is under way with gas injection anticipated to begin in 2013 and first oil production planned for 2014.

RPT-Israel's Leviathan gas field to cost at least $4.5B

The U.S.-Israeli consortium developing Israel's Leviathan natural gas field estimates it will cost $4.5 billion to develop the offshore well, not including infrastructure for exports, according to Reuters.

The cost forecast was part of a development plan the consortium recently presented the government, an official told the news service, speaking on condition of anonymity.



The group has said export options include building a liquefied natural gas (LNG) terminal, a pipeline to a neighboring country, or even bringing in a new technology known as a floating LNG vessel, which alone would cost $3 to $4 billion to construct.

Leviathan, discovered in 2010 with an estimated 19 tcf of natural gas, was the world's largest offshore discovery of the past decade.

A government committee recommended last year that Israel should keep enough gas to satisfy its own needs for 25 years, which comes out to a bit less than half of Israel's total reserves, currently estimated at 33.5 tcf.

U.S.-based Noble Energy has a 39.66% stake in Leviathan. Israel's Avner Oil Exploration and Delek Drilling each have a 22.67% stake, and Ratio Oil Exploration holds the remaining 15%. Australia's Woodside has agreed to purchase a 30% stake in the project.

Eni Norge commissions dual-role support vessel for Goliat platform

Eni Norge has awarded Simon Møkster Shipping a 10-year contract for a new supply-standby vessel. This will support operations at the Goliat production platform in the Barents Sea.

The VARD PSV-06 LNG design vessel, which will be adapted for Arctic assignments, will offer standard platform supply capabilities, with standby class and NOFO-2009 oil spill systems. Additionally, it will provide a stern slip solution for operation of daughter craft and rescue of lifeboats and an emergency towing winch of 125 tons.

The vessel will be powered by four dual-fuel engines using LNG as the prime energy source. According to Eni, LNG-powered vessels have 20% lower carbon dioxide (CO^2 emissions) than standard vessels, around 80% lower NOx emissions, and offer a virtual 100% reduction in sulfur dioxide (SOx) emissions.

Talisman Energy produces oil from HST/HSD development off Vietnam

Canada-based energy firm Talisman Energy has started oil production from its Hai Su Trang and Hai Su Den (HST/HSD) development, offshore Vietnam. Talisman said that gross production is anticipated to reach 15,000 b/d once the facilities are fully commissioned. The HST/HSD development includes two offshore oil fields, which were discovered within Block 15-2/01, on the western edge of Vietnam's prolific Cuu Long Basin.

Thang Long Joint Operating Company (TLJOC) is the operator of Block 15-2/01, where Talisman (Vietnam 15-2/01) has a 60% working interest, while PVEP holds the remaining 40%.

Located 75 km offshore of southern Vietnam in shallow water (45 m), the development includes two wellhead platforms, which have been tied back to the existing Te Giac Trang floating production, storage, and offloading (FPSO) unit.

Talisman has drilled, completed, and tied-in four wells at HST and used PV Drilling to complete and tie-in two previously drilled wells at HSD. PTSC Mechanical and Construction, a subsidiary company of PetroVietnam, has constructed both the platforms in Vietnam. Talisman Energy Asia-Pacific EVP Paul Blakeley said the first oil has been achieved on schedule and under budget.

Santos begins oil production from Fletcher Finucane, Australia

Santos has commenced oil production ahead of schedule from the Fletcher Finucane project in the Carnarvon Basin offshore Western Australia.

Sanctioned in January 2012, the $490 million Fletcher Finucane development involves a three-well subsea tieback to the existing Santos-operated Mutineer Exeter FPSO facility.

The field's gross proved, and probable reserves are expected to be around 14 million bbls. During the first 12 months of production, the field is estimated to have an average gross production rate of 15,000 b/d, the company said.

The discovery is located north of the dampier sub basin and 17 km east of the existing Santos-operated Mutineer Exeter field facilities. Both Fletcher-1 and Fletcher-2 wells were drilled in 2007, while Fletcher-3 and Fletcher-4 were drilled in 2008 and 2009.

Development wells were drilled by the Nan Hai 6 mobile offshore drilling unit

The first two wells were drilled to appraise the eastern portion of the Fletcher oil discovery, while the subsequent two wells were designed to examine the former wells.

Santos said the project could deliver the first oil ahead of schedule and within 16 months of sanction due to strong project management and focused execution.

Santos, as the operator, holds 44% aggregate interest in the Fletcher Finucane project, while co-partners are Kufpec and JX Nippon Oil & Gas with 33.4% and 22.6% interest, respectively.

Apache begins producing from the Tonto oil field in th North Sea

Apache Corp. has started producing the Tonto oil field in the UK central North Sea. Tonto-1 was drilled as a deviated well from the Forties Bravo production platform. The appraisal wellbore encountered 62 ft of net oil pay in an Eocene sandstone reservoir at a depth of 6,325 ft. This was followed by a horizontal completion lateral that logged 243 ft of net oil pay. Currently, the well is flowing 10,346 b/d of oil.

"Seismic inversion processing unlocked pay in the Tonto field, which lies above the main Forties Paleocene reservoir," said James L. House, Apache's regional vice president for the North Sea. "We penetrated Tonto several times in wells targeting Forties. New seismic techniques enabled Apache's North Sea geoscience team to gain a better understanding of Tonto and establish a development plan."

House added that a new 3D seismic survey will be acquired over Forties in July. Oil from Tonto produced ahead of the survey should allow the company's geoscientists to image production patterns within the Eocene reservoir to optimize placement of future Tonto producers. Apache plans to drill an additional development well by year-end following analysis of the 4D time lapse seismic data.

This is the third new oil field brought online by the company in the Forties area in the past 3 years, the others being Maule and Bacchus. All three developments qualified under the UK government's small field allowance system.

Deep Panuke production unit off Canada close to start-up: SBM

SBM said commissioning is under way on the new mobile offshore production unit serving EnCana's Deep Panuke project offshore Nova Scotia.

Production was expected to start before the end of June.

Elsewhere, SBM's FPSO Cidade de Paraty departed the BrasFELS shipyard in Brazil in mid-April following mechanical completion. The vessel is now secured to anchor lines at the Petrobras-operated field offshore.

Once the subsea risers and umbilicals have been connected, testing with hydrocarbons can start as the final stage prior to systems acceptance. At that point, the vessel will be officially on hire.

Latest platform installed on Kuwait, Saudi Arabia offshore Al-Khafji field

Al-Khafji Joint Operations (KJO) has started operations at the seventh platform at the gathering station on the offshore Al-Khafji field on the median line between Kuwait and Saudi Arabia. The control and living platform is an integrated facility, designed to accommodate the increasing number of personnel needed for further field development. Other projects in progress include installation of an electrical distributor platform, deployment of a high voltage marine electrical cable, and equipping other installations to receive electrical current from the distributor platform.

Statoil said it found additional oil at Volve field in North Sea

Statoil said new drilling proved Volve field to hold additional oil reserves in a range from 8.8 to 9.4 MMbbl. That almost doubles estimated remaining reserves at the North Sea field, meaning that production there could be prolonged at least until the end of 2016, the company added. Statoil holds 59.6%, ExxonMobil 30.4%, and Bayerngas Norge 10% of the license.

Chet Morrison Contractors develops subsea rotating cutter called SHARC

Chet Morrison Contractors said it has developed an innovation in subsea cutting that offers substantial improvement over existing technologies. SHARC (Subsea Hydraulic Abrasive Rotating Cutter) was developed to make subsea P&A work safer for divers by eliminating the need for hand jetting and reducing the time divers spend underwater performing cuts themselves.

In addition, SHARC also reduces overall job time by 60% and can be deployed by Chet Morrison's 240-ft, four-point DSV Joanne Morrison, thus avoiding the higher cost of larger spreads.

The prototype for SHARC was developed during a 2012 four-well subsea P&A project for Helix ERT in three fields in the Gulf of Mexico. Chet Morrison Contractors then made the decision to further develop and refine the technology for use on other projects. According to Rod Hebert, consultant with Helix ERT, "The Chet Morrison P&A, dive, and marine crew did outstanding work. Using this new cutting tool, they completed four wells for us at about half of the expected cost. Chet Morrison saved ERT and partners many millions of dollars."

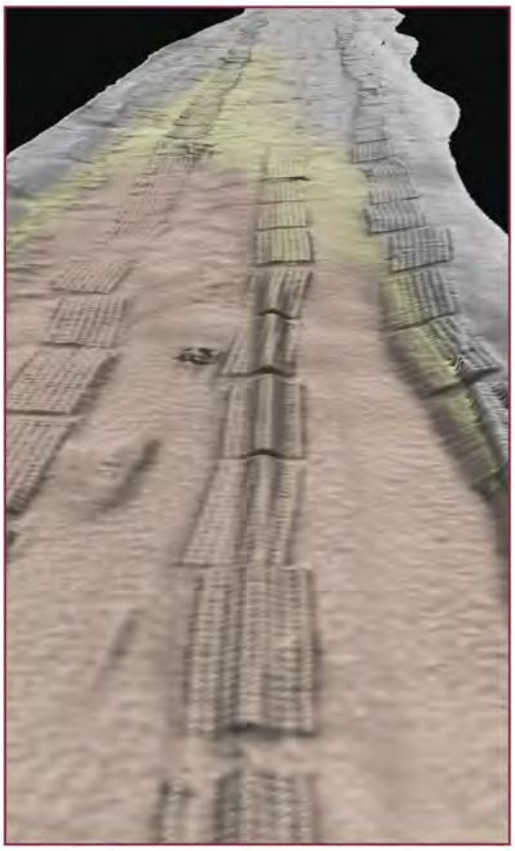
The 240 ft vessel DSV Joanne Morrison

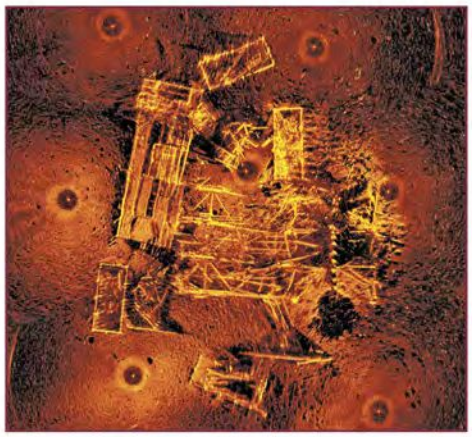
Following the project, engineers at Chet Morrison Contractors spent many months testing and refining the prototype to develop the new assembly. SHARC needs only a diver or ROV to position it over the pipe opening — then operations can be controlled and monitored from the surface. SHARC can make clean, even cuts on pipes 2 in. and larger, handle walls up to 3 in. thick with multiple strings and can cut any size caisson or jacket leg from surface or subsea to depths up to 500 ft. Not only is SHARC a safer option for divers, it is also better for the subsea environment, the company said, adding that unlike other methods, it does not require the use of explosives or hand jetting.

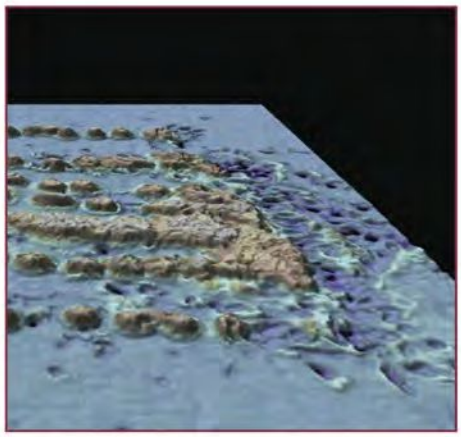
MacGregor develops crane with three-axis motion compensation

MacGregor, part of Cargotec, has developed an offshore crane featuring three-axis motion compensation to carry out installations, repairs, maintenance, and general service duties in the renewable energy and oil and gas markets. A 74-m infield support vessel (ISV) will debut a new MacGregor offshore crane that delivers full three-axis (x, y, and z) compensation, enabling equipment to be landed on small, high platforms with little margin for error. Siem Moxie is under construction at Fjellstrand shipyard in Norway and will operate in the offshore renewable energy and oil and gas markets for Siem Offshore. The crane has a safe working load of 5 tons at a 25-m outreach. Delivery is scheduled for January 2014.

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







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MicroCare makes improved downhole logging tools possible

The evolution of "smart" drilling, with advanced electronics being widely adapted for downhole logging, has advanced enormously over the past 40 years. With this has come the problem of cleaning the devices to keep them reliable, accurate and efficient. MicroCare Corp. has evolved several products that help to prolong the life of these intricate devices and avoid the costs of downhole failures.

Two particular products, Heavy Duty Degreaser – SuprClean™ and No Clean Flux Remover - VeriClean™ both are being used on downhole tools throughout the world, including offshore in the North Sea and Gulf of Mexico, as well as in Alberta fields and in Southeast Asia.

Downhole tools are electronic systems that have a hard life, despite being built of the strongest possible materials and engineered to withstand temperatures in the hundreds of degrees Celsius and pressures of thousands of pounds per square inch. They also have to survive the vibration of the drill bit and being flooded by drilling mud.

"Since any given tool might be cleaned hundreds of times during its operational life, cleaning quickly, thoroughly, safely and economically is paramount," said Mike Jones, MicroCare vice president. For more information, visit www.microcare.com.

DPV introduces new products to thermal heating product line

Diamond Petroleum Ventures (DPV), a thermal unit provider based in Lafayette, Louisiana, has developed the Diamond TH 450 and TH 650 to take care of client thermal heating requirements. Both units have been designed to fit in tight spaces and are easy to transport. These units weigh between 13,800 and 16,500 lbs and have redundant fluid transfer pumps. As Class 1 Div. 2 compliant, these flameless heaters can heat 100 bbl of diesel 100° over ambient in 80 and 60 min with no contact with corrosive exhaust gases.

Also available are the Diamond High Pressure Fluid Pump Skid and Thermal Tank System. The pump weighs 11,500 lbs, has a Gardner Denver TEE pump, and was designed for use by a single operator. The Diamond Thermal Tank System weighs 9,500 lbs, has multi-directional valving, and has a capacity of 88 bbl. As an ISNetworld member, DPV offers clients a complete thermal option. It specializes in the design, engineering, manufacturing, and maintenance of Class 1 Div 2 thermal pumping units, thermal tanks, and pressure pumps.

For more information, visit www.diamondpv.com.

PRODUCT SPOTLIGHT

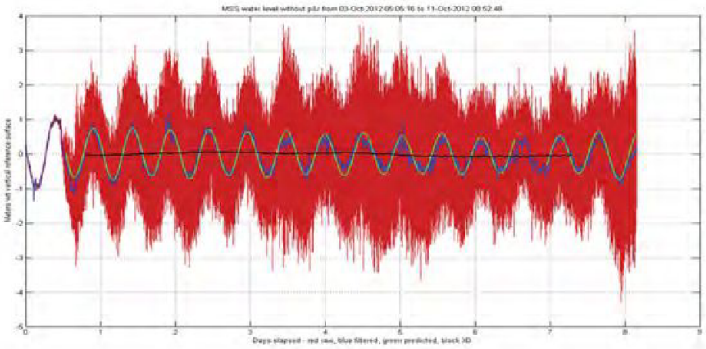
C-Nav SOLUTIONS

C-Tides:

Real-time Sea-level Using GNSS PPP Observations

The notion of deriving real-time tide information from the GNSS vertical component grew out of discussions with academics and tide experts excited by the idea of exploiting C-Nav's advanced Precise Point Positioning (PPP) solutions.

Generating tidal information from C-Nav data is not new. Experiments in 2003 demonstrated C-Nav's Global Positioning System (GPS) augmentation capable of delivering 35 cm vertical[1], and the U.S. Naval Oceanographic Office was achieving 24 cm vertical with C-Nav RTG GPS[2] in 2005. During the aftermath of Hurricanes Katrina and Rita in 2008, Science Applications International Corporation (SAIC), under contract to the National Oceanic and Atmospheric Administration (NOAA), conducted a rigorous study[3] comparing GPS PPP vertical with fixed tide gauges.



C-Nav began broadcasting its Full Constellation PPP Correctors in 2011, leading to a dramatic improvement in horizontal and vertical precision over the previous GPS RTG solution. Typical vertical precision is now 12 cm. It was this enhanced vertical accuracy that led C-Nav to develop its C-Tides package.

From its inception, C-Nav was determined that its new products represent the wide range of interests of its extensive customer base. Therefore, C-Nav designed C-Tides to meet a variety of applications, including marine charting; hydrographic, geophysical, and environmental surveys; the renewable energy community; and the wider offshore construction, exploration, and production industry.

In collaboration with the Hydrographic Science Research Center at the University of Southern Mississippi, a preliminary specification and method statement was prepared along with a contract for the development work awarded to Hydrometronics Inc. of Missouri City, Texas. The specification was revised following participation in an industry consultation undertaken by the E&P Development Division of TOTAL in early 2012. Further enhancements were included in the wake of a customer research and evaluation program. One of the aims was to ensure C-Tides' results were within the bounds for combining with other vertical component uncertainties to achieve IHO SP44 Order 1 or better.

C-Tides has two distinct software suites: an online package for real-time acquisition and display and an offline package with post-processing and other advanced features.

The C-Tides offline and online packages are available separately and in common with other C-Nav products. They are fully supported and can be tailored to a customer's specific needs or requirements.

References:

1. Alleman, P., A. Kleiner, and J. Chance. 2003. Experimental Use of GPS Derived Altitude in Hydrographic Surveys.

2. van Norden, M.F., E.N. Arroyo-Suarez, and A.S. Najjar. 2005. Hydrographic Surveys to IHO Standards Without Shore Stations Using the Real-time GIPSY (RTG) Global Positioning System, Naval Oceanographic Office, Stennis Space Center.

3. Quintal, R. et al. 200X. Vertical Control Via GPS vs. Tide Gauges: A Pilot Study, Science Applications International Corporation.

C-Tides Online features include the following:

- Unique, real-time alpha-beta elevation filter with user-variable filtering options and outlier rejection;
- Boxcar averaging;
- Predicted tide overlays;
- Contour plots in terms of EGM2008, Mean Sea Surface, Mean Ocean Topography, and the Vertical Offshore Reference Frame;
- Vessel offsets and online variable draft correction facility as well as full vessel dynamics;
- Online plots and series;
- Continuous outputs of vessel CoG relative to the reference surfaces; and
- ASCII CSV logging output.

The C-Tides Offline features include the following:

- Worldwide tidal predictions;
- Alpha-beta smoothing with outlier rejection;
- Boxcar averaging;
- Plots of the amplitude and phase for the tidal constituents;
- LAT estimation (amplified Indian Spring Low Water method);
- Linearly variable draft correction;
- Harmonic analysis (14 primary tidal constituents);
- Doodson X0 filter; and
- ASCII CSV log output.

World's smallest survey system gets a little bigger

Innovatum, maker of the world's smallest system for the location, tracking, and survey of submarine pipelines and cables, has added to its fleet of small-sized, yet powerful Falcon ROVs, the slightly larger, but compact, version of the more powerful Saab Seaeye Cougar XT.

Innovatum won its reputation for creating a smaller and smarter survey system that significantly cut the cost of inshore survey work. The idea was to use the compact Falcon to create a small and rapidly mobilized package that can be deployed from a small vessel, ready to survey all types of inshore and coastal submarine cables and pipelines.

Designed especially for working in shallow waters and in tight situations, the low-profile Cougar XT Compact minimizes the effect of current with its reduced frame size, buoyancy, and weight — and a thinner 17-mm tether cable that reduces the effect of drag.

Its power to hold steady in cross currents and work with precise maneuverability comes from six highly responsive and power efficient thrusters, along with a fast-acting control system.

Despite its small size, the Cougar XT Compact can be fitted with a wide range of equipment.

The Innovatum model is fitted with its own Smartrak system along with a high-resolution imaging sonar and dual-headed scanning profiler for mean seabed level measurement.

Innovatum's Smartrak is the only system in the world that can sense cables carrying either AC or DC current and cables carrying no current or signal at all. It can also undertake passive tracking of steel pipelines with ranges and accuracy said to be better than any other system.

For survey work, the Cougar, like the Falcon, has the advantage of a low electrical and acoustic noise signature for optimum survey sensor data.

The Innovatum system creates comprehensive reports and charts showing accurate cable route and depth of burial along the route. These data are required by installation contractors, owners, and regulatory authorities to ensure that the cable is properly buried and not in danger of being exposed to damage.

The system can undertake submarine cable surveys in shallow water depths — the typical scenario for offshore wind farms, interconnector power cables, and coastal communications cables.

For more information, visit www.seaeye.com.

Fugro, MacArtney, and EdgeTech move fast to supply ROTV

Through more than 70,000 km of successfully completed remotely operated towed vehicle (ROTV)-based pipeline inspection operations in the past decade, Fugro Survey Limited has always given priority to offering full compliance with customer requirements. These include simultaneously carrying more than one operational ROTV system on Fugro's Dynamic Positioning Survey Vessel, the M/V Fugro Discovery. This principle is set to enable operators to perform a hot-swap of vehicles, hereby minimizing downtime, maximizing system utilization, and effectively securing fast results for pipeline inspection clients.

At the beginning of the 2013 pipeline inspection season, client requirements led to Fugro needing to move fast to acquire a new ROTV vehicle.

In order to comply with custom Fugro specifications, the vehicle needed to undergo a range of preparations and modifications. These needed to be accomplished and the vehicle delivered in record time, hereby challenging MacArtney technicians to perform on the edge of capacity. Since FOCUS-2 systems operated by Fugro are fitted with state-of-the-art EdgeTech 2200-M integrated side-scan sonar systems operating at 300 and 600 kHz to provide high-resolution data with much improved signal-to-noise ratios — the rapid expert involvement of EdgeTech sonar technicians was required as well. In just 3 weeks, an impressive team effort led the transformation of a display model ROTV into a fully equipped and operational FOCUS-2 system, ready to serve with Fugro to offer highly efficient, high-definition acoustic pipeline inspection services in the North Sea.

The FOCUS series of ROTVs was introduced by MacArtney in 1989 and, since then, it has been used extensively for demanding underwater pipeline inspection tasks. In 2006, Fugro replaced existing FOCUS vehicles with the latest generation MacArtney FOCUS-2 system. In addition to providing increased stability (decimetre accuracy in height above seabed, plus superior roll/pitch/yaw control), the FOCUS-2 uses state-of-the-art MacArtney fiber-optic telemetry for vehicle and sensor communication, resulting in improved data quality and a more precise image of the pipeline.

In addition, increased capacity allows the FOCUS-2 to carry a broad range of sensor packages and underwater equipment, including digital side-scan sonar, multi-beam sonar, sub-bottom profiler, fiber-optic gyro, magnetometer, sound velocity sensor, MRU, INS, and others.

For more information, visit www.macartney.com.

UTEC Geomarine completes first North American geoROV™ survey

UTEC Geomarine has announced the successful completion of its first geoROV™ CPT survey campaign in North America.

The geotechnical survey in the Gulf of Mexico was in support of a major pipeline construction project, and work comprised in situ testing, interpretation, and production of the final reports.

The technology was perfectly suited to geotechnical survey operations in the Gulf of Mexico where challenging and variable seabed conditions required precise geotechnical data for pipeline design purposes.

The geoROV™ system is the innovative ROV-conveyed geotechnical testing and sampling system developed in-house by UTEC Geomarine to address industry requirements. It is a quick and cost-effective way of gathering high-precision geotechnical data that has an established track record in the North Sea and Asia-Pacific regions.

Following the acquisition of UK-headquartered Geomarine by UTEC in 2012, UTEC Geomarine now provides a range of advanced geotechnical services from UTEC's international office network.

Commenting on the project, UTEC Geomarine's Dr. Peter Allan, said, "A key factor in the selection of geoROV™ for this project was the ability to work close in to existing infrastructure and to very precisely investigate the geotechnical properties of features on the seabed."

For more information, visit www.UTECsurvey.com.

VideoRay retires Pro 3 series ROVs

After 9 years and nearly 700 systems sold, VideoRay has retired the Pro 3 series ROV systems. VideoRay will continue to provide support for existing Pro 3 ROVs, but will no longer manufacture or sell new systems.

The VideoRay Pro 3 ROV system is the technology that propelled VideoRay into its position as the global leader in MicroROV technology. The "work horse" of VideoRay's ROV product line, the Pro 3 improved upon VideoRay's original ROV technology through the introduction of computer integration, the now-industry-standard accessory port, and the ability to support a very wide range of sensors and positioning systems.

Released in 2004, the Pro 3 combined cutting-edge technology with the original design features that helped VideoRay cement its position as the leader in observation-class ROVs. Building upon the technology found in its predecessor the VideoRay Pro II, the Pro 3 offered control through a laptop PC and wireless hand controllers as an alternative to the original control box and joystick.

A year later, the Greater Thrust Option was introduced, greatly increasing the VideoRay's tether-pulling power for more advanced operations in currents up to 4.1 kts. These powerhouse systems expanded control over the ROV's position and laid the framework for VideoRay's latest technology — the Pro 4.

Now, almost a decade after the Pro 3's original release, VideoRay has made incredible advances in the design and capabilities of its ROV systems. With the release of the Pro 4 in 2009, VideoRay has a new benchmark system that features the latest in underwater technology. The Pro 4 can go twice as deep as the Pro 3, with a depth rating of 305 m (1,000 ft). Increased thrust allows for faster speeds and the ability to work in even stronger water currents. Topside integrated computer control through a supplied laptop is now standard for VideoRay ROV systems through VideoRay Cockpit, the most intuitive, easily operated, and visually appealing ROV control software available.

In addition to the state-of-the-art base system, the Pro 4 offers a wide variety of accessories that expand the ROV's capabilities, including autonomous control, sonars, HD cameras, and a wide variety of sensors and tools developed specifically for use with the Pro 4.

For more information, visit www.videoray.com.

Nortek delivers AD2CP-Gliders

Nortek has delivered one AD2CP-Glider acoustic Doppler current profiler to Scripps Institute of Oceanography for their Spray glider program. After initial integration, testing, and evaluate, Nortek has received an order for eight additional AD2CP-Glider profilers for an NSF-funded collaborative project between Scripps and WHOI. The AD2CP-Glider profilers will be used for gathering data around the Equatorial region, specifically by the Galapagos Archipelago. The Nortek AD2CP's will be mounted on Spray gliders and will profile down to 1000 m many times a day. The objective of the project is to quantify the variability in the position and strength of the Pacific Equatorial Front and the Equatorial Undercurrent.

Nortek AD2CP-Glider mounted in tail of Spray Glider (Photo Credit: Jeff Sherman, Scripps Institute of Oceanography)

The new Nortek AD2CP-Glider offers an acoustic Doppler current profiler specifically designed for ocean glider applications. The AD2CP is small in size, profiles on both the descent and ascent, and can be operated for glider profiling using about 0.2 W power. Nortek has developed a post-processing toolbox to support separating the total observed velocities into the glider velocity over ground and the water velocity over ground. The processed data may be used to observe the mean water column ocean currents and provide better navigation information for the glider mission and data analysis.

Nortek gained practical experience while working extensively with iRobot in mounting the AD2CP on the Seaglider. Results from this work were presented in a workshop and paper at the Oceans 2012 conference in Virginia Beach, VA. The experience and tested AD2CP hardware and firmware allowed Scripps to quickly integrate the system onto the Spray platform for their projects. Nortek looks forward to working with Scripps and WHOI on their glider research project and other groups using Spray and other glider platforms.

For more information, visit www.nortekusa.com.

IMCA publishes guidelines for installing ROV systems on vessels or platforms

The International Marine Contractors Association (IMCA) has published 'Guidelines for installing ROV systems on vessels or platforms' (IMCA R018). The new publication is aimed at vessel and platform owner/operators and designers; ROV contractor representatives; client and contractor staff who prepare bid documents and contracts; installation and rig managers; vessel and ROV managers;

and vessel designers and builders.

The purpose of IMCA R018 is to provide guidance on the installation of a remotely operated vehicle (ROV) System, or Systems, on to vessels and/or platforms. It is not intended to be a definitive guideline; instead it is intended to assist vessel and platform owners to understand the outline requirements of installing and mobilising an ROV System, i.e. to highlight some of the questions that may need to be asked. It can also be utilised in discussions with ship and platform owners, designers and fabricators/builders when build specifications are being prepared.

For more information, visit www.imca-int.com.

Modus to launch step change in advanced ROV technology

Modus Seabed Intervention, the leading subsea engineering and specialist Unmanned Underwater Vehicle (UUV) service provider, has confirmed an investment into a new advanced ROV to further enhance its fleet of subsea vehicles.

Manufactured by SMD in northeast England, the cutting edge 150-hp Quasar ROV ordered by Modus will be the first work-class system in operation in the industry that utilizes step-change technology in advanced auto function and control.

This offers greater performance, efficiency, and environmental resilience, targeted for deployment in high current areas experienced in offshore wind farms as well as oil and gas fields for survey, construction support, inspection, and maintenance of subsea infrastructure.

Modus will be the first operator in its field to deploy the state-of-the-art Quasar ROV that features the advanced functionality developed by SMD in conjunction with SeeByte.

Through the integration of technology from subsea vehicle software specialist SeeByte, this latest generation of SMD's DVECS-S control system enables pilots to perform operations with increased accuracy and reliability, which helps reduce task-based operational costs combined with offering greater versatility and minimized risk.

Offering a range of precision auto position controls, this system will enable greater accuracy in ROV positioning throughout the water column, including high current reactive control.

The new spread is currently in production and will join Modus' fleet of CS (Construction Support) ROV systems in the third quarter of 2013.

The company operates a fleet of state-of-the-art trenching and work-class ROVs and AUVs and is actively involved in marine trenching, survey, IRM, and construction support operations across the world.

For more information, visit www.modus-ltd.com.

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Cold weather altitude diving in California's High Sierra

Underwater Construction Team (UCT) 2 recently completed a diver training exercise in California's High Sierra designed to increase the team's cold-weather and altitude-diving expertise.

Members of Construction Dive Detachment (CDD) Bravo spent 10 days in Bridgeport training at the Marine Corps Mountain Warfare Training Center (MCMWTC), where they learned and exercised skills such as cold-weather survival, mountain medicine, cold-weather diving, and altitude diving, including both SCUBA and surface-supplied diving operations.

Occupying 46,000 acres of Toiyabe National Forest with elevations ranging from 6,000 to 12,000 ft, the training center conducts unit and individual courses to prepare Marines and joint and allied forces for operations in mountainous, high-altitude, and cold-weather environments. The center is also involved in the development of warfighting doctrine and specialized equipment for use in mountain and cold-weather operations.

During the winter season, from October to April, snow accumulation can reach 6 to 8 ft. The annual temperature at the center ranges from 20°F below zero in the winter to 90°F in the summer.

Before getting into the water, the detachment was required to undergo a pre-environmental training course designed to provide Sailors and Marines with the tools they need to survive in the strenuous mountain environment.

The dive portion of the exercise focused on honing the detachment's skills to establish and sustain a camp that supported diving operations in a mountain environment as well as the utilization of special dive gear designed to operate in intense cold environments.

CDD Bravo used both dry diving suits and hot-water diving suits to keep divers warm in the water. The hot-water suit is used during surface-supplied diving operations and employs a hot water heater and 600 ft of hose to push hot water into the diver's wet suit.

Ocean Server and SeeByte collaborate for rapid environmental assessment exercise

A group of marine industry technology providers gathered in San Diego, using OceanServer Technology's Iver2 AUVs as the payload platform to demonstrate improvements for both sonar and magnetic sensor data collection and subsequent "in-stride" and post-mission data analysis methods. These methods are emerging through cooperative developments in commercial and military survey operations. Participating in this 5-day exercise in the waters off Coronado were companies including EdgeTech, L-3 Klein, Marine Magnetics, and technical representatives from both the U.S. and Canadian Navies. A total of 37 individual AUV missions, simulating battlefield data collection methods, provided a variety of high-resolution imagery and validated recent sonar/platform integration projects.

At the week's end and in subsequent briefings, the full data sweep was imported to SeeByte's SeeTrack Military software and ultimately into the Navy's Common Operator Interface for Navy EOD (SeeTrack COIN). The objective of this very broad cooperative exercise was to demonstrate, for Navy observers, the ways in which recent advances in technology might apply to Navy applications.

Bob Anderson from OceanServer Technology, commented, "It is encouraging to see our collaboration with SeeByte producing such successful results. SeeByte's customers, including the U.S. Navy, can now benefit from the Iver2, a single-man portable AUV capable of carrying leading side-scan sonars and magnetic sensors, as the AUV is now fully compatible with SeeByte's software. Such instruments are vital when carrying out Rapid Environmental Assessment (REA) work."

For more information, visit www.seebyte.com.

Greensea delivers four navigation and control systems

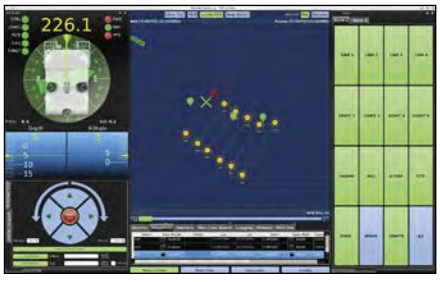
Greensea Systems, Inc., a leading developer of software for unmanned vehicles, marked the end of a successful 18-month R&D effort with the delivery of four navigation and control systems in May. The deliveries consisted of navigation and control software suites for a standalone Inertial Navigation System (INS), a 1,000-m rated commercial AUV, a 6,000-m work-class ROV, and a retrofit for a miniature ROV.

The recently completed R&D effort focused on modularizing Greensea's software architecture to allow for more flexibility in scope and increased portability across hardware platforms. This restructuring extends the capabilities of Greensea's INS technology through the modular addition of proven control, automation, and communication modules.

Both ROV systems delivered in May provided autonomous operating modes, route following, station keeping, dynamic positioning, and vehicle control on top of an integrated INS core. While the work-class system was tightly integrated during the factory build, the miniature ROV system was retrofit to a commercially available system using a separate small-pressure vessel on the vehicle that integrated to the original topside interface and original vehicle subsystems.

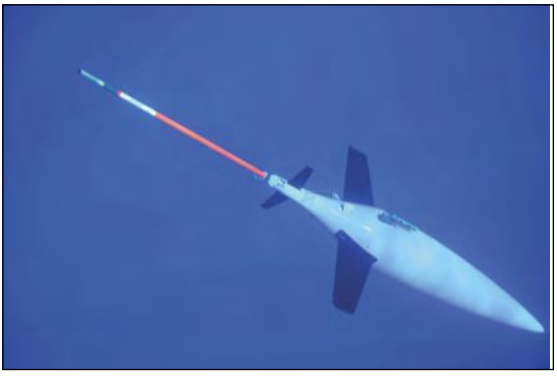
All four navigation and control systems featured variations of Greensea's Graphical User Interface (GUI) technology. This application framework provides a rich operator interface combining 2D navigation, chart plotting, vehicle control, payload management, mission planning, and diagnostics. Designed for OEMs, the GUI is also built on modular architecture and provides a fully customizable style sheet and graphical package.

For more information, visit www.greenseainc.com.



Ultra-long glider missions in the eastern Mediterranean provide near real-time data

Since March 2009, two ocean gliders owned by the Cyprus Oceanography Center of the University of Cyprus have completed 660 glider days and 2,570 deep dives in the EEZ of Cyprus. The gliders are deployed south of Cyprus and travel approximately 20 km per day for 5 to 6 months before being recovered and refurbished. Over 11,000 km have been covered to date. These University of Washington Seaglider Fabrication Center units dive to depths of 1,000 m and return to the surface every 7 hrs, transmitting profiles of sea temperature, salinity, chlorophyll, oxygen, and dive-averaged sea currents via satellite communication. The glider missions of the Cyprus Oceanography Center are the first ever in the Eastern Mediterranean.



The glider fleet manager and physical oceanographer, Dr. Daniel Hayes, describing the data set, said, "No previous experiment has collected this much detail on the hydrodynamics of this region."

The Cyprus Oceanography Center is currently operating the gliders in the frame of a 3-year European infrastructure design study project for gliders known as GROOM (Gliders for Research, Ocean Observation and Management).

The gliders demonstrate that near real-time data from gliders can be collected year-round and at extremely high spatial resolution, providing vital information for stakeholders dealing with the open seas around Cyprus and its EEZ. The glider data will aid in better understanding oceanic processes important for monitoring climatic changes, improving operational forecasting of sea conditions and assessing environmental health. Operational forecasts, also run out of the Oceanography Center, now assimilate the NRT glider temperature and salinity profiles in the daily forecasts.

"We have found that the addition of glider data provides critical information on the poorly-simulated Cyprus eddy: an anticyclone of diameter 100 km that dominates the region year after year," says Dr. Hayes. The real-time currents and their forecasts are useful in predicting trajectories of oil and other pollutants, using the well-known Medslik model, also developed at the Oceanography Center.

The Cyprus Oceanography Center is a research unit in the School of Pure and Applied Sciences at the University of Cyprus. It is an active research and applied marine center, with several European- and Cyprus-funded projects. The primary focus of the Center is the development and maintenance of near real-time ocean observing and forecasting systems.

For current mission data, visit www.oceanography.ucy.ac.cy/cycofos/glider.html.

For more information, visit www.oceanography.ucy.ac.cy.

Harris CapRock completes installation for Royal Caribbean
Harris CapRock Communications has completed installing advanced communications solutions onboard 33 Royal Caribbean Cruises Ltd. vessels that will improve crew morale, guest experiences, and company operational efficiencies. Harris was awarded the contract in April 2012 to provide communications services onboard Royal Caribbean's fleet for its Royal Caribbean International®, Celebrity Cruises®, and Azamara Club Cruises® brands. In 9 months, Harris CapRock completed the process, which included the de-installation and installation of more than 120 large antenna systems onboard the fleet. Each ship was equipped with Harris CapRock's SpaceTrack™ stabilized antenna systems, which deliver more than five times the amount of bandwidth previously available. The solution combines Ku-band and C-band connectivity to maximize service availability and avoid downtime. Installations spanned across more than 16 ports in the United States, Europe, and Asia Pacific and involved more than 59,000 individual components.

New maritime broadband offer from Thuraya
Thuraya Telecommunications Company has unveiled a new Maritime Broadband (MBB) service, enabling ship owners and managers to enjoy high-quality maritime broadband communications at practical prices. Teaming Thuraya's proven and reliable hardware solutions with a range of pricing options, MBB has been designed to provide users with the connectivity they need, while enabling them to budget with confidence. Thuraya's analysis of the maritime communications market identified a clear need to simplify choices for end users by providing pricing plans that reflect the best possible value. MBB from Thuraya MarineComms offers a flexible solution, regardless of whether users are looking for high or low volume usage or for a reliable backup. Thuraya MBB provides standard IP throughput at speeds of up to 444 kbps, meaning that maritime users can take advantage of true broadband connectivity for business-critical and crew welfare applications. The Thuraya network features the most powerful L-band satellites currently available to maritime users, and the service is known for its quality, consistency, and coverage continuity. The use of dynamic resource allocation ensures that traffic congestion is minimized in areas of high communication volume, such as major ports or busy shipping lanes. The price plans are initially available bundled with the Thuraya IP broadband terminal and a Spacecom IP321 antenna. The solution has been proven to be resilient in the harsh conditions of the maritime environment. It has been successfully deployed on leisure and commercial vessels for several years and is actively used across Thuraya's satellite coverage footprint.

Exelis C4i to deliver communications system to the Port of Darwin
Exelis C4i, a business unit of Exelis Inc., has been selected by Australian Maritime Systems to provide its SwitchplusIP® port and harbor control communications system to the Port of Darwin. The Exelis SwitchplusIP® system enables communications across dispersed maritime operations, management personnel, and systems. Port procedures, radios, and telephony are integrated onto a single touchscreen, providing a complete operational picture for Vessel Traffic Services (VTS) personnel. Single platform communication and automation decrease the time employees spend manually recording and relaying information, greatly enhancing safety and efficiency for port operations. SwitchplusIP® can be mobile or land-based and uses Voice-over Internet Protocol (VoIP) technology to integrate legacy and modern equipment. The system is fully fault tolerant and has network redundancy at every end-point to ensure high availability, minimum downtime, and rapid access to vital tactical communication assets at all times. The backup design allows for continuous operations in severe weather, such as cyclones, that may eliminate systems or radio sites. Exelis C4i is based in Melbourne, Australia and provides advanced communications software that supports mission-critical communications for a range of applications, including air traffic management, defense, public safety, mining, and homeland security. C4i Pty. Ltd. was acquired by Exelis in January 2013.

KVH Industries acquires Headland Media

KVH Industries, Inc. has acquired Headland Media Limited, a media and entertainment services company. Headland Media is a leading provider of commercially licensed news, sports, movies, and music content sold in the maritime, hotel, and retail markets.

"The acquisition of Headland Media supports our strategic vision of extending our maritime broadband service to also include delivering premium content to vessels," said Martin Kits van Heyningen, KVH's chief executive officer. "We've captured a leading market share in the maritime VSAT market for one-to-one connectivity and are now rolling out a new, highly efficient, low-cost multicasting capability that we believe will create significant growth opportunities for Headland Media's content by eliminating the time and cost of physically delivering DVDs to vessels. For KVH's mini-VSAT Broadband service, Headland Media's premium content offers us a great opportunity to create exciting new services that will help our customers keep their crews happy and, in the process, help us differentiate our service and increase our ARPUs."

With extensive experience in the licensed content business, UK-based Headland Media has 115 employees and offices in the UK, Europe, the United States, India, and the Philippines. Headland Media has established relationships with content providers and a customer base of 9,600 vessels, 1,700 hotels, and 1,700 retail outlets receiving their various services. In 2012, Headland Media generated revenue of $12.2 million, of which approximately 85% was derived from annual subscription-based services. During that same period, the gross profit margin was almost 78%.

Headland Media provides television shows, premium movies, sports, news channels, and music for exhibition in commercial locations, which include ships at sea. KVH's capabilities to multicast data in the background during network idle times and cache,

manage, and distribute data onboard vessels using its Integrated CommBox Modem (ICM) will serve as key enabling technology for Headland Media's services. Headland Media's broad content range, which KVH intends to deliver over the mini-VSAT Broadband network, will also enable KVH to bring Internet Protocol television (IPTV) technology to the maritime market.

For more information, visit www.kvh.com.

Boatracs sees growing demand for fleet management software

Boatracs Inc. announced that over 2,000 vessels are now being managed with Boatracs BTConnect®, making it the most widely used vessel tracking and fleet management software in the U.S. commercial maritime market. BTConnect® is the only fleet management platform to combine visual monitoring of vessel positions on an interactive map with location-based two-way messaging and reporting, providing intelligence that enables owners and operators of offshore service, inland waterways, coastal workboat, and commercial fishing fleets to run their companies more efficiently, safely, and profitably.

BTConnect® was launched to the maritime industry in North America as Boatracs' next generation fleet management platform in early 2012, introducing a shore-side user interface that is web-based for flexible access to fleet-wide data from any computer, tablet, or smart phone. The shore-side software was designed to improve efficiency with a single display that combines automated position reports with a host of other valuable features, including route planning, map overlays, custom landmarks, and historical vessel positions as well as two-way messages, logs, and reports that include detailed vessel position information on all shipto-shore communications. An optional vessel side application is also available with a simple user interface for captains to receive and send messages and logs to facilitate collecting critical vessel data.

BTConnect® supports hardware on the OmniTRACS, AIS, KVH mini-VSAT, and Iridium satellite networks. Boatracs is one of the few companies serving the maritime industry that provides both software and satellite communications hardware. That unique perspective has driven software development optimized for maritime communications networks by utilizing data compression and least-cost routing to minimize data transmission costs.

Benefits of Boatracs BTConnect® include:

- Integrated view to allow dispatch to monitor vessel positions and send a message or work order from the same display to streamline operations; positions are included on every ship-to-shore communication sent so fleet managers know what and where events occur.
- Custom landmarks and global map layers to monitor and manage vessels with greater precision to increase vessel productivity and ensure compliance with regulations.
- Extensive permission settings for granting limited or full information access to select employees, customers, or third parties to put the right information in the hands of the right users.
- Notifications tool to automatically route messages and logs to designated departments — billing information can go to accounting while safety information goes to HSE and vessel information goes to engineering — distributing vessel data easily and efficiently.
- BTConnect® API to access data for back-office integration with databases and other applications such as accounting to streamline billing.
- BTConnect® integrates AIS data in its interface for even greater operational value.

For more information, visit www.boatracs.com.

KVH introduces IP-MobileCast service for mini-VSAT Broadband network

KVH Industries, Inc. debuted its new IP-MobileCast™ content delivery service for its market-leading mini-VSAT Broadband℠ satellite network. The IP-MobileCast™ service solves an important problem for maritime customers by providing an affordable way to receive large files through satellite links to their ships. These links are designed to allow electronic charts, detailed weather forecasts, e-learning materials, live news, sports clips, movies, IPTV, and IP-radio to be economically delivered to ships at sea. The new service is expected to be available later this year and will take advantage of additional capacity, delivering content "over the top" of the mini-VSAT Broadband℠ network in a separate data stream without impacting customers' contracted data speeds or airtime rate plans.

KVH's IP-MobileCast™ service is designed to be an end-to-end solution that will use KVH's CommBox™ Ship/Shore Network Manager to efficiently transmit content over the mini-VSAT Broadband network. KVH's new TracPhone® V3-IP, V7-IP, and V11-IP all use the new Integrated CommBox™ Modem (ICM), which

enables the systems to receive and decode multicast content. KVH also offers a stand-alone CommBox™ server for owners of legacy systems, making the IP-MobileCast™ service available to all mini-VSAT Broadband[SM] subscribers. User devices that may access the multicast data stored on the onboard server include ECDIS navigation systems, desktop, laptop, tablet computers, smartphones, smart TVs, and any other IP-enabled device.

The IP-MobileCast™ service will use proprietary software designed to provide advanced error correction, compression, and validation of data integrity throughout the transmission from shore to ship for unparalleled reliability and efficiency. Shoreside servers encode files for transmission and queue them for multicast delivery "over the top" of the mini-VSAT Broadband[SM] network. The IP-MobileCast™ service's patented Forward Error Correction (FEC) technology will help ensure that the CommBox servers on ships receive each file in perfect condition the first time it is transmitted. The unique FEC algorithms deliver the highest level of file reliability by accommodating intermittent, non-continuous transmission, which might happen when large transmissions are interrupted by prioritized network traffic or in very poor weather conditions.

The file is transmitted once and is received by every vessel in the satellite footprint. If the vessel has subscribed to that particular content, the data are stored and decoded using rights management software on the CommBox™, and then made available on the onboard server. Normal mini-VSAT Broadband[SM] ship-to-shore and shore-to-ship transmissions are prioritized over the IP-MobileCast™ service and are completely unaffected in terms of speed or added airtime cost.

For more information, visit www.kvh.com.

Swire upgrades to FleetBroadband Unlimited

Swire Pacific Offshore (SPO), a Singapore-based leading service provider to the offshore oil and gas industry, is upgrading to Inmarsat's FleetBroadband (FB) Unlimited plan. The "all-you-can-eat" service will be provided on 65 of SPO's vessels by Inmarsat partner Station711, the mobile satellite arm of RRsat Global Communications Network Ltd. and Inmarsat service provider SMTS.

SPO's decision to upgrade from its previous FB 5-GB service was driven by the need to further enhance operational efficiency across its fleet and support the growing demand for increasingly important crew welfare services beyond basic e-mail.

Crew welfare was probably the most important consideration for the upgrade. SPO provides Internet access free-of-charge to all members of the crew, averaging 15 persons per vessel. SPO has also allocated an adequate number of computer terminals to ensure that everyone gets a chance to go online during the day.

The upgrade agreement for SPO comprises SAILOR FB500 terminals, on-going maintenance and support services, and Station711's smart@sea communication gateway, which was originally installed as part of the FB 5-GB contract awarded back in 2011.

SMTS will conduct surveys of all SPO's vessels before carrying out the installation of the antennas and FleetBroadband terminals as well as the on-board Local Area Networks (LANs). Station711 will provide the satcom management and control toolset based on its DPlatform solution. This is in addition to smart@sea for Unified Threat Management (UTM) security, the crew welfare voice and data module, IP traffic real-time compression, acceleration, caching and filtering, shore-side unified POP facility providing a centralized management interface, and a powerful control system.

For more information, visit www.inmarsat.com or www.station711.com.

Diginonymous offers shipboard video telemedicine initiative

Software developer Diginonymous LLC and Maritime Medical Access Program at The George Washington University (GWU) Medical Faculty Associates have teamed up to offer an advanced shipboard video telemedicine service for the international maritime industry to help clients meet the International Labor Organization's (ILO) Maritime Labor Convention (MLC) 2006 requirements for crew healthcare.

The GWU Maritime Medical Access Program and Diginonymous developed the Digi+Doc service, a maritime medical solution leveraging GWU's decades of experience and Diginonymous' innovative products to provide immediate, round-the-clock phone and video medical consults for ships at sea. Digi+Doc subscribers, including current shipowners such as Maersk Line, Limited, have immediate access to a team of more than 550 physicians and specialists at the GWU Medical Faculty. The use of Digi+Doc as an innovative way to meet the MLC 2006 healthcare requirements.

Digi+Doc communications systems are based on the DigiGone™ software platform, which offers low-cost, encrypted video and audio conferencing, video streaming, Voice over IP (VoIP), IM Chat, and file transfer, optimized for maritime satellite channels. The DigiGone™ software installs on most PCs, laptops, tablets, or smartphones. It can work over VSAT, Inmarsat, Thuraya IP, and other networks, with satellite airtime costs much lower than other commercial teleconferencing services, such as Skype.

In addition to teleconferencing, Diginonymous' Remote Viewing Station (RVS) for Telemedicine enhances a vessel's ability to access medical services and transmit medical data. The kit facilitates the real-time transmission of data from the ship to a remote clinician through instruments such as a handheld electrocardiogram device, blood pressure machine, electronic thermometer, and microscope camera.

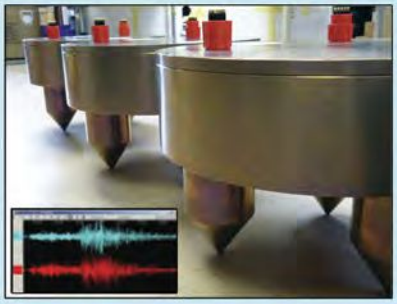
Title 4 of MLC 2006 requires that health protection and medical care for seafarers must be as compatible as possible to that which is generally available to workers ashore, including prompt access to the necessary medicines, medical equipment, and facilities for diagnosis, treatment, to medical information, and expertise. Having been ratified by more than 30 member states reflecting more than 33 percent of world gross tonnage, MLC 2006 comes into effect on 20 August 2013. This comprehensive document applies to more than 1.2 million seafarers, including those working on ships whose flag states have not ratified the Convention.

The DigiGone™ video software and hardware kit can also be used for other shipboard applications such as troubleshooting equipment failures and real-time anti-piracy security, in addition to telemedicine.

All that's needed for shipowners to take advantage of Digi+Doc is to install the DigiGone™ software on a shipboard computer, and sign up for an annual subscription to the Maritime Medical Access Service at GWU.

The entire cost of the system, including software license, medical access subscription, and satellite airtime, is far less than the expense of a single incident requiring medical evacuation or port diversion. In addition, the telemedicine service can reduce time off for a sick or injured crew member, and will provide important documentation in the event of a crew claim.

For more information, visit www.diginonymous.com.



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Experts in Seafloor Communications Network

CSnet offers end-to-end solutions providing global users a pre-engineered, expandable, portable system that can be deployed and redeployed anywhere – in water depths up to 3,000 meters. Meeting the needs for a wide range of spatial, power or bandwidth requirements, the Offshore Communications Backbone (OCB) serves research, industrial and government applications, providing the infrastructure needed to deliver power in support of continuous 24/7 monitoring; delivering data and providing command and control on-shore via satellite or shore-ended cable.

Offshore Communications Backbone

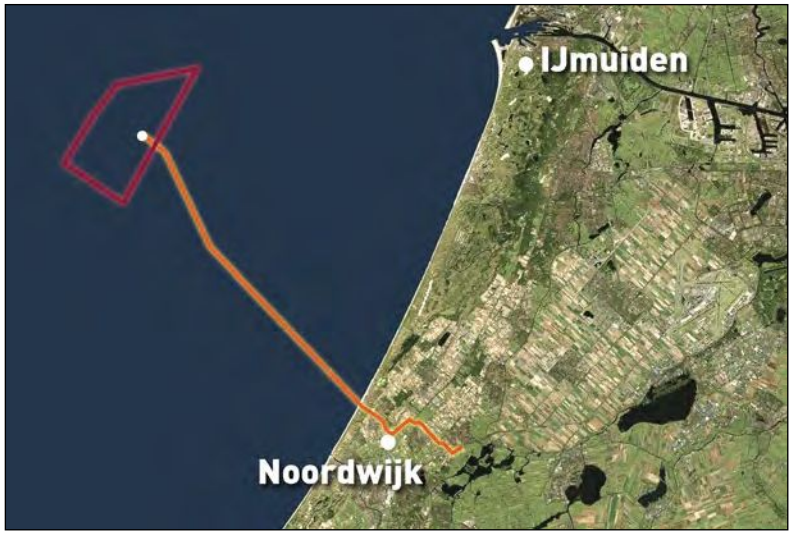
The OCB is a modular seafloor communications network that is directly connected to the Internet. Clients can provide and control their own sensors and data outputs, or CSnet can provide a suite of sensors from the surface to the seafloor with data directly forwarded to the client's onshore facilities. CSnet's OCB allows for individual component and end to end networked testing of power and communications functionality during the buildup and pre-deployment phases, ensuring a cost effective and successful installation. The OCB represents a proven network module that has been designed, constructed and tested, eliminating upstart time and cost. Each OCB module is expandable and so can be configured to accommodate large or small applications at a predictable cost.

Infinera grows 100-G subsea network footprint
Infinera announced that its DTN-X platform with ultra-long haul 500-G FlexCoherent™ super-channel technology is now being deployed in eight subsea networks across approximately 38,000 route-km of undersea fiber. Infinera has publicly announced the DTN-X platform in submarine networks with customers, including Telefonica, MedNautilus, PIPE Networks, PACNET, and KDDI. Infinera's solutions, long valued for their scalability, simplicity, and efficiency have reduced deployment times from months to days, while also improving space utilization by up to 33%. Submarine network operators have leveraged this new level of speed and efficiency along with the unique operational efficiency of 500-G WDM super-channels enabling them to build subsea networks faster while driving down Total Cost of Ownership (TCO). Further, Infinera subsea solutions, which are built on ultra-reliable photonic integrated circuit technology, are seamlessly integrated with terrestrial networks, reducing costs by eliminating equipment and power requirements while further improving overall network reliability and resiliency. Infinera continues to add capabilities to Infinera's submarine solutions to support network operators. Earlier this year, Infinera conducted a trial with Telstra Global, successfully demonstrating Soft Decision Forward Error Correction (SD-FEC) across a 4,200-km submarine link between Hawaii and California.

E SubCom sets record for transpacific transmission
E SubCom, a TE Connectivity Ltd. company, announced that its engineers have demonstrated record-breaking transpacific transmission using both 200-Gbps and 400-Gbps data channels. The results, presented at the recent post-deadline session of the 2013 OFC/NFOEC conference in Anaheim, California, demonstrated a total capacity on a single fiber pair of 21 Tb/s transmitted over more than 10,000 km at a spectral efficiency of 6 b/s/Hz. This achievement was enabled by careful engineering of the transmitted signals in order to achieve both long-distance performance and high spectral utilization. "Transpacific length transmission at 6 b/s/Hz spectral efficiency is a significant milestone for undersea communications," said Seymour Shapiro, CTO, TE SubCom. "More impressive is that this was achieved using both 200-Gbps and 400-Gbps channels and large total capacity. Such 400-Gbps laboratory experiments typically require multiple coherent receivers, whereas our recent demonstration used a single high-bandwidth receiver." In the first part of this groundbreaking demonstration, 106 channels at 200 Gbps each were transmitted over 10,300 km with only 33-GHz channel spacing. In the second part of the experiment, the same total capacity was transmitted over 9,200 km in 53 super-channels at 400 Gbps each, where each super-channel was detected by a single high-bandwidth receiver.

SSE pulls out of NorthConnect
Scottish energy company SSE will no longer have a financial involvement in NorthConnect, the interconnector development company seeking to build a subsea electricity cable between Great Britain and Norway. NorthConnect partners (Vattenfall UK, E-CO Energi, Agder Energi (AE), and Lyse) remain fully committed to developing the interconnector. The decision by SSE does not affect the deliverability of the project. SSE's decision is in line with its financial report for the 6 months to 30 September 2012 where it announced its intention to focus on its core markets (Great Britain and Ireland) in order to develop the broad portfolio of investment options held in both jurisdictions. Following an internal review of the project, it was deemed that a combination of the need to focus on core markets, the number of alternative investment opportunities available (particularly in network and generation assets), and the lack of short-term clarity on the regulatory regime around interconnectors meant that continuing the project was not in SSE's strategic interest. SSE continues to be supportive of the project itself as well as increased (commercially developed) interconnection and will retain contact with the other owners should priorities change.

LS Cable & System wins two European contracts



LS Cable & System will be the first cable maker in Korea to introduce the High Voltage Direct Current (HVDC) cables to the European market. On 15 April, the company announced that it would supply 24.5 km of 285-kV extra high voltage submarine cables and connectors to Energinet.dk- and 25.7 km of 150-kV alternating current extra high voltage submarine cables and connectors to Van Oord in the Netherlands, a leading international contractor specializing in offshore projects.

The HVDC cables supplied to Denmark will be the first such cables to be exported. They will be used to replace one of the old submarine cables installed between Jutland and Laesoe Island in the northeastern part of Denmark. HVDC refers to the method of converting the alternate current generated by the power plant into direct current, transmitting it, converting it back into alternate current, and supplying it. It can transmit a large quantity of electric power over a long distance with the minimum loss. The extra-high voltage cables used for this purpose must be robust against the high voltage applied to the cables during transmission of direct current. Only LS Cable & System can make such HVDC cables in Korea. The entire HVDC market is worth only KRW 4 trillion as of 2012, but is expected to rapidly grow and be worth more than KRW 70 trillion. So, the HVDC cable market is also expected to grow fast. Accordingly, LS Cable & System is as good as having established a bridgehead for entrance into the global HVDC market.

The cables supplied to the Netherlands will be used to connect the Dutch power grid to the Luchterduinen offshore wind farm, which will consist of 43 wind turbines and is being constructed in the North Sea. The farm is scheduled to commence operations in 2015.

For more information, visit www.lscns.com.

OSI achieves major milestone in Gulf of Thailand offshore fiber network

Ocean Specialists, Inc. (OSI) reports that 11 major oil and gas company offshore platforms located in the Gulf of Thailand are now connected to shore via a submarine fiber optic network. This caps a 6-year, groundbreaking involvement by OSI in developing the initial technical feasibility and then the detailed commercial business model development for a network that serves the major oil and gas operators in the region.

The fiber optic network connection will allow these offshore facilities to deploy the latest available technology to deliver greater efficiency for their exploration and production operations.

Jim Byous, OSI president, commented, "From initial conceptualization stages in the last decade, this sort of leading-edge fiber deployment has now become an accelerating trend across the offshore hydrocarbon production sector and has caught the attention of operators globally. An increasing number of producers are recognizing the benefits of broadband communications as a key enabler to their offshore "factory environment."

OSI worked closely with both the network owner and the oil companies that are the customers of the communications services provided on the network.

Pierre Tremblay, managing director of OSI's Asia Pacific region, stated, "As the lead technical and commercial consultants for this project, we are very proud to have supported world-class energy companies throughout the planning, design, and execution of the project." The continued rise in bandwidth demand as an enabler for greater efficiency further demonstrates that fiber optic systems will become the dominant technology for new offshore facilities in the years to come.

In addition to the Gulf of Thailand, OSI has supported more than 15 offshore oil and gas fiber network projects worldwide, including four major networks currently in various stages of development and construction in the EMEA region.

For more information, visit www.oceanspecialists.com.

Tunisian carriers sign agreement for Didon cable

Tunisiana and Orange Tunisia announced the signing of a partnership agreement with Interoute, the owner operator of Europe's largest next generation network, for the commissioning of a submarine cable, called Didon. The cable will connect the city of Kélibia, Tunisia to Interoute's pan European fiber optic network via its landing station in Mazara del Vallo, Siciliy, Italy. Didon, Tunisia's first private submarine cable, will cover nearly 170 km of optical fiber and be a real force for social development and economic growth for the country. The commissioning of the Didon cable is planned for April 2014, and its capacity will reach 8 Tb per second and per operator.

The signing of this agreement is part of the national initiative to support and strengthen the ICT sector and offer Tunisians additional access to international broadband networks and at reduced rates.

The new cable connection will use Alcatel-Lucent's submarine technology and be capable of handling data speeds of 100 Gbps and will help address the fast-growing demand for fixed and mobile broadband services in Tunisia and throughout the region as well as increase the reliability of the system dramatically. The submarine cable will provide the highest quality of service to subscribers of the two Tunisian operators by improving the capabilities of their existing international networks and providing better throughput to support continued growth in data traffic. The aim is also to provide more capacity and security for Internet users.

Tunisia has one of the most modern broadband infrastructures in the Mediterranean basin, with high-speed terrestrial and undersea links providing a fully digitalized network that provides an international gateway to broader global networks. Tunisiana and Orange Tunisia offer a wide range of mobile and fixed applications ranging from Internet-on-the-go to information and entertainment services for more than 9 million subscribers.

With this investment partnership, Tunisiana and Orange Tunisia once again demonstrate their willingness to provide their consumers and business customers services in accordance with international quality standards. All this with controlled costs, allowing them to have substantial capacity voice and data and expand opportunities in terms of connectivity and sharing data and information with the world.

For more information, visit www.alcatel-lucent.com.

Next SubOptic in Dubai

In a first for the Middle East region, E-marine, the principal provider of submarine cable solutions in the Middle East, has announced that it will host the next edition of SubOptic, the largest global conference for the submarine cable industry in Dubai, UAE.

The announcement was made during the closing ceremony of SubOptic 2013 and will see the event arrive in the Middle East region during late 2015 or 2016. As one of the highlights on the submarine cable industry calendar, the event is held every 3 years "by the industry, for the industry." It attracts between 600 and 700 attendees from over 200 organizations that span cable and component manufacturers, network, and system capacity purchasers, business analysts, regulators, financiers, and investors.

In recent years, the Middle East region has seen an influx in the construction and announcement of new submarine cable systems, competing terrestrial systems, and the total demand for international capacity from the Gulf countries has shown significant growth. The main drivers of this surge in activity are an increase of broadband penetration and availability, mobile penetration, and an increase in digital content consumption and emergence of local content.

Fiona Beck, president of SubOptic, said, "This will be the first time that SubOptic has ever been taken place outside of Europe, Japan, or the United States in its more than 25 years of existence and where better than an exciting global city such as Dubai. The excellent international flight connections and hospitality infrastructure make it the ideal place to discuss and promote the submarine cable industry, against a backdrop of significant growth expected in Middle East capacity over the coming years."

For more information, visit www.suboptic.org.

GlobeNet completes construction of Bermuda-U.S. (Segment 5) replacement

GlobeNet, a wholly owned subsidiary of Oi, has completed construction on its new, high-capacity subsea cable system (Segment 5). The new subsea cable system has a total design capacity of 30 Tbps and links Bermuda and the United States. The build was first announced in January 2012 and will provide more than 30 times the previously lit capacity between Bermuda and the United States.

Designed to support 150 wavelengths per fiber-pair at 100 Gbps per wavelength, the new segment is approximately 1,350 km in length and lands in St. David's, Bermuda, and Tuckerton, New Jersey. As an integral part of GlobeNet's dual-ring subsea cable system, Segment 5 has the largest cross-sectional capacity per fiber pair of any system built or contracted to date.

The Segment 5 system includes the use of TE SubCom Submarine Line Terminating Equipment (SLTE), which allows transmission of multiple high-quality, high-bandwidth optical signals over ultra-long distances.

The new cable segment is in response to the explosive demand across Latin America for high-speed bandwidth to support the wide adoption of video, gaming, and online data services over the past few years.

For more information, visit www.globenet.net.

Reliance picks Ciena® for FA-1 South upgrade

Ciena® Corporation announced that Reliance Globalcom is upgrading its trans-Atlantic FA-1 South submarine network with Ciena®'s GeoMesh solution. This upgrade will help Reliance Globalcom to better address growing global bandwidth demand for cloud computing, video, and other high-bandwidth services along the critical transatlantic corridor.

Reliance Globalcom owns and operates one of the world's largest and most advanced private submarine networks, spanning more than 73,000 km. When combined with more than 200,000 km of domestic fiber owned by its parent company, Reliance Communications, the combined global network connects over 40 key business markets across India, the Middle East, Asia, Europe, and the United States.

With Ciena®'s GeoMesh solution (based on its market-leading 6500 Packet-Optical Platform powered by WaveLogic 3 coherent optical processors and optical bypass), Reliance Globalcom will have what is expected to be one of the first transatlantic submarine networks capable of supporting OTN-based client services from OTU2 (10 G) to OTU4 (100 G). It will allow Reliance Globalcom to provide 100-GbE services between continental points of presence (PoPs) — whether a large data center or a central office.

The network upgrade will be managed by Ciena®'s OneControl Unified Management System that provides multi-layer service management capabilities to enable streamlined service activation, robust fault management, and comprehensive performance monitoring, which results in optimal use of critical network assets, all the way from its New York PoP to its Paris PoP.

Ciena® is also providing Reliance Globalcom with professional services through its specialist services portfolio, specifically for installation, integration, testing, and support.

This deployment builds on a long-standing relationship between Ciena®, Reliance Globalcom, and Reliance Communications. Over the past year, Ciena® solutions have been used in several strategic capacity upgrades to support Reliance Globalcom's submarine network, including a 100-G coherent capacity upgrade to its Hawk network from Marseille to London and its FEA network from Suez to Aqaba.

For more information, visit www.ciena.com.

Telefonica, Cisco® complete IPoDWDM trial

Cisco® and Telefonica Global Solutions have successfully completed a long-distance, 100-Gbps technology trial intended to increase available bandwidth, simplify network operations, reduce capital expenses, and help the user in a new generation of consumer and business services.

Telefonica and Cisco® completed the Internet protocol over wavelength-division multiplexing (IPoDWDM) trial using integrated, coherent 100-Gbps optical interfaces in the Cisco® Carrier Routing System (CRS) to prepare Telefonica's network for growth and services. IPoDWDM is an advanced technology that enables high-speed Internet services over existing DWDM networks, thereby eliminating the need for network upgrades and accelerating the introduction of new, higher-speed Internet services.

With the explosive growth of IP traffic driven by video, mobile, cloud services, and business applications, service providers are looking for ways to increase network capacity while also increasing network availability and reliability to deliver next-generation Internet experiences. The recently completed trial used Cisco®'s CRS core router, generating a standards-compliant 100-Gbps "alien wavelength" directly into Telefonica's existing submarine network between Boca Raton, Florida- and Puerto Rico. The total distance was a record-setting 4,000 km (nearly 2,500 mi). The underwater round trip span consisted of DWDM transport systems from multiple vendors — the longest such IPoDWDM test ever completed. Additional shorter tests using only terrestrial fibers were also successful.

Integrating the DWDM components into the router eliminates the need for a costly external transponder. Furthermore, Cisco®'s nLight™ coherent technology eliminates the need for additional dispersion compensation units and electrical and optical regeneration equipment that cannot be added to an existing submarine cable link. This helps further reduce capital and operational expenses.

IPoDWDM helps service providers increase operational efficiencies and realize significant cost savings in power and real estate through equipment reduction while deploying an eco-friendly solution that helps reduce the network carbon footprint.

For more information, visit www.telefonica.com.

Xtera to upgrade ECFS

The Eastern Caribbean Fiber System (ECFS) consortium has selected Xtera Communications, Inc. for the upgrade of its festoon submarine fiber optic cable system.

The ECFS subsea cable system is made of 10 segments connecting Tortola in the British Virgin Islands to Trinidad at the south of the Caribbean arc. Xtera's Nu-Wave Optima™ equipment offers the possibility to mix 10-G and 100-G channel rates to support existing and emerging high-capacity services. Reconfigurable Optical Add Drop Multiplexers (ROADMs) are used in cable landing stations to avoid or minimize the number of regeneration points for island-to-island connectivity.

The latest upgrade of ECFS continues the consortium's commitment to provide new and improved communication services to the region. The additional bandwidth will allow significant improvement in Internet access for residents, tourists, and business customers. In addition, the network provides a robust backbone that allows wireless customers to communicate across islands and to the rest of the world. The participants of the ECFS consortium will enjoy increased flexibility to offer new bundled and unbundled services and are better positioned to take advantage in the growth of cloud services.

Xtera's Nu-Wave Optima™ platform is a unique modular optical transport system designed to lower the total cost of ownership by using a common, integrated set of modules for long-haul unrepeatered and regional repeatered submarine applications.

Being the world's first 100-G equipment in the field since the second half of 2011 with soft-decision Forward Error Correction (FEC), Xtera's Nu-Wave Optima™ offers the industry's most advanced 100-G solution that is available today for multiple optical networking applications. For terrestrial backbone networks, the Nu-Wave Optima™ equipment delivers an unrivaled line capacity of 15 Tbps on more than 3,000 km. For unrepeatered applications, a capacity of 34 x 100G was recently transmitted over a cable attenuation exceeding 74 dB.

For more information, visit www.xtera.com.

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Subsea 7 uses Nexans DEH system

Nexans has been awarded a €25 million contract by Subsea 7 to design and manufacture the direct electrical heating (DEH) system for the subsea pipelines serving the Lianzi oil field development located in a unitized offshore zone between the Republic of Congo and the Republic of Angola. The Lianzi field is operated by Chevron Overseas (Congo) Limited.

The contract with Subsea 7 covers the delivery of a complete DEH system, including DEH riser cable, armored feeder cable, a 43-km long piggyback cable, and all associated accessories for connection to the pipeline that will connect the Lianzi Development Project subsea facilities with the BBLT platform. The piggyback cable incorporates Nexans' field-proven Integrated Protection System (IPS).

DEH is a technology for flow assurance developed to safeguard the wellstream through the pipeline to the platform. Alternating current transmitted from the DEH cable runs through the steel in the pipe, which heats due to its own electrical resistance. By controlling the current, the pipeline inner wall can, at all times, be maintained above the critical temperature for wax and hydrate formation. The DEH system eliminates the need for chemical injection, pressure evacuation, or other flow assurance methods that might have environmental or operational challenges. DEH allows the pipeline to be operated in a cost-efficient and environmentally safe manner.

The cables for the Lianzi DEH system will be manufactured at the Nexans factory in Halden, Norway for delivery during the summer of 2014.

For more information, visit www.nexans.com.

Siem orders DP cable lay vessel

Siem Offshore contracted Remontowa Shipbuilding S.A. of Poland to construct a dynamically positioned(DP) cable lay vessel (CLV). The associated gross project cost for the first vessel, scheduled for April 2015 and ready for operation, is approximately $85 million.

The CLV has been designed in close cooperation with VARD Design and will have an overall length of 95.3 m, a breadth of 21.5 m, a cable payload of 4,250 tons and accommodation for 60 persons. The CLV will be equipped with a state-of-the-art diesel-electric propulsion system consisting of four main generators providing power to two azimuth propulsion thrusters, two tunnel thrusters, and one retractable thruster, ensuring excellent station-keeping capability as well as environmentally friendly and fuel-efficient marine operations.

The focus for the design of this vessel has been to meet the challenging requirements of the installation, repair, and maintenance of medium and high-voltage submarine cable systems within the offshore renewable energy and offshore oil and gas markets.

Siem Offshore said that the contract for the CLV is the next step within its long-term strategy to support its subsidiary Siem Offshore Contractors with high-end installation and support assets to further strengthen its ambition to become the leading provider in the area of submarine cable installation services. The new ship is planned for work in combination with an installation support vessel ordered by Siem Offshore in October 2012.

For more information, visit www.siemoffshore.com.

Alcatel-Lucent signs maintenance agreement for WACS

Alcatel-Lucent and the West Africa Cable System (WACS) consortium have signed a contract for the maintenance of more than 9,000 km of the WACS system linking South Africa to Portugal. In commercial service since May 2012, WACS interconnects 13 African countries, unleashing a new wave of broadband capacity on the continent and enhancing international connectivity.

Under the new agreement, WACS will join the Atlantic Private Maintenance Agreement (APMA), allowing the consortium to access Alcatel-Lucent's maintenance vessels as well as experienced, fully trained, and certified specialist personnel for cable repairs.

In delivering high-speed bandwidth of more than 5 Tbps, the WACS infrastructure provides open access to regional telecom operators and Internet service providers. Furthermore, it contributes to opening up broadband in Africa, lowering the cost of access and allowing the delivery of innovative applications such as e-education and e-health, contributing to the improvement of people's lives.

For more information, visit www.alcatel-lucent.com.

Emerald Networks announces landing party agreement

Emerald Networks, a new-build network submarine cable system that will connect North America to Europe and Iceland, announced the signing of an agreement with Mayo County Council.

Under this agreement, Mayo County Council will provide certain rights and required support for the landing site of the Emerald Express subsea cable in County Mayo, Ireland. This infrastructure will enable Emerald Express to utilize the most innovative optical technologies and provide the most advanced undersea telecommunications system constructed to date.

Emerald Networks is an open network architecture platform that is agnostic and enables upgrades with various new technologies. It will be the first 100-G system with a unique route that links Shirley, New York to the West Coast of Ireland with a branch connection to Grindavik, Iceland and a future branch connection to Southern Europe. The system is scheduled to be ready for service by the third quarter of 2014.

For more information, visit www.emeraldnetworks.com.

Xtera expands turnkey offering and joins ICPC

Xtera Communications, Inc. announced further steps to expand its footprint in the turnkey solutions market in conjunction with the recent introduction of its repeater at SubOptic 2013 in Paris, France. The company said it has significantly increased its internal and external skillset to support full turnkey projects and that it has been accepted as a full member of the International Cable Protection Committee (ICPC).

Xtera has taken a step-by-step approach in building and expanding its expertise and credibility to deliver full solutions to submarine network operators — starting from involvement in unrepeatered new builds and redeployments to more recently delivering projects as a prime contractor or jointly with other suppliers, such as the Guam-Okinawa-Kyushu-Incheon project in Asia for AT&T.

The ICPC is a non-profit organization with the vision to be the premier international submarine cable authority providing leadership and guidance on issues related to submarine cable security and reliability.

For more information, visit www.xtera.com.

BMT delivers metocean support for cable projects

BMT ARGOSS (BMT), a subsidiary of BMT Group, has recently completed a comprehensive evaluation of meteorological and oceanographic environmental conditions for the Martin Linge field in the Norwegian sector of the northern North Sea. BMT's assessment also included the installation routes of associated subsea assets, a submarine power cable to Kollsnes (Norway) across the Norwegian Trench via the Troll field, a fiber-optic network to Huldra, and a pipeline to the TP1 tie-in point. This work was an extension of metocean studies previously performed by BMT for Total Norge AS in the region.

The Martin Linge gas field is approximately midway between the Shetland Islands and the Norwegian coast in approximately 115-m water depth. The Huldra and TP1 sites are in equivalent water depths, and a spatial review of the western study area was completed to check the validity of using the Martin Linge Criteria at these three sites.

To provide power to the Martin Linge field from the Norwegian mainland electrical grid, Total selected a new 170-km long submarine power cable — the world's longest alternating current power line from shore to an offshore platform. The subsea cable running between Martin Linge and Kollsnes crosses the Norwegian Trench that reaches its deepest (approximately 300 m) in the vicinity of the Troll Field.

This study involved a collation of existing BMT and third-party reports as well as new analysis to evaluate both extreme design and typical (ambient) operational conditions in order to provide a single, comprehensive study for the development project.

BMT worked closely with Total Norge AS to determine the optimal approach to extend the existing information and cover the new requirements. This included carrying out spectral wave transformation modeling of BMT's EU Shelf hindcast to nearshore Kollsnes — the analysis of which was then integrated with the wider region study. The spatial overview of the western sites and recommended changes to existing criteria helped BMT deliver a timely and comprehensive final report.

For more information, visit www.bmtargoss.com.

JDR completes successful delivery of complex project for Santos

JDR has delivered a complex scope of work for the Australian oil and gas operator Santos. The project includes the design, manufacture, and supply of subsea production umbilicals and subsea power cables. These products will be used to enhance oil recovery at Santos' Fletcher Finucane Project offshore Western Australia.

This represents the delivery of another major project for JDR and comes after significant new business wins for the Group, which included the award of contracts from Swiber Offshore Construction, Otto Energy, and Premier Oil in recent months. It demonstrates the market's recognition of JDR's ability to deliver a complex, end-to-end product.

The subsea production umbilicals and subsea power cables created for the Santos project were designed by JDR's in-house engineering team. The team specializes in custom-engineered systems for subsea installations and interventions at ever-increasing water depths and distances, designing products to meet the most complex and demanding project requirements.

The umbilical and cable package totaled over 50 km in length and were manufactured and loaded out of JDR's state-of-the art facility in Hartlepool. JDR's Hartlepool plant features multiple manufacture routes for both products, enabling it to offer quality products with competitive delivery times. Aftermarket support will be provided by JDR's AIM Services, which provides 24/7 aftermarket, installation, and maintenance through a global network of highly experienced and fully certified technicians.

For more information, visit www.jdrcables.com.

ESS to deploy SCAR plough system on Baltic 2

Ecosse Subsea Systems (ESS) has been awarded its largest boulder clearing and multi-pass trenching contract to date by Siem Offshore Contractors. ESS will deploy its SCAR plough system for clearing and pre-lay trenching operations on a 90-km route on the EnBW-owned Baltic 2 offshore wind farm project.

Baltic 2 is an 80 turbine development located 32 km north of Rügen Island in the Baltic Sea. The 27-sq. km site spans water depths ranging from 20 to 45 m LAT and has a wide array of soil conditions from fine sands to gravels and cobbles.

This 80-cable inter-array workscope follows on from two highly successful projects on behalf of Total in Shetland and on E.ON's Humber Gateway wind farm project in the North Sea. The workscope includes providing a trench design for each array cluster and all pre-engineering, including the provision of

plough tips for variant soil conditions and plough cut depth configuration.

Boulder clearance and multi-pass trenching to 1.5 m depths is scheduled to take place over a 90-km long route. ESS will use its own ROV system to monitor, survey, and record operations, and a vessel-mounted multi-beam will determine the quality of trenching achieved.

Rapid deployment from a range of vessels, including anchor handlers, and smaller operational crews make SCAR much more cost effective compared to traditional subsea plough solutions. It can work in varying soil conditions, and speedy conversion to different plough types offer versatility and greater efficiency.

ESS has mobilized from Aberdeen to Gdansk enroute to the Baltic 2 site and expects the project to be completed within 10 weeks.

For more information, visit www.ecosse-subsea.com.

NKT Cables to acquire Ericsson's power cable operations

NKT Cables has signed a conditional purchase agreement with Ericsson concerning an acquisition of Ericsson's power cable operations. The transaction is subject to relevant regulatory approval and is expected to be completed in the beginning of 3rd quarter 2013. The total consideration amounts to 250 million SEK, equivalent to approx. 220 million DKK (enterprise value).

Ericsson's Energy Business realized a revenue in market prices of approximately 1.3 billion DKK in 2012, and the company is a leading supplier of medium voltage products to the Nordic utility groups. In addition, Ericsson's Energy Business is an important supplier of low-voltage products to the wholesalers and installers in Sweden, and a significant portion of revenue also comes from innovative specialty power cables.

The acquisition is a central element in the growth strategy for NKT Cables' products business unit, focusing on strengthening the company's position in the medium and low-voltage cables segment in selected markets. The acquisition of Ericsson's power cable operations will

add a number of unique products to NKT Cables' portfolio, strengthen development competences for new and innovative power solutions, and improve scope for servicing Nordic customers.

NKT Cables will gain approximately 320 employees and a factory in Falun, Sweden, which contains production facilities and a development department as well as sales, and administration. The factory's location and product portfolio will be complementary to NKT Cables' factory in Asnæs, Denmark, thereby creating a cost-efficient production and logistics set-up for servicing the Nordic market.

The transaction is expected to have neutral impact on the NKT Group's earnings in 2013, but to contribute positively as of 2014.

For more information, visit www.nktcables.com.

ABB achieves HVDC technology milestone

ABB has achieved another technology milestone, energizing its fourth generation of HVDC Light® transmission systems. At ±320 kV, this latest innovation sets a new record for voltage-sourced converter (VSC) HVDC applicationscompared with the current maximum installed rating of ±200 kV, accredited to ABB. It will also enable power transmission capacity to be boosted by more than 50% while restricting transmission losses to less than 1% per converter station.

The HVDC Light® converter station was energized at the Dörpen West substation in northern Germany for the Dutch-German transmission system operator, TenneT. This station is the receiving end of the DolWin1 transmission link, which will integrate 800 MW of offshore wind power generated in the North Sea into the European transmission system and will operate at the new record voltage level of ±320 kV.

The advance was made possible by developments in converter technology, a new valve concept, enhanced semiconductor performance, and advanced control systems. It will provide further impetus to the evolution of multi-terminal systems and interconnected HVDC grids, where ABB recently removed a major technology stumbling block with the announcement of its hybrid HVDC breaker development.

ABB pioneered HVDC technology nearly 60 years ago and has built a vast global installed base of more than 90 HVDC projects around the world with a total transmission capacity of over 95,000 MW. HVDC Light® is a manifestation of HVDC that helps to address the needs of underground and subsea transmission, and ABB leads the way in this technology, having delivered more than 20 such converter stations.

HVDC Light® continues to be a preferred solution for long-distance underground and underwater power links and interconnections. This technology is increasingly being deployed across a range of applications, including integration of renewable energies from land-based and offshore wind farms, mainland power supply to islands, offshore oil and gas platforms, city center in-feeds where space is a major constraint, and cross-border interconnections that often connect across the seas. The ability of this technology to meet grid code compliance ensures robust network connections regardless of application.

For more information, visit www.abb.com.

COMPANY SPOTLIGHT

TESLA OFFSHORE LLC.

Integrity is an Essential Component in Tesla Offshore's Expansion Strategy

TESLA OFFSHORE LLC is a survey service provider offering comprehensive geophysical, geoscience, marine construction, and marine salvage support in offshore waters around the world. In recent months, Tesla Offshore has embarked upon a strategic plan for growth marked by key new hires, the launch of a state-of-the-art Autonomous Underwater Vehicle (AUV) program, and a commitment to expanding its global reach.

History

Formed in 2004 from two highly regarded and pioneering survey companies servicing the Gulf of Mexico, Tesla Offshore was inspired by a simple idea: Integrity is not merely a concept, but a series of intentional actions. By continuing to select its people, develop its processes, and maintain only the highest standards of performance with integrity, the quality of Tesla Offshore's products and services are unparalleled in the industry. This core belief has been the driving force behind Tesla Offshore's success and is an essential part of a promising future marked by expansion on numerous fronts.

People

Tesla Offshore's core leadership has worked together since 1976. This extensive history provides unmatched project efficiency, a wealth of pre-existing knowledge of the industry, and quality assurance for the needs of its customers. Tesla Offshore's commitment to integrity in all aspects of its business assures that any new hires are like-minded field leaders who regard quality customer service as the primary focus of business relationships. This is surely the case with the company's most recent additions, each highly respected in his field of expertise. As director of geoscience, Nathaniel Usher will be instrumental in global expansion as well as working with innovative solutions manager, George Loy, to spearhead the implementation of the AUV program from Houston, Texas. Jay Northcutt, a recognized and respected 37-year veteran of the industry, is operations general manager, headquartered in Prairieville, Louisiana. Donizeti Carneiro, a Ph.D. in geophysics and a civil engineer, has joined Tesla Offshore as area manager for South America and will operate from Tesla Offshore's office in Rio de Janeiro, Brazil.

Process

Tesla Offshore's commitment to integrity begins with its mission statement, "To utilize ethical and sound business practices, to provide an unparalleled balance between meeting or exceeding the stated objectives of our customers; Upholding the responsible intentions of the regulatory entities that govern our industry; Providing for the employees and owners of our company; All within a safe and respectful work environment." Bringing the mission to reality manifests in Tesla Offshore's goal to infuse efficiency, quality assurance, and innovation into every effort. As evidenced by satisfied repeat customers and 100% acceptance statistics for final deliverables submitted to customers and governing entities of the industry, the extra efforts are paying off.

Performance

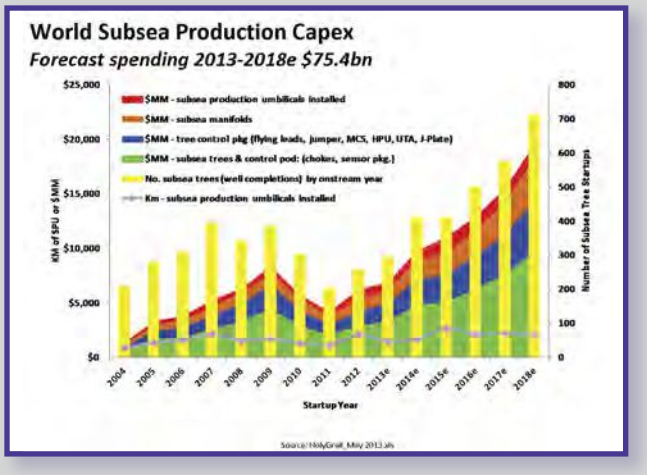
Tesla Offshore's dedication to providing its customers with the most expertly acquired and interpreted data available is exemplified by the purchase of the Bluefin-21 AUV. Acquiring the BF-21 fits Tesla Offshore's intent to expand its presence in deepwater oil and gas field development as well as position itself to pursue governmental, environmental, and academic utilizations. Along with CHIRP subbottom, broadband multibeam echosounder, and high-definition still cameras, Tesla Offshore's will be the first AUV in the industry to boast a fully integrated, state-of-the-art PROSAS® Surveyor synthetic aperture sonar (SAS), produced by Raytheon Applied Signal Technology. In depths up to 4,500 meters, Tesla Offshore will operate the AUV on a global basis and in the Gulf of Mexico, where regulatory agencies are considering proposals that mandate archaeological and shallow hazard survey data be acquired by AUV technologies.

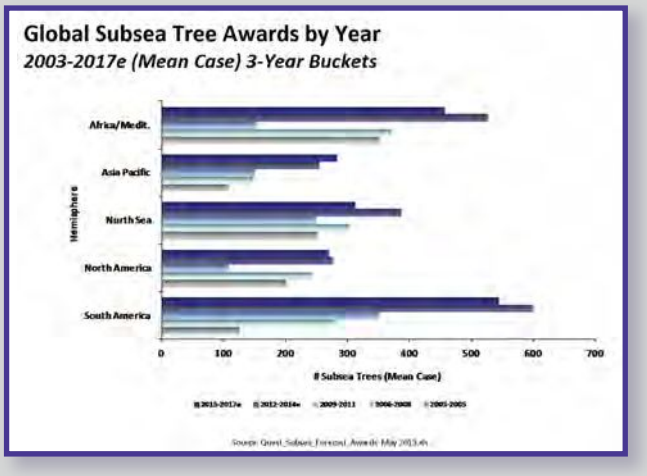
Contact.

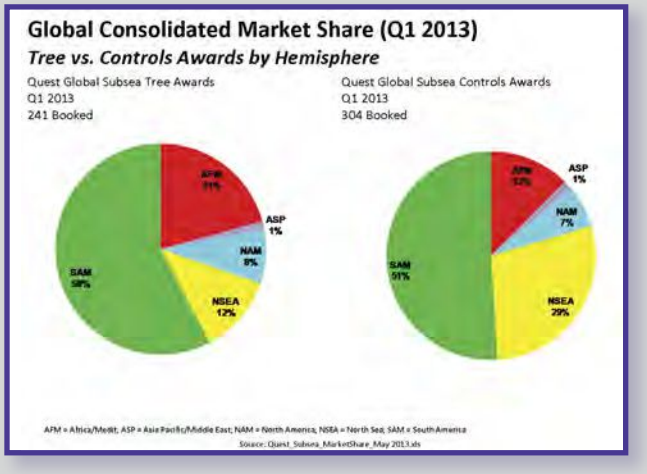
With offices in Houston, Texas, Prairieville, Louisiana and Rio de Janeiro, Brazil, Tesla Offshore LLC serves offshore waters around the globe. For more information, contact C.D. Schempf, Jr., Sr. Vice President of Sales and Marketing, Tesla Offshore LLC, at (281) 880-8015 or schempfc@teslaoffshore.com.

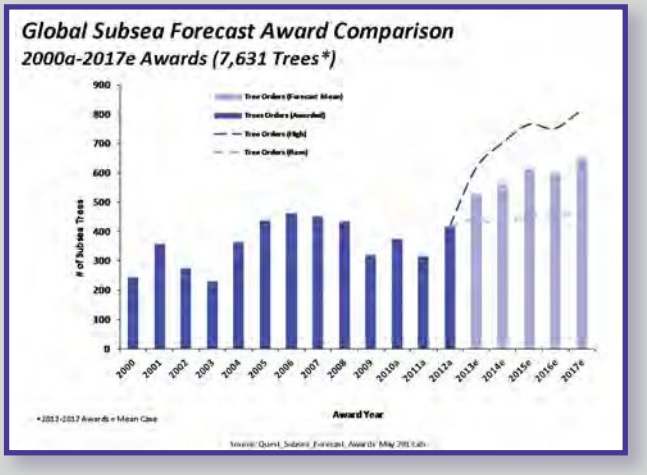
Offshore At-A-Glance

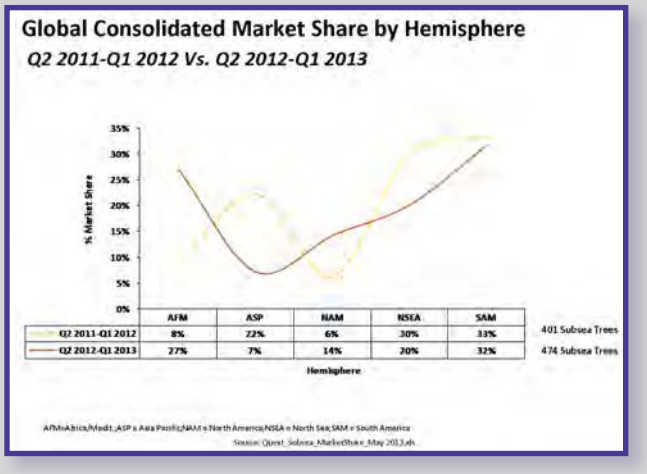
Quest Offshore Activity Report

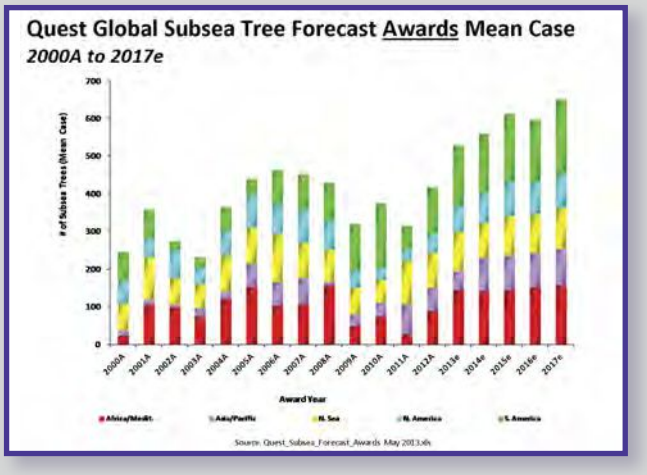












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www.QuestOffshore.com • www.SubseaZone.com • www.FloatingProductionZone.com

Gulf of Mexico Data
Current Deepwater Activity

Operator	Area	Block	OCS Lease	Rig Name	Prospect Name	Water Depth (ft)
Petrobras America, Inc.	WR	425	G16987	VANTAGE TITANIUM EXPLORER	Chinook	8,843
Anadarko Petroleum Corp.	DC	535	G23520	ENSCO 8506	Raptor	8,161
Petrobras Amercia, Inc.	WR	206	G16965	ENSCO DS-5	Cascade	8,147
Shell Offshore, Inc.	AC	857	G17570	NOBLE DANNY ADKINS	Great White	8,044
Shell Offshore, Inc.	AC	857	G17561	H&P 205	Great White	7,819
Statoil Gulf of Mexico LLC	WR	970	G26420	MAERSK DEVELOPER		7,403
Shell Offshore, Inc.	MC	393	G26254	T.O. DEEPWATER NAUTILUS	White Ash	7,375
Chevron USA, Inc.	WR	758	G17015	T.O. DISCOVERER CLEAR LEADER	Jack	6,965
ConocoPhillips Co.	WR	460	G32688	T.O. DEEPWATER CHAMPION	Thorn	6,915
Anadarko Petroleum Corp.	KC	875	G21447	ENSCO 8500	Lucius	6,817
Chevron USA, Inc.	KC	736	G22367	T.O. DISCOVERER INDIA	Moccasin	6,537
Union Oil Co. of California	WR	98	G21841	PACIFIC SANTA ANA	Coronado	6,127
Noble Energy, Inc.	MC	948	G24133	ENSCO 8501	Gunflint	6,083
BP Exploration & Production, Inc.	KC	292	G25792	SEADRILL WEST SIRIUS	Kaskida	6,031
Shell Offshore, Inc.	WR	95	G31943	NOBLE GLOBETROTTER	Yucatan North	5,847
Eni US Operating Co., Inc.	MC	214	G24059	T.O. DEEPWATER PATHFINDER		5,815
BP Exploration & Production, Inc.	MC	777	G09867	T.O. DISCOVERER ENTERPRISE	Thunder Horse South	5,613
Cobalt International Energy, LP	GC	896	G31765	ENSCO 8503	Ardennes	5,510
BP Exploration & Production, Inc.	GC	743	G15607	T.O. DEVELOPMENT III	Atlantis	5,405
Anadarko Petroleum Corp.	GC	768	G21817	ENSCO 8505	Ticonderoga	5,256
Anadarko Petroleum Corp.	GC	680	G22987	NABORS MODS RIG 150	Constitution	4,970
BP Exploration & Production, Inc.	KC	93	G25780	SEADRILL WEST CAPRICORN	Gila	4,853
LLOG Exploration Offshore, LLC	MC	208	G24055	ENSCO 8502	MC 208-253	4,645
Anadarko Petroleum Corp.	GC	683	G16783	T.O. DISCOVERER SPIRIT	Caesar	4,485
Hess Corp.	MC	725	G22898	STENA FORTH	Tubular Bells	4,328
Anadarko Petroleum Corp.	GC	608	G18402	BLAKE 1007	Genghis Khan	4,320
BHP Billiton Petroleum (GOM) Inc.	GC	654	G20085	GSF C.R. LUIGS	Shenzi development	4,300
Chevron USA, Inc.	GC	640	G20082	T.O. DISCOVERER INSPIRATION	Tahiti 2	4,298
Chevron USA, Inc.	GC	640	G20082	T.O. DISCOVERER DEEP SEAS	Tahiti 2	4,292
Shell Offshore, Inc.	MC	809	G09873	CAL DIVE Q-4000	Princess	3,853
Shell Offshore, Inc.	MC	721	G33171	NOBLE JIM DAY		3,688
Anadarko Petroleum Corp.	EB	602	G20725	NABORS POOL 140	Nansen	3,669
Eni US Operating Co., Inc.	GC	385	G25142	DIAMOND OCEAN VICTORY	Pegasus	3,585
Shell Offshore, Inc.	MC	809	G12166	NOBLE JIM THOMPSON	Princess	3,461
Anadarko Petroleum Corp.	EB	643	G09184	WIRELINE UNIT (L.J. DIST)	Boomvang spar	3,453
Murphy E&P Co.	GC	338	G21791	NABORS MODS 200	Front Runner	3,330
Shell Offshore, Inc.	VK	956	G06892	NABORS 202	Ram-Powell	3,214
Shell Offshore, Inc.	MC	762	G07957	NOBLE BULLY I	Deimos	3,147
Shell Offshore, Inc.	GC	158	G07995	H&P 202	Brutus	2,985
W&T Energy VI, LLC	MC	243	G19931	NABORS SUPER S.D. XIX	Matterhorn	2,816
LLOG Exploration Offshore, LLC	MC	503	G27277	NOBLE AMOS RUNNER	WhoDat	2,646
Hess Corp.	GB	386	G10350	ATWOOD CONDOR	Llano	2,627
Walter Oil & Gas Corp.	MC	583	G16624	DIAMOND OCEAN SARATOGA	Killer Bee	2,487
Shell Offshore, Inc.	GB	341	G15879	NOBLE DRILLER	Habanero	2,013
Chevron USA, Inc.	VK	786	G12119	NABORS 87	Petronius	1,754
Hess Corp.	GB	260	G07462	NABORS S.D. XVI	Baldpate	1,648
Dynamic Offshore Resources, LLC	GC	65	G14668	H&P 206	Bullwinkle	1,353
SandRidge Offshore, LLC	EB	110	G02650	NABORS S.D. IV	Tequila	660

Deepwater prospects with drilling and workover activity: 48

Current Deepwater Activity as of Monday, 17 June 2013

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,669	35,044	2,684
201 to 400	118	1,116	20
401 to 800	289	860	10
801 to 1,000	395	574	9
1,000 & above	3,475	1,840	26

Rig Activity Report 21 June 2013

Location	Week of 6/21	+/-	Week Ago	+/-	Year Ago
Land	1682	-12	1694	-218	1900
Inland Waters	23	0	23	5	18
Offshore	54	0	54	6	48
U.S. Total	1759	-12	1771	-207	1966
Gulf of Mexico	52	0	52	7	45
Canada	197	21	176	-41	238
N. America	1956	9	1947	-248	2204

Activity by Water Depth Information current as of Monday, 17 June 2013

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.

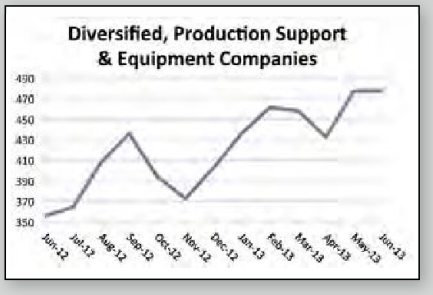
Information provided courtesy of the U.S. Bureau of Ocean Energy Management

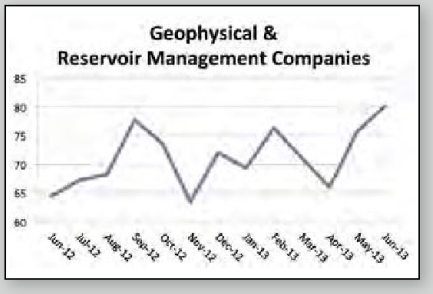
Monthly Stock Figures & Composite Index

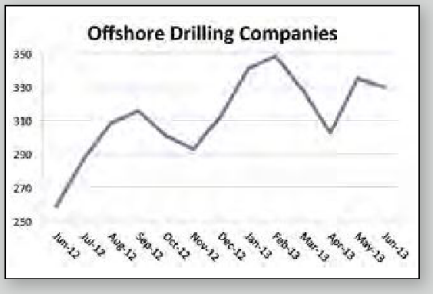
Industry Company Name	Symbol	Close(*Mid*) *June*	Close(*Mid*) *May*	Change	Change %	High 52 week	Low 52 week
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	46.74	46.14	0.60	1.3%	50.97	37.08
Cameron Intl. Corp.	CAM	64.98	63.60	1.38	2.2%	67.42	38.38
Drill-Quip, Inc.	DRQ	92.36	92.22	0.14	0.2%	95.44	58.87
Halliburton Company	HAL	43.90	44.06	-0.16	-0.4%	45.75	26.28
Tenaris SA	TS	41.52	43.65	-2.13	-4.9%	44.48	31.41
Newpark Resources, Inc.	NR	11.20	11.43	-0.23	-2.0%	11.78	5.19
Schlumberger Ltd.	SLB	74.41	75.78	-1.37	-1.8%	82.00	59.12
Superior Energy Services, Inc.	SPN	28.47	28.27	0.20	0.7%	29.22	17.54
Weatherford International, Inc.	WFT	14.12	13.54	0.58	4.3%	14.65	8.84
Deep Down, Inc.	DPDW	2.05	1.85	0.20	10.8%	2.18	1.00
FMC Technologies	FTI	57.56	56.55	1.01	1.8%	59.27	36.89
Total Diversified, Production, Support and Equipment.....		**477.31**	**477.09**	**0.22**	**0.0%**	**530.16**	**320.60**
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	38.17	36.03	2.14	5.9%	38.52	20.20
Mitcham Industries, Inc.	MIND	16.91	15.15	1.76	11.6%	18.79	11.51
Compagnie Gnrale de Gophysique-Veritas	CGV	25.09	24.49	0.60	4.5%	34.84	20.00
Total Geophysical / Reservoir Management..……..		**80.17**	**75.67**	**4.50**	**5.9%**	**92.15**	**51.71**
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	56.24	52.55	3.69	7.0%	56.71	34.93
Diamond Offshore Drilling, Inc.	DO	68.65	70.50	-1.85	-2.6%	76.85	55.83
ENSCO International, Inc.	ESV	59.67	61.83	-2.16	-3.5%	65.82	41.63
Nabors Industries, Inc.	NBR	16.73	15.90	0.83	5.2%	18.24	12.40
Noble Drilling Corp.	NE	38.85	39.94	-1.09	-2.7%	42.34	28.73
Parker Drilling Company	PKD	5.16	4.45	0.71	16.0%	6.18	3.61
Rowan Companies, Inc.	RDC	34.33	34.78	-0.45	-1.3%	39.40	28.62
Transocean Offshore, Inc.	RIG	49.94	54.96	-5.02	-9.1%	59.50	41.67
Total Offshore Drilling..……..		**329.57**	**334.91**	**-5.34**	**-1.6%**	**365.04**	**247.42**
Offshore Contractors, Services, and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	24.14	24.91	-0.77	-3.1%	25.99	14.90
Gulf Island Frabrication	GIFI	21.06	20.41	0.65	3.2%	31.69	18.76
McDermott International, Inc.	MDR	9.01	8.81	0.20	2.3%	13.56	8.48
Oceaneering International	OII	73.92	73.93	-0.01	0.0%	76.60	43.22
Subsea 7 SA	SUBCY.PK	22.12	21.73	0.39	1.8%	25.90	18.16
Technip ADS	TKPPY.PK	28.53	27.29	1.24	4.5%	30.21	23.31
Tetra Technologies, Inc.	TTI	11.02	9.39	1.63	17.4%	11.48	5.35
Cal Dive International, Inc.	DVR	2.08	1.97	0.11	5.6%	1.00	3.08
Total Offshore Contractors, Service, and Support..……..		**191.88**	**188.44**	**3.44**	**1.8%**	**216.43**	**135.26**
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	80.82	76.91	3.91	5.1%	100.00	71.59
Gulfmark Offshore, Inc.	GLF	46.11	45.70	0.41	0.9%	47.49	27.17
Bristow Group	BRS	64.62	66.09	-1.47	-2.2%	69.05	38.91
PHI, Inc.	PHII	33.84	33.71	0.13	0.4%	35.77	22.43
Tidewater, Inc.	TDW	58.16	56.58	1.58	2.8%	61.65	42.33
Trico Marine Services, Inc.	TRMAQ.PK	0.04	0.04	0.00	0.0%	0.11	0.01
Hornbeck Offshore	HOS	55.88	51.64	4.24	8.2%	56.05	31.96
Total Offshore Transportation and Boat ……..		**339.47**	**330.67**	**8.80**	**2.7%**	**370.12**	**234.40**

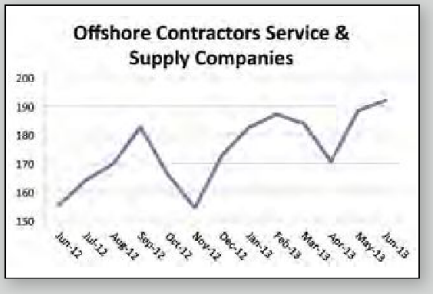
Monthly Stock Figures & Composite Index

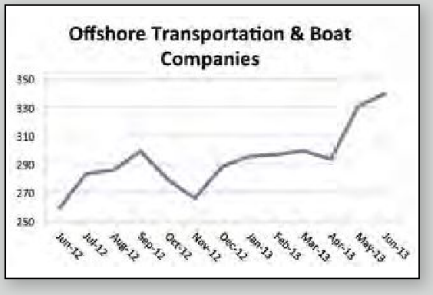
Industry	Close(*Mid*) *June*	Close(*Mid*) *May*	Change	Change %	High 52 week	Low 52 week
Total Diversified, Production, Support and Equipment	**477.31**	**477.09**	**0.22**	**0.0%**	**503.16**	**320.60**
Total Geophysical / Reservoir Management	**80.17**	**75.67**	**4.50**	**5.9%**	**92.15**	**51.71**
Total Offshore Drilling	**329.57**	**334.91**	**-5.34**	**-1.6%**	**365.04**	**247.42**
Total Offshore Contractors, Service and Support	**191.88**	**188.44**	**3.44**	**1.8%**	**216.43**	**135.26**
Total Offshore Transportation and Boat	**339.47**	**330.67**	**8.80**	**2.7%**	**370.12**	**234.40**
Total Offshore Source Index	**1,418.40**	**1,406.78**	**11.62**	**0.8%**	**1,546.90**	**989.39**

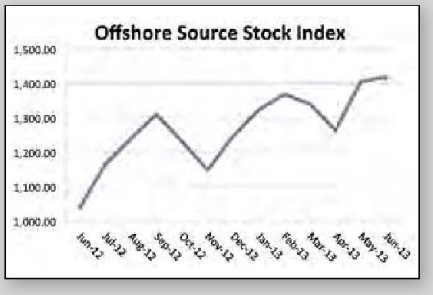










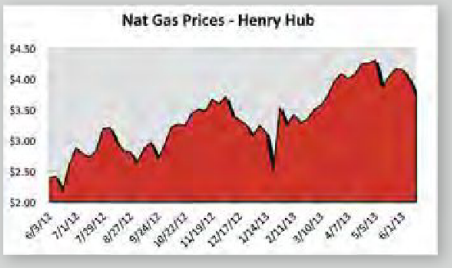


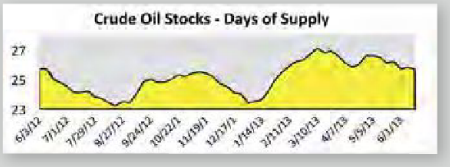
DISCLAIMER

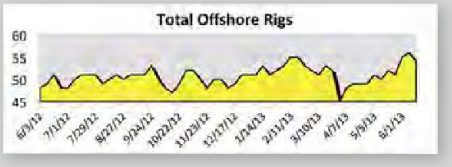
The information on this page is provided for information and comparison purposes only and should not be used to make financial and business decisions and is accurate to the best of our knowledge for the period indicated.

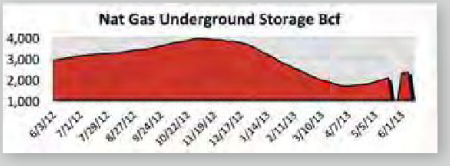
Oil & Gas Industry Trends

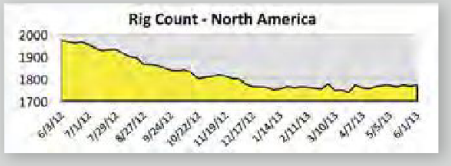
Monitoring the Pulse of the U.S. Offshore Oil & Gas Industry











Positive trend, at least 3 weeks
Changing trend, less than 3 weeks
Negative trend, at least 3 weeks

Ross Laboratories delivers turn-key sweep system to USACE

The U.S. Army Corps of Engineers, St. Paul District, has taken delivery of a turn-key, multi-channel sweep system from Ross Laboratories of Seattle, Washington. The system is installed on a 24-ft Armstrong Marine aluminum work boat. Ross Laboratories was awarded the contract to provide the boat and survey electronics as a "turn-key" system.

The Ross "Mini-Sweep" is a small boat, multi-channel survey system designed for inland rivers and shallow water surveying. The "Mini-Sweep" is ideally suited for installation on small trailerable vessels. The turn-key system for the Fountain City Service Base office is installed on a custom-designed, 24-ft catamaran hull work boat from Armstrong Marine of Port Angeles, Washington.

Two 10-ft booms mounted on either side of the vessel provide a 25-ft overall sweep width using six transducers. The booms are stored in recessed areas in the hull, leaving the deck clear at all times. The booms are deployed by a hydraulic system using controls at the helm station.

Electronics are mounted in a custom-built work cabinet with slide out drawers for easy access containing the depth sounding system, Panasonic Toughbook™ data collection computer, and a Trimble DGPS sub-meter system. Hypack® software is used for data collection and processing.

The St. Paul District is responsible for surveying and mapping the upper 243.6 mi of navigation channel to a minimum depth of 9 ft on the Mississippi River from Minneapolis, Minnesota, at river mile 857.6, to Guttenberg, Iowa, at river mile 614.0, and 40.6 mi on three tributaries: the Minnesota, St. Croix, and Black rivers.

This new vessel replaces a Ross sweep survey boat that has been in operation for over 12 years.

For more information, visit www.rosslaboratories.com.

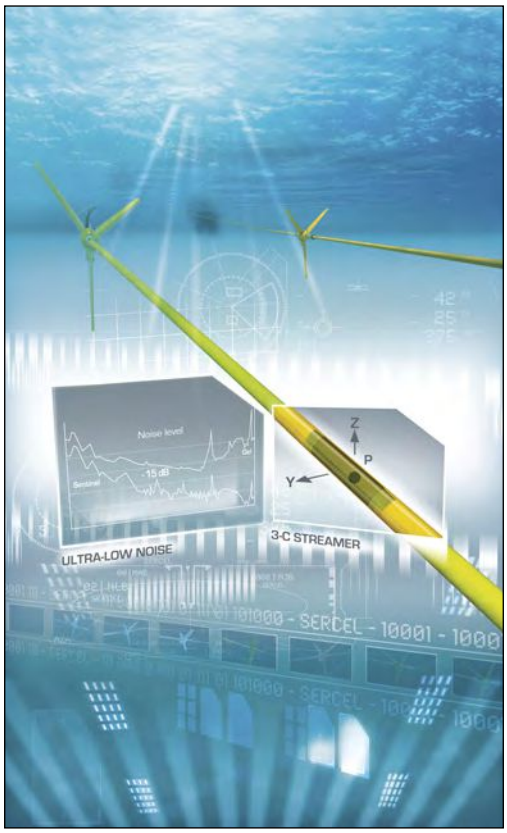
Sercel launches multi-sensor Sentinel® solid streamer

Sercel announces the launch of Sentinel® MS, its new multi-sensor solid streamer to address the needs of the E&P Industry for ever more detailed and accurate images of the subsurface.

The new Sentinel MS features two additional acceleration components offering directional measurements for both cross-line and vertical wave fronts to deliver multi-sensor datasets for enhanced broadband imaging.

Sentinel® MS builds on the success of the Sentinel® solid streamer. In addition to the high-quality pressure measurement provided by its hydrophone sensor, the new Sentinel® MS features two additional acceleration components offering directional measurements for both cross-line and vertical wave fronts to deliver multi-sensor datasets for enhanced broadband imaging.

Fully compatible with Nautilus®, Sercel's powerful all-in-one streamer positioning system, Sentinel® MS extends marine acquisition capabilities to a new level. The addition of directional measurements to the most advanced low-noise, low-frequency capabilities of Sercel's Sentinel® solid streamer family makes the new Sentinel® MS the multi-sensor streamer system of choice in any geophysical environment.



Pascal Rouiller, CEO of Sercel, said, "We have added the Sentinel® MS multi-sensor streamer to our Sentinel® family to offer the industry the best broadband capabilities as part of our on-going commitment to deliver the highest-end seismic equipment to our customers. With over 5,000 km of Sentinel® streamers delivered to date, our Sentinel® family, including the Sentinel® MS and Sentinel® RD, is unmistakably the best solid cable available to the industry today."

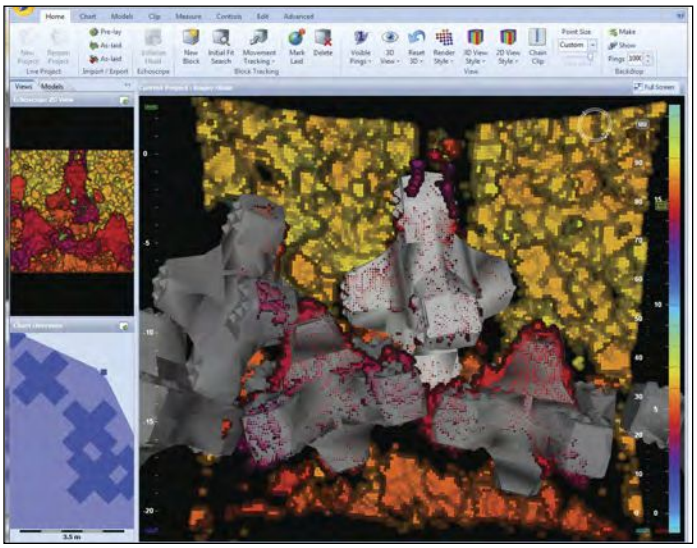
Jean-Georges Malcor, CEO of CGG, said, "Sentinel® has played a significant role in the development of broadband marine seismic and is at the heart of our BroadSeis™ and StagSeis™ marine acquisition solutions. With the launch of Sentinel® MS, we can now take our long-offset, full-azimuth, and broadband marine seismic to the next step in imaging and enhanced illumination of the most complex geologies."

For more information, visit www.sercel.com.

CodaOctopus releases its new realtime 3D underwater construction software

CodaOctopus is pleased to announce the release of the latest version of its unique underwater Construction Monitoring System software (CMS™)

CMS™ is designed for monitoring the placement of concrete armour units in breakwater construction projects and makes full use of the unique capabilities of the company's real-time Echoscope® 3D sonar to give crane and excavator operators a clear view of concrete blocks as they are placed. Originally designed to automatically track ACCROPODE™ concrete armour units, CMS™ was originally deployed on the Ras Laffan breakwater project in Qatar by RLNBC, a joint venture between Van Oord NV and Royal Boskalis Westminster NV. Since then, the technology has been successfully used on numerous breakwater projects around the world.



The latest version of CMS™ has an improved tracking algorithm that gives better results with more challenging environments, and it has been expanded to work with ACCROPODE II™ and Xbloc® units. Moreover, it has been enhanced with new key capabilities to make placement tasks easier, including functions such as automatic mosaicing tools, profile views, chain removal capabilities, and the ability to interactively build and edit databases of already placed blocks.

CMS™ is a significant tool for companies building coastal structures such as breakwaters where the accurate placement of concrete armour units underwater is important to the effectiveness and longevity of the structures.

For more information, visit www.codaoctopus.com.

New sensor observation service for LOBO monitoring networks

Satlantic is pleased to announce the latest advancement for its Land Ocean Biogeochemical Observatory (LOBO) moored buoy system.

LOBO is an integrated real-time, water quality monitoring package developed by Dr. Ken Johnson's team at the Monterey Bay Aquarium Research Institute (MBARI). LOBO is Satlantic's complete turn-key water quality monitoring system that addresses the need for automated, robust, and accurate water quality measurements, particularly in sensitive and diverse ecological areas such as estuaries and inland waters.

LOBOViz is a significant, value-added component of the LOBO system, which integrates data visualization and a display package for an entire network of monitoring sites. LOBOviz now has its own native implementation of the Integrated Ocean Observation System (IOOS) Sensor Observation Service (SOS).

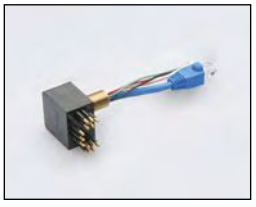
The SOS provides access to observatory metadata and sensor observations via three HTTP GET services that enable SCCF RECON to automatically publish data on-demand to the Gulf of Mexico regional observatory and to national and international portals such as U,S. IOOS and the National Data Buoy Center. This new development significantly improves the reach and impact of critical environmental monitoring data acquired by LOBO networks.

For more information, visit www.satlantic.com.

New SubConn® 13 pin low profile power and ethernet connector

The MacArtney Group is pleased to announce the introduction of the new 13 Pin SubConn® Low Profile Power and Ethernet Connector.

Building on the successful SubConn® Ethernet Connector program known as the first high-speed underwater connector to offer true Ethernet type performance — the new SubConn® Low Profile 13 Pin Power and Ethernet Connector offers a unique set of benefits for operators of underwater systems and equipment.



Like the existing standard size SubConn® Power and Ethernet Connector, the new 13 Pin Low Profile version provides Gigabit data speed, signal, and power transfer for underwater instruments in one high-performance connector. Moreover, the connector comes with an appurtenant specially designed SubConn® Combined Power and Ethernet Cable.

While allowing ROVs and other underwater systems and equipment to be powered through the same cable and connector as used for data transfer, the entire solution works to make data and power transmissions faster and less expensive. When one adds the design optimization capacity provided by the low-profile layout of the new SubConn® connector — operators will gain the opportunity assemble more streamlined and effective underwater systems, with sensors, sonar heads, and other types of equipment producing less drag.

For more information, visit www.macartney.com.

Greensea Systems launches openSEA Suite™ for AUVs and ROVs

Greensea Systems, Inc., a leading software developer for AUVs launched a new commercially packaged software suite for AUVs and ROVs based on the company's successful Open Software and Equipment Architecture, openSEA™. The openSEA Suite™, a collection of applications built on the proven openSEA™ core library, provide off-the-shelf modular software solutions for aided inertial navigation, vehicle control, mission management, device and sensor integration, and operator interfaces. Based on a proven code base of tested technologies from over 200 deliveries, the openSEA Suite™ offers thousands of hours of at-sea experience on ROVs and AUVs of all sizes. Greensea also released a Software Development Kit to support integrators developing with the openSEA™ API or integrating with the openSEA Suite™ applications. These new products will be available for shipment starting in July 2013.

Greensea's primary business interest is control and navigation software for AUVs and ROVs. Greensea anchors its navigation and control technology with the Open Software and Equipment Architecture, openSEA™. Greensea began development of openSEA™ in 2006 specifically as a modular programming environment for unmanned vehicles. This flexible and scalable architecture provides a development platform and a rich API upon which powerful, independent applications may be developed with significantly reduced effort. openSEA™ is built on a robust error reporting and communication backbone and provides proven and tested software modules, ranging from optimal control and Kalman filtering to data management and native support for hundreds of industry standard sensors and devices. This open architecture is unparalleled in both breadth and robustness and continues to serve as the core technology framework at Greensea.

Greensea's new product line, the openSEA Suite™, is built on openSEA™ and can be deployed as independent applications or as linked modules to form a larger system capability. Applications within this suite include a sensor server (openDEVICE™), a configurable aided inertial navigation system (openINS™), a vehicle autopilot and control system (openCMD™), and a mission management and planning system (openMNGR™). All applications in the openSEA Suite™ have visual components that can be linked into Greensea's user interface framework, openVIZ™. All modules provide defined client-side communication interfaces via serial or Ethernet and can communicate with each other via a private internal network enabling large interlinked systems. Greensea offers Software Development Kits for the openSEA Suite™ and openSEA™ API to promote customization, private labeling, and servicing.

For more information, visit www.greenseainc.com.

Seaview Systems releases efficient power controller for ocean data buoys

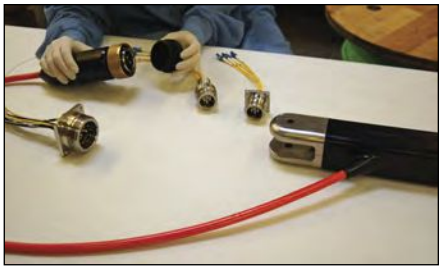
Power efficiency is important in remote data collection systems that are typically solar-powered. Systems such as the Real-time Coastal Observation Network (ReCON) require controlling power to sensors and components with currents of up to 2 amps and voltages up to 48 volts. Though there are some off-the-shelf solutions available, these systems either consume unnecessary power or are limited in the amount of current and voltage that they can handle.

The System Power Controller board provides eight channels of semiconductor-switched power that can handle the current and voltage requirements while consuming a low amount of quiescent power. Each power channel provides high-side switching of up to 60 volts and currents of up to 2 amps. A low-power microprocessor using an RS-232 serial interface allows programming of the channels, including time-delayed events. Three analog input channels allow measuring system voltages such as solar panel, battery, and system bus voltages. The controller includes a watchdog timer with relay output that allows a full-power reboot of the data collection system. The system can be operated with any voltage from 7 to 60 volts, and the entire controller only consumes 0.14 watts of power when powered at 12 volts. The controller board conforms to the PC/104 standard form factor.

For more information, visit www.seaviewsystems.com.

Birns creates complex electrical assemblies for AUV

Birns' latest projects have included creating complex electrical assemblies for a fascinating AUV project to developing a sophisticated custom Electro-Opto-Mechanical (EOM) Kevlar-strength member tow cable. One included a forked clevis with a unique side exit design to facilitate cable routing



and deep submergence BIRNS Millennium™ 3O and 3T optical and electro-optical hybrid connectors. Birns' EOM cable assemblies provide immense performance capabilities and are developed with precision to preserve the integrity of the fragile optical fibers. Plus, they deliver huge levels of power, signal, and data and withstand extreme environments, while providing load strengths of > 50,000 lbs.

For more information, visit www.birns.com.

Improved magnetic logger

Star-Oddi has just launched an improved version of the miniature DST magnetic data logger.

The memory size of the logger has been increased by 50%, up to 26,158 measurements per parameter, and the battery life has been prolonged from 1.5 to 3 years.

The DST magnetic measures the earth's magnetic field strength (in 3D), tilt (in 3D), acceleration, temperature, and depth. The compass direction is also displayed in the data, which are generated from the magnetic field strength measurements. The compass can either be shown as a 4-point or 8-point compass.

The logger is ideal for use on nets, gear, and underwater equipment for analyzing orientation and movements. The DST is available with a specially designed adjustable housing that keeps it in a fixed position inside to prevent rolling. The housing also gives more flexible mounting options and protects the logger against impact.

For more information, visit www.star-oddi.com.

SWE SeaSafe™ smart battery module passes 10,000-psi pressure testing

Southwest Electronic Energy (SWE), an industry leader in subsea batteries, has announced that it successfully completed 10,000-psi pressure testing of its SWE SeaSafe Smart Battery Module. The exhaustive test conducted in the 30-in. hyperbaric chamber at a third-party test laboratory included nine complete pressure cycles between 0 and 10,000 psi while continuously performing battery charge and discharge. 10,000 psi enables a safe operating sea depth of 6,000 m plus margin. SeaSafe™ Modules are autonomous battery building blocks, each with its own BMS (battery management system).

"In addition to pressure and temperature instrumentation provided by the test lab, the module's BMS supports continuous monitoring of around 50 module parameters and status registers," said David White, senior member, technical staff at SWE. "And as far as I know, we are the first to support full battery recharge at these depths."

For more information, visit www.swe.com/seasafe.

Turner Designs launches new DataBank Datalogger Station

Fluorometry specialists Turner Designs, USA, has released a new, fully enclosed, all-weather version of its DataBank datalogger to store data from a Cyclops fluorometer continuously during long-term, stationary field deployments.

The DataBank Datalogger Station (DDS) approximates IP66 and NEMA 4X, providing a degree of protection against corrosion, windblown dust, and rain water splash-down. It can store up to 9,999 records in addition to 16 calibrations and uses an intuitive GUI interface for easy sensor configuration, calibration, and data download via USB connection to a PC.

The Cyclops fluorometer is offered with optical kits for detecting in vivo chlorophyll, crude oil, refined fuels, CDOM/FDOM (dissolved organic material), blue/green algae, fluorescein dye, rhodamine dye, PTSA dye, optical brighteners, tryptophan, and turbidity. Cyclops fluorometers can also be configured with custom optics for specialized applications per customer request.

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

Okeanus expands winch fleet with 6,000-m system

Okeanus Science and Technology, LLC (Okeanus) has recently acquired a custom DT Marine 125-hp electric-hydraulic Slip-Ring Tow Winch, model DT-3125. The custom-designed winch is spooled with over 6,000 m (20,000 ft) of 0.68" UNOLS coax cable. The system is configured to support a wide variety of oceanographic, survey, and scientific equipment and is ideally suited for various deepwater tow sled operations.

The winch's bare drum line pull is over 20,000 lbs at 0 to 150 ft/min. The drive system consists of a 125-HP, 480 VAC, 3-phase, 650-HZ, totally enclosed, fan-cooled electric motor driving a hydraulic pump that, in turn, drives a hydraulic motor connected in open loop configuration.

The hydraulic motor is coupled to the drum through a planetary gear reducer that is attached directly to the winch drum. A multiple disc, fail-safe brake is incorporated into the final drive and located between the hydraulic motor and the gear reducer.

The hydraulic reservoir is supplied with a sight level gauge and drain plug contained in the base of the winch such that, except for having to be supplied with outside electric power, the unit is self-contained. The DT-3125 is controlled by a self-centering, single lever, 4-way control valve, with metering spool that affords variable speed in both directions, and is located on a sloping panel on the drive component housing. The winch is also equipped with a remote output that allows for the winch to be controlled from any point on the vessel.

The winch and a full suite of spares will be stationed at Okeanus' main facility located in Houma, Louisiana and is available for lease. Okeanus can also offer many subsea components and solutions to integrate into the DT-3125.

For more information, visit www.okeanus.com.

Macro Sensors introduces submersible LVDT position sensors

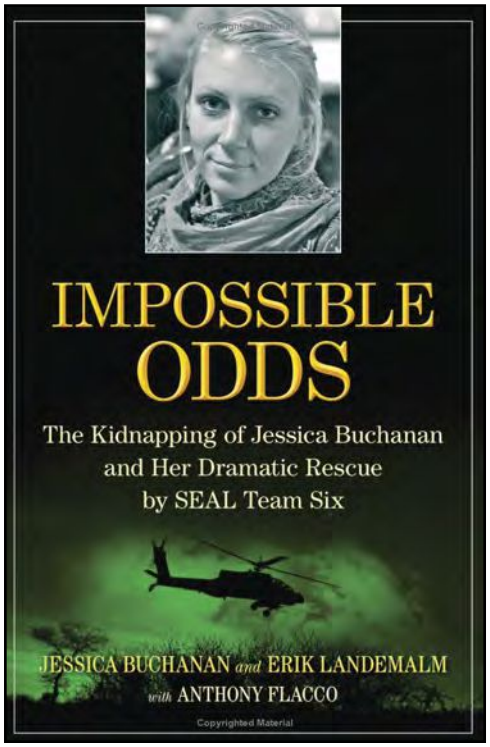
Macro Sensors introduces a line of submersible LVDT Position Sensors for use as part of subsea measurement systems. Macro Sensors LVDTs are proven to offer reliable measurement and feedback for continuous monitoring. The SSIR 937 Series Submersible LVDT Position Sensor is now a standard design available from stock for fast turnaround.

Offering extraordinary repeatability in extreme pressure environments, the SSIR 937 Series Submersible LVDT Position Sensors can withstand deep sea environments with external pressures to 5,000 psi. Inconel construction enhances the already high reliability of the LVDT assembly, ensuring the submersible transmitters can meet life requirements of at least 20 years, even if the device is fully exposed to seawater at depths greater than 10,000 ft.

Designed for use in either pressure-balanced, oil-filled containers or directly in seawater, these rugged, 0.94-in. (24-mm) diameter LVDT Position Sensors are available in standard ranges of 2.00 in. (50 mm), 3.00 in. (75 mm), or 4.00 in. (100 mm). Other ranges are available upon special request.

SSIR 937 Series Submersible LVDT Position Sensors also resolve the problem of getting a signal back to the surface, even at great water depths. To minimize the number of pressure-sealed connections and I/Os, a 4-20 mA two-wire, loop-powered I/O is utilized. A 4-20 mA I/O also minimizes noise over long transmission lines. Offsets can be easily made in the data acquisition system on the platform above. A high-pressure Seacon-Brantner subsea connector is standard. A welded connector is also available.

For more information, visit www.macrosensors.com.



Impossible Odds

The Kidnapping of Jessica Buchanan and Her Dramatic Rescue by SEAL Team Six

By Jessica Buchanan, Erik Landemalm and Anthony Flacco

In 2006, 27-year-old Jessica Buchanan stepped off a plane in Nairobi, Kenya, with a teaching degree and long-held dreams of helping to educate African children. By 2009, she had met and married native Swede Erik Landemalm, who worked to coordinate humanitarian aid with authorities in Africa. Together, the two moved from Nairobi to Somalia, and with hopes of starting a family, their future couldnt have been brighter...

But on 25 October 2011, Jessica and a colleague were kidnapped at gunpoint and held for ransom by a band of Somali pirates. For the next 3 months, Jessica was terrorized by more than two dozen gangsters, held outdoors in filthy conditions, and kept on a starvation diet while her health steadily deteriorated. After 93 days of fruitless negotiations and with Jessica's medical state becoming a life-or-death issue, President Barack Obama ordered Navy SEAL Team Six to attempt a rescue operation.

In riveting detail, this book chronicles Jessica and Erik's mutual journey during those torturous months. Together, they relate the events prior to the kidnapping; the drama of Jessica's fight to stay alive; and Erik's efforts to bolster and support the hunt for her while he acted as liaison between their two families, the FBI, professional hostage negotiators, and the U.S. government. Both a testament to two peoples' courage and a nail-biting look at a life-or-death struggle, this is a harrowing and deeply personal story about their triumph over impossible odds.

Atria Books; ISBN-10: 1476725160 - Hardcover, 320 pages, May 14, 2013

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1st Keynote Speaker Announcement

R. Michael Haney

R. Michael Haney founded Douglas-Westwood's Houston office in 2012 and has more than a dozen years' experience consulting for energy and chemicals clients with Accenture, Arthur D. Little and Booz Allen Hamilton. Mike has completed consulting projects for most of the IOC's, many NOC's, and several oilfield service clients, working on projects around the world.

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Anadarko Petroleum Corp. said **James J. Kleckner**, formerly vice president, operations (Rockies), was promoted to executive vice president, international and deepwater operations, and will join the company's executive committee. Kleckner brings more than 30 years of experience to this position, having served in exploration and production leadership positions in the North Sea, South America, China, the Gulf of Mexico, and the U.S. onshore. Most recently, Kleckner has played an instrumental role in the phenomenal growth of the Wattenberg field in Colorado and the Greater Natural Buttes area in Utah, two of Anadarko's largest U.S. onshore assets. Kleckner began his career in the oil and natural gas industry in 1981 with Sun Oil Co. He holds a bachelor of science degree in petroleum engineering from the Colorado School of Mines. He is a member of the Society of Petroleum Engineers and the American Petroleum Institute.

Greene's Energy Group (GEG), a provider of integrated testing, rentals, and specialty services, named **Todd Naquin** as general manager of Cherokee Services, a division of GEG. Based in Lafayette, Louisiana, Naquin will assume responsibility for the overall growth of Cherokee Services, including expansions into new regions, product development and service opportunities. Previously, Naquin served as operations manager of Cherokee Services. He has more than 25 years of oilfield experience. He has significant background in drilling, well control, well testing, pumping, and pipeline, and his expertise will serve clients and the overall Greene entity well.

Naquin

Gulfstream Services, Inc. (GSI), an oilfield rental company providing high pressure equipment for the international oil and gas industry, named **Robert Bates** as vice president of global business development. Based in Houston, Texas, Bates will be responsible for the oversight of global business development, account management, and global expansion of all product lines offered by GSI. Prior to joining GSI, Bates worked for 35 years at Halliburton Energy Services in varying roles, including operations management, sales management, and global account management. Bates is a member of the Houston chapter of the American Association of Drilling Engineers and the Society of Petroleum Engineers.

ExxonMobil Corp. elected a new member, **William C. Weldon**, to its board of directors. Weldon, 64, served as chairman and chief executive officer of Johnson & Johnson from 2002 to 2012, vice chairman from 2001 to 2002, and as worldwide chairman, Pharmaceuticals Group, from 1998 to 2001. Weldon earned a bachelor of arts degree in biology from Quinnipiac University in Hamden, Connecticut in 1971. With the addition, the ExxonMobil board stands at 13, 12 of whom are non-employee directors.

Songa Offshore SE appointed **Bjørnar Iversen** as the company's new chief executive officer. Iversen was to relocate to Limassol and take up the position only weeks after he joined the company as president of Songa Rig AS. Before signing with Songa, he held a number of senior management positions and had been member of the executive leadership team at Odfjell Drilling AS for the past 12 years. His latest position was president and chief executive officer of Odfjell Galvao Ltda in Brazil.

Megan Bel has joined the staff of the National Ocean Industries Association (NOIA) as senior director, government & political affairs. She comes to NOIA from the Office of Congressman Steve Scalise (R-LA), where she served as legislative director since 2008. She also recently served as deputy director of the Republican Study Committee.


Corbetta

Giovanni Corbetta has been appointed managing director of DOF Subsea UK. Corbetta, who was most recently managing director with Hallin Marine, will lead the company's transformation from vessel operator to provider of integrated subsea solutions for the market from its headquarters in Aberdeen. In total, Corbetta has more than 22 years of experience in the subsea sector and has also worked with major companies, including Sonsub and Saipem. He holds an MSc in Aeronautical Engineering from Milan.

Saab Seaeye has recently promoted **Terry Wood** to engineering manager and **Chris Henderson** to customer support manager. Wood heads a major expansion of Saab Seaeye's engineering resources that include new product development and a growing team of engineers. Before joining the company a year ago, he held engineering management positions in the aerospace industry and in safety and reliability consultancy. Henderson now manages an expanding customer support function for underwater vehicle systems around the world, including the provision of spares, 24-hour technical support, and product service.


Sheehan

Ashtead Technology has strengthened its management team with the appointment of **Tim Sheehan** as commercial director. The appointment, which is a new position, comes as part of the company's strategy to expand its global service offering, which includes rental equipment, calibration, repair and maintenance, offshore personnel, and bespoke engineered solutions. With over 30 years of subsea industry experience, Sheehan takes up his new role following 2 years as executive vice president commercial at Reef Subsea, having also previously held senior management positions with Technip, Bibby, Acergy, and Rotech.

Teledyne Benthos has added a new member to its team — **Dan Shropshire**. In his new role as senior program manager, Shropshire will manage government programs and complex engineering specials across the company's full product line. He brings over 10 years of experience in program and project management and systems engineering. Most recently, Shropshire worked for Northrop Grumman Corporation as program manager for NASA's Chandra X-ray observatory. He holds Bachelor of Science and Master of Science degrees in Aerospace Engineering from the University of Colorado at Boulder.

Global Diving & Salvage, Inc. announces the hiring of **Tracy Krawiec**, joining the health, safety, & environment (HSE) group as the dive safety specialist, based out of Global's corporate headquarters in Seattle, Washington. Krawiec will be essential in ensuring that Global's Safety Program stays abreast of regulatory and industry changes that may affect the company's dive safety programs and training.

Channel Technologies Group, LLC ("CTG"), a manufacturer of piezoelectric ceramics, transducers, and complex sonar and navigation systems used in the defense, medical technology, and energy industries, announced that **Ralph L. Phillips** has been named chief executive officer. Phillips succeeds Kevin Ruelas, who is leaving to pursue new opportunities.

Unique Hydra, a Unique Maritime Group Company, has signed an agency agreement with **EIVA** to represent its products and services in the southern part of Africa. Based in Cape Town (South Africa), Unique Hydra is a leading manufacturer and supplier of marine and diving equipment to the oil and gas industry. EIVA is an engineering company with more than 30 years of experience in the offshore construction and survey industry, providing software, hardware, turn-key solutions, and services to a wide range of segments for virtually any subsea task.

A custom-built service center at the new Offshore Marine Center in the Tuas industrial area of Singapore will boost **Acteon** operations and improve its customer service in Southeast Asia. Due to open in July 2013, the new $11 million, 10,000-m^2 Acteon Singapore Operations Center will support the offshore operations of Acteon companies across the region.

T.D. Williamson has opened a new maintenance center in Abu Dhabi, United Arab Emirates. The addition of the new 7,500 ft^2 facility represents the first phase of TDW plans to expand in the Middle East region. The facility complements the existing 7,500 ft^2 Hot Tap and STOPPLE Plugging Service Center by adding a stand-alone maintenance capability aimed primarily at the ILI regional market.

CDL, announced that it has joined forces with **3D at Depth**, underwater LiDAR system specialists, to create a joint venture. The partnership reinforces the commitment of both companies to support the growing needs of the subsea oil and gas industry. By combining the technical innovation of 3D at Depth with the significant market presence of CDL, the joint venture will allow the two companies to introduce a comprehensive range of underwater scanning technology, including CDL's most recent product launch - INSCAN, the world's 3D scanning subsea laser designed for use in the oil and gas industry.

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Kongsberg Seatex is a leading international marine electronics manufacturer specializing in the development and production of precision positioning and motion sensing systems. Our commitment is to provide quality products and solutions for safe navigation and operations at sea in the commercial offshore, maritime, hydrographics and defence industries

Teledyne TSS Ltd.
UK Office: 1 Blackmoor Lane
Croxley Business Park
Watford, Hertfordshire WD18 8GA
Tel: +44(0)1923 216020
Fax: +44(0)1923 216061
E-mail: tsssales@teledyne.com
Website: www.teledyne-tss.com
Contact: Carolyn Jones

USA Office:
10801 Hammerly Blvd., Suite 128
Houston, TX 77043
Contact: Keith Pope
Tel: (713) 461 3030
Fax: (713) 461 3099

Comprehensive family of motion sensors available; ranging from a heave sensor through to heave, pitch and roll, and at the top end of the range highly accurate position and heading systems.

OCEANOGRAPHIC INSTRUMENTS

ASL Environmental Sciences, Inc.
#1-6703 Rajpur Place, Victoria
BC Canada V8M 1Z5
Phone: +1-250-656-0177
Fax: +1-250-656-2162
Email: asl@aslenv.com
Web: www.aslenv.com

ASL provides physical oceanographic consulting services and instruments. Services: flow measurement, ice studies, wave measurement and analysis, numerical modeling, and remote sensing. Products: Ice Profiler- measures ice-keel depths; Acoustic Zooplankton Fish Profiler- monitors the presence and location of zooplankton, fish or sediments; and the WERA NorthernRadar – measures surface currents and waves from shore up to 200km. ASL has a large lease pool of oceanographic instruments.

nke Instrumentation
rue Gutenberg
56700 Hennebont, FRANCE
Tel: +33 2 97 36 41 31
Fax: +33 2 97 36 10 12
E-mail: info.instrumentation@nke.fr
Website: www.nke-instrumentation.com

• Fresh and marine waters multiparameter probes: CTD, dissolved oxygen, turbidity, fluorescence, pH • Monitoring data loggers for atmospheric and marine corrosion, and cathodic protection • Dedicated and customized measurement and monitoring equipment for: sediment transport, underwater systems behaviour, fishing efforts and environmental parameters, intelligent networks...
Contact : Valérie Le Pen - vlepen@nke.fr or Goulven Prud'homme - gprudhomme@nke.fr

• Provor and Arvor profiling subsurface floats (ARGO project), CTD, dissolved oxygen and optical sensors; Argos and Iridium transmission. • Drifting surface buoys with temperature and GPS receiver for Surface velocity project. • Carioca drifting buoy: sea water dissolved pCO2, chlorophyll, wind speed and salinity.
Contact: Patrice Brault - pbrault@nke.fr

Nortek AS
Vangkroken 2
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E-mail: inquiry@nortek.no

NortekUSA
27 Drydock Avenue
Boston, MA 02210
Tel: 617-206-5750
Email: inquiry@nortekusa.com
Website: www.nortek-as.com

Nortek's products span from single point turbulence sensors to long range current profilers. Our customers are scientists, consulting engineers and professionals working in the offshore oil and gas industry. Nortek provides solutions measuring surface waves to currents 6000 m deep. Nortek is global, positioned to help you wherever your solution is needed.

RBR
95 Hines Road, Ottawa
Ontario Canada K2K 2M5
Tel: 613.599.8900
Fax: 613.599.8929
E-mail: info@rbr-global.com
Website: www.rbr-global.com

RBR designs and manufactures rugged submersible data loggers*, recorders, sondes, controllers, and sensors for water quality measurement. Our standard data logging instruments range from one to 24 channels, configured as a* CTD*, or multi-parameter (sensor) recorders. Specialty loggers are available with specific sensors for harsh environments or unique applications like measuring tides and waves.*

Sea-Bird Electronics, Inc.
13431 NE 20th St.
Bellevue, WA 98005
Tel: 425-643-9866
Fax: 425-643-9954
E-mail: seabird@seabird.com
Website: www.seabird.com
Contact: Calvin Lwin, Applications Engineering

Sea-Bird is the leader in accurate, stable ocean instruments for measuring conductivity, temperature, pressure (salinity); oxygen; and related variables. Our CTD profilers, water samplers, moored CT recorders, wave/tide recorders, and DO sensors are used by research institutes, ocean observing programs, government agencies, and navies globally. Investments in engineering, metrology, calibration, software, and analysis make our products the best choice.

Star-Oddi
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Gardabaer, Iceland
Tel: +354 533 6060
Fax: +354 533 6069
E-mail: baldur@star-oddi.com
Website: www.star-oddi.com
Contact: Baldur Sigurgeirsson

A manufacturer of miniature data loggers with sensors as temperature, depth/pressure, salinity, tilt/acceleration, compass direction/magnetometer, light levels, acoustic receiving/transmitting. The loggers are used for various researches, including oceanography, fishing gear studies, equipment behavioral monitoring and fish tagging. Data is presented in the application software with a time-stamp for each measurement.

Turner Designs
845 W Maude Avenue
Sunnyvale, CA 94085
Phone: 408-749-0994 x146
Toll Free: 877-316-8049 x149
Fax: 408-749-0998
Contact: Tom Brumett, Sales Engineer
E-mail: sales@turnerdesigns.com
Website: www.turnerdesigns.com

Providing fluorescence-based solutions for research, water quality, and pollution control for over 40 years. Known for reliable and stable submersible, field, handheld, laboratory, and online fluorometers and turbidimeters. Customers rate us an average of 9, on a scale of 1-10, when asked how likely they would be to recommend us.

OFFSHORE EQUIPMENT

Unique System, L.L.C.
(Survey & Hydrographic)
5355 W. Sam Houston Pkwy. N,
Suite 320
Houston, Texas 77041
Tel: (713) 937 6193
Fax: (713) 937 8695
E-mail: infous@uniquegroup.com
Website: www.uniquegroup.com

Unique System, L.L.C.
(Diving Equipment)
1302 Import Drive
New Iberia, LA 70560
Tel: (337) 365 5650
Fax: (337) 365 5610
E-mail: infous@uniquegroup.com
Website: www.uniquegroup.com

Unique System, L.L.C. (USA), Unique Maritime Group's operating entity in the United States, provides Survey and Hydrographic rentals and sales support for products such as Kongsberg C Node Maxi/Mini and Sonardyne G6 Series products. Also in inventory are IXSEA, CDL, Edgetech, Tritech, Blueview, Hypack, Valeport and Teledyne products at our Houston, TX office. These products along with the rest of the inventory allow our client's acoustic, positioning, ROV, navigation and hydrographic needs to be served. The New Iberia, LA office provides diving rentals and sales for DNV and ABS classed Saturation Diving Systems, Hyperbaric Rescue Facilities, LARS and surface diving equipment.

PROJECT CONSULTING/ADVISORY SERVICES

Ocean Specialists Inc.
8502 SW Kansas Ave
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Tel: (772) 219-3033
Fax: (772) 219-3010
Email: jbyous@oceanspecialists.com
Website: www.oceanspecialists.com
Contact: Jim Byous

Ocean Specialists, Inc (OSI) provides a broad range of capabilities and services to the Offshore Oil & Gas, Submarine Telecom, Government and Scientific markets, including: Market analysis, project consulting, submarine fiber cable systems, subsea technology development, & corporate services.

ROV COMPONENTS

ROVSCO, Inc.
5263 Barker Cypress Road, Suite 600
Houston, Texas 77084
Tel: (281) 858-6333
Fax: (281) 858-6363
E-mail: sales@rovsco.com
Website: www.rovsco.com
Contact: Jessica McKenney

Rovsco provides support and solutions to the offshore subsea and marine industries; work-class ROV and Commercial Diving operations. We manufacture a number of tools/equipment and subsea video items. We have an excellent reputation worldwide based on our product knowledge, dependability, commitment to customer service and speed of response.

SONAR SYSTEMS

Imagenex Technology Corp.
209-1875 Broadway St., Port Coquitlam
BC, Canada, V3C 4Z1
Tel: (604) 944-8248
Fax: (604) 944-8249
E-mail: imagenex@shaw.ca
Website: www.imagenex.com
Contact: Steve Curnew

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

iXBlue
Tel: +33 (0)1 30 08 88 88
Fax: +33 (0)1 30 08 88 01
Website: www.ixblue.com

SHADOWS SAMS
- *High-performance mapping sonar*
- *Synthetic Aperture Sonar processing*
- *Provides real time ortho-rectified and geo-referenced images*
- *No gap at nadir*

iXBlue provides a range of fine, high-technology equipment, systems and turn-key solutions in the areas of navigation and surveillance, underwater positioning and communication, seabed imaging and surveying.

Acoustic Products – Advanced Components
Inertial Products – Integrated Solutions – Marine Works
Motion Systems – Sea Operations – Sonar Systems

Marine Sonic Technology, Ltd.
P.O. Box 730
White Marsh, VA 23183-0730
Toll Free: (800) 447-4804
E-mail: jdemille@marinesonic.com
Website: www.marinesonic.us

Marine Sonic Technology, Ltd. builds high quality, high resolution side scan sonar systems. Located in Gloucester, Virginia, Marine Sonic has been in business for more than 20 years. Our towed systems are rugged, easy to deploy and easy to operate. We also offer highly efficient embedded side scan systems for use in AUVs which occupy minimal space in the vessel and operate with minimal power consumption.

Sound Metrics
11010 Northup Way
Bellevue, WA 98004
Tel: 425-822-3001
E-mail: sales@soundmetrics.com
Website: www.soundmetrics.com
Contact: Jeanne Dorsey

Sound Metrics manufactures imaging sonar, capturing the clearest, most detailed video images in their class. Sound Metrics has built a reputation for support and for innovating solutions around their customers' applications. ARIS, the next generation of DIDSON, offers lower power consumption, smaller size and unprecedented clarity and resolution among other benefits.

Teledyne BlueView, Inc.
2515 N. Northlake Way, Suite 214
Seattle, WA 98103, USA
Tel: (206) 545-7260
Fax: (206) 545-7261
E-mail: swa_info@teledyne.com
Website: www.blueview.com

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

SOUND VELOCITY PROBES/CTDS

SAIV A/S
Nygardsviken 1, 5164
Laksevag, Norway
Tel: +47 56 11 30 66
Fax: +47 56 11 30 69
E-mail: info@saivas.no
Website: www.saivas.no
Contact: Gunnar Sagstad

- *STD/CTD, Sound Velocity probes/recorder with optional multi-parameter facilities; Turbidity, Fluorescence, Oxygen etc.*
- *Precision pressure /depth (0.01% accuracy) and temperature sensors/recorders. Applications: hydrographic profilings, installation on ROVs and towed systems, etc. Robust and compact designs are combined with accuracy and "plugand play" compatibility. Output format for sonar equipment, e.g. EM1002, EM3000, SSP, HiPAP and Reson 8125.*

SUB-BOTTOM PROFILES

iXBlue
Tel: +33 (0)1 30 08 88 88
Fax: +33 (0)1 30 08 88 01
Website: www.ixblue.com

ECHOES
- *wide band*
- *flat spectrum*
- *from 500 Hz to 15 kHz*
- *fish, hull-mounted, pole-mounted. AUV-mounted*
- *shallow to 6000 m deep*

iXBlue provides a range of fine, high-technology equipment, systems and turn-key solutions in the areas of navigation and surveillance, underwater positioning and communication, seabed imaging and surveying.

Acoustic Products – Advanced Components
Inertial Products – Integrated Solutions – Marine Works
Motion Systems – Sea Operations – Sonar Systems

SUBSEA FABRICATION

New Industries
6032 Railroad Avenue
Morgan City, LA
Tel: 985-385-6789
E-mail: bill.new@newindustries.com
Website: www.newindustries.com
Contact: Bill New

New Industries provides quality fabrication services to the offshore oil & gas and marine industries focusing on large diameter pressure vessels, suction piles, DNV buildings and deepwater subsea production equipment such as jumpers, PLETs, PLEMs and manifolds.

SUBSEA TOOLING

Seanic Ocean Systems
8860 Fallbrook Drive
Houston, TX 77064
Tel: 713-934-3100
E-mail: contact@seanicusa.com
Website: www.seanicusa.com
Contact: Karen North

Seanic Ocean Systems is an industry leader in providing simple, rugged and reliable subsea tooling for remote intervention.

SWITCHES

SEACON Advanced Products, LLC.
1321 Nelius Road
P.O. Box 767
Bellville, Texas 77418, USA.
Tel: (979) 865-8846
Fax: (979) 865-8859
E-mail: sales@seacon-ap.com
Website: www.seacon-ap.com

SEACON Advanced Products, LLC., manufactures a wide variety of versatile and robust switches to suit a number of applications. These include Limit, Positive Action and Proximity switches in a range of materials including Titanium, Plastic and Stainless Steel which can be supplied in varying load capacities up to 7 amps and pressure rated to 10,000 psi. To further aid simplicity, our proven range of Modular Proximity Switches have been integrated with the Micro WET-CON electrical wet-mate connector making this switch a very modular component that is easily installed and replaced in the field, but without compromising reliability.

UNDERWATER VEHICLES/AUVS

Exocetus Development LLC
1444 East 9th Avenue
Anchorage, AK, 99501
Tel: 858-864-7775
Fax: 907-569-0268
E-mail: sales@exocetus.com
Website: www.exocetus.com
Contact: Ray Mahr, VP Sales & Marketing

The new Exocetus Coastal Glider is specifically designed for use in coastal waters where high currents and large variations in water densities occur. A larger buoyancy engine than legacy gliders designed for open-oceanoperation enables the Exocetus Coastal Glider to easily operate in up to 2 knots of current, handle densities from 7 ppt to 37 ppt, operate up to 60 days with a lithium battery pack and easily integrate additional sensors.

Hydroid, Inc.,
a subsidiary of Kongsberg Maritime
6 Benjamin Nye Circle, Pocasset
MA 02559-4900, USA
Tel: 508-563-6565
Fax: 508-563-3445
E-mail: glester@hydroid.com
Website: www.hydroid.com
Contact: Graham Lester

Hydroid, a subsidiary of Kongsberg Maritime, is the world leader in manufacturing advanced Autonomous Underwater Vehicles (AUVs). REMUS AUVs provide innovative and reliable systems for the marine research, defense, hydrographic and offshore/energy markets. Hydroid vehicles represent the most advanced, diversified and field-proven family of AUVs and support systems in the world.

UNDERWATER VEHICLES/ROVS

Deep Ocean Engineering Inc.
2528 Qume Drive, Suite 11
San Jose, CA 95131 USA
Tel: 408-436-1102
Fax: 408-436-1108
E-mail: sales@deepocean.com
Website: www.deepocean.com
Contact: Bill Charbonneau

Deep Ocean Engineering, Inc. provides remotely operated and unmanned surface vehicle (ROV / USV) solutions which are used by a broad range of industry applications - security, military, nuclear and hydroelectric power plants, inshore dams and lakes, oil and gas, scientific research, fisheries, salvage, search / recovery, and pipeline inspections.

Perry Slingsby
10642 West Little York, Suite 100
Houston, TX 77041
Tel: 713-329-8230
Fax: 713-329-8299
E-mail: perry.sales@f-e-t.cm.com
Website: www.f-e-t.com/Subsea

Forum Energy Technologies' Perry Slingsby brand supplies deepwater work class ROVs, tooling solutions, burial systems, and control-system-based products to the oil, gas, and telecommunications industries. Providing the most advanced, robust and dependable ROVs and subsea products in the world, Forum's Subsea group has facilities in the US and UK and sales offices and agents around the world.

Schilling Robotics, LLC
260 Cousteau Place
Davis, California 95618
Tel: +1 530.753.6718
Fax: +1 530.753.8092
Contact: Peter MacInnes
E-mail: peter.macinnes@fmcti.com
Website: www.fmctechnologies.com

Schilling Robotics, a business unit of FMC Technologies, is a leading global producer of high-technology subsea systems, including remotely operated vehicles (ROVs), manipulators, and custom-engineered systems for subsea production. We bring nearly 30 years of technological expertise and innovation to the challenges facing customers in the subsea environments. www.fmctechnologies.com

SeaBotix Inc.
2877 Historic Decatur Road, Suite 100
San Diego, CA 92106 USA
Tel: +1 619 450-4000
Fax: +1 619 450-4001
E-mail: Info@SeaBotix.com
Website: www.SeaBotix.com

SeaBotix Inc. is the world leading manufacturer of capable MiniROV systems. The Little Benthic Vehicle range of systems have become the benchmark in compact ROVs around the world. All systems perform a multitude of tasks including maritime security, body rescue, sensor deployment, object recovery, hazardous environment intervention, and hull inspection.

Sub-Atlantic
Woodburn Rd.
Blackburn Business Park
Blackburn, Aberdeen
AB21 0PS, Scotland
Tel: +44(0)1224 798660
Fax: +44(0)1224 798661

10642 West Little York, Suite 100
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Tel: +1 713 329 8730
Fax: +1 713 329 8299
E-mail: sub-atlantic.slaes@f-e-t.com
Website: www.f-e-t.com/Subsea

Forum Energy Technologies' sub-Atlantic brand manufactures world class ROVs ranging from portable units to light work class systems. Sub-Atlantic also supplies thrusters, hydraulic power units, valve packs, compensators and pan and tilt systems to other ROV manufacturers. Sub-Atlantic is part of the FET subsea group and has facilities in the US and UK and sales offices and agents around the world.

VideoRay
580 Wall Street
Phoenixville, PA 19460
Tel: (610) 458 3000
Fax: (610) 458 3010
E-mail: info@videoray.com
Website: www.videoray.com
Contact: Brian Luzzi

With more than 1,900 Remotely Operated Vehicles (ROVs) in service around the world, VideoRay has clearly become the global leader in Observation ROV technology. VideoRay is an extremely versatile, portable, affordable, and reliable solution for underwater operations including surveys, offshore inspections, search & recovery, homeland & port security, science & research, fish farming, and other unique applications in underwater environments. VideoRay is available on the General Services Administration.

UNDERWATER VIDEO EQUIPMENT

Kongsberg Maritime Ltd.
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Email: km.camsales.uk@kongsberg.com
Website: www.km.kongsberg.com/cameras
Contact: Mark Esslemont

Kongsberg Maritime Ltd is a world leader in providing harsh environment underwater camera & imaging technology and marine CCTV systems to the Offshore Oil Field & Renewable Energy, Power Generation, Scientific, Maritime and Military sectors.

SIDUS Solutions, Inc.
San Diego, CA Office:
Tel: (619) 275 5533
Fax: (619) 275 5544
Houston, TX Office:
Tel: (281) 658-2555
E-mail: info@sidus-solutions.com
Website: www.sidus-solutions.com

SIDUS Solutions LLC is an integrated systems provider for security/video surveillance systems specializing in customization with products operational to subsea depths of 6,500m. As a full service provider offering end-to-end solutions from concept design, product selection, engineering, manufacturing, technical and customer support, we serve the Oil and Gas, Scientific, Military and Academic industries worldwide.

WINCHES, HANDLING & CONTROL SYSTEMS

Hawboldt Industries
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Chester, Nova Scotia
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Tel: 902 275 3591
Fax: 902 275 5014
E-mail: paul.phillips@hawboldt.ca
Website: www.hawboldt.ca
Contact: Paul Phillips

Hawboldt Industries has built robust commercial and scientific deck machinery for over a century, focusing on custom winch solutions and satisfying project requirements from engineering to commissioning. ROV winches, A-frames, and electro-hydraulic power packs are available to satisfy the offshore and subsea markets. Our scientific winches, preferred by universities and governments worldwide, are renowned for their durability and performance particularly in harsh environments.

Markey Machinery Company
7266 8th Ave. South
Seattle, WA 98108 USA
Tel: +1 800 637 3430
Fax: +1 206 623 9839
E-mail: info@markeymachinery.com
Website: www.markeymachinery.com

Preferred by the US fleet, Markey's advanced oceanographic winch systems provide ultimate dependability, reliability and precise performance when and where you want it. Operating within critical windows of opportunity you can count on our custom winches, capstans, windlasses and auxiliary machinery for the successful execution and completion of your research.

Radoil, Inc.
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Houston, TX 77041
Tel: (713) 937 4494
E-mail: pvanderlinden@radoil.com
Website: www.radoil.com

Radoil's goal is to identify challenges, design innovative solutions and manufacture quality products that solve your deepwater problems. Our business is to save you time and money. Everyone encounters delays and with day rates where they are any delay can be very costly to you, your clients and your vendors.

Rapp Hydema AS
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Tel: +47 75550100
Cell: +47 90755058
E-mail: runar.tunem@rapphydema.com
Website: www.rappmarine.com

ROV-Winches for the Offshore & Sub Sea Drilling/Construction. Specially designed and developed for use with a range of Remotely Operated Underwater Vehicles with computerized Active Heave Compensation Control systems & Moon Pool ROV Launch & Recovery system (LARS). Deepwater Heavy Lift Winches with Superior Performance.

WINCHES - UNDERWATER

ALL OCEANS Engineering Ltd.
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Fax: +44(0)1224 791002
E-mail: admin@alloceans.co.uk
Website: www.alloceans.co.uk
Contact: Brian Abel

MECHANICAL HANDLING UNDERWATER
Launch and Recovery Systems - 6,000m plus Underwater Winches - ROV and Diver operated Tether Management Systems - 6,000m plus Torque Tools - Electric and Hydraulic systems - ROV and Diver operated General Products - Compensators, latches, swivels, metrology sets, cable reels, pressure housings, junction boxes Workshop Services - Fabrication, assembly and testing Engineering - prototyping, product development, solutions engineering AC-ROV - The mini ROV that broke the mold.

OCEANS '13 MTS/IEEE San Diego preview

Heeding the call to join "An Ocean in Common," authors flooded the OCEANS '13 MTS/IEEE San Diego technical program committee with a record number of abstracts in a single day. "We expected a good turn-out," said Barbara Fletcher, technical program chair, "but this shows we're on the right track with the technical and scientific program."

Special topics include an ultra-deep track discussing current and prospective robotic technologies, plus a panel of scientists to consider research questions. Oceans2013 Chair Bob Wernli, and Co-Chair Kevin Hardy, developer of the unmanned "landers" for James Cameron's DeepSea Challenge Expedition, will be the session conveners. "James' intention is to be certain the door remains open to other explorers," said Hardy. "This track will help facilitate that vision. We've barely imagined the possibilities." Cameron will co-author one paper in the track.

Legendary oceanographer, explorer, author, lecturer, Dr. Sylvia Earle joins other notables on the Plenary Session. Fondly called "Her Deepness," Dr. Earle has been at the frontier of deep ocean exploration for four decades. She's led more than 50 undersea expeditions and been a tireless advocate for our oceans and the creatures who live there.

Special ground tours are being arranged, including exhibitor equipment demos from a ship and a tour of a new NOAA laboratory located on the north end of the Scripps Institution of Oceanography/UCSD.

Online registration for OCEANS '13 MTS/IEEE San Diego is open.

For more information, visit www.oceans13mtsieeesandiego.org.

Discover new opportunities in multi-beam sonar solutions

Reson is happy to announce that registration for the World Tour 2013 Underwater Technology Seminar in Copenhagen, from 17 to 19 September, is now open. The seminar is open to all multi-beam sonar users and non-users interested in learning more about SeaBat multi-beam sonar systems and the data acquistion software PDS2000. Please note that Reson is hosting two other Underwater Technology Seminars in the fall: One in Shanghai, China, 1 to 3 September and one in Austin, Texas, 18 to 21 November.

To register, please visit http://go.teledyne-reson.com/wtsignup.

Registration open for October 2013 REMUS/HUGIN AUV users conference

Kongsberg Maritime and its subsidiary Hydroid, Inc., the leading manufacturer of AUVs, have announced that all members of the global AUV community are invited to join them at their AUV Users Conference at the Villa Marigola in Lerici, Italy, from 14 to 17 October 2013. The conference is open to all users of Kongsberg and Hydroid AUVs, with limited availability for non-users interested in learning more about the vehicles.

The 3-day conference, which focuses on Kongsberg's HUGIN and Hydroid's REMUS AUVs, will include informational presentations, a HUGIN simulator, a REMUS 100 demonstration, updates on products, new trends in the market, Q&A periods, and networking sessions. Existing users of Kongsberg and Hydroid AUVs will have the opportunity to share their experience and knowledge to optimize their AUVs, and non-users will learn first-hand about the capabilities of the latest AUV technology. All attendees will have access to full schedule of events, including a comprehensive technical program and guest speakers from both the military and commercial industries.

"Like our previous user conference, this event is all about customer networking," said Christopher von Alt, president and co-founder of Hydroid. "Kongsberg and Hydroid are proud of the AUVs we build, and we want customers to put them to their fullest use. For non-users, the event presents a unique opportunity to learn more about how AUVs can improve their operations. Our AUV Users Conference is one of the best ways for the AUV community to exchange ideas and increase their knowledge of these systems."

The 2013 event follows the highly successful REMUS/HUGIN user conference in October 2010. The 2010 conference in San Diego brought together nearly 100 AUV users from nine countries to discuss topics, including the 2009 search for Amelia Earheart's plane and emerging AUV applications such as pipeline inspection and environmental monitoring.

For more information, visit https://www.viaregi.com/auvuserconf2013.

July 23-26, 2013
Hydrovision International 2013
Denver, Co
www.hydroevent.com

August 12-15, 2013
AUVSI's Unmanned Systems N.A.
Washington, D.C.
www.auvsishow.org

September 3-6, 2013
Offshore Europe Oil & Gas
Aberdeen, UK
www.offshore-europe.co.uk

September 22-27, 2013
SEG Annual Meeting
Houston, TX
www.seg.org

September 23-27, 2013
Oceans '13 MTS IEEE
San Diego, CA
www.oceans13mtsieeesandiego.org

September 30-October 2, 2013
SPE Annual Technical Conference
New Orleans, LA
www.spe.org

October 8-9, 2013
MTS Dynamic Positioning
Houston, TX
www.dynamic-positioning.com

October 9-13, 2013
International Workboat
New Orleans, LA
www.workboat.com

October 22-24, 2013
Deep Offshore Technology
Houston, TX
www.deepoffshoretechnology.com

October 22-24, 2013
LAGCOE
Lafayette, LA
www.lagcoe.com

October 22-24, 2013
AWEA/Offshore Windpower
Providence, RI
www.offshorewindexpo.org

November 5-7. 2013
Deepwater Operations
Galveston, TX
www.deepwateroperations.com

November 6-8, 2013
Oil Comm
Houston, TX
www.oilcomm.com

November 11-13, 2013
Subsea Survey IMMR
Galveston, TX
www.subseasurvey.com

Ocean News & Technology

2013 EDITORIAL CALENDAR

January/February 2013
Editorial: Decommissioning & Abandonment, Subsea Fiber Optic Networks
Distribution: Decommissioning & Abandonment Summit, NACE, Offshore Mediterranean, U.S. Hydro
Product Focus: Navigation, Mapping & Signal Processing

March
Editorial: Oceanology & Meteorology, Maritime Security
Distribution: Ocean Business, SubOptic 2013
Product Focus: Ocean Instrumentation, Diver Detection Systems

April
Editorial: Offshore Technology, Ocean Mapping & Survey
Distribution: GMREC, IDGA Maritime Homeland Security, OTC
Product Focus: Connectors, Cables & Umbilicals

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Product Focus: Subsea Tools & Manipulators

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August
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Product Focus: Multibeam & Side Scan Sonars

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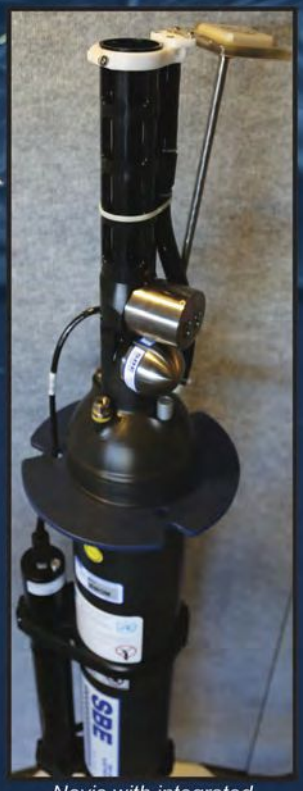

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