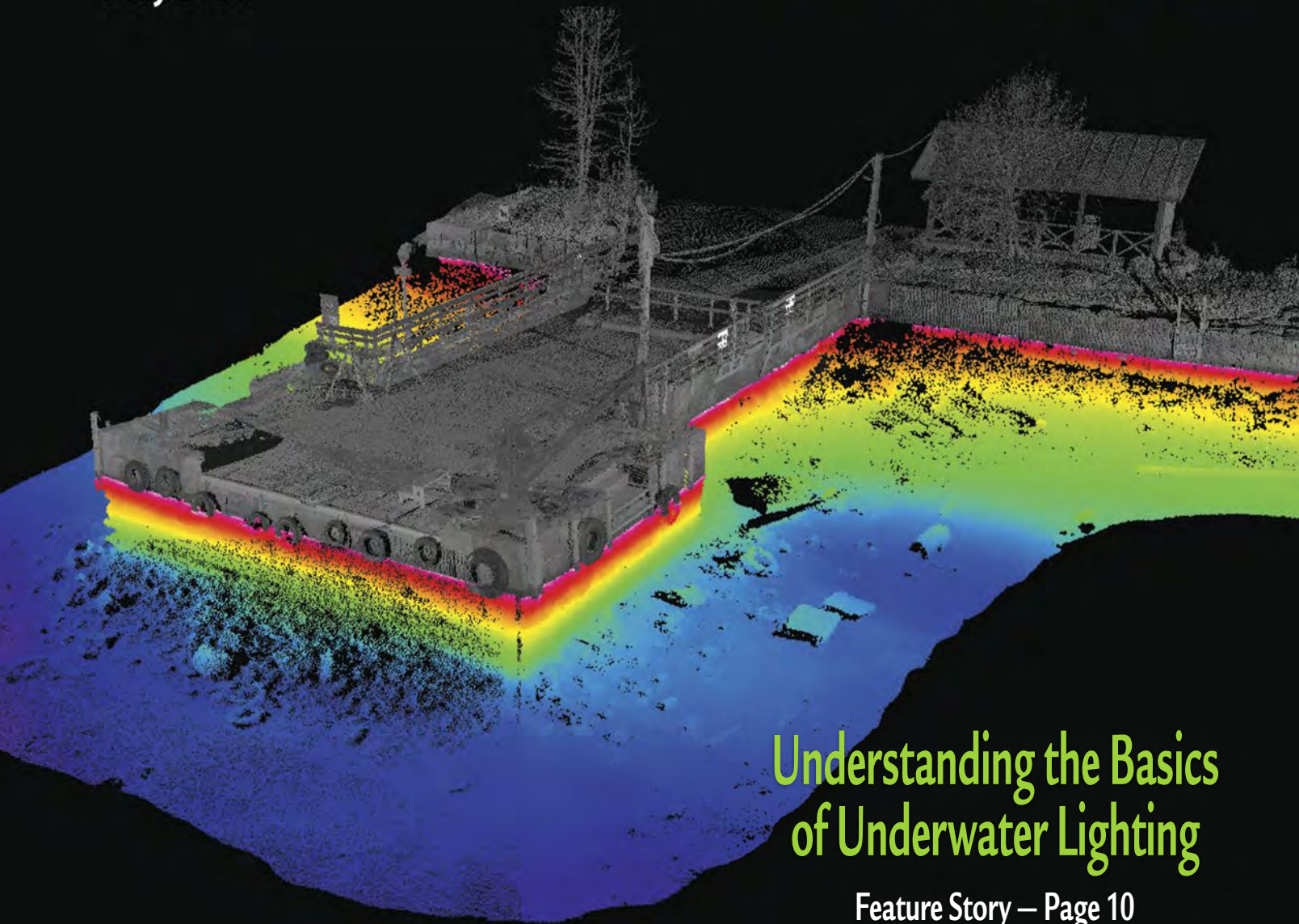


News for the Ocean Industry
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May 2013



Understanding the Basics of Underwater Lighting

Feature Story – Page 10



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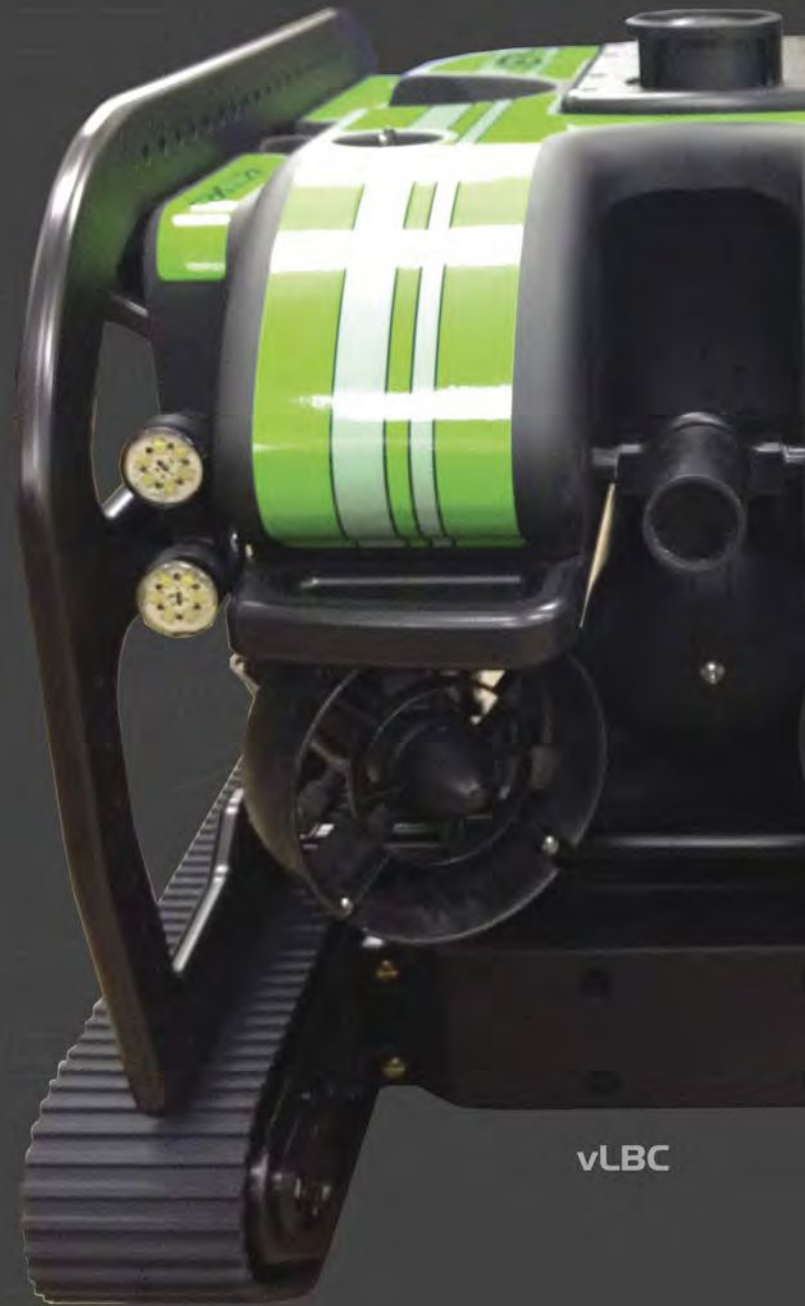
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Harakka island pier in front of Helsinki. Underwater data collected with Reson and above water captured by Riegl laser scanner installed in Meritaito's unique mobile survey platform.

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Submarine Power Cables – A Booming Global Market

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Never in its over 100-year history has the demand for submarine power cables been anywhere near what it is today. All of the major segments for submarine power cable market—grid interconnection, offshore renewables, and links to islands and oil and gas platforms—are growing at a pace that would have been difficult to image only a few years ago. It is a pace that suppliers are struggling to keep up with.

The basic driver for all segments of the submarine power cable market is the push towards “green” energy. Grid interconnection allows the movement of inexpensive electricity produced by environmentally friendly means across national borders from countries or regions that have a surplus to those that need it. Offshore renewable projects, such as wind farms and tidal generation, produce green energy and need submarine power cables to bring that energy ashore. Links to island and offshore platforms are necessary to bring inexpensive power to isolated locations, allowing them to reduce their dependence on expensive and dirty diesel generators and, in the case of islands, improve the standards of living of the local population. In some cases, the power flows in the other direction—from island to mainland—as onshore wind farms are built to take advantage of the wind resources on more and more islands.

Meanwhile, plans for new cables are proliferating well beyond the industry’s ability to supply them. With more than 80 grid interconnection and island link projects underway or in various planning stages along with dozens of offshore wind farm projects and a small but growing market for connecting offshore platforms, there are more projects in the pipeline than can be supplied at current manufacturing rates. In 2011, leading European energy company TenneT told the German government that it would have to slow the development of offshore wind farms in the North Sea due to the “lack of human, material, and financial resources of all the parties involved.”

A July 2012 report by the Crown Estate, which manages most of the United Kingdom’s offshore territory, noted a shortage of manufacturing capacity for export cables, those cables that connect offshore wind turbines to the land. An August 2012 report by Pike Research, which the company confirmed again in December, also concluded that the industry did not have the manufacturing capaci-

ty to meet the high demand for submarine power cables in the coming years.

With every segment of the market for submarine power cables showing strong growth and with no end in sight to the conditions driving this growth, suppliers are working to increase production. In January 2012, ABB announced that it would invest over US\$400 million to double the capacity of its high-voltage cable manufacturing facility in Karlskrona, Sweden to meet growing demand for submarine power cables. The investment plan includes construction of new buildings and installation of additional manufacturing lines at the existing plant. The expansion will be carried out in a phased manner and is expected to be completed by 2015.

In June 2012, Prysmian inaugurated a new submarine cable plant in Finland, having invested approximately €40 million to increase its production capacity at the Pikkala facility, already one of Prysmian’s centers of excellence for high voltage cable production. Prysmian also is expanding production of submarine power cable capacity at its Arco Felice plant in Italy, after winning in February 2012 the Western Link contract worth around €800 million to build a new submarine power link between Scotland and England—the highest value submarine power cable contract ever awarded.

More announcements from these and other submarine power cable manufacturers are likely in the future. Demand certainly is not slowing thus far in 2013. In the first 3 months of the year alone, 10 new submarine power cable contracts were awarded to five different suppliers. In all of 2012, probably the strongest year in the history of the submarine power cable industry, only 23 contracts were awarded. If the 2013 pace continues, it would nearly double the number of contracts awarded in 2012.

Submarine power cables require a huge investment, both to manufacture and install. But the demand is there and is not going away. The potential for offshore wind to reduce the effects of global warming, the need to move electricity from where it is produced to where it is needed, and the potential quality of life advantages that reliable, affordable power can bring will continue to drive the market.

There are not many times when you can say that the “sky is the limit,” but for submarine power cables, it just might be accurate.



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Understanding the Basics of Underwater Lighting

By Aaron Steiner on behalf of DeepSea Power & Light

In subsea photographic and video imaging applications, one of the challenges that system designers, integrators, and operators face is bringing along all of the light they will need for tasks below depths of about 150 to 250 m. At these depths, an understanding of how light propagates through water helps designers and users balance mission requirements against the real-world constraints of underwater lighting while helping them make informed lighting choices. A glossary

of terms in the sidebar is provided for reference throughout the article.

Behavior of Light Underwater

Light in water exhibits behaviors outside of the range of day-to-day human experiences. These behaviors are the result of the interplay of phenomena from the atomic scale to the macroscopic life that permeates the oceans. Light no longer follows straight lines from source to subject, and the inverse square law becomes a poor predictor of luminous intensity at a given distance from a source.

Glossary of Terms

Luminous Flux (Lumens, lm): Total power emitted from a light source, scaled for human visible wavelengths. Used to evaluate useful light output.

Illuminance (Lux, lm/m²): A measure of the amount of light incident on a surface. Used to describe intensity within a beam of light at a subject.

Correlated Color Temperature (CCT, kelvin): A measure used to evaluate the hue of white light sources from “warm” red-hot hues to “cool” blue-hot hues that follow black body emission spectra.

Color Rendering Index, CRI: Figure of merit used to describe how accurately a light source will represent the visible color space.

Total Illumination: Describes the combined total direct and indirect illumination on a subject. Helpful for evaluating the effectiveness of lighting.

Attenuation length (m): Distance light will travel before the intensity drops to 37% of the source intensity. Used to describe penetration of light underwater, and is a function of wavelength with blue-green light having longer attenuation lengths than red or yellow light.

To understand these behaviors, it is useful to frame the discussion in terms of total illumination of a subject at a distance from a light source. Total illumination is the sum of the direct and diffuse illumination that reaches the subject. Direct illumination is light arriving in direct line-of-sight from the source; whereas, diffuse illumination is light traveling in an indirect path through multiple scattering processes to arrive at the subject. Characteristics of direct and diffuse illumination are governed by physical and practical limits related to a wide range of parameters from temperature, salinity, and concentrations of dissolved solids to the atomic structure of water molecules themselves. These parameters contribute to attenuation of the light by absorption and scattering phenomena, which exhibit a strong relationship to the wavelength of light (or the spectral power density) and the beam angle of the light source.

Direct illumination losses are primarily caused by the absorption of light in the water volume between the source and subject. Absorption

of light in pure water is generally dominated by the interaction of photons with water molecules. As a photon contacts a water molecule, it is absorbed and converted to heat energy. This interaction has a strong dependence on wavelength, with light in the red and violet ends of the spectrum being strongly attenuated while blue-green region of the visible spectrum has minimal attenuation. This is what gives seawater its strong blue-green appearance. Other substances in the water—such as suspended solids, biological matter, and dissolved organic matter—may further attenuate light and tend to do so more in the blue wavelengths. In coastal and estuarial waters where the concentration of organic matter and other dissolved material is generally higher, the level of absorption can increase and additional absorption in the blue spectra will cause a general shift towards green. This explains why coastal waters are typically greener in appearance than in the open ocean (See Figure 1)

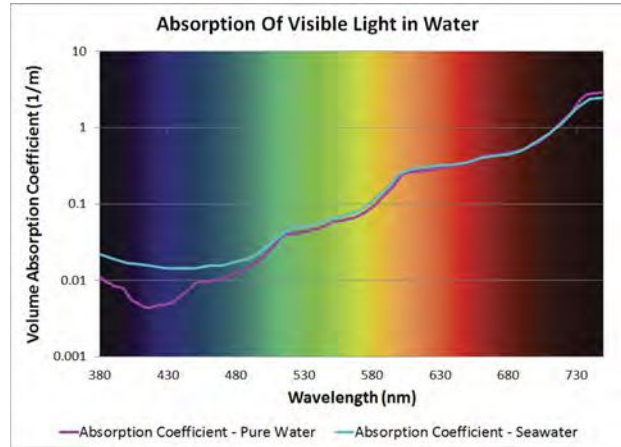


Figure 1. Volume absorption coefficient and attenuation length in pure water (Pope and Fry, 1997) and seawater (Smith and Baker, 1981).

Scattering describes a wide range of phenomena that generally break down into small variances within the light path, refracting or reflecting part of the light away from the original direction of travel. These variations are caused by temperature transitions, suspended particles, dissolved solids, and biological “snow.” Although there is a relationship between wavelength and some scattering phenomena, the strongest contributors are generally not heavily dependent on the color of the light. The particular components contributing to scattering may vary significantly from sample to sample, but the general pattern of scattering in natural seawater is consistent. Some of the scattered light will return to the main beam, reach the subject, and contribute to the total illumination. In fact, at distances greater than one to two attenuation lengths from the source, the scattered or diffuse component of total illumination will become significant and begin to overtake and exceed the direct illumination component.

The color content of an underwater white light source will de-saturate due to absorption and scattering and approach the color of a monochromatic source (Figure 3). Attenuation limits not only the total illumination of a target, it also constrains the useful range over which color information is transmitted under water. This is due to the non-uniform spectral attenuation through the water (See Figure 2).

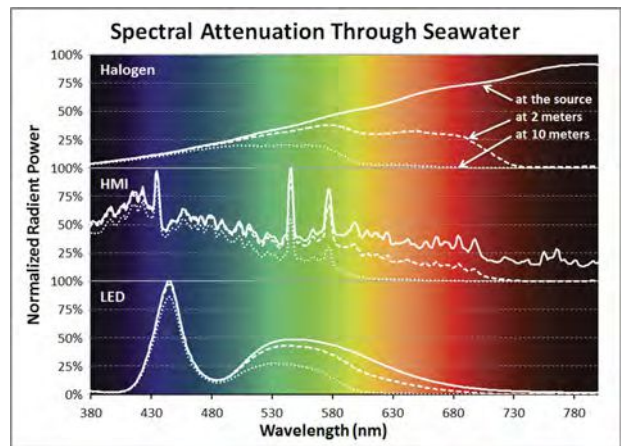


Figure 2. Spectral attenuation of various light sources at different distances through seawater

While it may help increase illumination at the subject, scattering also reduces the contrast between the subject and the background. In part, this is due to backscatter along the illumination path washing out the subject as well as scattering of the reflected light from the subject itself blurring the image. Increasing total illumination of the subject will not improve contrast in this case because the scattering scales with intensity and no net increase in contrast will result. This imposes practical limits on the distance at which an object can be detected in contrast-limited imaging applications like human vision or film. Fortunately, for electro-optical imaging applications, the signal-to-noise ratio at the detector determines detectability of a subject more than the contrast. The signal-to-noise ratio will increase with the square root of the total illumination of the subject. For instance, if there is a 10X increase in the subject illumination, there will be about a 3.1x increase in the detectability of a subject against an ocean background.

Why Does All of This Matter?

Different tasks underwater impose unique constraints and requirements on the system. The balance between lighting properties and practical limits must be based on the intended application. Understanding how to evaluate a light for the mission requirements and how lighting parameters change underwater is critical for system designers.

For instance, when designing illumination for remotely operated vehicle (ROV) piloting, the main objective is to provide the pilot with sufficient visual information about his surroundings to be able to safely maneuver to the work site, avoid hazards, and be alerted to nearby obstacles. This necessitates high contrast and high signal-to-noise ratio in the imaging system as well as broad, diffuse light sources that can be optimized for the local scattering conditions. The parameters with the most importance in this application would be total luminous flux, spectral content, and dimming range. Using higher CCT lighting (>5000K) helps ensure that less of the power emitted by a white source will be attenuated. Selecting a light with a high luminous flux will ensure that sufficient light is available to boost detectability for low contrast subjects or distant objects. Depending on the operating environment, dimming may also be critical in this application. Since conditions at a site can vary drastically, the ability to dim down the light source allows the pilot to compensate for high backscatter.

In a High Definition (HD) imaging application for inspection tasks, biological surveys, or archeological expeditions, the lighting

requirements impose a very different set of constraints. For these applications, color accuracy, uniform illumination, and high angular contrast are key. HD imaging particularly benefits from a full, rich color space, which helps differentiate species in biological surveys or distinguish between natural surface variations and corrosion on a subsea structure. Color accuracy is most closely described by CRI parameters, but attenuation causes the spectral content of the light source, even a high CRI source, to change drastically over the distance to and back from the subject. This sets practical limits on imaging distances and the minimum illumination where color accuracy is needed. In some cases, supplemental monochromatic sources are required to boost spectral content in the highly attenuated portions of the visual spectrum. For a given imager size, sensors used in HD imaging have lower sensitivities than their standard definition counterparts and generally require more light. The higher resolution of HD imagers is also more sensitive to scattering from the reflected light off a subject since more subtle angular separation of light is detectable in the captured data. The scattering behavior of light underwater is proportional to the beam angle of the source. Having more tightly collimated light sources helps reduce scatter at longer distances and takes full advantage of the detector resolution.

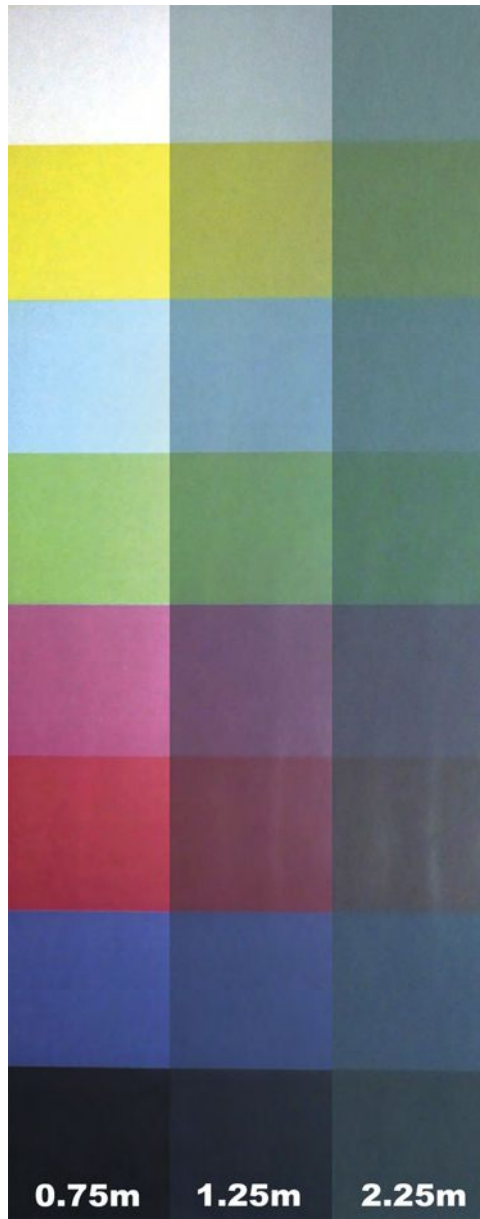


Figure 3 - Color shift underwater with a 90-CRI LED light source at 0.75m, 1.25m, and 2.25m from left to right.

Why Choose LEDs for Underwater Lighting?

Solid state lighting technologies are supplanting incandescent, fluorescent, HMI, and HID lighting in many applications—and for good reason. LEDs prove to be highly efficient and extremely flexible solutions. They are well suited to nearly every lighting application, including subsea imaging. Using LEDs, system designers can optimize a variety of the lighting characteristics discussed here for a particular set of requirements. CCT, lumens, lux, CRI, color, and beam patterns are all tunable characteristics within the standard selection of LED devices and provide the system designer with an unprecedented level of flexibility within a single lighting technology.

LEDs are also intimately tied to the semiconductor industry and benefit from the same economies of scale, product improvement cycles, and R&D investments that drive forward other consumer electronics markets. Other technology trends from the semiconductor industry and the consumer lighting markets continue to push innovative solutions for drivers and control systems, allowing for lighting solutions that were never before possible.

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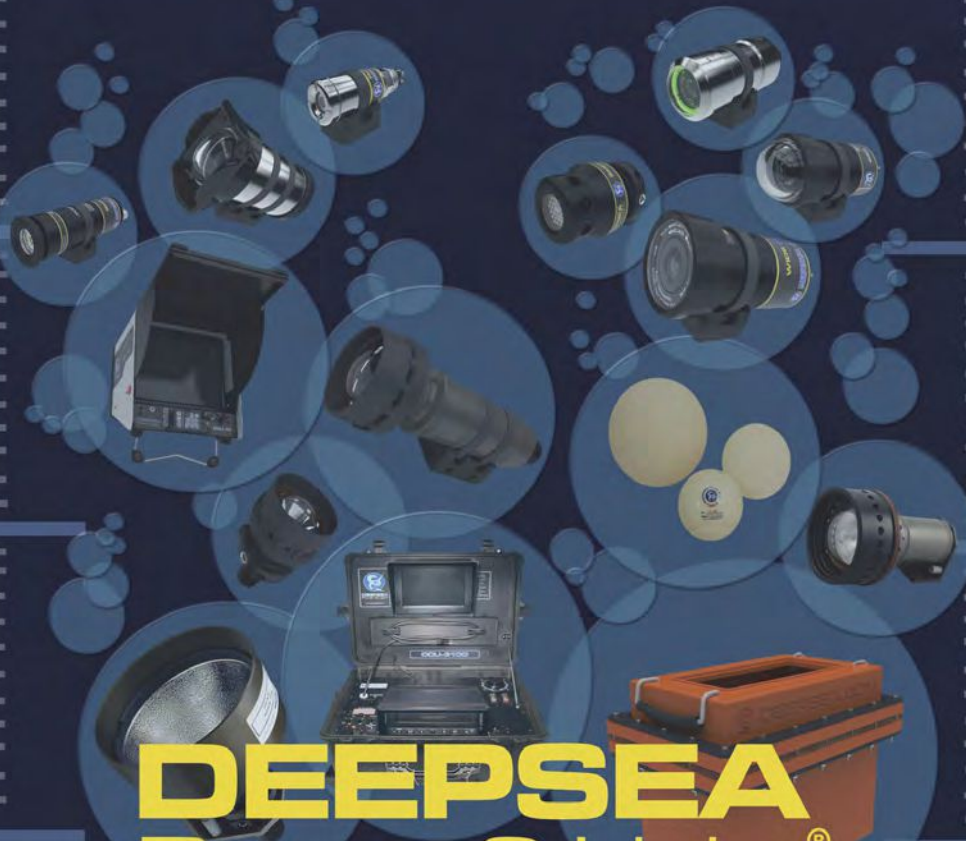
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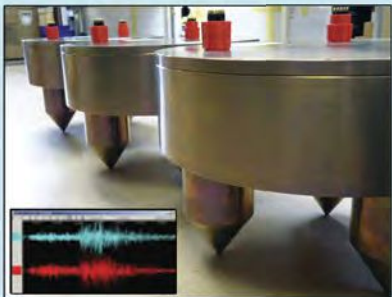
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Offshore Communications Backbone

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.

OCEAN INDUSTRY

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Explorer and Filmmaker James Cameron forms partnership with WHOI



James Cameron talks with engineers and technicians in the Alvin submersible group during a recent visit to Woods Hole Oceanographic Institution (Photo by Matt Barton, Woods Hole Oceanographic Institution)

Explorer and filmmaker James Cameron and Woods Hole Oceanographic Institution (WHOI) have formed a partnership to stimulate advances in ocean science and technology and build on the historic breakthroughs of the 2012 Cameron-led Deepsea Challenger expedition exploring deep-ocean trenches. The announcement comes on the 1-year anniversary of Cameron’s unprecedented solo dive to 35,787 ft, almost 11,000 m, to the deepest place on Earth—the Challenger Deep in the Mariana Trench—in the vertically-deployed vehicle he and his team engineered, the Deepsea Challenger submersible system and science platform.

Cameron will transfer the Deepsea Challenger to WHOI where scientists and engineers will work with Cameron and his team to incorporate the sub’s numerous engineering advancements into future research platforms and deep-sea expeditions. This partnership harnesses the power of public and private investment in supporting deep-ocean science.

“The 7 years we spent designing and building the Deepsea Challenger were dedicated to expanding the options available to deep-ocean researchers. Our sub is a scientific proof-of-concept, and our partnership with the Woods Hole Oceanographic Institution is a way to provide the technology we developed to the oceanographic community,” says Cameron. “WHOI is a world leader in deep submergence, both manned and unmanned. I’ve been informally associated with WHOI for more than 20 years, and I welcome this opportunity to formalize the relationship with the transfer of the Deepsea Challenger submersible system and science platform. WHOI is a place where the Deepsea Challenger system will be a living, breathing, and dynamic program going forward.”

“Jim’s record-breaking dive was inspirational and helped shine a spotlight on the importance of the deep ocean,” says Susan Avery, president and director of

TSC expands publishing division with new magazine and new hires

TSC has expanded its publishing division, adding a new magazine focused on the coastal and offshore environmental market. ENVIRONMENT coastal & offshore (ECO) is published bi-monthly in print, digital, and APP formats and focuses on policy and regulation issues as well as technology developments and industry news. ECO is distributed to industry professionals around the world. For more information or a peek at the latest issue, visit www.eco-tsc.com.

TSC welcomes **Greg Leatherman** as editor of ECO magazine. Mr. Leatherman has previous experience as a public affairs writer at the Department of Energy’s National Energy Technology Laboratory and over 15 years experience writing about science for NASA, the Department of Defense, and similar organizations—a valuable asset in his responsibilities for the editorial direction of this new publication.



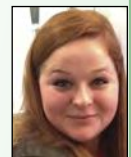
Leatherman

Amy Dukes joined TSC’s Media & Events division as Sales Representative. Ms. Dukes is responsible for advertising sales for Ocean News & Technology in Texas and Louisiana as well as ECO advertising sales in North America. Her responsibilities also include exhibit and sponsorship sales for the Subsea Survey IMMR conference, which is held annually and organized by TSC.



Dukes

TSC is also proud to announce that **Mimi Shipman** has joined the group as sales representative for ECO and Ocean News & Technology magazines. Ms. Shipman is responsible for advertising sales for both publications, joining Zinat Hassan in the international territory. She previously worked as an events assistant for Intelligent Exhibitions, most recently helping to organize Ocean Business 2013.



Shipman

Zinat Hassan, an existing member of TSC’s team with responsibilities for international advertising sales for Ocean News & Technology, will now also focus her attention on advertising sales within an international territory for ECO magazine. She joined the company in 2007.

Samantha Burn recently joined TSC as marketing coordinator. Ms. Burn will assist with marketing and sales development for TSC’s publication, conference, research, and catalog divisions.



Burn

WHOI. “We face many challenges in our relationship with the ocean, so there is heightened urgency to implement innovative approaches. Partnerships such as this one represent a new paradigm and will accelerate the progress of ocean science and technology development.”

James Cameron has logged more than 3,000 hrs underwater and is a veteran of 85 submersible dives, most of them to depths greater than 2 mi, and of eight oceanographic expeditions.

For more information, visit www.who.edu.

FoundOcean awarded major grouting contract to help raise the Costa Concordia

Scottish-based FoundOcean has been working at the Costa Concordia wreck removal site since October 2012, having been awarded the scope of work to design, manufacture, and grout 2,500 fabric formworks that will support the ship’s hull during the up-righting phase of the salvage operation. FoundOcean will also carry out the foundation grouting of six subsea support platforms, which are critical in the parbuckling (or rolling) of the Costa Concordia from its current beached position.

FoundOcean is a globally recognized subsea grouting specialist, with nearly 50 years experience in the oil and gas and offshore wind sectors. It is one-third owned by Ambienta SGR, the environmental-sector-focused Italian private equity house.

FoundOcean has designed and manufactured the speciality formworks that are being placed and grouted *in situ*, much like standard pipeline freespan correction grout bags. Once the formwork embankment has been completed, grout mattresses will be installed on top of them and filled in the same way. The grout mattresses will provide a flat, stable platform for the ship’s hull to rest on once it has been rolled upright.

An estimated 14,000 tonnes of cement sourced from Italian cement manufacturer Italcementi will be used to fill the formworks and mattresses, with an additional 900 tonnes for the platform pile-grouting phase.

In order to meet the environmental requirements of the salvage project, the seabed must be returned to its original condition. FoundOcean’s grout bags, each of which will weigh up to 70 tonnes, are designed to be lifted

back out of the sea when the salvage operation is complete. They will then be taken ashore for processing and recycling.

For more information, visit www.foundocean.com.

RV Tiburon’s ROV “Otis” documents WWII submarine

The WWI R-Class submarine was called back to service for WWII and sank on 12 June 1943 just 12 mi offshore while on wartime training patrol. She sank in seconds, entombing 42 of her crew and has been essentially forgotten for 70 years.



“I have known about the R-12 for years; from time to time in the history books, you would get a mention of her sinking, but nothing concrete. The locations taken at the time of her sinking were very general. The fact that no one else had gone looking for her amazed me. I had the skills and technology and felt it was time this boat was found so the families could see the final resting place of their loved ones,” states Tim Taylor, owner of RV Tiburon, Inc.

Since the mid 2000s RV Tiburon Inc. had been working with developing offshore operational strategies based on a small boat model for autonomous underwater vehicles. This included launching and running a 12-in. diameter, 13-ft long, 1,500 m AUV to depth for extended missions up to 200 mi offshore. Applying this tool to the search for the R-12 was a logical step.

The AUV allowed them to survey up to 47 sq. mi in one day. Utilizing this tool they were able locate and then photograph the wreckage of the USS R-12 that has been lost since World War II.

After coordinating with the U.S. Navy, it was decided that they would build a custom ROV system to help in the next phase of the exploration. “We took the controls of a Phantom system and brought it into the 21st century,” states Taylor. Working with DOER Marine in Alameda, California, they added a host of current technology to the re-christened Spectre platform.

For more information, visit www.rvtiburon.com.

Ashtead Technology announces sale of North American Instruments business

Leading international subsea equipment solutions specialist, Ashtead Technology, has announced the sale of its North American Instruments business. The Instruments business, which specializes in the rental of onshore environmental monitoring, non-destructive testing, and visual inspection equipment, has been acquired by New Jersey-headquartered Pine Environmental Services LLC.

Allan Pirie, CEO at Ashtead Technology, said, “The divestment of the North American Instruments business is a key step in our long-term growth strategy to focus on our offshore business, which has significant growth potential in the coming years.”

“The sale enables us to accelerate our strategic investment plans globally and to further meet our customers’ requirements for the highest quality subsea equipment rental solutions.”

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

Mitsubishi Heavy Industries joins World Ocean Council

Mitsubishi Heavy Industries, Ltd. (MHI) has joined the World Ocean Council (WOC) as the first Japanese entity to join the organization and the first from the shipbuilding industry.

Through participation in the WOC, MHI aims to acquire firsthand knowledge of policy and practical issues affecting the future of ocean industries, deepen exchanges with responsible ocean companies and organizations, and proactively engage with other sectors on areas of mutual value. MHI will engage in WOC activities as a team spanning various company business sectors—not only shipbuilding and ocean development, but also other ocean-related operations.

Through involvement in this international, multi-sectoral network, MHI will gain opportunities to interact with industries it has collaborated with infrequently until now. Going forward, the company intends to focus on establishing human and information networks in preparation for new business exploration and technological development from the new perspectives it can gain from being part of the WOC.

For more information, visit www.oceancouncil.org.

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POLAR WIND



*By: Kerry Walsh,
Global Diving & Salvage, Inc.*

In the realm of heavy marine salvage, there are key fundamental factors in every instance that serve to challenge and drive the response to any maritime casualty. These elements include the location of the casualty, the risk posed to the environment, the risk posed to the salvors, the weather and seas impacting the casualty, and the value of the vessels and their cargoes. In the case of the response to the grounding of the Northland Services tug Polar Wind and her tow, the barge Unimak Trader, each of these elements were in full force.

Background

On 12 November 2012, the 2900-Hp tug Polar Wind, towing the 250-ft barge Unimak Trader, departed Sand Point, Alaska bound for Dutch Harbor. The Unimak Trader was loaded with a cargo consisting of 97 40-ft containers, 33 of which were filled with nearly 1.5 million pounds of frozen seafood. Later that day, with severe weather in the forecast, the captain of the Polar Wind sailed into the relative shelter of Volcano Bay in the Eastern Aleutian Islands. The bay, located just west of the entrance to the notorious Pavlof Bay, is frequently used as a safe location to heave to and wait out heavy weather.

The following day, the wind shifted, forcing the tug to pick up the towline and maneuver to safer waters. During the maneuver, the towline became fouled in the port propeller of the Polar Wind—beginning a series of events that ultimately led to the tug and barge being driven hard aground on the southern shore of Ukolnoi Island, one of the most inhospitable areas of Alaska.

With the tug and the nearby barge pounding on the rocks and rolling hard in the heavy surf, the crew of the Polar Wind were rescued by U.S. Coast Guard helicopter and transported to safety in Kodiak. The time was 0413 on the morning of 14 November 2012 and a challenging salvage operation was about to begin.

Response

Secure in the knowledge that the crew were rescued and safely on shore, the managers in the Seattle offices of Northland Services (owner and operator of the tug and barge) turned their

full attention to salvage. To facilitate the complex salvage operations, Northland contracted Seattle-based Global Diving & Salvage, Inc. Global's Senior Salvage Master worked with Northland to develop the initial response plans, while Global's Anchorage, Alaska office began mobilizing equipment and personnel. Vessel specifications and cargo information were provided to Global's Naval Architect who began the complex salvage engineering and computer modeling of the casualties. Northland quickly activated its Alaska-based landing craft Nunaniq and Sam M. Taalak, directing them to prepare for sea and rig to undertake lightering of the cargo from the barge.

Northland Services assigned Global the task of representing them in the role of Incident Commander in the Unified Command, which had been established in Anchorage to oversee the response to the casualty. The Unified Command consisted of the U.S. Coast Guard Captain of the Port for Western Alaska who served as the Federal On-scene Coordinator and the Alaska Department of Environmental Conservation State On-scene Coordinator. Global immediately dispatched a Salvage Master to its regional office in Anchorage to oversee the response and assume the position of Incident Commander.

From Global's Anchorage office, the Global Salvage team organized the effort into three distinct lines of response: 1) Mitigation of pollution through lightering of fuel/spill response capability; 2) Preservation and salvage of the barge cargo; and 3) Salvage of the tug and barge and the equipment aboard. Detailed plans were developed and placed into action, and salvage foremen were assigned to supervise each part of the response.

Global activated the Sand Island, its Homer, Alaska-based dive/salvage support vessel to serve as the on-scene command post and support dive operations. Specialized high volume/low pressure salvage blowers, staged in Portland, Oregon, were mobilized to King Cove. Northland dispatched a tug, the 4200-Hp Ocean Ranger and a deck barge from Dutch Harbor as well as their landing craft Nunaniq and the Sam M. Taalak, which sailed from Homer and Petersburg. Under contract to Global, Magone Marine Services mustered their forces and sailed the salvage vessel Redeemer and barge Kashega from Dutch Harbor toward the casualties.

The first members of the salvage team battled dangerously heavy Northerly winds and arrived on scene at 1700 on 16



November, 2 days after the rescue of the crew. They found the Polar Wind and the Unimak Trader bow to and hard up on the rocky shore, but in relatively calm water in the lee provided by the steep cliff sheltering the vessels from the severe Northerly winds. It was immediately noted that a strong Southerly wind would quickly demolish both casualties. Time became of the essence.

On boarding the vessels, the salvage crew found the engine room of the Polar Wind to be dry, thanks in large part to the actions of the crew before they departed the vessel. Similarly, on board the Unimak Trader, the crew found the two generators running, providing electrical power to the 33 containers of frozen product. The crew conducted an initial salvage assessment and returned to King Cove to update the plans and complete the preparations for the salvage operations.

In Anchorage, coordination and planning was an on-going process. Daily meetings were conducted to discuss the operations and plans with the Unified Command and the various stakeholders, which included Northland Services and a wide range of Federal, State, and local agencies, including (among others) the Department of the Interior, Fish & Wildlife Service, the National Oceanic and Atmospheric Administration (NOAA), and the city governments of King Cove and Sand Point.

During high tides and when seas allowed, Global and Northland's crews aboard Nunaniq and the Sam M. Taalak worked in the shallow rocky water alongside the Unimak Trader and, using the crane and forklift on board the wreck, quickly and safely offloaded all of the containers and transferred them to the flatdeck barge. The Ocean Ranger safely delivered the frozen product to Dutch Harbor and immediately returned to Ukolnoi Island. The seafood cargo was inspected and sent to market with no loss.

Meanwhile, the salvage crew had boarded the tug, including Global's Naval Architect and the Chief Engineer of the Polar Wind. The crew safely transferred approximately 13,500 gal-

lons of diesel fuel from the tug to the Redeemer. Based on the condition of the tug, the swell affecting the vessel at high tide, and the results of a sonar bathymetric survey in hand, the Ocean Ranger was made up to the Polar Wind and successfully pulled her from her strand 16 days after she grounded. Divers inspected the tug, and she departed for Sand Point under tow by the Redeemer.

Salvage assessment of the Unimak Trader indicated that she had severe bottom damage, with only 1 of her 15 tanks undamaged and most of her internal bulkheads compromised. The salvage crew had worked to prepare the barge for refloating by connecting the salvage blowers to air fittings that were welded into her tank tops. The salvage blowers provided the capability



to supply 7,200 cubic feet per minute of air to the barge to displace the water in the flooded tanks.

Suitably plumbed and rigged for salvage, the plan was set for the refloating attempt to occur later that day at the high tide predicted for 1530. At 1300, the towline from the Ocean Ranger was fastened to the stern bridle and the tug took a light strain on the tackle. The crew started the salvage blowers and proceeded with dewatering the barge, carefully monitoring internal pressures in the barge compartments. At 1330, the barge, under a light strain from the tug, slipped from the rocks and came afloat.

Conclusion

Both the Polar Wind and Unimak Trader arrived in Sand Point safely. Global's dive crew worked to install sturdy patches to the hull of the Polar Wind and install pumps and a water intrusion alarm system. The Polar Wind was taken to a shipyard in Seattle where she was delivered to her owners and is currently undergoing repairs before returning to service.

The hull of the Unimak Trader was surveyed by divers. With the severe bottom damage she had sustained during the grounding, temporary patching was not an option. The salvage blowers were rigged to allow unmanned operation, and the barge was taken under tow to Homer by the Ocean Ranger. Due to the significant bottom damage, the vessel sustained the Unimak Trader was declared a constructive total loss and was sold to a scraper in Homer.

Northland Services exhibited great leadership in their rapid and dedicated response to the accident. Deservedly, the entire operation was deemed a major success by the agencies and stakeholders. "This has been one of the more successful recovery operations in the past few years," said Steven Russell of the Alaska Department of Environmental Conservation. "We are grateful for a job very well done."

Carnival Corporation refuses to reimburse costs incurred by U.S. Coast Guard

U.S. Senator Jay Rockefeller, a West Virginia Democrat, is questioning Carnival over its refusal to pay the \$780,000 for costs associated with the rescue of the crippled Triumph cruise ship. Questions were also raised about the line's failure to cover the \$3.4 million costs to the Coast Guard and U.S. Navy over the 2010 stranding of the Splendor in the Pacific Ocean. Carnival Corp says that all maritime interests must assist without question those in trouble at sea—a duty that would not include reimbursement.

Ship recycling—global shipping industry slams European Parliament proposals that will offend EU trading partners

The world's national shipowners' associations in nearly 50 countries—represented by the European Community Shipowners' Associations (ECSA), the International Chamber of Shipping (ICS), and the Asian Shipowners' Forum (ASF)—have united to condemn proposed amendments on a new EU Ship Recycling Regulation. Shipowners especially object to the proposal by the EP Environment Committee to impose a tax on merchant ships of all flags calling at EU ports in order to fund ship recycling facilities in the European Union. "This is an unacceptable tax on trade and will cause grave offense to the EU's trading partners, not just major ship recycling nations such as China and India, but to major shipping nations such as Japan and Singapore. These proposals have simply not been thought through," said ECSA Secretary General Alfons Guinier. "As a matter of principle, it is wrong to impose a tax on one industrial sector in order to assist another, especially without proper consultation with the parties affected. Shipping is a global industry operating under global rules. The European Parliament should really not be contemplating measures which will work against the aim to improve recycling conditions globally, an aim which we fully support." The shipowners' groups also believe that, if adopted, the EP amendments will fatally undermine the entry into force of the International Convention for Safe and Environmentally Sound Recycling of Ships (Hong Kong), which was adopted by the UN International Maritime Organization (IMO) in 2009—with full industry support—to improve working and environmental conditions in the world's ship recycling yards, most of which are located in Asia. The IMO Convention has not yet entered into force, pending the development of detailed Guidelines on implementation that have only recently been finalized by IMO. But the Convention has the full support of the global shipping industry, which has already produced its own recommendations so that shipowners can comply with the IMO requirements in advance of governments formally ratifying the Hong Kong Convention. "If the proposed amendments are taken forward, it will be seriously damaging to the Hong Kong Convention. The EP measures would, therefore, be completely counterproductive," said ICS Secretary General, Peter Hinchliffe. "It's not just the tax. Many of the other measures being proposed, such as sanctions against non-EU shipowners who don't comply and the creation of a unilateral list of recycling facilities that meet EU requirements, will almost certainly mean that Asian nations will be unable to ratify the IMO Convention. This will undermine years of hard work by governments at IMO (including EU Member States) as well as by shipowners and ship recyclers to develop a binding global solution that will actually work."

LNG tanker Coral Energy completed

MEYER WERFT completed its new Liquefied Natural Gas (LNG) tanker, the Coral Energy, for Dutch owner Anthony Veder, based in Rotterdam. It is the first ship of a new gas tanker type that is equipped with an eco-friendly, dual-fuel engine. The tanker is operated with natural gas, bringing the emissions of the vessel to extremely low values that are clearly below the prospective applicable limits for ECA-areas.

The ship was already named in Rotterdam on December 7 by Her Royal Highness Princess Máxima of the Netherlands. This event was perceived as very special by all stakeholders involved in the small to mid-scale LNG business.

For decades, MEYER WERFT has specialized in building gas tankers; 55 gas tankers have been built in the past years. The new tanker built for transporting LNG that is cooled down to -161°C has a length of about 155 m and a breadth of 22.70 m, with a cargo capacity of 15,600 sq. m and a maximum speed of 15.80 kn. Fully loaded with LNG, the ship will have a draught of 8.20 m. MEYER WERFT will further develop this new propulsion system intensively so that this technology can also be used on passenger ships in the future. The ship owner Anthony Veder is specialized in transporting gas by seagoing vessels. Its fleet currently consists of more than 25 ships. MEYER WERFT and the Anthony Veder have collaborated in both the new building and the repair sector since the mid 1970s.

The ship has proven its seaworthiness during the seal trials when all systems and plants were tested.

For more information, visit www.meyerwerft.de.

Wärtsilä 34DF is the first dual-fuel engine family to receive U.S. EPA certificate

Wärtsilä, the marine industry's leading solutions and services provider, has obtained certification of emission standard compliance from the U.S. Environmental Protection Agency (EPA) for its Wärtsilä 34DF dual-fuel engines. It will enable Wärtsilä to strongly enter the American market with marine engine technology that offers operators and owners the option of using either diesel or gas as fuel. The certification was obtained on 17 January 2013.

"The Wärtsilä 34DF is the first dual-fuel engine fulfilling the EPA requirements, and this is a very important statutory

recognition of Wärtsilä dual-fuel technology,” says Andrea Bochicchio, director, product management & engineering, product centre 4-stroke, Wärtsilä PowerTech.

With the passing of this compliance milestone, Wärtsilä anticipates that market demand in the U.S. for its range of dual-fuel engines will further increase. The first engines will equip the Harvey Energy, an offshore supply vessel built for Harvey Gulf International Marine. Four sister vessels will shortly be supplied with the same Wärtsilä engines, further demonstrating both the viability of liquefied natural gas (LNG) as a marine fuel and its growing popularity among ship owners and operators. LNG-fuelled vessels offer compelling operational cost savings and significant environmental benefits.

“Economic and environmental factors are having a tremendous impact on the shipping industry, and, at Wärtsilä, we firmly believe that flexible fuel options are a positive step in alleviating these challenges. Our dual-fuel engine technology enables environmental legislation to be met where necessary, while maintain-

ing the ability to use conventional diesel fuel in unrestricted areas,” says Giulio Tirelli, director, Wärtsilä ship power, 4-stroke portfolio & applications.

EPA certification applies to U.S. flagged vessels. The Wärtsilä dual-fuel engine capability enables ships to be operated on either conventional liquid marine fuels or LNG. The switch between fuels can be made seamlessly without loss of power or speed. Such fuel flexibility enables compliance with emission regulations in controlled areas, while giving operators the option of determining the fuel according to cost and availability.

For more information, visit www.wartsila.com.

Hyundai Heavy unveils membrane LNG cargo containment system

Hyundai Heavy Industries (HHI), the world’s biggest shipbuilder, announced that it has developed a high-performance Hyundai Membrane LNG Cargo Containment System. The shipbuilding giant’s new membrane-type containment system for LNG received design approval from classification societies,

including ABS and DNV.

The containment system useable for LNG carriers, LNG FPSO, LNG-fueled vessel, and LNG bunkering systems features dual metal barrier and high-performance insulation systems. The thin STS304L and Invar-alloy barriers optimized to sustain thermal, fatigue, and sloshing loads are specifically designed to prevent LNG leakage at the welded secondary barrier. New insulation panels with low-density polyurethane foam and glass fiber composite material reduce boil off rate by more than 10% of the stored LNG in comparison with conventional insulation panels. Moreover, the insulation panels made up of reinforced polyurethane foam and plywood are specially designed for areas prone to sloshing damage such as LNG tank corners.

HHI’s LNG technology meets International Maritime Organization standards requiring high level of structural analysis, fatigue analysis, comparative wet/dry drop test, and fluid-structural interaction analysis for membrane-type LNG cargo containment systems. HHI will commercialize the Hyundai

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Maritime Transportation

Membrane LNG Cargo Containment System after the final performance test.

In November 2012, the Ulsan, South Korea-based company introduced an independent LNG storage tank model, Lobe-Bundle Tank. This model uses ring-shaped plates instead of conventional flat plates to reduce the weight of the tank and building cost and spray-type insulation to substantially reduce construction time.

With the development of Lobe-Bundle Tank and Hyundai Membrane LNG Cargo Containment System, HHI is now better positioned to build quality LNG carriers living up to the high standards demanded by the global market.

For more information, visit www.english.hhi.co.kr.

Twin Axe catamarans SeaZip 1 and SeaZip 2 named and deployed

In Harlingen (the Netherlands), two newly constructed Damen Twin Axe catamaran ships of the FCS 2610 type were officially named on Friday 22 March. In the near future, these ships will be deployed in the completion stage of a large-scale wind farm on the North



Sea, 90 km northwest of the island of Borkum. This offshore wind farm is being constructed by the German BARD Group, which will charter the vessels from their owner, SeaZip Offshore Service, a sister company of JR Shipping Group in Harlingen.

The naming ceremony took place at Korte Lijnbaan where the ships were moored opposite JR Shipping's office. Guests had the opportunity to look round the ships. The naming ceremony was performed by Mrs. Akkie van der Weij, accompanied by her husband, Mr. Willem Roelof Sluiter, Harlingen's mayor.

The newly-built service vessels, SeaZip 1 and SeaZip 2, have recently been delivered to SeaZip Offshore Service and were built by Damen

Shipyards Group based in the Netherlands. Damen was also responsible for the development of this FCS 2610 Twin Axe Bow vessel type. A number of vessels of this type have already been put to use on the North Sea. They distinguish themselves due to their speed and maximum seaworthiness, which, combined with economical fuel consumption and a high degree of stability, enables them to sail in rough weather conditions, too. While primarily built for the purpose of transporting personnel, the ships can also transport small quantities of freight. With the FCS 2610 Twin Axe Bow design, Damen has created a new standard in the market for offshore service vessels.

Using this new standard, Damen and SeaZip Offshore Service are anticipating the trend of devising wind farms at locations far from the coast and at ever-greater depths. During the next 10 years, the industry is expected to shift towards locations at a distance of over 20 km from the coast, with depths exceeding 20 m.

For more information, visit www.damen.com.

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The Most Effective Solution for a Professional Inspection of Coastal Infrastructure

By: Jani Meritaito, Hydrographic Survey Engineer, M.Sc. (Surveying)

A Teledyne RESON user outlines how to make an effective coastal inspection by using high-resolution multibeam survey, mobile laser scanning, and scanning sonar technology.

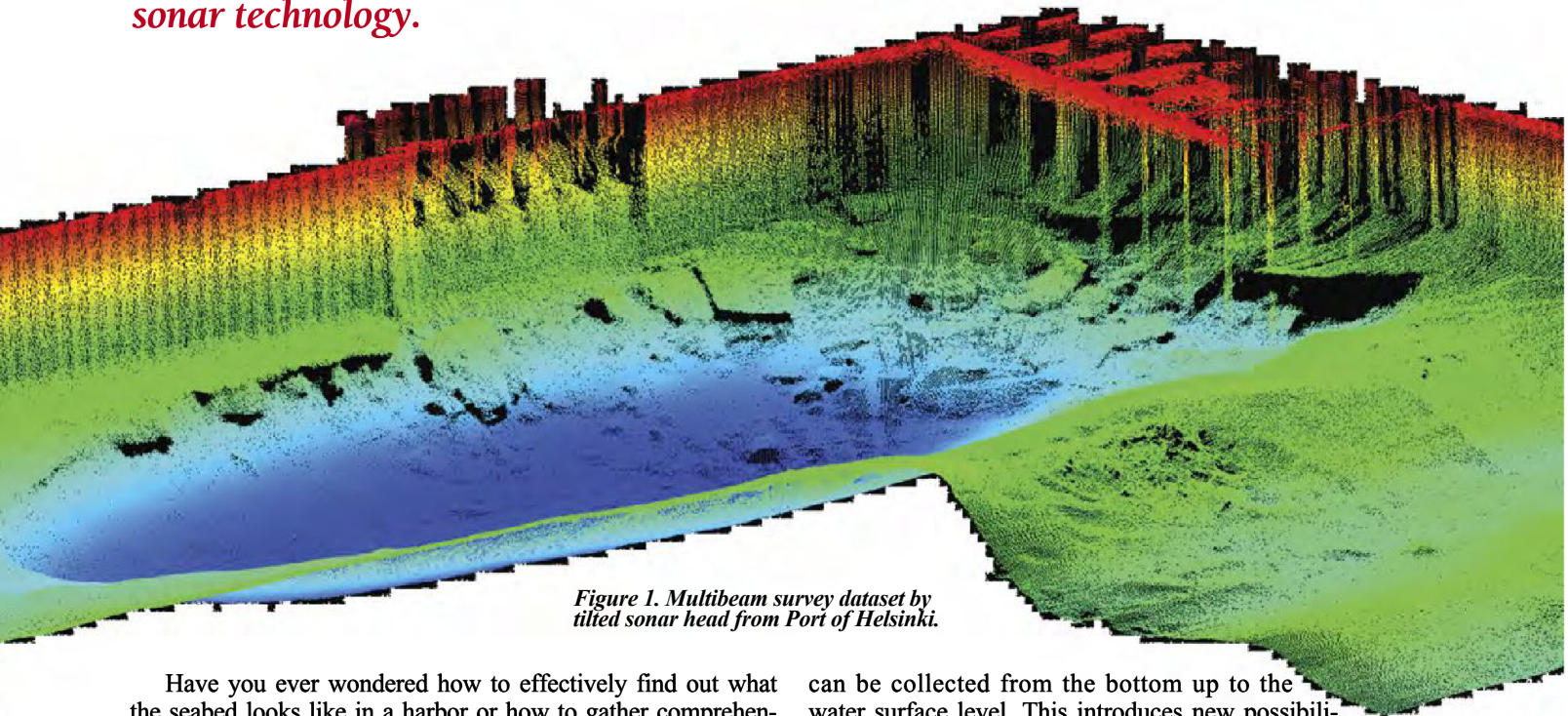


Figure 1. Multibeam survey dataset by tilted sonar head from Port of Helsinki.

Have you ever wondered how to effectively find out what the seabed looks like in a harbor or how to gather comprehensive information of your coastal infrastructure? According to Hydrographic Survey Engineer, M.Sc. (Surveying), Jani Pötrönen from the Finnish company Meritaito, the solution is a combination of high resolution multibeam (MBES) survey, mobile laser scanning and scanning sonar technology.

The following is a paper from Mr. Pötrönen on how high-resolution multibeam (MBES) survey, mobile laser scanning, and scanning sonar technology can be used in an effective way to gather comprehensive information of your coastal infrastructure above and below the water surface.

Multibeam Survey

Multibeam survey is commonly used for hydrographic charting. Technical development with these sensors has been fast. Nowadays, it is possible to collect a huge number of high-resolution survey points not only from the natural seabed, but also from other kinds of underwater objects. This way, much smaller targets can be located and identified underwater.

Multibeam survey is the most economic and effective way to get an extensive underwater view of coastal structures. By tilting the multibeam sonar head sideways, underwater 3D data

can be collected from the bottom up to the water surface level. This introduces new possibilities to inspect harbor structures and other underwater civil engineering targets more comprehensively.

High-resolution multibeam data show valuable information about possible slope failures, mass movements due to propeller race, and condition of erosion protection in front of quay walls. Also, missing objects like containers and quay wall fenders can be located from the data with high accuracy beside possible hazards for safe navigation in the harbor. The survey results as presented in 3D point clouds are compatible with all modern software for designing, planning, and engineering purposes.

Mobile Laser Scanning

Laser scanning is a state of the art method to collect a 3D point cloud of a certain area of interest in extremely high detail. Carrying out mobile laser scanning simultaneously with the multibeam survey from a modern hydrographic survey vessel is a highly cost-effective way of working.

Combining diver's observations and photographs in a paper report is not comparable to what you can achieve by combining mobile laser scanning of coastal infrastructure with multibeam point cloud of underwater structures. All the objects located in

the dataset have exact coordinates and are easy to locate for further inspection through a comprehensive view of the area of interest above and below the water surface. This kind of dataset also allows users to document the complete infrastructure for the future development needs.

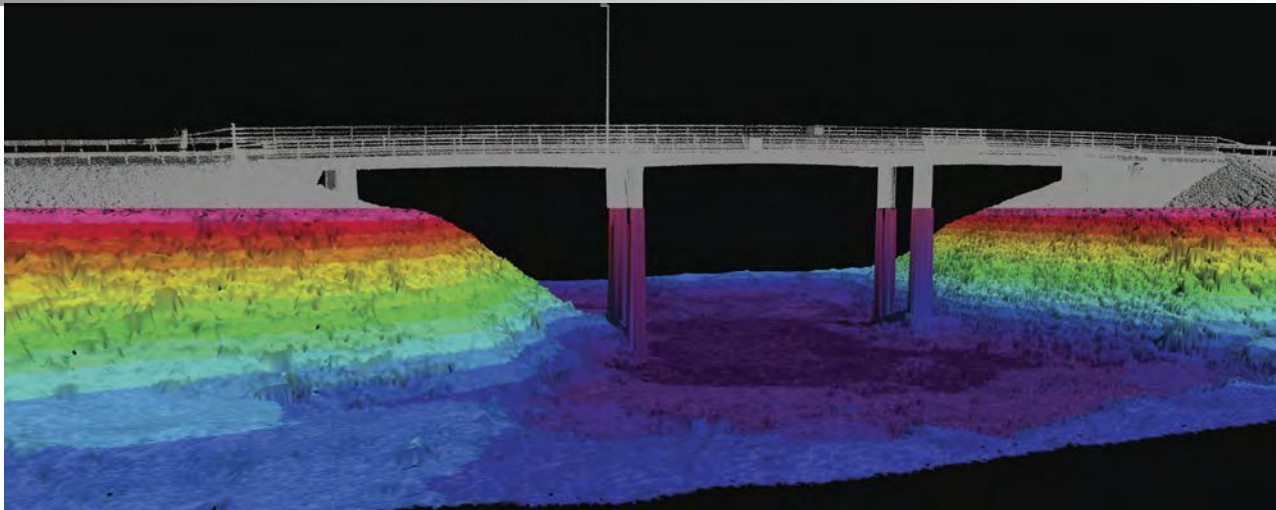


Figure 2. Combined multibeam and laser scanning dataset from Särkisalo bridge.

Scanning Sonar

Scanning sonar is the most accurate method to make supplementary inspections for underwater structures in strong current or turbid waters where diving is not possible. Scanning sonar operates at high frequency typically from 600 kHz, which has a good resolution. Scanning sonar data can be presented in accurate 2D images or 3D point clouds tied to a coordinate system. Any kind of damage or structural deviation as well as their location and extent can be defined in the inspection.

Depending on the circumstances at the site, the inspections can be carried out from a barge, crane, or even from frozen sections of water. Compared to multibeam data the resolution of the data, is better when sonar mount is static; this way, recognized potential targets can be inspected more carefully to do the repair planning.

Conclusion

Multibeam survey and mobile laser scanning provide us a tool to obtain a comprehensive view of a location on a larger scale and to recognize potential targets for further inspection. These specific targets can then be inspected more closely, for example, by professional divers. Alternatively, scanning sonar technology offers the most accurate method to inspect underwater structures locally without the need to worry about visibility or strong current.

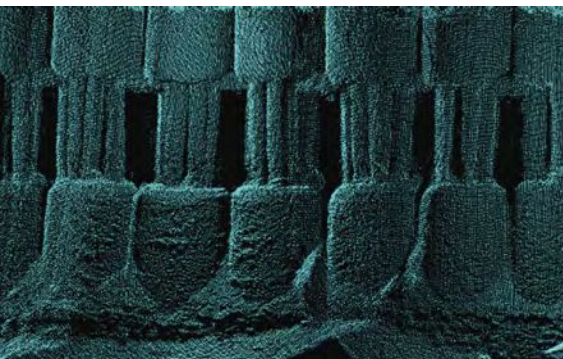


Figure 3. Scanning sonar dataset of the piles (VRT Finland Ltd).

For a professional inspection of coastal infrastructure, the most effective solution is a combination of simultaneous multibeam survey and mobile laser scanning combined with focused scanning sonar inspection. All information in 3D digital format is then usable in modern software for further maintenance planning and engineering purposes. This approach will help to safeguard maritime investments and improve maintenance planning in harbors and other marine infrastructure.

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An online poll will determine the top five videos**, and a jury will select the overall winner. All the data must be collected by a Teledyne RESON sonar. However, the data processing software is free of choice. Good luck!

THREE EASY STEPS

- 1) Upload your Multibeam Sonar video
- 2) Add a description of the survey/expedition
- 3) Tell your friends and colleagues to vote for your entry

* The Winner can choose between plane ticket, hotel and free admission to one of the seminars on the Teledyne RESON World Tour or a brand new MacBook Air 13-inch : 128GB.

** The online poll will end July 15th and the overall winner will be published August 1st.

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NOAA retires polar-orbiting satellite

After nearly 11 years of helping the National Oceanic and Atmospheric Administration (NOAA) predict weather and climate patterns and save lives in search and rescue operations, NOAA announced it has turned off the NOAA-17 Polar-Orbiting Environmental Satellite (POES). It was one of NOAA's longest operating spacecraft, which have a typical lifespan of 3 years. The shutdown will result in no data gap, as NOAA-17 was being used as a back-up satellite and was removed from service after several key systems on board became inoperable. NOAA will continue operating several POES spacecraft—NOAA-15, NOAA-16, NOAA-18, and NOAA-19—in addition to the nation's newest polar-orbiting satellite, Suomi NPP, launched 28 October 2011. NOAA's POES spacecraft fly a lower, pole-to-pole orbit, capturing atmospheric data from space that feed NOAA's weather and climate prediction models. NOAA began the deactivation process of NOAA-17 on 18 February. Launched in June 2002, NOAA-17 made 55,000 orbits of the globe, traveling more than 1.5 billion miles while collecting huge amounts of valuable temperature, moisture, and image data.

New tool for measuring frozen gas in ocean floor sediments

A new collaboration between the National Oceanography Centre (NOC) and the University of Southampton is seeking to improve geophysical remote sensing of seafloor methane gas and hydrate through innovative laboratory experimental and theoretical studies. Researchers will develop a new laboratory instrument capable of simulating the high pressures and low temperatures needed to create methane hydrate in sediment samples and carry out acoustic and electrical properties experiments. The results will be used to develop theory for modeling geophysical survey data in terms of seafloor gas and hydrate content. Dr. Angus Best of NOC and Professors Tim Leighton and Paul White from the University of Southampton's Institute of Sound and Vibration Research (ISVR) have been awarded a grant of £0.8 million by the Natural Environment Research Council (NERC) to investigate methods for assessing the volume of methane gas and gas hydrate locked in seafloor sediments.

EPA finalizes vessel general permit

The U.S. EPA has issued a final vessel general permit regulating discharges from commercial vessels, including ballast water, to protect the nation's waters from ship-borne pollutants and reduce invasive species in U.S. waters. The final vessel general permit covers commercial vessels greater than 79 ft in length, excluding military and recreational vessels, and will replace the 2008 vessel general permit due to expire on 19 December 2013. This permit regulates 27 specific discharge categories and will also provide improvements to the efficiency of the permit process and clarify discharge requirements. The new discharge standards are supported by independent studies by the U.S. EPA's science advisory board and the National Research Council and are consistent with those contained in the International Maritime Organization's 2004 Ballast Water Convention. The U.S. EPA is issuing the permit in advance of the current permit's expiration to provide the regulated community time and flexibility to come into compliance with the new requirements.

Navy launches new oceanographic survey ship

The U.S. Navy christened and launched its newest oceanographic survey ship, USNS Maury (T-AGS 66), the last of its class at VT Halter Marine's shipyard in Moss Point, Mississippi, in a traditional Navy ceremony on 27 March.

The 350-ft ship is named for Cmdr. Matthew F. Maury, considered to be the father of oceanography, nicknamed the "Pathfinder of the Seas," and the first superintendent of the U.S. Naval Observatory. Maury is 24 ft longer than its six sister ships to accommodate a 300-sq. ft moon pool for easier deployment and retrieval of unmanned underwater vehicles.

Rear Adm. Jonathan White, Oceanographer and Navigator of the Navy and the principal speaker at the launch and christening, said the T-AGS ships are a reflection of Matthew Maury, who he said, "led a transformation in our Navy."

Matthew Maury developed wind and tide charts in the 1840s from ships' logs. White said that Maury realized the importance that understanding the natural environment has for ship operations. That lesson has persisted.

"We need to know about the environment to be the best Navy in the world," White said.

USNS Maury will survey the world's oceans, collecting ocean data for Navy operations, continuing the work in the 21st century that Matthew Maury started in the 19th. The ship will be operated by the U.S. Military Sealift Command (MSC) for the Naval Meteorology and Oceanography Command (NAVMETOCOM).

"If Matthew Fontaine Maury was here today to see this ship and to see the character of the people who built it, there is no doubt he would say, 'all's well.'"

NAVMETOCOM directs the Navy's meteorology, oceanography, and hydrography programs; operates the Navy's atomic clock for precise time; and tracks the positions of the stars for navigation. The command comprises approximately 2,500 officer, enlisted and civilian personnel stationed around the world. Naval Oceanography enables the safety, speed, and operational effectiveness of the fleet by identifying the risks and opportunities for naval and joint forces posed by the present and future battlespace.

For more information, visit www.navmetocom.navy.mil.

Arctic nearly free of summer sea ice during first half of 21st century

For scientists studying summer sea ice in the Arctic, it is not a question of “if” there will be nearly ice-free summers, but when. And two scientists say that “when” is sooner than many thought—before 2050 and possibly within the next decade or two.

James Overland of NOAA’s Pacific Marine Environmental Laboratory and Muyin Wang of the NOAA Joint Institute for the Study of Atmosphere and Ocean at the University of Washington looked at three methods of predicting when the Arctic will be nearly ice free in the summer. The work was published recently online in the American Geophysical Union publication Geophysical Research Letters.

The “trendsetters” approach uses observed sea ice trends. These data show that the total amount of sea ice decreased rapidly over the previous decade. Using those trends, this approach extrapolates to a nearly sea ice-free Arctic by 2020.

The “stochasters” approach is based on assuming future multiple, but random in time, large sea ice loss events

such as those that occurred in 2007 and 2012. This method estimates it would take several more events to reach a nearly sea ice-free state in the summer. Using the likelihood of such events, this approach suggests a nearly sea ice-free Arctic by about 2030 but with large uncertainty in timing.

The “modelers” approach is based on using the large collection of global climate model results to predict atmosphere, ocean, land, and sea ice conditions over time. These models show the earliest possible loss of sea ice to be around 2040, as greenhouse gas concentrations increase and the Arctic warms. But the median timing of sea ice loss in these models is closer to 2060. There are several reasons to consider that this median timing of sea ice loss in these models may be too slow.

Taken together, the range among the multiple approaches still suggests that it is very likely that the timing for future sea ice loss will be within the first half of the 21st century, with a possibility of major loss within a decade or two.

For more information, visit www.noaanews.noaa.gov.

McArtney displays sensorbots

The MacArtney Underwater Technology Group demonstrated their pathbreaking Sensorbot technology at Ocean Business 2013.

As human understanding and appreciation of the oceans rapidly increases, so does the demand for equipment capable of remotely monitoring this inhospitable and underexplored ecosystem. For this purpose, scientists at the Arizona State University have developed Sensorbots—a potentially transformative technology that promise to mark the beginning of a new era in ocean sensing.

Sensorbots are small, transparent, spherical devices equipped with a variety of surface-mounted sensors for measuring various analytes such as pH, trace metals, and temperatures related to underwater environmental micro and macro events and conditions. Once the surface-mounted sensors pick up a reading, this is reported to the inner electronics which, in turn, transmit these into what is basically a visual Morse code of bright blue flashes of LED light. These optical signals are picked up and passed on by neighboring Sensorbots

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until they are eventually received and transmitted to the surface by a central masternode that is designed and manufactured by MacArtney.

This kind of optical underwater light propagation—where Sensorbots relay information about the surroundings to neighbouring bots and ultimately to a masternode—is based on the theory of underwater optical networks (UON). By means of UONs, the optical signals transmitted by the Sensorbots are intelligently linked using so called “multi-hop” networking technologies, not unlike that used for cell phone and other land-based wireless networks. This entails that information and data are “hopped” between the nodes to overcome optical range limitations of underwater signal propagation.

In essence, this means that one will be able to apply Sensorbots like strings of pearls over great distances—with full utilization of all the benefits of optical communications speed and energy efficiency—but without the detriment of optical loss attenuation in seawater. Furthermore, the Sensorbots feature an omni-directional commu-



nicative capability, meaning each Sensorbot can both emit and detect optical signals from any direction.

For more information, visit www.macartney.com.

OceanWorks and ONC engineers return VENUS coastal network to operation

OceanWorks International is pleased to announce the successful re-deployment of the VENUS coastal network in the Strait of Georgia. In response to the failure of a power connector on the VENUS array in early fall 2012, a joint team of engineers from OceanWorks International (OWI) and Ocean Networks Canada (ONC) spent a week aboard the vessel CS Wave Venture recovering, repairing, testing, and re-deploying the network.

The marine operation was a challenging procedure for the cable ship, but proceeded smoothly without any major complications.

The repair coincided with the seventh anniversary of operations for the VENUS network, which began on 8 February 2006.

VENUS, part of the ONC Observatory, is a cabled undersea laboratory with nodes that provide live video, acoustic images, and real-time data for ocean researchers and explorers. VENUS delivers real-time information from seafloor instruments via fiber optic cables to the University of Victoria, British Columbia.

For more information, visit www.oceanworks.com.



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Intracoastal City Shoreline Operation

Shorebase Services

LaRose Scrap and Salvage has a fleet of 700 scrap bins and a new fleet of 2013 Mac Gold tractors with options of hydraulic trailers, drop neck trailers, and low boy trailers to support offshore operations. LaRose offers additional shore-base services with its land-based equipment. It is capable of dismantling gas plants, refineries, production facilities, and oversized material from shorebase facilities for the aging oil and gas industry.

Vision

Mr. Paul Cummings, founder and CEO of LaRose Scrap and Salvage, has

Federal and state authorities have increased the requirements for decommissioning non-producing facilities. So far in 2013, the Bureau of Safety and Environmental Enforcement (BSEE) has approved 359 permits for the decommissioning and removal of offshore production facilities in the Gulf of Mexico.

Devoted to delivering a safe and cost effective decommissioning service to the oil and gas industry, LaRose Scrap and Salvage provides operators with assistance from land support to help with the disposal of the aging facilities in the Gulf. LaRose Scrap and Salvage offers a valuable resource to the oil and gas industry by providing 24/7 service, coupled with the fact that they purposely positioned themselves in four strategic locations along the Gulf of Mexico shoreline. These locations, in close proximity to operator's offshore structures helps, reduce the logistical cost of removing these production facilities. The company also has over 700 scrap bins (30 and 40 yard capacity) to service Gulf of Mexico shoreline operations.

over 37 years of experience in the oil and gas industry. He started LaRose Scrap and Salvage with the vision of providing a means for the operators to safely dispose of surplus materials cost effectively. His company has over 100 employees who are specially trained and certified to safely provide dismantling and decommissioning services. Mr. Cummings runs a company known for its solution-based contributions to the oil and gas industry and for its strong commitment to enhancing safety standards.

The Bottom Line

Operators have to deal with decommissioning in compliance with BSEE regulations and LaRose Scrap and Salvage are committed to helping make these costs more tolerable with the best equipment...on demand...conveniently accessible at any one of LaRose's shorebase operations.

For more information, contact Paul Cummings at LaRose Scrap and Salvage/337-837-5410 or Andrew Dillahunt/337-303-4942.

Visit www.larosescrapandsalvage.com.

SERVICE LOCATIONS

- Intracoastal City
- Grand Chenier
- Grand Isle
- Houma

Locations:

Houma, Louisiana: 30-acre yard located off the Houma Navigational Canal

- 24/7 service
- 1,000 ft of fully lighted waterfront
- 400 ft of bulkhead
- 600 ft of rubberized dolphins
- 550-ton Link-Belt ringer crane on engineered pad
- 150-ton 4100 Manitowoc track crane
- New 2013 scrap handlers and forklifts

Grand Isle, Louisiana: 10-acre yard located on the north side of the island

- 24/7 service
- 250-ton Link-Belt crane
- 450 ft of fully lighted bulkhead
- New 2013 scrap handler and forklift
- Fuel and water available

Intracoastal City, Louisiana: 20-acre yard

- 24/7 service
- 300-ton Lima track crane
- 165 ton American track crane
- New 2013 Link-Belt track hoe with Genesis rotating sheer
- New 2013 forklifts and scrap handlers
- 700 ft of fully light waterfront

Grand Chenier, Louisiana: 20-acre yard

- 24/7 service
- 400 ft of lighted bulkhead
- New 2012 300-ton Sany track crane
- 110-ton Link-Belt track crane
- New 2013 forklift and scrap handlers
- Fuel and water available



Crane Offloading Structure



Offshore Structure transported by barge

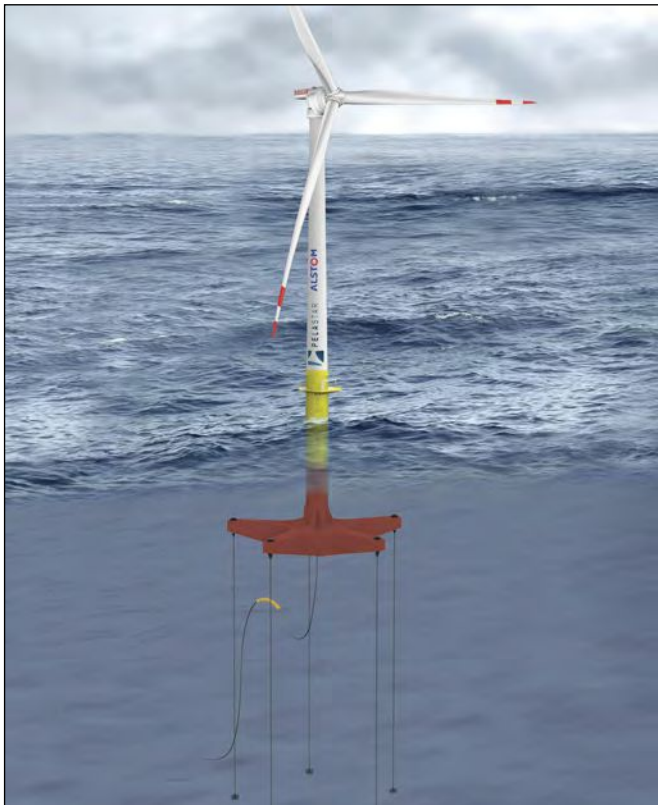
President's FY 2014 budget for BOEM Includes \$169.4 M to advance exploration and development of the Nation's offshore resources

President Obama's fiscal year 2014 budget request, includes \$169.4 million to fund the Bureau of Ocean Energy Management (BOEM), which is charged with managing the Nation's offshore energy and mineral resources in a way that promotes efficient and environmentally responsible energy development through oil and gas leasing, renewable energy development, and a commitment to rigorous scientific studies. The budget requests continued funding to fulfill BOEM's program implementation responsibilities, which include leasing and planning for conventional energy development through implementation of the Five Year Outer Continental Shelf (OCS) Oil and Gas Leasing Program, planning for individual lease sales, and conducting post-sale review of companies' exploration and development plans. BOEM also manages the development of offshore renewable energy resources, including implementation of the Secretary's "Smart from the Start" initiative to accelerate leasing in offshore wind energy areas off of U.S. coasts. In support of both its conventional and renewable energy programs, BOEM conducts extensive analyses, including environmental review, resource assessment, and economic analysis. Applied research through BOEM's Environmental Studies Program supports science-based decision-making. The budget proposes an increase of \$8.7 million above the FY 2012 enacted level to support a number of high-priority initiatives. These include developing an "ePlans" Portal to digitize exploration and development plan processing functions and increase efficiency; acquiring and managing geological and geophysical data for the Atlantic; enhancing BOEM's air quality regulatory program in light of new statutory responsibilities; advancing offshore wind lease sales; increasing capacity to review plans to explore and develop offshore Alaska; and expanding BOEM's Marine Minerals Program in light of increasing demand for sand and gravel resources for coastal restoration purposes.

ABS releases comprehensive guide for floating offshore wind turbines

ABS, the leading provider of classification services to the global offshore industry, has released the ABS Guide for Building and Classing Floating Offshore Wind Turbine Installations to provide the most comprehensive requirements to date. Based on the results of case studies and existing technologies, the new Guide provides criteria for the design, construction, installation, and survey of permanently sited floating offshore wind turbines and includes specific guidelines for areas subject to cyclonic storms. The Guide addresses the floating support structure; the stationkeeping system; and onboard machinery, equipment, and systems that are not part of the turbine rotor-nacelle assembly. The design environmental conditions and design load cases specified in the Guide were determined on the basis of International Electrotechnical Commission (IEC) 61400-3 standards in conjunction with a number of revisions and refinements to address the uniqueness of floating offshore wind turbines. The site-specific design is directly reflected in the definition of the design load cases, and the effects of tropical hurricane conditions were one of the main considerations in the calibration studies.

Designer named for Energy Technologies Institute's floating platform system demonstrator



Glosten Associates, Inc. (Glosten) announced it has been awarded a contract from the UK-based Energy Technologies Institute (ETI) for the engineering phase of the floating offshore wind turbine demonstrator using the PelaStar tension leg platform (TLP) foundation system.

The US\$6 million, 12-month contract will complete the Front End Engineering Design (FEED) in advance of construction and deployment of a 6-MW demonstration unit off the south coast of the UK as early as 2015.

Upon successful completion of the FEED, the ETI is prepared to commit up to US\$31 million to the demonstration project financing package—with ETI financing aimed at accelerating development and deployment of the technologies that can reach the UK's vast deepwater wind resources and attain the low cost of energy targets required for an economically viable system.

The demonstration project will showcase key PelaStar technology developments crucial to achieve cost-effective, utility-scale installations. These include a new five-arm design that enhances system reliability for the demonstration project; synthetic fiber tendons developed primarily for optimal performance while minimizing material and installation cost; and integration of large, next-generation offshore wind turbines as the keystone to effective utilization of the wind resource.

Glosten brings a world-class team to the demonstration project. The fast-growing team includes Alstom Renovables España S.L. (Barcelona, Spain) to provide their cutting-edge Haliade 150-6MW offshore wind turbine; Harland and Wolff (Belfast, Ireland) to build the PelaStar foundation; Dockwise (Breda, The Netherlands) to provide the offshore logistics;

Cefas (Suffolk, UK) leading the environmental review; NREL (Golden CO, USA) providing expertise in system modeling, instrumentation, and test planning; project certification by Det Norske Veritas (DNV) (Hovik, Norway); and comprehensive scale model testing by MARIN (Wageningen, The Netherlands).

For more information, visit www.glosten.com.

Gamesa makes progress on its offshore strategy as it begins to erect its 5-MW turbine

Gamesa, a global technology leader in the wind power industry, has marked further progress on its offshore strategy by shipping components for its 5-MW marine turbine from the port of Bilbao to the Canary Islands (Spain). The company thus begins the process of erecting Spain's first-ever offshore wind turbine at the Arinaga Quay (Gran Canaria, Canary Islands).

The blades, manufactured at a Gamesa plant in Aoiz (Navarre), each span 62.5 m and weigh 15 tonnes. They are the largest turbine blades ever produced and transported in Spain and are among the largest ever manufactured in Europe.

Meanwhile, the nearly 90-m tower was manufactured by Windar (a joint venture between Gamesa and Daniel Alonso).

In late 2012, Gamesa obtained design certification for its offshore turbine from independent organisation DNV. The DNV endorsement heralded a major leap forward in the system's development, as a guarantee of the turbine's launch, commercial rollout, and manufacture in coming years.

This offshore system, with a rotor diameter of 128 m and a modular, redundant design, ensures reliability and maximizes energy output. Gamesa's G128-5.0 MW offshore turbine is equipped with the technology Gamesa has proven and validated in its 4.5-MW system, plus the know-how and experience acquired during the 4.5-MW's rollout. The company invested more than half a million engineering hours in the turbine's design process.

For more information, visit www.gamesacorp.com.

Makai Ocean Engineering embarks on initiative to add 100-KW turbine

Makai Ocean Engineering announced two endeavors in assisting the Navy to reach its alternative energy goals. The first is the design, planning, and procure-

ment of a 100-KW turbine-generator for the Hawaii Ocean Thermal Energy Conversion (OTEC) Test Facility. The second project includes the installation and operation of this turbine-generators as well as the design and testing of two new OTEC heat exchangers. "Makai Ocean Engineering is committed to developing alternative energy solutions that are impactful and ahead of the curve," said Billy Pieper, vice president, Makai

Ocean Engineering. "Due to our partnership with the Navy, I believe Makai will help achieve a more sustainable future with the solutions we are pursuing."

The first endeavor, which will result in a turbine-generator delivered to the site, will be completed by February 2014. The projected funding requirements are approximately \$1 million. During the second phase, Makai will install the turbine and begin operation

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testing. Michael Eldred, project manager of the OTEC Test Facility, says that the technical benefits of having a turbine are huge. “Besides the obvious benefit of once again including OTEC power on the grid, it will also validate the results from our OTEC models and allow us to fine-tune our control systems,” says Eldred. The new generator would result in the world’s only operational OTEC plant since 1998 and is likely to create a stepping stone to commercial-size renewable energy supplies for Navy and Department of Defense bases in Hawaii and Guam.

For more information, visit www.makai.com.

DONG, Siemens enter into agreement for 6 MW wind turbines

DONG Energy and Siemens AG have entered into agreements securing potential supplies and servicing of a total of 154, 6-MW offshore wind turbines, giving a total capacity of 924 MW.



The agreements give DONG Energy the option to install the turbines on its Gode Wind projects in Germany from 2015. Utilization of the potential supplies and services under the agreements is subject to official approvals for the specific projects and DONG Energy making a positive investment decision for the projects.

Following the acquisition of the ownership interest in the Gode Wind projects in August 2012, DONG Energy invited tenderers for the supply of offshore turbines in accordance with EC tender rules. The agreements signed with Siemens AG are a result of the tender procedure. The agreements concern Siemens’ 6-MW offshore wind turbine based on gearless direct drive technology and with a 154-m rotor.

The agreements are key elements of DONG Energy’s strategy to significantly expand offshore wind and will strengthen the company’s position as market leader in the offshore wind industry. Larger and more efficient turbines are cornerstones of the company’s ambition to reduce the cost of energy from offshore wind.

For more information, visit www.dongenergy.com.

Fedem Technology and DNV Software join forces

Two forces in the software industry, Fedem Technology and DNV Software, have joined forces to produce a new module for coupled analysis in Sesam Wind. The module for coupled analysis is an integration of FEDEM Windpower and Sesam.

Fedem Technology, which has been developing software

for more than 20 years, produces the leading software for fully integrated analyses of mechanical systems and structures in motion.

The soon-to-be-released software module will be the newest addition to DNV Software's product portfolio in Sesam Wind. It incorporates state-of-the-art algorithms geared toward structural analysis, completing DNV Software's solutions for wind turbine design, strength, and fatigue analysis. Many different users—from substructure designers and turbine manufacturers to wind park operators and verification bodies—will benefit from the new package.

Features ranging from the purely mechanical aspects of a wind turbine to customizable control systems and detailed wind and wave loads make it a versatile tool for complete dynamic modeling and analysis of any wind turbine project.

The module is built over the FEDEM simulation engine and contains several features that facilitate the modeling and simulation of wind turbines. Fedem Technology has already served several offshore wind farm projects in Norway,

the UK, and Germany with their engineering capabilities and software solutions.

For more information, visit www.dnv.com.

Piriou enters offshore wind market

Thanks to experience gained in the building of 100 aluminium crew boats, ranging in length from 18 to 53 m and delivered in the last 25 years to the offshore oil and gas sector, Piriou is now moving into the offshore wind farm support ship market.

To respond rapidly to the growing needs of the offshore wind farm market (i.e., needs regarding the maintenance of machines and the transportation of personnel and equipment to the wind farms), PIRIOU has chosen to enter into a contract with BMT Nigel Gee, a world-renowned architect recognised for his experience in wind farm support vessels (WFSV).

The construction of the first two units has begun, and the vessels will be available for operation in Europe at the end of 2013. PIRIOU and BMT Nigel Gee are working in parallel to finalize

the development of the design of the 24-m WFSV model.

For more information, visit www.piriou.com.

ORPC submits first annual environmental report

On 26 March, the Ocean Renewable Power Company (ORPC) submitted its first annual environmental monitoring report for the Cobscook Bay Tidal Energy Project to the Federal Energy Regulatory Commission (FERC), which details the 2012 construction, installation, and operational activities of ORPC's grid-connected TidGen™ Power System in Maine.

The report describes environmental monitoring conducted during the first phase of ORPC's Cobscook Bay Project, including methods used and the vital role of the project's adaptive management team. Results indicate no observed, adverse interaction of the TidGen™ Power System with the marine environment.

For more information, visit www.orpc.co.

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IMB advises continued vigilance as maritime piracy attacks decline

The International Chamber of Commerce (ICC) International Maritime Bureau's (IMB's) latest quarterly report on Piracy and Armed Robbery Against Ships recorded a total of 66 incidents worldwide in the first 3 months of 2013. This is down markedly from the 102 incidents reported for the corresponding period in 2012. In the first 3 months of 2013, four vessels were hijacked, 51 vessels were boarded, 7 were fired upon and 4 reported attempted attacks. Also 75 crew members were taken hostage, 14 kidnapped, and 1 killed. IMB Director Pottengal Mukundan commented; "Although the number of acts of piracy reported in Somalia has significantly decreased, there can be no room for complacency. The drop in reported attacks is due to proactive naval actions against suspect Pirate Action Groups, the employment of privately contracted armed security personnel, and the preventive measures used by the merchant vessels (as per latest Best Management Practices recommendations). The attacks will rise to past levels if the naval presence is reduced or vessels relax their vigilance."

SAIC awarded contract by U.S. Naval Facilities Engineering Command

Science Applications International Corporation (SAIC) announced it was awarded a prime contract by the U.S. Naval Facilities Engineering Command (NAVFAC) to provide security engineering services in support of the Anti-terrorism/Force Protection (AT/FP) Ashore Global Sustainment Program. The single-award contract has a 1-year base period of performance, two 1-year options, and a total contract value of approximately \$74 million, if all options are exercised. The AT/FP Ashore Global Sustainment Program provides a centrally managed life-cycle sustainment program to assist Navy shore installations in obtaining services to maintain the AT/FP Ashore systems and equipment in accordance with operational requirements. Under the contract, SAIC will provide engineering services in support of the operational requirements of high-value Navy and other government activities where security is of high or vital interest.

U.S. Navy awards Boeing high altitude anti-submarine weapon contract

A new precision-guided weapon that Boeing will provide to the U.S. Navy will fundamentally change anti-submarine warfare by incorporating technologies never before used on an anti-submarine weapon. Through a recently awarded \$19.2 million contract, Boeing will design and build the High Altitude Anti-Submarine Warfare Weapon Capability (HAAWC). The system will leverage combat-proven technologies from Boeing's Joint Direct Attack Munition (JDAM) and Small Diameter Bomb (SDB) so it can be launched from high altitudes and far from targets. "A new era in anti-submarine warfare is about to begin," said James Dodd, vice president of Boeing Weapons & Missile Systems. "The capability HAAWC gives U.S. Navy sub-hunters is unparalleled compared with what is available today." Adapting current JDAM and SDB technologies will also reduce development risk and cost for the Navy. "Providing this advanced capability to Navy warfighters as soon as possible is vital to help protect the United States' maritime interests around the world," said Scott Wuesthoff, director of Boeing Direct Attack Weapons.

Bluefin completes deep testing of DARPA UUV

Bluefin Robotics, a leading provider of Unmanned Underwater Vehicles (UUVs), announced that the company has successfully completed deep-water testing of a specialized UUV for the Defense Advanced Research Projects Agency (DARPA). The system was developed under a Phase II subcontract from Applied Physical Sciences Corp. (APS) for the Deep Sea Operations (DSOP) Program. DSOP is part of DARPA's Distributed Agile Submarine Hunting program (DASH), which aims to develop affordable distributed technology to address Anti-Submarine Warfare (ASW) surveillance needs over large, operationally relevant areas.

In February, Bluefin mobilized a Boston Harbor Cruisesvessel, the *Scarlett Isabella*, at their dock in Quincy, Massachusetts and transited for over 48 hrs towards the testing site. While severe weather brought on by Storm Q forced the team to adjust logistics plans, they were able to successfully conduct 6 days of operational testing, including two 4,450-m dives totaling 11 hrs.

Testing of the system provided Bluefin with an opportunity to vet several new vehicle capabilities for their modular UUVs, including an extended operational depth rating, an advanced pressure vessel design, a new power system, a newly available high-powered acoustics transducer system, and a transportable docking head launch and recovery system.

"I am proud to have a team, partners, and vendors that step up to solve subsea challenges," said David P. Kelly, president and CEO of Bluefin Robotics. "We are looking forward to tackling the next set of challenges posed by the DARPA Program and applying our hard-won experiences to others."

Phase III of the contract was awarded in early March and will fund the full integration of the deep-sea sonar into the vehicle as well as the production of a second system with sonar to support networked operations.

For more information, visit www.bluefinrobotics.com.



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General Dynamics completes CDR of Knifefish UUV for U.S. Navy

General Dynamics Advanced Information Systems has successfully completed the critical design review for Knifefish, the surface-mine countermeasure unmanned undersea vehicle (SMCM UUV) 1 month ahead of schedule. The General Dynamics team will now begin the development of the system hardware and software to integrate the approved design via the fabrication of three engineering development modules. Knifefish is an essential component of the Littoral Combat Ship (LCS) mine countermeasure (MCM) mission package, providing U.S. Navy commanders and sailors with enhanced mine-hunting capabilities.

Expected to attain initial operational capability in 2017, Knifefish is the first heavyweight-class mainstream mine countermeasure (MCM) UUV that will address the Navy's need to reliably detect and classify mines resting on the seafloor and buried mines in high-clutter environments and areas with potential for mine burial. Knifefish also gathers environ-

mental data to provide intelligence support for other mine warfare systems.

Knifefish will help greatly reduce risk to Navy personnel and ships by operating in minefields as an off-board sensor, while the host ship stays outside the minefield boundaries. The modular, open Knifefish has been designed to integrate with both variants of LCS via the common LCS interface control document.

The General Dynamics Advanced Information Systems team on the Knifefish program includes Bluefin Robotics, Ultra Electronic Ocean Systems, Oceaneering International, Inc., Metron, Applied Research Laboratory at Penn State University, 3 Phoenix, General Dynamics Information Technology, and ASRC Research Technology Solutions.

For more information, visit www.gd-ais.com.

U.S. Navy commissions eighth San Antonio-class LPD

The Navy commissioned the newest San Antonio-class amphibious transport dock ship, Arlington, during a ceremony on 6 April at Naval Station

Norfolk, Virginia.

The ship is named for the County of Arlington and honors the first responders and the 184 victims who died when American Airlines Flight 77 crashed into the Pentagon 11 September 2001.

"This ship and her proud name symbolize what is exceptional about the United States," said Secretary of the Navy Ray Mabus. "For the next several decades, Arlington will take Marines and their equipment wherever they are needed, whether to provide humanitarian assistance or lethal combat capability. But more important, Arlington will carry with her the legacy of valor exhibited by Marines throughout the Corps' history and shown by those who lost their lives on American Airlines Flight 77."

Two previous ships have carried the name Arlington. The first was a steel-hulled C1-B type cargo ship operating during World War II. The second USS Arlington was a 14,500-ton Vietnam War era, major communications relay ship, that assisted with communications during a June 1969 conference between U.S. President Nixon and Republic of Vietnam President Thieu.



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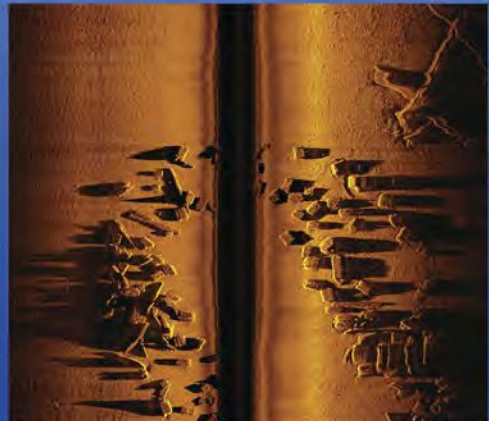
Marine Sonic Technology, Ltd. is innovating the side scan market yet again with our newest generation of side-scan sonar in the Sea Scan® ARC towed system. It is designed for durability, one person deployment, and an easy to use setup. Utilizing Marine Sonic Technology, Ltd.'s newest proprietary sonar technology, Adaptive™ CHIRP to provide extended ranges and more accurate results for faster surveys.

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Designated LPD 24, Arlington is the eighth amphibious transport dock ship in the San Antonio class. As an element of future expeditionary strike groups, the ship will support the Marine Corps “mobility triad,” which consists of the landing craft air cushion vehicle, amphibious vehicles, and the Osprey tilt-rotor aircraft.

For more information, visit www.navy.mil.

Virginia Tech Researchers develop robotic jellyfish for U.S. Navy

Virginia Tech College of Engineering researchers have unveiled a life-like, autonomous robotic jellyfish the size and weight of a grown man, 5 ft 7 in. in length and weighing 170 lbs, as part of a U.S. Navy-funded project.



The prototype robot, nicknamed Cyro, is a larger model of a robotic jellyfish the same team—headed by Shashank Priya of Blacksburg, Virginia, and professor of mechanical engineering at Virginia Tech—unveiled in 2012. The earlier robot, dubbed RoboJelly, is roughly the size of a man’s hand, and typical of jellyfish found along beaches.

“A larger vehicle will allow for more payload, longer duration, and longer range of operation,” said Alex Villanueva of St-Jacques, New-Brunswick, Canada and a doctoral student in mechanical engineering working under Priya. “Biological and engineering results show that larger vehicles have a lower cost of transport, which is a metric used to determine how much energy is spent for traveling.”

Both robots are part of a multi-university, nationwide \$5 million project funded by U.S. Naval Undersea Warfare Center and the Office of Naval Research. The goal is to place self-powering, autonomous machines in waters for the purposes of surveillance and monitoring the environment in addition to other uses such as studying aquatic life, mapping ocean floors, and monitoring ocean currents.

For more information, visit www.vtnews.vt.edu.

U.S. Navy calls on BAE Systems to provide critical mine detection sensor prototype

BAE Systems has been awarded a \$20 million contract to develop an advanced prototype system that detects mines and obstacles in nearshore waters for the U.S. Navy and Marine Corps. As part of the Coastal Battlefield Reconnaissance and Analysis (COBRA) program, the laser-based airborne system will provide 24-hr capability to ensure our troops’ safe transition from ship to shore.

These technologies are being prototyped under Section 819 of the National Defense Authorization Act, which is aimed at the development of advanced components or prototypes, according to Brian Almquist, program officer in the ONR Ocean Battlespace Sensing Department. “This law helps to reduce acquisition costs and also accelerates delivery of technology to the fleet to protect our sailors and marines from this prolific threat,” Almquist said.

The COBRA program leverages BAE Systems’ borderless approach to harness key resources in design, integration, and testing. The work will be performed at the company’s facilities in Honolulu, Hawaii; Greenlawn, New York; Acton, Massachusetts; and Hudson, New Hampshire.

For more information, visit www.baesystems.com.

HII Awarded RCOH Contract for Abraham Lincoln (CVN 72)

Huntington Ingalls Industries (HII) has been awarded a \$2.6 billion cost-plus-incentive-fee contract for the refueling and complex overhaul (RCOH) of the nuclear-powered aircraft carrier Abraham Lincoln (CVN 72). The work will be performed at the company’s Newport News Shipbuilding (NNS) division.

The ship arrived at NNS using planning contract funding. Lincoln was originally scheduled to arrive earlier, but was among the projects delayed due to uncertainties surrounding the defense budget and funding of the work. The president signed legislation enabling the Navy and NNS to move the Lincoln to the shipyard to begin the RCOH.

The RCOH represents 35 % of all maintenance and modernization in an aircraft carrier’s 50-year service life. Lincoln’s RCOH will include the refueling of the ship’s reactors as well as extensive modernization work to more than 2,300 compartments, 600 tanks, and hundreds of systems.

Ekinox INS

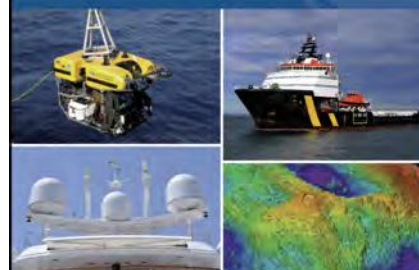
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GPS/GNSS, EM Log



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Continuing Growth Forecasted for Unmanned Maritime Systems (UMS)

By: Antoine Martin, Market Info Group Analyst

Notably, 2012 was a year of intense growth and development for Unmanned Undersea Vehicles (UUVs), including Autonomous Underwater Vehicle (AUV), Remotely Operated Vehicle (ROV), and Unmanned Surface Vehicle (USV) technologies and markets. With growth also comes maturity, which is seen as a decreasing proportion of R&D, as Figure 1 shows.

All indicators show that 2013 is likely to also be a banner year for the industry.

Dynamic Marketplace

Responding to indications of significant growth, companies in this sector show heightened activity. After raising money, SeaRobotics Corp. (USA) continues to develop USVs and recently announced a new 11-m USV of 30-day endurance. After purchasing the intellectual property and assets of Alaska Native Technologies LLC, Exocetus LLC (USA), a new company, offers UUV gliders for coastal roles, introducing the ability to operate to and from fresh and saltwater without re-ballasting. L-3 Communications Corp. purchased USV integrator Calzoni (Italy), which now puts a new large defense contractor in the USV arena.

The heightened activity results in a flurry of new products. ACSA (France) developed a new high-speed, high-capacity payload glider. A number of companies are developing “hybrid ROVs,” such as Total/Cybernetix (France), Bluefin Robotics (USA; leveraging their 2011 acquisition of Hawkes ROV), Saab Seaeye (Sweden), and Subsea 7 (UK). Rafael (Israel) has stretched its Protector USV to 11 m to achieve better sea worthiness and increased reliability through sub-systems redundancy. Zycraft Pte. Ltd. (Singapore) offers more missions of its USV through new clever modules.

Partnership activity also reflects the upbeat tempo of the market: Liquid Robotics (USA) formed with Schlumberger (France), a joint venture for exclusive distribution rights of the Wave Glider USVs for oil and gas.

And, of course, alongside the successes there is a downside aspect as well. iRobot Maritime (USA), a division of iRobot, which was created by the purchase of Nekton Research LLC for \$10M cash in 2008, is shutting down its UUV business, including some advanced technological projects engaged with the Office of Naval Research. The future of the SeaGlider as a product is uncertain.

Government Commitment to UMS

Whether governments are decreasing their defense budgets as a whole, as is the case in Western Europe and North America, or increasing their budgets and commitment to selected technologies as in the greater Asia-Pacific region, Unmanned Maritime Systems (UMS) projects are getting a distinctly preferential treatment. France continues its SLAMF effort with the Sterenn Du – a large USV carrying up to six UUVs for MCM missions. This project involves heavy weights in the naval and UMS industry, such as Thales, DCNS, and ECA.

In the UK, there is commitment to MCM using UMS, continuous procurement of USV targets from ASV Ltd, which also develops a USV under a Thales contract, and evidence of long-term commitment to naval unmanned vehicles in their visionary “Black Swan” class ship.

The Netherlands originated and hosts a consortium dedicated to solving the problem of launching and recovery unmanned maritime vehicles through a joint program called LAURA.

The European Defense Agency, with its UMS Category B initiative, continues to manage UMS projects as part of a greater EDA UMS Roadmap. A successful event called SARUMS took place in 2012 and is likely to spur a greater collaboration between the member states and their respective businesses.

In India, a modernization program involves UUV and USV to a small extent, and Israel’s Rafael has already positioned itself to capture the Indian USV market with local contractor Mahindra. And in the United States, there is a commitment to a large USV mine sweeping program (UISS) and the impending Large Displacement UUV program, to which the ONR has already awarded contracts for energy/power R&D.

Industry Trends

It is now clear that UMS technology manufacturers are pushing their way into the oil and gas market in addition to the defense market, which has been the bread and butter for most UUV manufacturers outside large ROVs; even large defense contractors are starting to transfer their existing and evolving technologies, product development and R&D efforts, and funding into that market. Oil and gas end-users are looking forward to a reliable and cost-saving UMV in order to successfully address deep-ocean energy extraction and service needs. Meanwhile, builders of ships of all sizes are looking at the USV market as an emerging market, although they are not yet sure how it will take shape. Both governments and technology innovators know that UUVs and USVs have a promising future after the success of UAVs and ROVs. The market is increasingly global, as shown in Figure 2. However, a lot of questions remain unanswered, including how quickly end-users will trust and make use of the technology on a regular and operational basis.

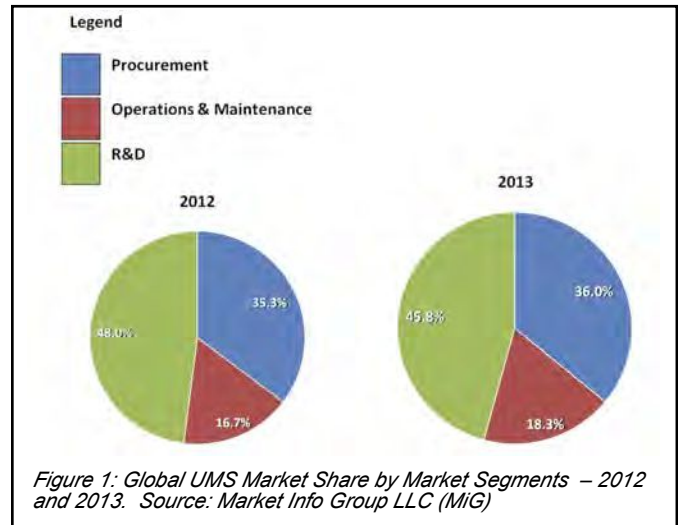


Figure 1: Global UMS Market Share by Market Segments – 2012 and 2013. Source: Market Info Group LLC (MiG)

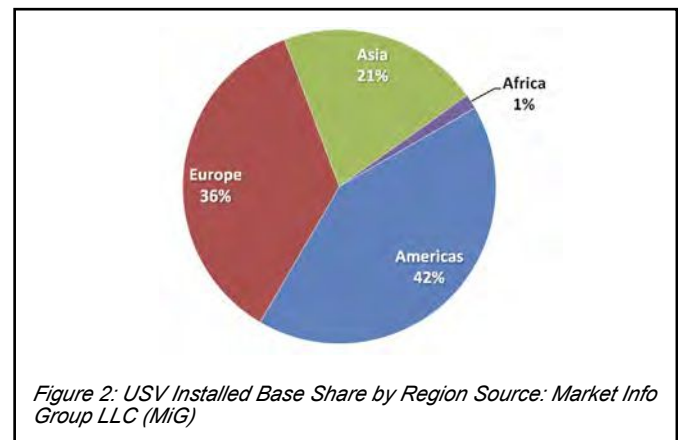


Figure 2: USV Installed Base Share by Region Source: Market Info Group LLC (MiG)

What does it mean?

Like every rapidly evolving market, the UMS market presents a number of opportunities along with a number of traps. The high dynamics and global aspect of UMS means that companies and clients alike need to communicate with each other effectively and clearly define needs and capabilities. One thing is certain: users will increasingly rely upon UUVs and USVs to a point where they will simply not be able to do without them.

Learning More

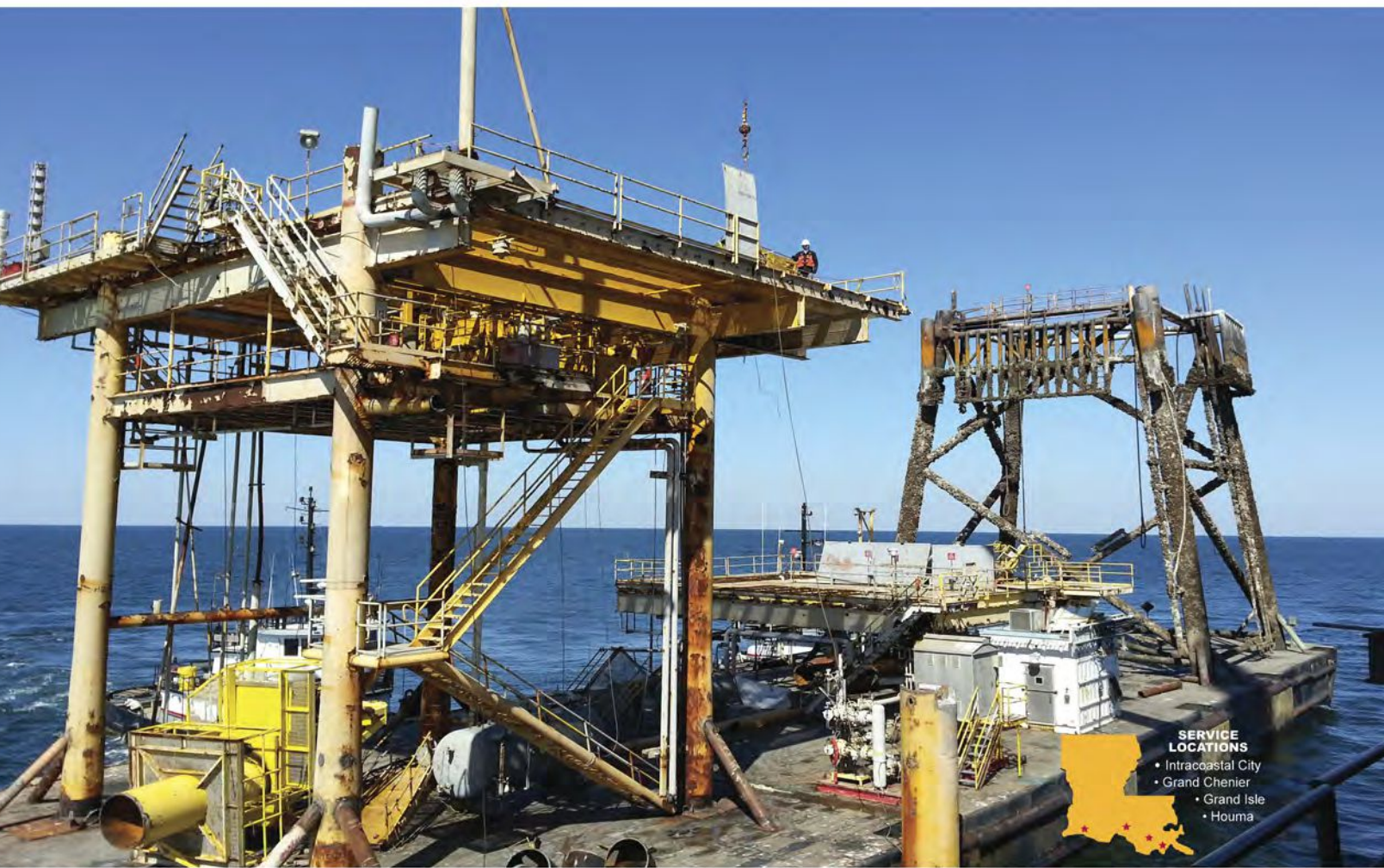
The insights provided above about companies, governments, products, and trends are just the tip of a very active market and technology sector. What the future holds is forecasted in detail in a business analysis on UUVs and USVs published by Market Info Group LLC (MiG). The forecasts outline numerous opportunities, detail current and evolving markets and technologies, and describe more than 200 vehicles, along with photos. A new series of focused and competitively priced analysis reports offer convenient insight, much like MiG’s highly praised, best-selling UMS report.

You can learn more about MiG’s UMS forecasts at www.ums-report.com. Ocean News & Technology readers will receive a 10% discount on all of MiG UUV or USV reports. Interested readers are invited to contact MiG at info@marketinfogroup.com or call Ed Herlik at +1 719-440-4423.

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OFFSHORE INDUSTRY

UK government seeks to retrain ex-soldiers for oil and gas industry

The UK government is looking to establish a national program to retrain ex-military personnel to work in the country's oil and gas industry as part of efforts to address a skills shortage in a sector that is vital for the UK economy.

The move could help boost employment at a time when the UK is teetering on the brink of its third recession in 5 years. It will also help provide skilled personnel for an industry that is on the cusp of a resurgence as companies ramp up investment following a recent raft of tax breaks and other incentives. The UK's oil and gas industry employs over 400,000 people.

Filling the skills gap is seen as one of the biggest challenges facing the oil and gas industry, especially for small and medium-sized enterprises, the Department of Business, Innovation and Skills said in a statement in its long-term oil and gas strategy. The industry expects it will require an additional 15,000 staff over the next 4 to 5 years across a range of disciplines.

China has most proved reserves in Asia-Pacific with 14.7B bbls

Of the countries in the Asia-Pacific region, China accounted for the highest proved oil reserves, with 14.7 billion barrels, followed by Malaysia with around 5.9 billion barrels of proved oil reserves, GlobalData reported, adding that India holds the third largest proved oil reserves in the region, with around 5.7 billion barrels.

Australia ranked first in 2011, with the highest amount of proved natural gas reserves. Australia's share was 22.4% of total natural gas proved reserves in the Asia-Pacific region. Among the other leading nations in the Asia-Pacific region were China with 18.2%, Indonesia with 17.7%, and Malaysia with 14.5%, based on their proved natural gas reserves in 2011.

Meanwhile, PIRA Energy Group reports that China reached a milestone in December 2012, as Chinese net petroleum imports were greater than U.S. net petroleum imports for the first time. And this trend should continue for years. Every year for at least the last two decades, Chinese oil demand has increased.



Deepwater Inspiration at work in GoM

U.S. Gulf production to rebound in 2013: Raymond James report

Oil production in the Gulf of Mexico is expected to increase in 2013, the first such increase in 4 years, according to an economic analysis by Raymond James. The firm said that offshore oil production beyond 2020 is expected to increase at a faster rate than onshore production.

"While production is likely to flatten out in 2014 and 2015, there is a very meaningful amount of volumes on deck for startup in the second half of the decade," the report was quoted by the Online Oil and Gas Journal as saying.

A drilling moratorium imposed by the Obama administration following the Deepwater Horizon explosion and Macondo oil spill in 2010 was responsible for the decline in U.S. Gulf production.

Sentiment toward oil companies rebounds since Gulf spill: study

Consumer sentiment toward energy companies has rebounded since the Gulf of Mexico oil spill, and consumers are feeling better not just about how energy companies are contributing to the economic well-being of the country, but also how they are protecting the environment.

Consumers believe that energy companies are more credible than in recent years on environmental issues, according to results of the latest Market Strategies International E2 (Energy + Environment) Study. Conducted twice each year, the national survey captures Americans' attitudes and opinions about issues where energy and the environment intersect.

"As of December 2012, the E2 Index stands at the highest level we've seen," said Jack Lloyd, senior vice president of the firm's energy division. Results are based on 1,004 nationwide interviews.

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Supercomputers give oil explorers a sharper view underground

Total is the most recent big oil company to enter the realm of supercomputing. The French integrated powerhouse recently unveiled Pangea, which Total said will process geological data to help company geologists more accurately decide how and where to drill wells. And it will help them do it faster.

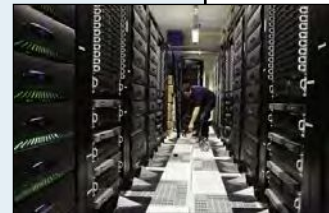
"It is absolutely true that the seismic industry, probably next to the Defense Department, has always been the biggest user of computer power," said Peter Duncan, chief executive officer of Microseismic, a Houston-based geophysical service company. "The original post-World War II computer at MIT—the Whirlwind—one of its original tasks was to do seismic data processing."

Total's Pangea has a computing capacity of 2.3 quadrillion operations per second, the equivalent of 27,000 office computers, and is in the top 10 in terms of computing power, according to the company.

As with smart phones and other technology, the race for the best super computer is perpetual. British oil giant BP is building a new, 110,000 sq. ft supercomputing facility at its U.S. offices in Houston that it will use to go farther, faster, and deeper in its global search for oil and gas.

The new high-performance computing facility, which will replace a smaller existing one, will be equipped with 5,000 computers, each with 12 to 16 central processing units. Together, they will process data at a rate of up to two petaflops, a roughly 63% increase in speed from its existing facility's capabilities. A petaflop is equivalent to a thousand trillion floating point operations per second.

"BP sees seismic imaging as a key focus for us," said John Etgen, a BP researcher who advises the company on the technology. "The challenges never stop coming. We're always working on improving resolution, imaging, deeper targets."



Harris poll: 74% of U.S. voters oppose raising energy taxes

Approximately 74% of voters nationwide believe Washington should resolve the country’s budget issues without raising taxes on energy, according to a new poll conducted by Harris Interactive for American Petroleum Institute’s “What America is Thinking on Energy Issues” series.

“Higher energy taxes hurt everyone,” said API president and CEO Jack Gerard. “Americans know that driving up energy costs harms families and slows down job creation; a sentiment expressed across every political, age, and gender line. Higher energy taxes are not a solution that will solve Washington’s budget problems.”

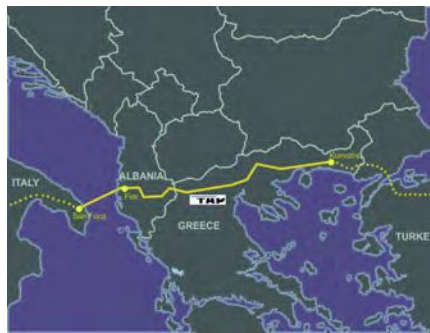
The telephone poll of 1,000 registered voters, conducted 8 to 17 March, also found a strong majority (63%) said singling out the oil and natural gas industry for higher taxes—or even just a handful of companies in the industry—is unfair, discriminatory, and bad tax policy. Voters agreed raising taxes on oil and natural gas companies could drive up costs for consumers (69%) while killing jobs and hurting the economy (57%), according to the poll.

“Singling out specific companies or specific industries for tax increases is discriminatory, unfair, and simply bad public policy,” said Gerard. “Today, it’s oil and natural gas, but who’s next? This is not how tax policy should be made. Americans get that raising taxes can increase their costs. We should focus on bringing down costs for energy consumers by approving the Keystone Pipeline, speeding up drilling permits, ending costly and unattainable ethanol mandates, and opening up some of the 83% of Federal lands and waters that remain off limits.”

Albania approves international pact on Trans Adriatic Pipeline

Albania’s parliament has approved the Intergovernmental Agreement (IGA), signed in February between Albania, Italy, and Greece, on the construction and operation of the Trans Adriatic Pipeline (TAP) project. The TAP will interconnect with the Trans Anatolian Pipeline (TANAP) near the Turkish-Greek border, cross Greece, Albania, and the Adriatic Sea, finally reaching shore in southern Italy.

The offshore leg of the pipeline will be laid at a maximum depth of 2,690 ft at a distance of 65 mi. Designed to expand the capacity from 10 to 20 bcm per year, the pipeline is expected to open up



Southern Gas Corridor to increase Europe’s energy security. It will also support the creation of a national Gas Master Plan (GMP) as part of the cooperation with the Albanian government. The GMP is expected to help the Albanian government to meet its strategic goal of becoming an energy hub in the region.

Routing of TAP is anticipated to enable gas supply to several southeastern European countries, including Bulgaria, Albania, Bosnia and Herzegovina, Montenegro, and Croatia. The pipeline will be 492 mi, of which 297 mi will be in Greece, 127 mi in Albania, 65 mi offshore, and 2.5 mi in Italy.

TAP’s shareholders include Switzerland-based Axpo and Norway’s Statoil, with 42.5% interest each, while Germany’s E.ON Ruhrgas holds the remaining 15%.

ConocoPhillips suspends Alaska offshore drilling plans for 2014

ConocoPhillips has suspended plans to drill for oil in the waters off Alaska in 2014 until Federal regulations for offshore Alaska drilling become clearer.

The announcement is another setback for the energy industry’s plans to explore the waters off the Alaskan coast. Royal Dutch Shell called off its 2013 Alaskan drilling program after one of its rigs in the area became damaged after running aground earlier this year.

ConocoPhillips, which has been drilling offshore and onshore Alaska for 50 years, received 98 exploration lease tracts in the Chukchi Sea outer continental shelf in 2008. ConocoPhillips said it decided “it would not be prudent” to make the investment necessary to explore in the harsh Arctic environment until the U.S. government and energy industry hammered out an Arctic-specific regulatory model for offshore oil and gas exploration.

“Once those requirements are understood, we will re-evaluate our Chukchi Sea drilling plans,” said Trond-Erik Johansen, president of ConocoPhillips Alaska.

Obama administration releases new offshore drilling safety regulation

The Obama administration released a new regulation designed to improve the safety of offshore drilling, including a requirement that rig workers be given the authority to shut down operations to deal with potential emergencies. Employees on the Deepwater Horizon rig were criticized by the administration for allegedly not recognizing safety threats and not taking immediate steps to shut down operations before an explosion killed 11 workers and triggered a huge oil spill in the Gulf of Mexico in 2010.

The International Association of Drilling Contractors (IADC) said it supports the regulation, noting that rule “is a complement” to the original rule, issued in October 2010 and known as the Workplace Safety Rule.

“This rule is intended to address a myriad of complex operations associated with the effective management of offshore oil and gas activities,” said Alan Spackman, vice president, IADC offshore division.

The new rule also requires companies to submit their safety and environmental management systems to third-party assessments. Under the regulation, due to take effect in 60 days, companies can conduct their first safety and environmental review themselves. But subsequent reviews, under the new regulation, would have to be done by outsiders, accredited auditors, the administration said.

U.S. Senate confirms Sally Jewell as nation’s next Interior Secretary

Sally Jewell, a former petroleum engineer and chief executive of outdoor retailer Recreational Equipment Inc., has won U.S. Senate confirmation to be the nation’s next Interior Secretary. The



Sally Jewell

Senate approved her nomination 87 to 11, with all the no votes coming from Republicans. Senate minority leader Mitch McConnell, Republican of Kentucky, was among those who opposed Jewell.

Jewell will oversee more than 500 million acres of national parks and other public lands, plus more than 1 billion acres offshore. President Obama nominated Jewell last month to replace Salazar, who announced his departure in January. Jewell, 57, of Seattle, also was a banker before taking over Kent, Washington-based REI in 2005.

DNV and Statoil cooperate to enhance Arctic competence

DNV and Statoil have launched a competence program that aims to enhance the two organizations' knowledge about Arctic challenges.

"Due to Arctic-specific risks such as remoteness, darkness, ice, and low temperatures, it is utterly important to take a stepwise approach in which we learn and improve from the experience gained. Our complementary roles as operator and risk-management expert in challenging environments are the best reason for sharing best practices and enhancing our own expertise," said Knut Ørbeck-Nilssen, chief operating officer of DNV Norway, Finland, and Russia. DNV is a global provider of knowledge for managing risk.

The growing interest in the commercial use and exploitation of Arctic resources is driven by the high demand for energy. To be able to meet the particular Arctic challenges with sound knowledge and safe technologies, Statoil and DNV are launching the Arctic Competence Escalator (ACE) Program. This has been developed to enhance the expertise of their own specialists and share and improve solutions for specific Arctic issues.



Knut Ørbeck-Nilssen

"We will implement the ACE Program as a joint effort because we have similar ambitions and backgrounds. We have a long history of successful technology collaboration. Although this is an internal program, we aim to share our developments with the industry," said Ørbeck-Nilssen.

"Statoil already has many years of experience of Arctic offshore operations, for example in the Barents Sea and at Newfoundland in Canada," said Morten Karlsen, head of Statoil's Arctic Technology Research Program.

He added, "But the Arctic is a highly diverse part of the world, and operating in the more challenging areas, with longer distances, lower temperatures, and ice-covered waters, may require enhanced knowledge and solutions. I hope the ACE Program will be an important driver in obtaining these. Deep insight matched with respect for the Arctic's particular conditions will be necessary to manage the risks in this promising but sensitive part of the world."



First quarter 2013 oil, gas M&A activity was lowest since 2007

Merger and acquisition (M&A) activity in the global oil and gas sector slowed dramatically during the first quarter of 2013, according to data released by Houston-based PLS Inc. and partner Derrick Petroleum Services.

The value of 106 separate transactions in the first quarter was \$20.6 billion, down from a record \$140.9 billion in 208 deals during the fourth quarter of 2012. This compares to a transaction value of \$44.9 billion in 197 deals during the first quarter of 2012.

The deal value in the first quarter of 2013 is the lowest since the equivalent quarter in 2007 (\$21.8 billion).

"After a record level of activity late in 2012 due to U.S. fiscal cliff concerns, the oil and gas deal markets slowed dramatically in early 2013 as buyers digested their acquisitions," PLS managing director Brian Lidsky said.

Deal activity slipped about 40% from the prior four-quarter average, and deal inventory has grown by about one third. Linn Energy LLC's \$4.3 billion buy of Berry Petroleum was the largest during the first quarter. In Canada, the major highlight was the final approval by both Canada and the United States of CNOOC Ltd.'s \$17.9 billion purchase of Nexen, which closed on 25 February 2013.

Investment to spur huge jump in North Sea oil and gas production

Oil & Gas UK believes around 470 mmbbl of oil and gas will be extracted from the area in 2013, a five-fold increase on the average over the past 3 years. Approximately 2 mmbbl/d of oil are set to come on stream by 2017, up from 1.5 mmbbl this year.

The trade group attributes this to a significant rise in investment in the North Sea, from \$16.8 billion in 2012 to a record \$19.9 billion this year.

The prediction, by Oil & Gas chief executive Malcolm Webb, suggests that a slump in investment in the North Sea since the 2000s is coming to an end. That was exacerbated by a \$3 billion tax raid in 2011, when marginal tax rates on North Sea operators were raised to up to 81pc. The measures were eased by a series of tax allowances to promote exploration in challenging fields.

Webb told the Financial Times that the new incentives for so-called "awkward squad" fields had "commercialized what would have been uncommercial projects." He also hailed moves to clarify decommissioning costs in this year's budget.

Judge rules Cameron won't face punitive damages in oil spill trial

Cameron International Corp. will not face punitive damages stemming from the 2010 Deepwater Horizon explosion, a Federal judge in New Orleans ruled.

Cameron manufactured the blowout preventer (BOP) that was connected to the Deepwater Horizon rig when it exploded in 2010, leading to 11 deaths and the worst offshore oil spill in U.S. history. The BOP is said to have failed to stop the explosion.

Judge Carl Barbier granted Cameron's motion for judgment denying the plaintiffs' claims for punitive damages against the company.

The civil trial, which began last month, wraps together hundreds of civil claims and cross-claims made against BP, Transocean Ltd, Halliburton Co., and

other companies and businesses, the Gulf Coast States, and the Justice Department. In the first phase, Judge Barbier was to determine the degree of culpability each company has for the accident.

In 2011, Cameron paid BP \$250 million to settle most of the legal claims arising from the spill. BP agreed to indemnify Cameron against all claims for compensatory damages, but the agreement did not cover fines, penalties, or punitive damages.

Also, Judge Barbier dismissed M-I Swaco, a drilling-fluid provider that is now a unit of Schlumberger Ltd., from the lawsuit.

"We are very pleased with the court's complete dismissal of M-I Swaco from the Deepwater Horizon lawsuit and its finding," said Stephen Harris, a spokesman for Schlumberger.

Cal Dive awarded \$63M Pemex pipeline contract
Cal Dive International, Inc. was awarded a contract by Mexico's Pemex for the engineering, procurement, installation, and commissioning of 12 km of 8 in. subsea pipeline and associated tie-ins on four existing platforms located in the Abkatun-Pol-Chuc field in the Bay of Campeche, Gulf of Mexico. The contract is expected to generate total revenue of approximately \$63 million and will utilize three of the company's vessels. The offshore construction is expected to commence in the third quarter of 2013.

Lukoil taps Schlumberger for Caspian field wells
Lukoil has contracted Schlumberger to design wells for the V. Filanovsky field development in the northern Caspian Sea. In 2012, subsidiary company Lukoil-Engineering opened the Center of Geologic Exploration Technologies at its premises in Moscow. It was established for integrated studies of prospective assets in the company's licensed areas, applying advanced geologic exploration technologies and equipment supplied by Schlumberger, Lukoil's partner in the project. Hardware and software developed by the center is designed to make reservoir modeling more reliable, forecasting of oil and gas incidents more precise, and to lessen geological risks and uncertainties. Filanovsky was discovered in 2005. It is Lukoil's second offshore project in the Russian sector of the Caspian Sea. Production is scheduled to start in 2015.

Tideland lights up offshore Qatar platforms
Tideland Signal has supplied LED light stations to Occidental Petroleum for the offshore Idd El-Shargi South Dome (ISSD) oil field, 50 mi northeast of Doha, Qatar. The initial contract was for five LED warning systems to be installed on South Dome platforms, all comprising Tideland's solar-powered MLED-150 EX light station with a range of 10 NM. The lantern includes a high-intensity LED flasher controller with 256 flash code and PE-cell in a rugged Exd housing. The solar-battery system is wired to an Exd junction box and the batteries are housed in a stainless-steel battery EX-certified box, all mounted on a galvanized steel pedestal. Each light station is fitted with an Exd alarm and monitor system mounted in an alloy enclosure. All equipment is ATEX certified for use in Zone 1 (Cat 2) hazardous areas.

McDermott unit secures projects in Arabian Gulf
McDermott International said one of its subsidiaries has won two offshore projects worth \$900 million from a client in the Arabian Gulf. The engineering, procurement, construction, and installation (EPCI) company, as part of the first project, will be responsible for the EPCI of a new tie-in platform, with a 3,200-t topside and six-pile jacket; two auxiliary platforms, jackets, and bridges; and five observation platforms. McDermott will also carry out EPCI of 72 km of pipelines and 45 km of subsea cables. The project is expected to be completed in the third quarter of 2015. Under the second project, McDermott will undertake fabrication, transportation, and installation of five drill support structures, weighing a total of 7,993 t, in water depths ranging from 30 to 65 m.

Big Foot to be U.S. Gulf's deepest TLP installation



Dockwise delivers mega sized ETLT hull to the Gulf of Mexico

Dockwise Ltd. has safely transported the Chevron-operated Extended Tension Leg Platform (ETLP) hull from Silli-do Island, South Korea, around Cape of Good Hope, and discharged at Corpus Christi, Texas. The mega-sized hull, weighing 35,000 t, will be used for the Big Foot field, considered to be one of the largest and deepest oil discoveries in the Gulf of Mexico.

The Big Foot ETLP pushed the Mighty Servant 1 (MS1) to the vessel's limits, Dockwise said, noting that for this project, the deck was enlarged with four outriggers and was opened to reinforce the internal hull to support the mammoth cargo.

"A great deal of engineering was required to ensure a safe and successful transport across the open ocean," said Bas Mabélus, project manager at Dockwise. The hull was loaded at the Daewoo Shipbuilding & Marine Engineering yard and transported 16,100 nmi totaling 60 days.



Technology advancement continues to push TLPs into deeper water. TLPs historically have been limited to working in around 5,000-ft water depth because of the challenges associated with tendon design and installation. The Magnolia TLP is the deepest TLP installation to date at 4,700-ft water depth. The Big foot TLP will be pushing the boundaries to 5,330-ft water depth to be the deepest TLP installation.

Discovered in 2006, the Big Foot field lies in the Walker Ridge area about 225 mi south of New Orleans and is estimated to contain total recoverable resources in excess of 200 mmbbl. Primary pay sands are Middle to Upper Miocene, ranging from 19,000 to 24,000 ft and lie below a salt canopy ranging from 8,000 to 15,000 ft thick.

The proposed facility will be installed 35 mi south of Chevron's producing Tahiti field. Project costs were estimated to be around \$4 billion. FloaTEC was selected to provide engineering and project management services to develop the platform hull design; specify the required marine systems equipment; and optimize the hull, tendons, and risers global design. The company is also performing structural analyses and will assist in planning subsequent phases of development.



Shenandoah well turns up large discovery with over 1,000 ft of pay

ConocoPhillips has a significant oil discovery from its recently drilled Shenandoah appraisal in the deepwater Gulf of Mexico. The WR51-2 Shenandoah appraisal well encountered more than 1,000 ft of net pay in high-quality Lower Tertiary-aged reservoirs.

“The potential of the Shenandoah discovery, combined with very positive indicators of hydrocarbons in the nearby Coronado well, further strengthens our position in the Lower Tertiary play,” said Larry Archibald, senior vice president, exploration.

“We believe this discovery could be material and, together with the doubling of our deepwater Gulf of Mexico acreage position in the last 2 years, reinforces our global exploration strategy of getting into the right plays early in their life-cycle. (This) is an important first step in demonstrating our ability to grow a high-value Gulf of Mexico portfolio through organic exploration.”

The Shenandoah appraisal well, located in Walker Ridge Block 51, was drilled to a total depth of 31,405 ft in about 5,800 ft of water. The well was about 1 mi southwest and roughly 1,700 ft structurally down-dip from the 2009 Shenandoah-1 discovery well.

Log and pressure data collected in the Shenandoah-2 well indicate high-quality reservoir and fluid properties similar to those encountered in the discovery well. Logs indicate that the targeted Lower Tertiary sands were full to base with hydrocarbons and there was no evidence of an oil-water contact.

ConocoPhillips holds a 30% working interest in Shenandoah. Other co-owners are Anadarko Petroleum Corp., 30% working interest and operator; Cobalt International Energy, LP, 20%; Marathon Oil Co., 10%; and Venari Offshore LLC, 10%.

The Coronado wildcat exploration well, located in Walker Ridge Block 98, was drilled to a total depth of 31,866 ft, in 6,127 ft of water. The well is located

approximately 190 mi off the coast of Louisiana and about 12 mi southeast of the Shenandoah discovery.

Results from the Coronado well are still being evaluated, and additional appraisal will be needed to determine the full extent of the resource.

ConocoPhillips holds a 35% working interest in Coronado. Other co-owners are Chevron Corp., 40% working interest and operator; Anadarko Petroleum Corp., 15%; and Venari Offshore LLC, 10%.

FMC Technologies gets subsea contract for Mad Dog Phase 2

FMC Technologies, Inc. signed a contract with BP for the manufacture and supply of subsea equipment to support the Mad Dog Phase 2 field development in the Gulf of Mexico. The development is located near Green Canyon Block 825, about 150 mi south of New Orleans in about 5,100 ft of water. Under the initial contract, FMC will supply subsea trees, manifolds, and jumper equipment.

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Rigs & Vessels



Tug supply vessel Normand Mjolne

GSP buys Solstad anchor-handling tug supply vessel Normand Mjolne

GSP Offshore (Grup Servicii Petroliere SA/GSP) has acquired the anchor-handling tug supply vessel Normand Mjolne from Solstad Offshore and will rename the vessel GSP Antares.

The AHTS was built in Ulstein Yard, Norway in 1985 as a multi-purpose vessel with two independent engine rooms (starboard and portside) to allow continued operations in the event of a major accident.

It provides rescue, fire fighting, oil recovery, inspection, and maintenance of underwater loading systems, anchoring and towing, buffer storage and consumables, supply services, emergency preparedness, and full standby rescue for 300 persons.

Maersk secures jack-up for next phase drilling offshore Qatar

Maersk Oil Qatar has contracted Gulf Drilling International's newbuild jack-up Al Jassra for a 4-year program. The contract covers drilling and well workover activity on Al Shaheen, Qatar's largest offshore oil field.

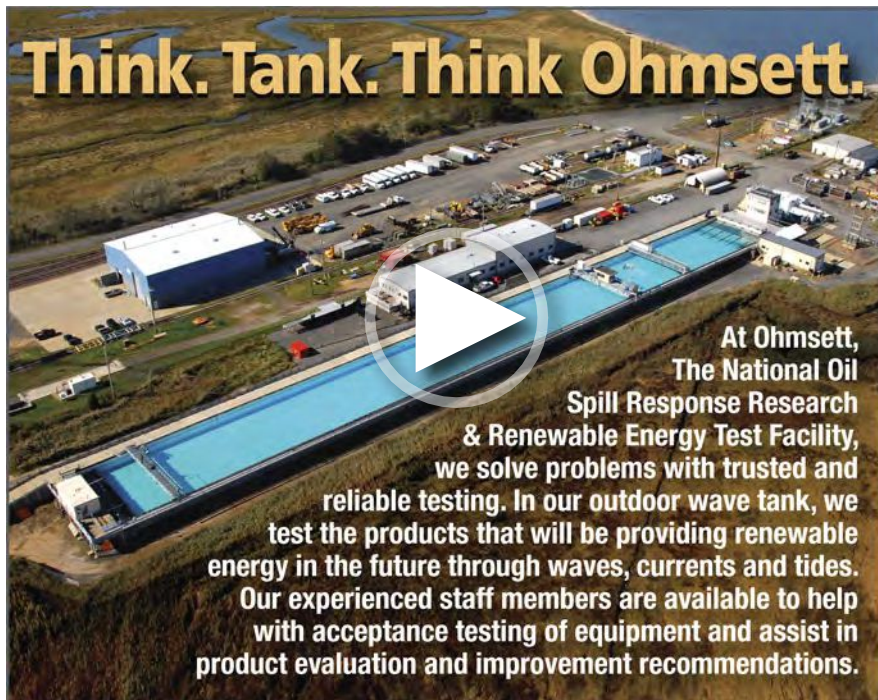
"By working closely with our partner Qatar Petroleum, Maersk Oil has started to unlock the significant potential of the Al Shaheen oilfield," said Lewis Affleck, Maersk Oil's managing director. "We have already drilled in excess of 300 wells, and we expect to drill many more in the years ahead to optimize recovery from this giant offshore oil field."

Al Jassra will be one of several rigs used to deliver Maersk Oil's latest phase development of the field, agreed last November, which calls for drilling of 51 new wells on Al Shaheen.

The new rig is a Pacific Class 400 jack-up. It will feature a 75-ft cantilever outreach and will provide the ability to drill extended-reach wells to access the field's long, thin reservoirs.

Al Jassra is under construction at the PPL shipyard in Singapore. Following commissioning and dry tow, it is expected to arrive in Qatar mid-year.

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the firm said, noting that the SUDB is a 4000-hp vessel with a 15,000-psi well control system, a 12-hole well pattern, a drilling capacity of 35,000 ft, and can operate in 8 to 60-ft water depths.

Many new-age technologies are employed in the design of the SUDB, creating a vessel that is high-tech and efficient. Schellstede believes that the oil and gas marine industry will be modernized with the deployment of the SUDB, which is expected this year.

Mexican driller Grupo R orders four Keppel jack-ups for \$820M

KeppelFELS has secured contracts worth \$820 million to build four jack-up rigs for Mexican driller Grupo R. The jack-ups are scheduled for delivery from the second quarter of 2015 to the fourth quarter of 2015. The rigs will operate in water depths of up to 400 ft and drill to depths of 30,000 ft. Pemex said it plans to invest \$25.3 billion this year to help counter production declines.

BP contracts Helix Q5000 for deepwater GoM interventions

BP has entered a 5-year contract with Helix Energy Solutions Group Inc. to use the deepwater Q5000 vessel for well intervention services in the Gulf of Mexico. The Q5000 is being built in Singapore, and the offshore work is expected to begin between April and August of 2015 following delivery from the shipyard.

The agreement also includes options for additional days each year and extension for two consecutive 1-year terms.

Schellstede's drilling, completion vessel technology breakthrough

Herman J. Schellstede and Associates, Inc. has unveiled a new drilling vessel design that will accommodate shallow continental shelf zones and inland rivers, bays, and sounds with one operating vessel called the Schellstede Ultimate Drilling Barge (SUDB).

"The SUDB is the beginning of a new era in technology for marine drilling and completion," Schellstede said, noting that development of the SUDB was preceded by a state-of-the-art Schellstede patented vessel design, Parker Rig 75, which has been operating in Nigeria since 1999.

The initial application of the SUDB is set for the West African Coast where many profitable lease zones consist of varying water depths. For the past 50 years, companies have used at least two vessels in order to drill in these areas.

Drilling vessels that are designed for inland services, such as 8 to 20-ft water depths, do not have the stability qualities required to operate in the shallow offshore waters with high surf zones, currents, and tides. Also, offshore vessels, which can operate in 20 to 60-ft water depths, are expensive and too heavy and wide to enter the narrow passages and shallower waters of inland, rivers, bays, and sounds, Schellstede said.

Schellstede's solution of using one vessel to service both of these marine areas cuts production costs by up to half,



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Wintershall discovers oil in North Sea's Hibonite formation

Wintershall has discovered oil in the Hibonite exploration well (5504/1-3) in Licence 5/06 in the Danish territory of the North Sea. Located about 337 km north of Den Helder in The Netherlands and 278 km west of Esbjerg in Denmark, the exploration area Hibonite is nearly 7 km north of the field Ravn, which was developed by the company in 2009 with the Ravn-3 well.

As per preliminary resource estimation from the company, the Hibonite formation is expected to contain about 100 mmbbl of potential crude oil in place. In water depths of 52 m, the bore Hibonite-1 was drilled to a total depth of 4,431 m below sea level. Wintershall collected cores, performed several well logs, and produced oil and gas during a production test in the drilling program.

The company drilled two deflected holes, Hibonite-1A and-1B, to further analyze the size of the oil discovery, while both wedge holes have confirmed oil-bearing sandstone formations of the Upper Jurassic.

Wintershall holds a 35% stake and operatorship in Hibonite, while other part-

ners include Bayerngas Petroleum AS Denmark, Nordsøfonden, and EWE Sales, with 30%, 20%, and 15% interests, respectively. The company currently operates three licenses—4/06a, 4/06b, and 5/06—and holds 35%, 80%, and 35% stakes in the licenses, respectively.

ExxonMobil begins drilling at Porcupine Basin, offshore Ireland

ExxonMobil has began \$160 million worth of planned drilling activity on two prospects at the Dunquin licence area in the Porcupine Basin, 200 km offshore Ireland. The company is planning to drill test wells during a 4-month period. Earlier data suggested the presence of nearly 300 mmbbl of oil and 8.5 tcf of gas between the two Dunquin prospects.

The prospects, if proven and extracted, could be one of the biggest ever global discoveries of oil and gas and are expected to change Ireland's economic fortunes, reported Independent.ie.

Drilling over the Dunquin prospects, which are situated in the Atlantic where the ocean is 1.6 km deep, is a much anticipated program and is being eagerly watched by oil companies across the globe. In March 2008, Irish independent

oil and gas exploration company Providence Resources, along with ExxonMobil and UK-based Sosina Exploration, was awarded two exploration licenses in Porcupine Basin. The licenses in the Porcupine Basin comprise 13 blocks across 760,000 acres.

ExxonMobil and Italian firm Eni hold 27.5% interest each in the Dunquin prospect, while Spanish energy firm Repsol, UK-based Sosina, and Providence Resources have 25%, 4%, and 16% interest each, respectively, in the prospect.

Myanmar auctions offshore oil and gas exploration blocks

Myanmar's government has commenced an auction of 30 offshore oil and gas exploration blocks, which is anticipated to attract huge interest from foreign multinational companies. Successful bidders will be granted full rights to up to 3 of the 19 deepwater blocks on offer. Energy firms must submit their bids by 14 June, reported the AFP. Previously, companies were required to explore onshore blocks in partnership with state oil companies, but bidders are now expected to take full control for deepwater exploration.

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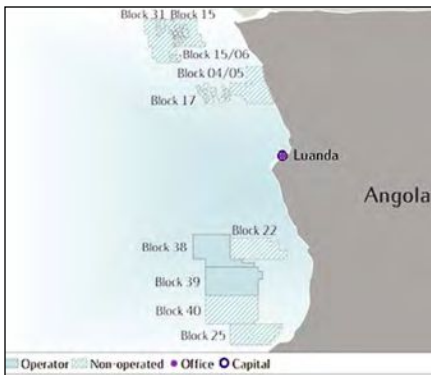
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"We are pleased to secure these ultra-deep water rigs," said Jon Arnt Jacobsen, Statoil's chief procurement officer.

"Statoil has an ambition to produce 2.5 mmb/d in 2020, which requires that we ensure sufficient and appropriate rig capacity. We have secured rigs for our needs in 2013 and 2014, and we are also targeting the allocation of rigs and developing new rig concepts to ensure more capacity in the market."



Stena Carron drillship headed to Angola

Statoil secures exploration rig capacity offshore Angola

Statoil has signed a 3-year contract for the Stena Carron drillship for exploration drilling in the pre-salt blocks (Blocks 38 and 39) in the Kwanza basin in Angola.

The agreement managed by Stena Drilling is for a 3-year, fixed-term with start-up between the fourth quarter of 2013 and the first quarter of 2014. The estimated total contract value is \$700 million. Statoil has also secured two 1-year extensions.

Statoil has also allocated the Discoverer Americas drillship to East Africa to perform exploration drilling in the Statoil-operated blocks in Tanzania and Mozambique.

"Statoil has now secured rig capacity for its planned global exploration program in 2013 and 2014. We have drilled four successful wells in Tanzania over the last year and are now committed to drilling additional wells in Tanzania as well as in Mozambique and Angola," said Tim Dodson, executive vice president for exploration in Statoil.

"Together with a three-well campaign in the Gulf of Mexico, three Statoil-operated wells in Canada, and a 1-year drilling campaign in the Barents Sea, this demonstrates an ambitious exploration program."

In Angola, Statoil will test the pre-salt potential in the Kwanza blocks by drilling the commitment wells in Blocks 38 and 39. In East Africa, Statoil, along with its respective partners, plans to drill three to four wells testing the further potential in Block 2 in Tanzania and explore the Blocks 2 and 5 area in Mozambique.

In the Gulf of Mexico, Statoil will drill three operated wells during 2013 utilizing the semi-submersible Maersk Developer. The company also has exploration activities in two to three partner-operated wells in this region coming up in addition to a three-well campaign

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Work under way on new North Sea Montrose BLP topsides

Heerema Fabrication Group's Zwijsdrecht yard has started construction of the Montrose BLP (bridge-linked platform) topsides for Talisman Sinopec Energy UK.

The 8,500-t topsides will serve the Montrose and Arbroath field area in the UK Central North Sea. The completed structure will be 246 ft long, 144 ft wide, and 131 ft high. A bridge will link the existing Montrose Alpha platform to the new Montrose BLP facility.

Heerema expects the project to create more than 1.3 million man hours of fabrication, with on average 500 people working at the yard. The topsides and bridge should be ready for load out in April 2015. The topsides will be assembled in the company's covered hall under controlled conditions.

Total signs Aker for deepwater production system off West Africa

Total has signed an \$850 million letter of award with Aker Solutions for the subsea production system offshore the Republic of the Congo at the Moho Nord project. Scope of work includes the delivery of 28 vertical subsea trees, including wellhead systems, two installation and workover control systems, seven manifold structures, subsea control, and tie-in systems.

Aker and Total will also establish a service base in Pointe Noire, Republic of the Congo. The subsea trees and workover systems will be manufactured at the Tranby manufacturing center outside Oslo. The production of the manifolds will be at Aker Solutions' facility in Egersund on the west coast of Norway, while the facility in Aberdeen, UK will deliver the control systems and the wellheads. The first deliveries of the Moho subsea production system are scheduled for the second quarter of 2014.

Iran completes South Pars Phase 19 sour gas pipelay in Persian Gulf

Offshore installation of the second South Pars Phase 19 sour gas 32-in. pipeline is complete in the Persian Gulf. This will take gas from the Phase 19 platforms to an onshore processing terminal in Iran. Work on the first sour gas transfer 32-in. line and associated glycol 4-in. line was completed this past October. In total, 143 mi of pipelines were laid.

As for the ongoing South Pars 17 and 18 projects, drilling of the first seven wells is complete at the A18 platform.

According to Hassan Boyeri, director for development of both phases, the first

InterMoor completes IRIS installation and recovery in the Gulf of Mexico

InterMoor, an Acteon company, has completed an installation and recovery project for Apache Deepwater LLC in Mississippi Canyon Block 148, Well 5 in the Gulf of Mexico. The work scope included the overboard, wet transfer, deployment, and recovery of a 30-t interchangeable riserless intervention system (IRIS) owned by Blue Ocean

Technologies. InterMoor undertook the work in water approximately 168 m deep from Cal Dive's Uncle John semi-submersible vessel.

InterMoor delivered the project using its compensated anchor handler subsea installation system (CASIM), which reduces heave motions relative to vessel motions. CASIM units are pre-charged at the surface to deliver the needed heave compensation for the load at depth.

InterMoor's proprietary CASIM method requires less deck space and demands fewer deck operations than the traditional buoy-based heave-compensated landing system. The company also provided the associated rigging equipment and a technician to help facilitate the subsea compensation.

"Apache selected InterMoor for this project on the basis of our service record, the fact that we had the necessary equipment available, and because of our experience in subsea operations of this kind," said InterMoor project manager Jacob Heikes.

"Although we have used CASIM to deploy and recover many types of subsea equipment, this is the first time that we have used CASIM for IRIS deployment and recovery, and the project's success shows that this proven installation method is suitable for a wide range of subsea equipment."



CASIM system used in recovery

part of offshore drilling operations in this project was completed successfully after conducting final tests. The seven drilled wells have a gas production capacity of 550 mmcf/d.

He added that a new schedule has been agreed for these two phases to achieve early development of the offshore facilities.

Sembmarine SLP gets minimum facility platform concepts license

Sembmarine Marine subsidiary Sembmarine SLP has secured an exclusive license from Seahorse Platform Partners Ltd. (SPPL) to use the patented Seaharvester and SeaHorse technology in the design and construction of minimum facilities platforms (MFPs) for the North Sea, other UK territorial, and Irish waters.

These designs were originally developed for shallow-water platforms in the Gulf of Mexico.

Further, SLP and SPPL have signed a

memorandum of understanding under which SPPL will award an additional exclusive license to apply the technology in the design and construction of MFPs for Southeast Asia and Australasia (excluding Malaysia and Brunei).

"Our Seaharvester and SeaHorse technology has proven itself in more than 170 platforms worldwide; and, over the years, SLP has adapted the designs originally utilized in the Gulf of Mexico for the stringent conditions of the North Sea," said Patricia Blandford, chief executive officer of Houston-based SPPL.

"It was not only SLP's knowledge and experience of MFPs that led us to award the exclusive license, but also SLP's ability to satisfy the client's requirements safely, on time, and to a high standard of workmanship. SLP's new association with SMOE opens up new and exciting opportunities."

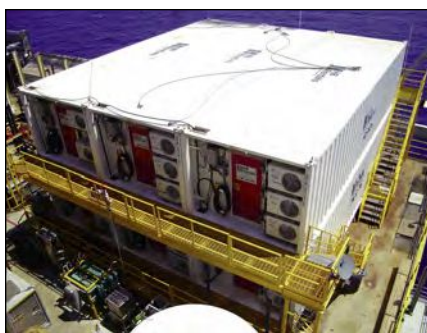
HB Rentals completes 10-building package on platform off Trinidad

Accommodations specialist HB Rentals, a Superior Energy Services company, was awarded an A60-ABS-approved, 10 building package to accommodate 58 personnel on a fixed platform off the northern coast of Trinidad, said Glenn Aguilar, HB Rentals senior vice president of global operations.

In addition to the 58 beds, HB Rentals also supplied the galley, diner, laundry facilities, and medic's room as well as the generators, electrical distribution system, water maker and storage system, sewage treatment equipment, stairs, and platforms. The units, outfitted at HB Rentals' Broussard, Louisiana facility, were shipped via ocean freight to HB Rentals' Trinidad facility.

"Through the combined efforts of both the Trinidad and U.S. team members, this was a successful design, installation, and commissioning package," said Jude Primeaux, HB Rentals director of offshore operations.

"With projects like this one that aggregate the skills of people in different regions, it is integral that teams are able



HB Rentals' accommodation package

to work together to get the project done in an efficient and timely manner."

BP, Shell to drill for more reserves at offshore Clair field

BP and its partners have agreed to drill five additional wells at the Clair field west of Scotland's Shetland Islands as Europe's second-biggest oil company seeks to expand the giant discovery. Royal Dutch Shell, ConocoPhillips, and Chevron Corp. are the partners in the project that will require an initial investment of more than \$500 million. The first well has already started.

The UK government, seeking to boost domestic oil and gas resources and reduce imports, approved tax breaks last year to boost investment in North Sea fields. The incentives included \$4.5 billion of allowances to spur development of "large and deep fields" west of the Shetland Islands.

Zidane partners favor Heidrun field tieback in Norwegian Sea

RWE Dea and its partners have opted for a subsea platform tieback for the Zidane gas-condensate field in the Norwegian Sea. Zidane is in license PL435, 9.3 mi northwest of the Statoil-operated Heidrun field and 22 mi south of the recently onstream Skarv field.

The discovery well in September 2010 encountered a 492-ft gas column in the Fangst group. Zidane 2, drilled in 2012, delivered a 459-ft column of gas in the same interval.

RWE Dea estimates total volumes in the range 494 to 777 bcf recoverable. Zidane will be connected to the Heidrun platform via a four-slot subsea template, with four producing wells with the well-stream sent through a 9-mi thermally insulated production flowline.

G-882 TVG - TransVerse Gradiometer Marine Magnetic Survey System

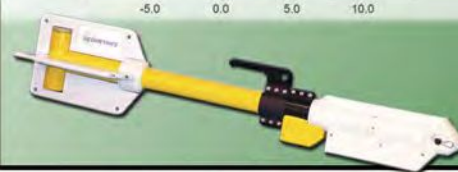
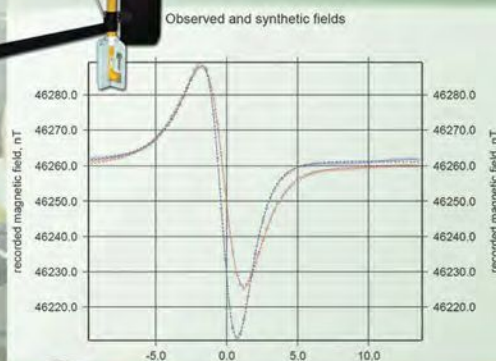
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New era begins in Israel with startup of offshore Tamar field

Natural gas has started flowing from an offshore rig in the Tamar field in the Mediterranean Sea, off the coast of Israel, ending 4 years of preparation.

“This breakthrough is the first signal for additional private companies to partake in the energy independence of the state of Israel,” Energy and Water Minister Silvan Shalom was quoted as saying in The Jerusalem Post.

Israeli Prime Minister, Binyamin Netanyahu, was quoted by the publication as saying, “The flow of gas from the Tamar reservoir has commenced. This is an important day for the Israeli economy.” The Tamar production platform is about 290 m and weighs nearly 34,000 t, including the rig’s legs. It is located about 90 km west of Haifa, while a 150-km long pipeline of around 45 cm in diameter connects it to the Ashdod reception facility along the seabed.

Israel, which is expected to use gas from the Tamar field in the next couple of decades to meet its domestic needs, is estimated to save \$3.5 billion on energy costs annually with this latest development. In addition, the use of natural gas



from the Tamar field will help reduce carbon dioxide emissions by nearly 195 million tons, which is equivalent to eliminating all vehicles from Israeli roads for 14 years. A consortium of Noble Energy, Delek Drilling, Avner, Isramco, and Dor Gas have explored, drilled, and developed gas from the field.

Noble Energy said Tamar is producing about 300 mmcf/d of gas a day. Discovered in 2009, the company recently boosted the gross resource estimate of Tamar to 10 tcf.

The development is designed to deliver up to 1 bcf/d, a volume Noble expects to reach during the third quarter, the company said in a statement. Noble operates Tamar with a 36% working interest. Other owners include Isramco Negev 2 LP, Delek Drilling LP, Avner Oil Exploration LLP, and Dor Gas Exploration.

First production launched from Beibu Gulf platform off China

Roc Oil (China) Co. reported first production from the WZ 6-12 wellhead platform offshore China in the Beibu Gulf. The A5H and A2 development wells are the first online, and three more production wells were anticipated within a few weeks.

The HYSY 931 jack-up drilling rig will drill three additional development wells (A8, A9, and A10). The successful A6 and A7 wells, drilled late 2012, will be equipped for production.

A number of completion hook-up and commissioning activities are in progress. On completion, 10 wells will have been drilled from the WZ 6-12 platform and connected to the production system, 5 more wells than originally contemplated.

Production from the Beibu fields will progressively ramp up through the year as batches of development wells are drilled, completed, and brought on line.

Participating interests in the project are CNOOC, 51%; Roc Oil (China) Co., 19.6%; Horizon Oil (Beibu) Ltd. and Horizon Oil (Nanhai) LLC1, 26.95%; and Oil Australia Pty Ltd (Majuko Corp), 2.45%.



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Production

Centrica Energy delivers first gas production from Rhyl field

Gas production has begun from the Rhyl gas field in Morecambe Bay in northwest England. The Rhyl field, located 39 km off the coast of Barrow, was first discovered in 2009 and is wholly owned and operated by Centrica Energy.

Gas from Rhyl will be produced through Centrica Energy's existing North Morecambe platform, then come onshore to its Barrow terminal complex by pipeline for processing.



Mike Astell

This is the first new field to be brought on stream in the region for 10 years and represents an important milestone in extending the life of Centrica's Morecambe Bay operations, taking production well beyond

2020. Earlier this year, additional appraisal drilling on the Rhyl reservoir confirmed that it extended further than originally anticipated.

"This is incredibly exciting news for everyone involved because it marks another lease of life for the Morecambe Bay area, securing energy for the UK and



The Morecambe gas rig

jobs for the local area," said Mike Astell, Centrica Energy's regional director for the East Irish Sea.

The Morecambe Bay gas fields were first discovered in the 1970s and production began in 1985. The South Morecambe gas field is one of the UK's largest fields, and, at peak, Centrica Energy's East Irish Sea operations are able to supply around 8% of the UK's residential gas demand.

Centrica Energy's facilities in the Northwest include the South and North Morecambe and Rhyl gas fields, the Barrow Gas Terminals, the Rampside Terminal, the Heysham Support Base, and the Barrow Offshore wind farm.

Appraisal drilling at Rhyl North towards the end of 2012 was successful and led to 2P reserves being revised

upwards from around 40 bcf to around 80 bcf. In early 2013, further appraisal drilling at Whitehaven confirmed that the Rhyl reservoir extends further than originally anticipated, potentially leading to additional reserve bookings.

Petrobras plans to triple oil output from fields offshore Brazil by 2017

Brazil-based Petrobras has announced plans to triple oil production from the country's extensive deepwater fields by 2017. The state-run energy producer said it will invest nearly \$147 billion, mainly in exploration and production, or 62% of the total \$236.7 billion that it earmarked for the 5-year plan, reported AFP.

Petrobras stated, while releasing its management and business plan to investors, that it plans to extract 962,500 bbl/d by 2017, which is three times more than its current 300,000.

The company expects its crude oil production to reach 2.7 mmbbl/d in 2017, up from 1.98 mmbbl/d in 2012. The rise in production will mainly come from the pre-salt reserves, located at a depth of 19,000 ft under a thick deposit of salt off southeastern Brazil, Petrobras said.




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Oil Spill Response: subsea well control response now available

Oil Spill Response Ltd. has unveiled new well capping equipment for deployment in the event of a subsea well control incident. The Subsea Well Intervention Service (SWIS) is available to oil and gas companies across the industry and to any offshore location worldwide.

SWIS includes four capping stacks to shut in an uncontrolled subsea well and two hardware kits to clear debris and apply subsea dispersant at a wellhead, making surface working conditions safer and enhancing bio-degradation.

The equipment is claimed to be suited to most known subsea wells and can be deployed in water depths up to 9,842 ft and control flow pressures up to 15 kpsi, according to the company.

It will be stored at four locations in Norway, Brazil, South Africa, and Singapore—and maintained ready for immediate mobilization and transport by sea and air in response to an incident.

The equipment in Stavanger is already available for international use, with a further three devices to be delivered this spring and summer.



Headhunter installs sewage plant on GoM oil spill response vessels

Headhunter, Inc. has completed installation of the Tidalwave HMX sewage treatment plant on the Eagle Texas and Eagle Louisiana, which will be deployed as oil spill response and well-containment vessels in the U.S. Gulf of Mexico. The two tankers have been chartered for 20 years to Marine Well Containment Co. of Houston, Texas.

The Eagle Texas and Eagle Louisiana are the first of two specially outfitted Aframax tankers owned by AET Tanker Holdings of Kuala Lumpur, Malaysia.

AET is a global leader in petroleum shipping with a fleet of more than 80 vessels.

“The fact that our system was chosen for installation on these state-of-the-art vessels is testimony to the quality of our products and the reliability of our services. All of our waste treatment systems are certified for worldwide compliance under MARPOL,” said Mark Mellinger, president of Fort Lauderdale, Florida-based Headhunter.

Tidalwave HMX systems are USCG-certified and Bureau Veritas-approved to IMO MEPC 159 (55) standards. They can process up to 50,000 gallons/d and use flocculants, chemical oxidation, hydro-maceration, and patented crossflow separation techniques to destroy influent biomass. The six-stage process provides trouble-free treatment of black and gray water and a sterile effluent for disposal.

The PLC controller allows treatment techniques to be customized after installation for varying hydraulic and organic loading conditions or to meet varying performance standards in different parts of the world. For more information, visit www.headhunterinc.com.

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Petrofac unveils 'Introduction to Oil & Gas' eLearning course

Fresh on the heels of its recent acquisition of eLearning specialist Oilennium Ltd, Petrofac Training Services (PTS) announced the launch of "Introduction to Oil & Gas," a new eLearning course.

Developed by Oilennium, the course offers an engaging, interactive overview of the oil and gas industry that can be used to enhance a trainee's in-class training experience and be made available to thousands of employees around the world.

The Introduction to Oil & Gas course, which can be accessed any time online, offers a concise summary of how the industry works, from explo-

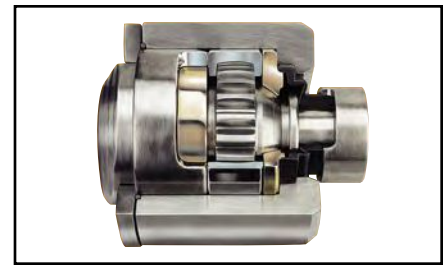
ration and production upstream to processing and transmission downstream. This user-friendly course, which features full voiceover guidance and colorful 3D animations technology throughout, is completely interactive.

When a module is successfully completed, a certificate is issued to reward the user's efforts, fueling the learning process. Upon completing the 12-module course, the user will have a good understanding of how hydrocarbon fields are found and developed, industry terminology, and technical know-how.

For more information, visit www.petrofactraining.com or e-mail karen.e.scott@petrofac.com.

Moyno launches improved gear joint for maximum performance

Moyno, Inc.'s proprietary gear joint design is now improved to offer decreased wear, reduced friction, and increased loading capabilities. The improved gear joint is used on all new Moyno® 2000, Moyno® 2000 WA, and Moyno® 2000 WB pumps. The improved gear joint is also available as a drop-in replacement for any existing



Moyno® 2000, Moyno® 2000 WA, and Moyno® 2000 WB pump models and requires no modification.

The Moyno crowned gear universal joint drive train configuration provides exceptional torque and thrust control. Patented joint seals effectively protect the gear joints from pumpage contamination.

The improved gear joints are the result of advanced material selection and improved manufacturing methods that help reduce wear characteristics and improve overall performance. The precision manufacturing of the gear joint components creates greater surface contact, which also helps reduce overall wear and elevate performance.

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Liquid Robotics announces breakthrough in unmanned ocean observation with Wave Glider® SV3

Liquid Robotics® announced the introduction of the Wave Glider® SV3, the world's first hybrid wave- and solar-propelled unmanned ocean robot. The Wave Glider® SV3 incorporates the latest advancements in energy-harvesting technology, providing the ability to utilize both wave and solar energy for forward propulsion. These innovative propulsion and energy systems will help customers explore portions of the world's oceans in conditions that previously were too challenging or costly to operate. Customers will now have the ability to conduct missions, 24x7, through all weather conditions, across most of the planet to help solve some of the world's critical problems such as global climate change, ocean acidification, fisheries management, hurricane prediction, tsunami warning, and exploration for valuable natural resources.

The end-to-end ocean data solution provided by the new Liquid Robotics® integrated platform provides ocean data collection and processing at the point of collection with real-time delivery of critical information to shore. The Wave Glider® SV3 can tap into the inexhaustible supply of the planet's wave and solar energy, travel tens of thousands of miles,

collect data in the most demanding sea states/conditions (doldrums, high currents, hurricanes/cyclones) and deliver this data in real-time to users around the globe. This capability provides access to new levels of ocean data, more pervasively and more cost effectively than from existing alternatives.

For more information, visit www.liquidr.com.



Tesla Offshore orders Bluefin-21 AUV to expand deepwater survey business

Bluefin Robotics, a leading provider of AUVs and related subsea technologies, announced that Tesla Offshore LLC has purchased a Bluefin-21 AUV.

Randall P. Bergeron, president and CEO of Tesla Offshore, stated that, "In the highly competitive and evolving field of AUV development, Bluefin Robotics certainly belongs at the top of a very short list of suppliers that could meet our subsea data acquisition and sensor integration criteria. With such a strong background in innovative solutions in the AUV market and the flexibility to meet our operational goals and timeframes, Bluefin Robotics was able to put together an ideal vehicle that will allow Tesla Offshore to undertake our clients' most challenging deepwater survey operations anywhere in the world."

This purchase coincides with Tesla's intent to expand its presence in deepwater oil and gas field development, as well as positioning itself to pursue governmental environmental, and academic applications support. Tesla Offshore will operate their AUV on a global basis and, specifically, in the Gulf of Mexico where U.S. government regulatory agents are

considering proposals that mandate archeological and shallow hazard survey data be acquired by AUV technologies. Assigned to spearhead the implementation of the technology are Tesla's Nathaniel Usher, director of geoscience, and George Loy, innovative solutions manager.

The Tesla Bluefin-21 AUV is a modular system capable of carrying multiple sensors in a single payload section. It boasts a highly efficient power solution that enables extended operations at depths up to 4,500 m. The innovative design includes swappable payload sections and battery modules for fast surface turnaround as well as portability and flexibility to operate from various ships of opportunity worldwide.

The AUV's unique sensor suite has been chosen to exceed the data quality and resolution requirements of today's deepwater survey markets. These include a broadband multibeam echosounder, a chirp subbottom profiler, and a high-definition digital camera. In addition, the system will be the first AUV in the industry to boast a state-of-the-art, fully integrated synthetic aperture sonar (SAS) produced by Raytheon Applied Signal Technology. The PROSAS® Surveyor is expected to provide a decimetric imaging resolution across swath ranges up to 450 m per side, which in turn can lead to increased survey efficiency at depth.

For more information, visit www.bluefinrobotics.com.



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Underwater Intervention

CSA Demonstrates Capabilities of USV During Live Field Tests

CSA Ocean Sciences Inc. (CSA) recently introduced its new Unmanned Surface Vehicle (USV) to select audiences during two live field demonstrations, with the first staged at Harney Park, Tampa and the second at Demens Landing Park, St. Petersburg. During these live demonstrations, CSA staff put the USV through its paces, demonstrating a few of the unique interactive and autonomous operation capabilities of the USV to staff representatives of the Southwest Florida Water Management District, Hillsborough County Environmental Protection Commission, private consulting firms, and the University of South Florida College of Marine Science and Center for Ocean Technology. The USV was also put on display for a static demonstration in front of a few select staff representatives of the Tampa Port Authority and another private consulting firm at the Port of Tampa in downtown Tampa.

The USV, manufactured by SeaRobotics Corporation, is a safe and reliable system designed to economically conduct environmental/ecological



support surveys for habitat mapping, bathymetry, cultural resources, hazards, and munitions and explosives of concern, including unexploded ordnances and discarded munitions. This relatively small, lightweight, and highly adaptable platform can be quickly outfitted to carry an array of specialized marine survey equipment, including differential global positioning systems capable of utilizing real-time kinematic corrections for increased accuracy, side-scan sonar, sub-bottom profiler, multi-beam sonar, single/split-beam scientific echo sounder, magnetometer, imaging sonar, and water quality sampling equipment. Unlike traditional manned vessels, the highly maneuverable battery-powered USV can be deployed in areas of hazardous conditions and can operate in shallow nearshore waters, rivers, lakes, canals, and/or other confined waterways with limited accessibility.

For more information, visit www.csaocan.com.

HyBIS robotic underwater vehicle deployed to accurately position ocean bottom seismometers

The versatility of Hydro-Lek's HyBIS robotic underwater vehicle has been further demonstrated in the deployment of Ocean Bottom Seismometers (OBS) and Ocean Bottom Electromagnetic Receivers (OBEM) on the seafloor in the Arctic Ocean. The expedition was conducted by members of the marine geology team from Southampton's National Oceanographic Centre (NOC) to collect data from sites of methane gas and seafloor gas vents.

HyBIS, a mnemonic for Hydraulic Benthic Interactive Sampler, is a 6,000-m rated, fully modular electro-hydraulic platform designed to operate in conjunction with existing deck handling and cable systems. The vehicle comprises an upper command and power unit with a lower hydraulic and mechanical docking interface. The dock allows a variety of different tooling modules to be interfaced with the command module, including a 0.5 cu. m hydraulic grab, a five-function manipulator arm and retractable sample tray, a passive

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winch to recover up to 3-ton bottom landers—and now a module for the precise positioning of OBS and OBEMs on the seafloor.

Traditionally, seismometers have been randomly dropped from the side of a ship into the ocean. However, modern geophysical studies require instruments to be placed on solid parts of the seabed with a precise position and preferred orientation.

HyBIS is able to meet these requirements—and within modest budgets. Unlike a conventional ROV, HyBIS does not have any flotation; it is suspended directly from the ship by its armored umbilical cable allowing it to carry payloads of up to 750 kg. Using its two powerful thrusters HyBIS is also able to target and accurately position OBS instruments within a small tight array and orientate OBEMs to their correct compass alignment.

For more information, visit www.hydro-lek.com.

Brazil gets another Lynx

Belov Engenharia has ordered a second Saab Seavee Lynx ROV for its operations in Brazil’s vast oilfields. General manager, André Weber Carneiro explains why he favors the Lynx. “It’s powerful for its type, with a good depth rating that enables us to perform a wide span of services.”

The six-thruster, 1500-m rated Lynx will be used for the inspection of oil lines, risers, and jackets.

For line inspection, a Tritech digital precision altimeter has been fitted to maintain accurate offset from the seabed as the ROV follows the pipeline.

When undertaking jacket inspection, a fitted CDL fiber-optic gyro means there is no magnetic interference from the jacket structure while accurately tracking the ROV’s motion.

Constantly moving the ROV system across and between rigs makes the Lynx system and its tether management cage an ideal choice, as it is particularly easy to relocate, says André Weber Carneiro.

He also says that operating the ROV from a cage reduces the influence of currents—even though its thruster power still allows precise maneuverability while swimming on its 250-m excursion tether.

Other hi-spec equipment fitted to the system includes a Seavee wide-angle, low-light color camera, a range of Kongsberg cameras, including a high-definition low-light CDD camera, a color zoom camera, and a high-definition TV camera with fiber output.

For more information, visit www.seavee.com.

IMCA publishes updated Design for Saturation (Bell) Diving Systems

Offshore equipment and operating practices are routinely improved in the constant quest for ever-greater levels of safety and efficiency. The International Marine Contractors Association’s (IMCA’s) newly published Diving Equipment Systems Inspection Guidance Note (DESIGN) for Saturation (Bell) Diving Systems (IMCA D 024 Rev 1)

reflects the changes that have taken place since its initial publication in 2001.

“It is intended that this document should be used in conjunction with IMCA D 018 ‘Code of practice on the initial and periodic examination, testing and certification of diving plant and equipment,’ says IMCA’s Technical Director, Jane Bugler. “Cross-references to this Code are provided where appropriate.

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Saturation (Bell) Diving Systems is presented in the form of detail sheets, each of which specifies the requirements for a generic item of plant or equipment, or a group of items, which is covered by the same criteria. The testing requirements identified will normally correspond with the certification that the diving contractor maintains in a plant and equipment register or records in the planned maintenance system.

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

L-3 Klein to provide S5900 side scan sonar for the Royal Canadian Navy

L-3 Klein Associates, Inc. announced that it has received a \$4.3 million award from MacDonald, Dettwiler, and Associates Ltd. (MDA) of Canada to supply four of its S5900 side-scan sonar systems and accessories for the Royal Canadian Navy's Route Survey System Life Extension (RSSLE) Program.

The RSSLE Program will provide required updates for certain subsystems of Canada's Integrated Survey and Inspection System (ISIS), operated in the

Kingston-class Maritime Coastal Defense Vessels (MCDVs). The S5900, together with other updates, will provide the Canadian Armed Forces with extended in-service life-cycle support through the end of the planned operational life of the MCDV fleet (projected to at least 2025). The system will also provide improved seabed obstacle detection capability and a reduced risk of obstacle collision and tow body grounding during operations.

For more information, visit www.L-3com.com/Klein.

National Hyperbaric Centre joins Unique System FZE for the Middle East region

Unique System FZE, a Unique Maritime Group company that is one of the world's leading integrated turnkey subsea and offshore solution providers, signs a joint venture with the National Hyperbaric Centre (NHC) to launch a training center and training courses in the UAE.

The National Hyperbaric Centre (NHC) provides expertise and services to the Subsea industry and pressure-related industries and has been involved in the

diving industry for over 25 years through the provision of training, testing, hyperbaric facilities, and decompression studies.

Unique System and the National Hyperbaric Centre will provide quality training on diving-related courses in its new purpose-built training centre. The complete training schedule will be conducted at the training center, which is situated in the office premises located at Hamriyah Free Zone in Sharjah. Upon successful completion of the course and passing the end of course exam, the attendees are issued with either a certificate of participation from the NHC or an IMCA or OGP-recognized certification from the relevant authority. Some of the courses that are offered include IMCA Air Diving Supervisor, IMCA Assistant Life Support Technician, IMCA Bell/Gas Diving Supervisor, OGP Client Representative, Dive Technician, IMCA Diver Medic, Diver Medic Refresher, Diving Systems Auditing, and Assurance & Subsea Rigging and Lifting.

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TE supports Maritime Communications Partner on cruise ships

TE Connectivity (TE) announced that Maritime Communications Partner (MCP) is deploying TE's InterReach Unison distributed antenna systems (DAS) on nine U.S.-based cruise ships to facilitate passenger and crew communications both in port and at sea. MCP chose TE systems because they are easy to deploy and easy to manage through an SNMP-based network management system. The TE InterReach Unison DAS supports 850- and 1900-MHz UMTS frequencies as well as 1800-MHz service onboard the ships. Because the InterReach Unison DAS uses thin, flexible CAT-5 cabling to connect the electronics, it is much easier to install compared to other DAS that use 0.5-in. or larger coaxial cabling. MCP is also considering upgrading to 3G and LTE services, so the InterReach Unison DAS is a smart choice because its modular nature will make these upgrades easier, requiring changes only to the host unit electronics. Ease of deployment and upgrade is especially critical for ships since their available work hours are extremely limited.

NSB standardizes fleet with Globe iFusion

Globe Wireless announced that Niederelbe Schifffahrtsgesellschaft mbH & Co. KG (NSB) will standardize 85 vessels of their fleet with the Globe iFusion system. Each vessel will be equipped with a Globe i250, a backup FB150, Globe Wireless' Fixed Multiple Lines, GlobeMobile, and GlobeSSAS. NSB selected Globe iFusion as a result of Globe's existing relationship and strong reputation as a leading maritime communications provider along with being an innovator in maritime communications solutions. With enhanced crew solutions, the Globe iFusion system enables multiple calls using Globe's unique Digital Quality Voice (DQV) technology on both the GSM and VoIP phones allowing up to five inbound and outbound calls over DQV. By installing the Globe iFusion system with Fixed Multiple Lines, GlobeMobile, and GlobeSSAS, NSB will be standardizing satellite communications across its entire fleet, providing a total solution for its business and crew services. In addition, the remote management support that Globe iFusion gives NSB the ability to provide remote IT support with expanded functionality to its fleet.

Globecomm Maritime puts cost-effective live video chat onboard ship

Globecomm Maritime has rolled out Access Chat Plus, an optimized chat and video conferencing offering designed for maritime satellite communications. Access Chat Plus provides maritime users from the bridge to the mess with a means to make video calls and chat live over satellite using a fraction of the data and at a fraction of the cost of shore side applications. Access Chat provides instant messaging and voice calling while Access Chat Plus provides the same with the addition of video conferencing. Both Access Chat and Access Chat Plus are available in a range of pricing options for corporate and crew use, with customized pricing available when the service is bundled with Globecomm Maritime airtime service contracts. Access Chat and Access Chat Plus are very light applications both in terms of set up and data usage. Both are no more than 1 Mb in size and can be installed easily and quickly on any Windows or Android device, with an Apple OS version due in the second quarter of 2013. Either application may be loaded to a USB stick, enabling them to be used across multiple devices. Both can be installed without the need for proprietary ship management software, making them convenient for crew.

Harris CapRock, O3b provide advanced broadband for cruise ships

Harris CapRock Communications has expanded its collaboration with O3b Networks to deliver an advanced communications solution for Royal Caribbean Cruises Ltd's Allure of the SeasSM cruise ship. The two companies also are teaming to integrate systems aboard Royal Caribbean's Oasis of the SeasSM—one of the largest and most innovative cruise ships in the world.

The collaborative solution will enable Royal Caribbean to offer a wide range of consumer and enterprise Broadband applications—greatly enhancing guest experience and crew morale. The solution will leverage O3b's unique, low-latency Medium Earth Orbit satellite fleet and Harris CapRock's maritime systems integration expertise. Harris CapRock will install stabilized antenna systems and provide continuous, fully managed service to deliver high levels of dedicated, fiber-quality bandwidth to the Allure of the SeasSM and Oasis of the SeasSM throughout their voyages.

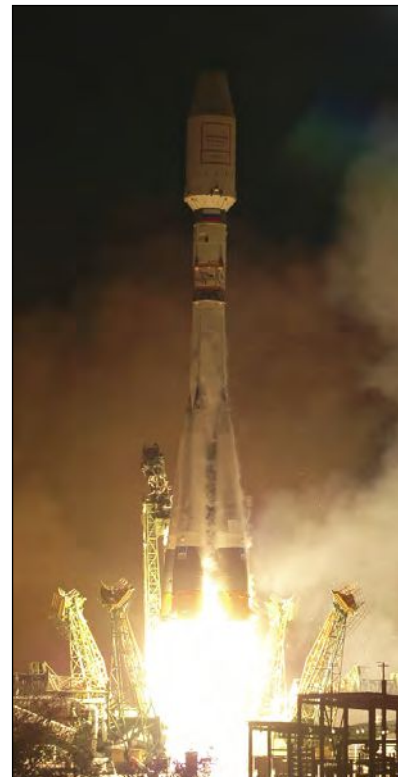
In May 2012, Harris CapRock was awarded a 5-year contract with Royal Caribbean to provide communications services onboard its fleet of 35 ships in its Royal Caribbean International®, Celebrity Cruises®, and Azamara Club Cruises® brands. To date, the company has completed the de-installation and installation of more than 120 large antenna systems onboard the fleet as an essential component of the managed network service for Royal Caribbean.

For more information, visit www.harriscaprock.com or www.o3bnetworks.com.

Astrium survey reveals maritime satcom state-of-play

A unique crew communications survey carried out by Astrium Services reveals that a growing number of seafarers see onboard Wi-Fi connectivity as essential in order to use their own smartphones, tablets, and laptops aboard ships. Unsurprisingly, social media, especially Facebook, was highlighted as one of the most popular web destinations for crews while it was also revealed that many seafarers are prepared to pay for connectivity.

The Crew Communications 2012 Survey, which was commissioned by Astrium Services to fill the market gap in up-to-date data on crew communications requirements and supported by consultants Stark Moore McMillan, questioned 960



Filipino seafarers during the second and third quarters of 2012. Approximately 12% of those surveyed were officers and 88% were general crew. The survey explored the availability of communications for crew, with a positive finding that 68% of seafarers can now use some form of communication service most or all of the time when at sea, while almost all crew can make voice calls using a vessel's satcom system, at least occasionally.

The survey highlights the growing requirement for data communication among seafarers. The popularity of using one's own device shows that owners investing in vessel-wide broadband connectivity and corresponding Wi-Fi connections to provide either free or low-cost Internet access will experience return in terms of crew recruitment and retention. This is especially important considering that the survey whitepaper states that the lack of qualified officers continues to grow, from a deficit of 10,000 to 13,000 in the period 2005 to 2010. Therefore, shipping companies able to offer strong crew welfare packages are better positioned to recruit from the limited pool of talent and increase staff loyalty.

The emergence of onboard hybrid networks with VSAT and MSS empowers owners to provide the levels of reliable, cost-effective connectivity required to support changing communication usage patterns. Astrium Services offers the most advanced prepaid and crew communications solutions portfolio on the market—enabling crew and passengers onboard to stay in seamless contact with friends and family. The Universal Card allows crew to make telephone calls, access the Internet, and exchange messages at predefined costs—all using a single prepaid card.

Web compression and filtering solutions help to control communication cost and make crew communications affordable. Moreover, the Crew PC, configured for safe, efficient and unsupervised private usage, can serve as a personal communications center. Another way of organizing crew voice and data usage is offered by XChange, Astrium Services' integrated solutions platform. Over XChange, crew can use their personal laptop or tablet in the privacy of their living quarters and can make voice calls via their own smartphones.

For more information, visit www.astrium.eads.net.

Kordia, MNZ sign deal to keep New Zealand's waters safe

Kordia and Maritime New Zealand (MNZ) have signed a new, 11-year contract that will see Kordia retained to supply maritime distress and safety communications services via Kordia's Maritime Operations Centre (MOC) in Wellington.

The new contract will take effect on 1 July 2014. The contract was subject to a competitive international tender process and will see Kordia commence its third consecutive multi-year contract with MNZ.

Between the Australian and New Zealand businesses, Kordia monitors almost a quarter of the world's oceans. New Zealand's communications area of responsibility is one of the largest in the world. It stretches from the South Pole to the Equator, half way across the Tasman Sea and half way towards South America. That equates to some 50 million sq. km of ocean.

Under the new contract, the MOC will be modernized to incorporate the latest digital technology and Kordia will assume responsibility for maintenance of the network and infrastructure previously managed by MNZ.

For MNZ, the focus will be on the safety outcomes delivered by the contract rather than the day-to-day technical operation of the network.

The contract will deliver:

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Kordia's plan for the new MOC includes leading-edge technology allowing MOC FROM ANYWHERE potential, a world first in Maritime Coast Station capability. This new concept means the MOC has the potential to relocate rapidly and continue operation throughout a national emergency or loss of normal operations.

For more information, visit www.kordia.co.nz or www.maritimenz.govt.nz.

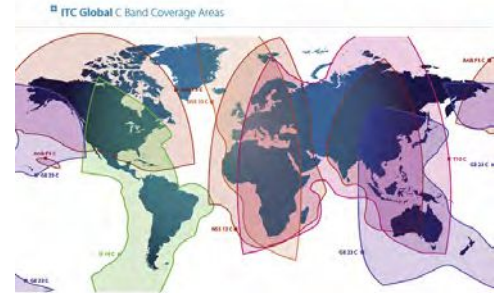
ITC Global to acquire NewSat Communications

ITC Global, Inc. has entered into a definitive agreement to acquire NewSat Communications SA, a privately held Swiss-based leading provider of satellite communications solutions to the Europe, Middle East, and Africa (EMEA) energy markets. Both companies focus on providing enterprise-

grade, fully integrated turnkey satellite communications solutions to maritime, energy, and mining customers around the world.

The combined companies will provide the most seamless coverage, service, and local support available for mining, energy, and energy-related customers in the Americas, Africa, Europe, Australia and the Middle East and will be the largest provider in the mining market and the second largest VSAT company in the energy market. Alexandre De Luca and Roland Loos, current shareholders and managing members of NewSat, will continue to manage NewSat's operations and will become senior executives of ITC Global. The transaction is expected to close following customary closing conditions.

ITC Global's announcement of its agreement to acquire NewSat follows the recent completion of its acquisition of Spidersat Communications Limited, an African-based provider of satellite communications services to mining customers in Africa. ITC Global is highly committed to the worldwide mining and energy markets as well as strategic geographies such as Europe and Africa and



continues to strengthen its position as the leading satellite communications provider with unparalleled local presence to serve the mining, energy, and maritime markets across the globe.

For more information, visit www.itcglobal.com.

Thuraya expands data products with the launch of Thuraya IP+

Thuraya Telecommunications Company announced the launch of Thuraya IP+, the latest addition to its expanding portfolio of mobile satellite broadband terminals with applications in the maritime, energy, broadcast media, military, and humanitarian NGO markets.

Thuraya IP+ is the fastest and lightest mobile satellite broadband terminal. Without compromising on portability, it

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is also designed to achieve the fastest IP speeds, ensuring quick and reliable access to broadband data services over Thuraya's extensive satellite network. Enhanced capabilities facilitate a wide range of applications, including live high-quality video broadcasting, web browsing, e-mail, social media communications, data transfer, and VoIP applications as well as access to corporate networks from remote locations.

Weighing just 1.4 kg and smaller than a regular laptop, Thuraya IP+ can be rapidly deployed to support high-bandwidth applications at speeds of up to 444 kbps on standard IP and 384 kbps on streaming IP with a built-in antenna. The satellite broadband terminal can be configured to provide asymmetric streaming capabilities, enabling users to control their upload and download speeds based on usage requirements to optimize bandwidth cost.

A highly portable and rugged device, Thuraya IP+ is ideal for various mission-critical operations such as broadcast media, defense, telemedicine, and disaster response. Thuraya's congestion-free satellite network helps to further ensure uninterrupted mobile broadband access. From supporting offshore operations to establishing critical field communication links, Thuraya IP+ provides the portable connectivity required by Thuraya's customers who live and work beyond the reach of traditional terrestrial networks.

For more information, visit www.thuraya.com.

DeLorme wins MSUA awards

The Mobile Satellite Users Association (MSUA) announced the winners of its 2013 Awards, with the Innovation Award made to DeLorme for its inReach™ Two-Way Satellite Communication solution, providing affordable two-way satellite messaging anywhere in the world. The 2013 MSUA Pioneer Award was made to Andrew Fuller, the deputy director of the International Mobile Satellite Organization (IMSO) for his work in developing satellite-based maritime distress and safety services. Commenting on the awards, MSUA president Tim Farrar, noted, "2013 is the sixth year in which MSUA has presented its annual Innovation Award, and this year we are delighted to recognize the DeLorme's inReach™ product, which has been a game-changing product in bringing satellite safety services to consumers, by providing two-way satellite-based messaging from smartphones and GPS devices anywhere in the world. This

year's Pioneer Award goes to Andy Fuller, who has also been instrumental in bringing satellite-based safety services to the maritime community, working for over 30 years on the development of distress and safety services at the UK Hydrographic Office, the International Maritime Organization, Inmarsat, and, most recently, the International Mobile Satellite Organization." With the introduction of inReach™ to the market, DeLorme has

created a new category in mobile satellite communications. inReach™ overcomes the inherent limitations of simplex satellite data services by providing reliable safety and communication service via two-way text messaging, SOS alerting, and GPS tracking anywhere in the world, leveraging Iridium's global coverage and robust low-latency short-burst data service.

For more information, visit www.delorme.com or www.msua.org.

The advertisement features a background image of ocean waves crashing onto a sandy beach. At the top, there is a circular logo containing a stylized blue shark with its mouth open, showing teeth. Below the logo, the text "seanic ocean systems" is written in a blue, lowercase, sans-serif font. The main headline, "Setting the Standard in Subsea Solutions", is written in a large, bold, red, sans-serif font with a slight shadow effect. Below the headline, the words "S.O.S." are written in the sand on the beach. At the bottom of the ad, the phrase "Simple, Rugged and Reliable" is written in a bold, red, sans-serif font. In the bottom left corner, there is a logo for "Ashtead TECHNOLOGY OFFSHORE DIVISION" with the website "www.ashtead-technology.com". In the bottom right corner, there is a smaller version of the shark logo and the text "seanic www.seanicusa.com".

TE SubCom completes TPE upgrade

TE SubCom, a TE Connectivity Ltd. company, has completed another long-haul network upgrade, this time to the Trans-Pacific Express (TPE) submarine cable system. The upgrade to the 18,000-km system brings an increase of over 1 Tb/s of capacity to meet the dramatic increase in demand in the transpacific market. Upon entering into service in 2008, the cable system was the first multi-terabit cable system to directly connect four countries/regions between NorthEast Asia and North America to play a significant role in driving new development for intercontinental telecommunications. TPE links the U.S. (Nedonna Beach, Oregon) and Asia with five landing stations (Chongming, Qingdao, Keoje, Tanshui, and Shin Maruyama) and is owned by AT&T Corp., Chungwa Telecom, China Telecom, China Unicom, KT, NTT Com, and Verizon Business.

OMM to protect Mexican telecommunications infrastructure

Offshore Marine Management (OMM) has completed a contract for Telmex to supervise and assist with repairs to the shore-end section of an existing fiber optic connection between the Mexican mainland and the island of Cozumel. Following OMM's review and recommendations, OMM was tasked with remedial work on an existing optical fiber network by installing protective pipe onto the submarine cable section in order to provide protection and prolong its operational lifespan. Environmentally friendly protection using specialized material is currently under consideration. The project comes as Telmex continues to expand and secure its telecommunications infrastructure throughout its network. Protecting such assets is crucial as the company looks to ensure reliable telecommunication services for personal and business users across the region. OMM noted that it is witnessing an increased demand for cable protection works as cable owners seek to protect their valuable investments and maintain not only the integrity of their assets, but also their operational lifespan.

Hibernia to supply 100-G capacity for NTT's expansion

Hibernia Networks announced during the Pacific Telecommunications Council (PTC) trade show in Hawaii that it will supply 100-Gbps of network capacity to NTT Communications in support of the Japan-based carrier's European expansion and its Global IP Network (GIN). NTT's agreement with Hibernia builds on the incumbent's own organic and acquisition efforts to expand its network presence across Europe and other regions, including the United States and Latin America, throughout 2011 and 2012. Europe, in particular, has been a growth target for NTT. In addition to opening an office in Stockholm to target customer opportunities in Scandinavia, NTT built out

PoPs in four major European hubs, including Amsterdam, Budapest, Bucharest, and Sofia. NTT is also a major provider of lit capacity to transport data between Japan and the United States. By establishing this new relationship with Hibernia, NTT will be able to connect its key PoPs in Europe with the West Coast market in the United States, allowing it to carry traffic over its core PC-1 transpacific cable. For Hibernia, which just recently renamed itself Hibernia Networks, the deal with NTT is significant because it illustrates that, while its subsea cable network is important, the provider has been no less aggressive on the terrestrial side. To date, it has established 120 PoPs across North America, Europe, and Asia and runs the Global Financial Network (GFN).



Alcatel-Lucent to design communications solution with Statoil



Alcatel-Lucent has signed an agreement with Statoil to co-design and deliver a solution incorporating high-bandwidth communications and electrical power supply into subsea control systems for offshore oil and gas production facilities. The solution will address tiebacks—connections from offshore/onshore production facilities to subsea equipment—for oil and gas recovery.

The solution developed by Alcatel-Lucent with Statoil will provide seabed connection points for the superior delivery of communication services and power supplies, thus eliminating the inherent interface bottlenecks in current subsea control architectures. Using advanced technology from Alcatel-Lucent's submarine telecommunication systems, the new solution will target near-unlimited distances at any sea depth, with superior reliability and resiliency. The subsea connection points will be compatible with existing offshore fields as well as future fields and technologies.

The solution is composed of an independent submarine electrical and optical fiber cable connecting the production facility with subsea nodes positioned anywhere along the submarine cable outlet. Each subsea node is able to deliver up to 10 kW through low-voltage DC or AC interfaces and optical fiber connection points with the production facility. The subsea cable outlet is powered from production facility with a high-voltage DC toward the subsea nodes. The design allows in-service extensions and repairs.

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

Globe notes progress on SJC

Globe Telecom was interconnected to the Southeast Asia-Japan Cable System (SJC), an international submarine fiber optic cable system being built by a global consortium of telecommunications and technology companies with its landing in Nasugbu, Philippines, on 10 February 2013.

Measuring 8,900 km, which could extend up to 10,700 km, SJC will support an initial design capacity of over 15 Tbps, equivalent to 1.8 to 2.3 million simultaneous HD videos streaming. Linking the Philippines with Brunei, China Mainland, Hong Kong,



Japan, and Singapore, with options to extend to Thailand, SJC allows open access in key destinations and flexible capacity on usage for carriers as well as cost-effective and resilient connectivity to other submarine cable systems. It is targeted to be operational during the second half of 2013.

The investment of Globe in the SJC will bring increased cable diversity to its network for continuous, superior Internet connectivity as well as voice services and bring more advanced solutions to customers, from bandwidth-intensive applications such as Internet TV and games to enterprise data exchange.

The SJC will help Globe address the increasing demand for bandwidth to serve both individual users and enterprise customers by providing much needed capacity and faster, more reliable connectivity to sustain the unprecedented growth in data, web applications, and Internet traffic within the Philippines. Being a co-owner of the cable, it will bring financial benefits and long-term security of bandwidth supply and reliable connectivity to Globe.

This global consortium of companies is composed of Brunei International Gateway Sendirian Berhad (BIG), China Mobile

International Ltd. (CMI), China Telecommunications Corporation (China Telecom), China Telecom Global Limited (CTG, an affiliate of China Telecommunications Corporation, and formerly known as China Telecom Hong Kong International Ltd.), Donghwa Telecom Co., Ltd., Globe Telecom, Inc., Google SJC Bermuda Ltd. (a subsidiary of Google Inc.), KDDI Corporation, Singapore Telecommunications Limited (SingTel), PT Telekomunikasi Indonesia International (Telin), and TOT Public Co., Ltd. (TOT).

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

NEC, Fujitsu complete Asia Submarine-cable Express

NEC Corporation and Fujitsu Limited have completed construction of all initially planned segments of the Asia Submarine-cable Express (ASE) system, a high-bandwidth optical submarine cable system that extends across approximately 7,800 km to link Japan with the Philippines, Hong Kong, Malaysia, and Singapore. NTT Communications, Philippine Long Distance Telephone Company, Telekom Malaysia Berhad, and StarHub Limited

placed an order for the new system in January 2011.

The connection of Hong Kong to the system, in addition to Japan, the Philippines, Singapore, and Malaysia for which construction was completed last August and service has already begun, means that ASE now connects major cities in East and Southeast Asia as a high-capacity (40 Gbps per wave, maximum capacity 15 Tbps) submarine cable system employed in services offered by NTT Communications and other participating carriers.

For the new system, NEC provided the submarine cables, submersible repeaters, and submersible OADM branching units as well as subsea monitoring equipment and power feeding equipment. Fujitsu provided the Submarine Line Terminal Equipment and the Networking Management System.

Employing the latest 40-Gbps digital coherent optical transmissions technology, ASE will ensure communications capacity that can sufficiently accommodate surging Internet data traffic in Asian countries as well as growing data traffic resulting from



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the rapid spread of smart devices. In addition, plans are in place to utilize the system to provide high-quality and low-latency dedicated line service that can also be leveraged for the carriers' cloud services.

For more information, visit www.nec.com or www.fujitsu.com.

NEC wins contract for TPKM3

NEC Corporation announced the signing of a multi-million dollar supply contract through its Taiwan subsidiary NEC (Taiwan) Co., Ltd., with Chunghwa Telecom to construct the Taiwan Penghu Kinmen Matsu No.3 (TPKM3) Submarine Cable system, a high-bandwidth non-repeater submarine fiber optic cable that will link Taoyan (North Taiwan) with Matsu and Tainan (South Taiwan) with Kinmen through Penghu.

Under the TPKM3 supply contract, NEC (Taiwan) will supply state-of-the-art optical submarine cables for non-repeater systems and will conduct the ocean-lay work. Total length is expected to be 510 km and will help meet the domestic demand for voice and internet connectivity.

For more information, visit www.nec.com.

Tata launches 100-G connectivity using Ciena's GeoMesh

Tata Communications announced the launch of 100 Gbps-enabled services on its TGN-Atlantic (TGN-A) submarine fiber optic cable system from New York to London.

Using Ciena's GeoMesh networking solution (based on its market-leading 6500 Packet-Optical Platform powered by WaveLogic 3 coherent optical processors and optical bypass), Tata Communications is upgrading its TGN-A submarine cable to 100 G—the first on its global submarine network.

The upgrade will deliver bandwidth and provide flexibility to carriers and enterprises to scale their network seamlessly and meet their increasing capacity demands driven by the use of cloud computing and mobile devices as well as other high-bandwidth services, including music/HD video downloading, and social networking applications. It will be instrumental in increasing carrier network performance through consolidation of transport traffic.

The implementation will pave the way for further upgrades leading to multifold increase in bandwidth availability across

Tata Communications' Global Network (TGN), which consists of 210,000 km of terrestrial and subsea network fiber, reaching countries representing 99.7% of the world's GDP. The TGN IP Transit Network (AS6453) makes up 20% of the world's Internet routes and carries 4,200 Petabits of traffic per month on its Internet backbone. Ciena's WaveLogic coherent receiver technology enables unobtrusive 40-G/100-G upgrades to existing submarine networks with only the addition of new terminal equipment, significantly extending the life of existing cable plants and further lengthening their lifespans into the future.

The first phase of the deployment will bring 100-G capability to the New York-London route, expected to be in full service during the first half of 2013.

For more information, visit www.tatacommunications.com or www.ciena.com.

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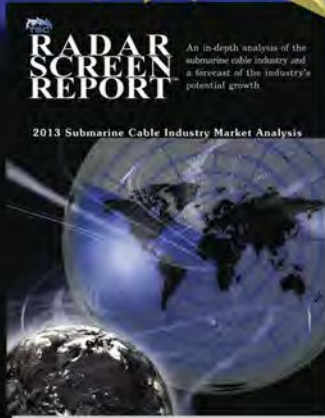
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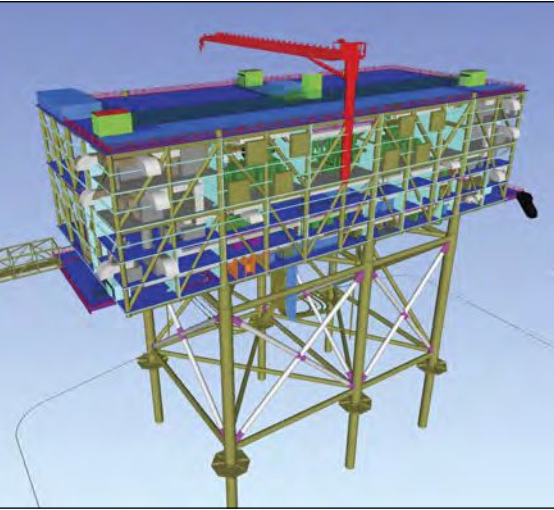
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TenneT, Mitsubishi jointly invest in offshore grid connections in Germany

TenneT and Mitsubishi Corporation officially closed their partnership with respect to two German offshore high-voltage cable projects, BorWin1 and BorWin2. Mitsubishi's voting interest will be 49%, with aggregate maximum equity commitment of EUR 240 million. At the same time, both partners



signed a contract for an investment in two more offshore projects named HelWin2 and DolWin2 in which Mitsubishi also will acquire a 49% voting interest for a maximum equity investment of EUR 336 million.

The planned high-voltage cables, involving a total investment of EUR 2.9 billion, will connect a number of offshore wind farms in the German North Sea to the onshore electricity grid and will have a combined total capacity of 2.8 GW, representing close to 30% of the total ambition of the German Government for offshore wind in the North Sea.

Currently, TenneT is operating two and working on eight further projects to connect wind farms in the German North Sea. These essential infrastructure projects total to a transport capacity of 5.3 Gigawatts of renewable electricity, equivalent to the consumption of 5 million households. With these projects TenneT has already committed an unprecedented amount of almost EUR 6 billion in offshore infrastructure and is with this the largest investor in the German market.

For more information, visit www.tennet.org.



Nexans delivers medium-voltage cables for wind farm

Westermost Rough Ltd, based in London, and Nexans recently signed an agreement for the delivery and assembly of medium-voltage submarine cables for the Westermost Rough wind farm, which is to be built 8 km off the Holderness coast in Yorkshire.

The order encompasses around 53 km of submarine cables. These will be used for connecting the individual wind turbines to each other and to the transformer platform. In addition, a further 2 km of cable will be delivered for the internal platform cabling. Delivery is scheduled to begin in spring 2013.

The offshore wind farm will be constructed and subsequently operated by Westermost Rough Ltd, a subsidiary of the Danish energy company DONG Energy. Upon completion, 35 wind turbines, each with an output of 6 MW, will be located northeast of the Humber estuary in the North Sea. Following commis-

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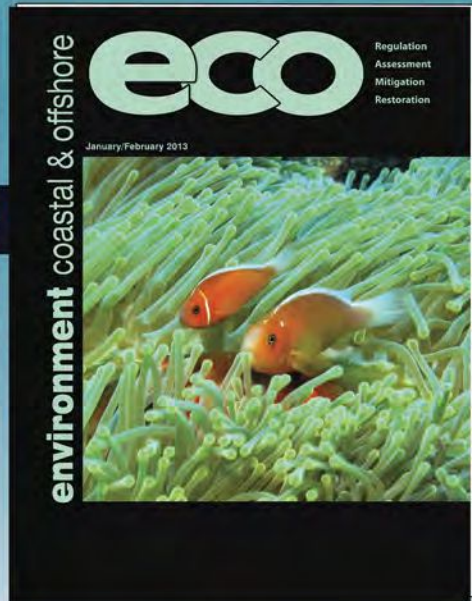
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Power Cables

sioning, which is scheduled for 2014, Westermost Rough will generate 210 MW of clean energy over an area of 35 sq. km, enough to supply around 160,000 households in Britain with power.

The new agreement is the third call-up from the framework agreement for the delivery of up to 900 km of medium-voltage submarine cables. This agreement was concluded between DONG Energy and Nexans' in August 2011. According to the agreement, the Danish contracting party can take delivery of up to 150 km of Nexans high-performance cables every year for further offshore wind farms. Previous call-ups were for the West of Duddon Sands wind farm and the Borkum Riffgrund 1 wind farm.

For more information, visit www.nexans.com.

Reef Subsea opens new offices

Reef Subsea, which provides specialist subsea services to the oil & gas and renewables industry, has just moved its

three main activity bases in Aberdeen—Reef Subsea IRM and Construction, Reef Subsea Power & Umbilical, and Reef Subsea Dredging & Excavation—into the brand new premises. This will allow them to service their clients' and projects' requirements more efficiently in their individual businesses and to work closer together on joint project delivery when needed.

Reef Subsea House is a two-story facility with more than 6,000 sq. ft of office space and an additional 9,000 sq. ft of warehouse, workshop, and yard space. The warehouse facilities will provide Reef Subsea Dredging & Excavation (RSDE) with new storage facilities for their subsea equipment and enable them full service and maintenance of the offshore assets between projects. RSDE equipment will continue to be housed at Rotech House yard until March 2013 when this part of the premises will be ready to accommodate them.

The three activities operate on an international basis with contracts gained independently and in combination for the oil and gas and renewables industries in the North Sea, Gulf of Mexico, and Asia.

The group boasts turnkey subsea activities, including IRM & subsea construction, ROV, and survey work, and seabed dredging and controlled flow excavation, backed by top range subsea construction vessels and a high-tech unique range of assets increasing its capability as a fully integrated tier-2 subsea contractor. Clients mainly include oil companies, top tier contractors, power companies, and engineering houses.

Reef Subsea is an international group providing cost-effective integrated subsea services—IRM and construction, installation, burial, dredging, and excavation—to the oil and gas and renewables industries. Its specialized subsidiaries provide operators and contractors with highly experienced personnel, key subsea technologies, and construction support vessels. Reef Subsea serves its clients in the deep-water or demanding environments of the North Sea, Americas, Middle East and Southeast Asia areas. Reef Subsea is a 50/50 owned company of GC Rieber Shipping and HitecVision.

For more information, visit www.reefsubsea.com.

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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.	SE	39	G27779	MAERSK DEVELOPER	Phobos	8,553
Anadarko Petroleum Corp.	DC	535	G23520	ENSCO 8506	Raptor	8,161
Petrobras America Inc.	WR	206	G16965	ENSCO DS-5	Cascade	8,147
Shell Offshore Inc.	AC	857	G17570	NOBLE DANNY ADKINS	Great White	8,044
Anadarko Petroleum Corp.	AT	37	G21826	CAL DIVE Q-4000	Merganser	7,919
Eni US Operating Co. Inc.	DC	618	G23526	T.O. DEEPWATER PATHFINDER	San Jacinto	7,823
Shell Offshore Inc.	AC	857	G17561	H&P 205	Great White	7,816
Shell Offshore Inc.	DC	529	G23517	NOBLE JIM DAY	Rydberg	7,639
Shell Offshore Inc.	MC	393	G26254	T.O. DEEPWATER NAUTILUS	White Ash	7,375
Union Oil Co. of California	WR	677	G18753	T.O. DEEPWATER INSPIRATION	Saint Malo	7,038
Chevron USA Inc.	WR	758	G17015	T.O. DISCOVERER CLEAR LEADER	Jack	6,965
Anadarko Petroleum Corp.	KC	875	G21444	ENSCO 8500	Lucius	6,840
BP Exploration & Production Inc.	GC	743	G15607	T.O. DEVELOPMENT DRILLER II	Atlantis	6,834
Chevron USA Inc.	KC	736	G22367	T.O. DISCOVERER INDIA	Moccasin	6,537
Chevron USA Inc.	KC	829	G25814	PACIFIC SANTA ANA	Buckskin	6,435
BP Exploration & Production, Inc.	MC	429	G07944	ENSCO DS-3	Ariel	6,106
Noble Energy, Inc.	MC	948	G24133	ENSCO 8501	Gunflint	6,083
BP Exploration & Production, Inc.	MC	778	G14658	THUNDER HORSE PDQ	Thunder Horse South	6,040
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
LLOG Exploration Offshore LLC	MC	258	G24066	ENSCO 8502	Malachite	5,843
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	Ardenness	5,510
Anadarko Petroleum Corp.	GC	680	G22987	NABORS MODS RIG 150	Ticonderoga	4,970
BP Exploration & Production Inc.	KC	93	G25780	SEADRILL WEST CAPRICORN		4,853
ExxonMobil Corp.	AC	24	G23257	T.O. DEEPWATER CHAMPION	Madison	4,850
ConocoPhillips Co.	GB	783	G11573	NABORS MODS 201	Magnolia	4,674
Hess Corp.	MC	726	G24101	STENA FORTH	Tubular Bells	4,610
Anadarko Petroleum Corp.	GC	683	G16783	T.O. DISCOVERER SPIRIT	Caesar	4,485
BHP Billiton Petroleum (GOM) Inc.	GC	653	G20084	T.O. DEVELOPMENT DRILLER I	Shenzi development	4,356
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 DEEP SEAS	Tahiti 2	4,292
Shell Offshore Inc.	MC	809	G05868	H&P 204	Princess	3,800
Shell Offshore Inc.	GB	602	G11553	NOBLE DRILLER	Macaroni	3,694
Anadarko Petroleum Corp.	EB	602	G20725	WIRELINE UNIT (L.J.#3)	Nansen	3,678
Anadarko Petroleum Corp.	EB	602	G20725	NABORS POOL 140	Nansen	3,669
Shell Offshore Inc.	MC	809	G12166	NOBLE JIM THOMPSON	Princess	3,638
Eni US Operating Co. Inc.	GC	385	G25142	DIAMOND OCEAN VICTORY	Pegasus	3,585
Murphy E&P Co.	GC	338	G21791	NABORS MODS 200	Front Runner	3,330
Shell Offshore, Inc.	YK	956	G08475	NABORS 202	Ram-Powell	3,214
Shell Offshore, Inc.	MC	762	G07957	NOBLE BULLY I	Deimos	3,147
Shell Offshore, Inc.	MC	807	G07958	H&P 201	Mars (Ursa/Princess)	2,945
Apache Deepwater LLC	GC	230	G33241	ENSCO 8505	Staurolite	2,723
LLOG Exploration Offshore, LLC	MC	503	G32334	NOBLE AMOS RUNNER	WhoDat	2,646
Hess Corp.	GB	386	G10350	ATWOOD CONDOR	Llano	2,627
Chevron USA Inc.	GC	205	G05911	NABORS 85 (MAYRONNE 162)	Genesis	2,590
Anadarko Petroleum Corp.	VK	826	G06888	NABORS P-10	Neptune	1,933
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
Chevron USA Inc.	GB	189	G06358	WIRELINE UNIT (L.C.#2)	Tick	718

Deepwater prospects with drilling and workover activity: 52

Current Deepwater Activity as of Monday, 8 April 2013

Activity by Water Depth			
Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,683	34,913	2,709
201 to 400	115	1,116	20
401 to 800	286	857	10
801 to 1,000	387	573	9
1,000 & above	3,408	1,824	26

Rig Activity Report 19 April 2013					
Location	Week of 4/19	+/-	Week Ago	+/-	Year Ago
Land	1684	-13	1697	-220	1904
Inland Waters	25	0	25	2	23
Offshore	49	0	49	4	45
U.S. Total	1758	-13	1771	-214	1972
Gulf of Mexico	47	0	47	2	45
Canada	126	-30	156	-20	146
N. America	1884	-43	1927	-234	2118

Activity by Water Depth Information current as of Monday, 15 April 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

Teledyne RESON introduces the new SeaBat T-Series plus advanced features for the SeaBat 7125

Teledyne RESON announces the launch of the SeaBat T20-P, the first product from the eagerly awaited SeaBat T-Series in parallel with ground-breaking new features for the SeaBat 7125 multibeam echosounder.

The SeaBat T20-P is the first product to arrive from the new SeaBat T-Series—the latest addition to Teledyne RESON’s class-leading portfolio of marine survey solutions. Designed for ease-of-use and portability, the SeaBat T20-P is based on a new wideband sonar receiver that is approximately half the size of the SeaBat 7125 array. It also uses the new Teledyne RESON Portable Sonar Processor to optimize interfacing of survey sensors with accurate single point time tagging and uses a flexible 24V DC and 110/230V power interface.

Robust and water resistant to withstand the most demanding marine environments, the SeaBat T20-P is a highly reliable solution that enables users to drive efficiency onboard.

Teledyne RESON continues to drive innovation and support customers with a new Feature Pack 4 upgrade for the SeaBat 7125. Designed to enhance usability where customers need it most—better productivity,

cleaner data, and more flexibility—its unique new functionality includes automated pipeline detection and tracking; multi-detect; configurable beamformer; new multi-view user interface; and a special new feature of Tracker that allows the user to set a constant swath width that is maintained by the system as the depth varies to help plan constant line spacing.

For more information, visit www.teledyne-reson.com.



OceanTools points the way with high-precision pan & tilt units

Leading subsea engineering company OceanTools has released a range of electric pan and tilt units suitable for a wide variety of underwater applications and budgets.

The rugged PT330 units have been designed for harsh environments and are suitable for long-term deployments. With three versions available (Mini, Heavy Duty, and Echoscope Kit [ESK] for CodaOctopus Echoscope sonar applications), all variants are 3000MSW depth-rated and pressure compensated. The PT330’s range is available in both hard-anodized aluminum and stainless steel.

Exceptionally well-engineered, the PT330 range are manufactured using extremely high-quality components, including low back-lash harmonic drives, brushless DC motors, and heavy duty bearings on the output shafts. The PT330s have a load capacity range of 10 to 25 kg, allowing the mounting of the heaviest of camera and light configurations and sonars. Camera and sonar applications are aided by the unit’s ability to operate in the horizontal and vertical axis, simultaneously enabling smooth footage capture and reduced sonar smear.

Controlled via PC or laptop, OceanTools SmartNET P&T, cameras, and LED lighting controller software presents a highly innovative and simple-to-use graphical user interface that gives the operator an exceptionally controlled and intuitive experience. With on-screen, high-accuracy positional feedback, the operator can command and display parameters such as go-to-a-position, limit end-stops, return to home, control pan and tilt angular rate, and multiple user labeled saved positions. Operations are enhanced by a range of selectable view screens, including directional button, press and go, and cat and mouse control of the unit—innovative is the word!

The PT330s are controlled by telemetry or optional direct voltage. Multiple PT330s can be connected to a single twisted pair and single 24VDC power supply and controlled via the SmartNET protocol. Illuminate the target or floodlight the whole work space by daisy chaining up to 16 OceanTools high-intensity OceanLED lights together. Through SmartNET, isolate or group them together while adjusting the dimmable LED lights to suit the operation.

The PT330s are complemented by the SP330 range of high-performance subsea positioning devices. The single axis movement units offer either rotate or tilt positioning and are engineered to the same core technical specifications as the PT330 series.

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



SeaRobotics Delivers 5.7-m USV to NATO

SeaRobotics Corporation has delivered an Unmanned Surface Vehicle (USV) in their 5.7-m hull series to the NATO's Center for Marine Research and Experimentation (CMRE). This general purpose USV will be utilized to improve payload capacity and efficiency of the impressive, fully autonomous mine neutralization system developed at CMRE. With over 350 kg of payload, the ability to be configured as an all-electric or as a diesel-electric hybrid system, and the ability to reach speeds in excess of 5 m/sec, the 5.7-m system will excel in numerous applications. Enhancing its role in mine neutralization operations or many other tasks, the system can ship worldwide in a standard 20-ft container. The engineered boat trailer doubles as a shipping cart and allows transport of the exceptionally stable USV at a reduced beam on the road or in a container.

"We are pleased to support NATO's mine countermeasures project at CMRE. This complex, fully autonomous system integrating a USV, AUV, and acoustic imaging with advanced autonomous behaviors is truly extending the state of the art and we are happy to be involved," stated Don Darling, President of SeaRobotics.

The SeaRobotics product line of USVs includes both 5.7-m and 11-m vessels, both of which can be used in arctic operations.



SeaRobotics specializes in smart vessels that are remotely or autonomously operated as well as autonomous ship hull grooming systems. Its clients include major military and commercial organizations, both U.S. and foreign. SeaRobotics' marine survey software interfaces with most data acquisition hardware, software, and sensing systems to produce multi-spectral, DGPS-stamped data for survey, research, or surveillance efforts. Applications for SeaRobotics vessels range from bathymetric and hydrographic surveys to coastal, harbor, and riverine surveillance. SeaRobotics surface vehicles range from small, modular, man-portable systems to large, long-endurance workhorse vehicles survey and surveillance systems.

For more information, visit www.searobotics.com.

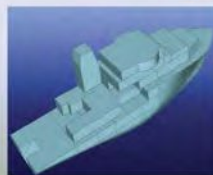
Bluefin subsea lithium battery receives Navy safety approval

Bluefin Robotics, a leading provider of AUV and related subsea technologies, announced that the U.S. Navy has granted a safety approval for its standard 1.5-kWh Subsea Battery for use with the HAUV system, including transport aboard Naval aircraft. The approval validates Bluefin's mature and proven design for subsea power solutions and is received as

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- Dynamic Positioning System Controls
- Various Tension Measurement Systems
- Cable Coiling Arms

The applicant shall have experience in both electrical and hydraulic machinery maintenance and repair, and experience working with high voltage and low voltage control interfaces.

The applicant should show a high level of proficiency in working with hydraulic and electrical schematics and block diagrams with a working level proficiency in AutoCAD applications, and have the ability to assist in system design. Ideally, the candidate for this position should have an engineering background with marine experience.

Work is divided between the field and the office. Successful candidate must be a team player, able to work with people in a wide variety of circumstances.

For a confidential evaluation, please email resume along with salary requirements to: marc.dodeman@caldwellmarine.com

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Caldwell Marine International, a leader in the submarine cable installation industry is currently seeking a field engineer / project coordinator.

Primary duties include set up and operation of surface and subsurface navigation equipment, specialized plow monitoring systems, computer systems, and management of our Dynamic Positioning system. Additional duties include report and as-built drawing preparation, proposal writing, and hydrographic surveys. Special consideration for submarine cable laying experience, software development, electronic systems development, hydrographic surveying, cable route engineering, and project management. Candidates should have a minimum of an Associate's Degree in Engineering along with 3+ years of marine related experience.

Work is divided between the field and the office. Successful candidates must be a team player, able to work with people in a wide variety of circumstances.

For a confidential evaluation, please email or mail resume along with salary requirements to:

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marc.dodeman@caldwellmarine.com

Product News

the company significantly increases production rates for this and similar battery systems.

In October 2012, the Naval Surface Warfare Center, Carderock Division (NSWCCD) performed an updated series of lithium battery safety tests, including those addressing both performance and safety. Safety tests were conducted primarily in accordance with NAVSEA TM S9310-AQ-SAF-010, but also with some input from NAVSEA TM SG270-BV-SAF-010. Results concluded that the battery delivered a consistent amount of energy without significant capacity fade, and safety devices were highly effective with respect to voltage, current, and temperature.

When the battery was cycled under high current conditions, it experienced high temperatures, which activated the safeties and prevented the battery from further charging, preventing high temperature conditions. Safety testing of the battery produced predictable and expected results for a Li-ion battery utilizing a LiCoO₂ cathode in a pouch cell format. In addition, the battery management system was highly effective in preventing unsafe operating conditions. Testing was performed by NSWCCD's Materials and Power Systems Branch, Code 616.



Bluefin Robotics has been designing, manufacturing, and fielding subsea batteries and custom power solutions for over 10 years and has produced over 1,000,000 watt-hours of energy. Bluefin batteries have powered AUVs, ROVs, manned vehicles, and other subsea platforms and structures.

For more information, visit www.bluefinrobotics.com.

Ocean Signal announces certification approvals for world's smallest personal locator beacon

Ocean Signal's rescueME PLB1 is fully certified for use throughout Europe and the U.S. after it was awarded the relevant Cospas-Sarsat and product approvals.

The world's smallest personal locator beacon has been awarded its type approval certificate by the Cospas-Sarsat Secretariat showing full compatibility with the 406-MHz Satellite System. The PLB1 also meets the full regulatory requirements for Europe and is backed up by verification from the certification body, TÜV SÜD BABT. Additionally, approval has been granted for use in the U.S. by the Federal Communications Commission (FCC).



Marine communication and safety specialist Ocean Signal has begun the first deliveries of the innovative PLB1 following the receipt of the approvals for usage, which confirm all the relevant requirements have been satisfied for a life-saving product.

Developed and manufactured in the UK, the rescueME PLB1 is typically 30% smaller than other PLBs (compared to other products approved to recognized maritime standards as of October 2012), with dimensions of 77 mm (height), 51 mm (width), and 32.5 mm (depth), and weighing 116 g.

All that is required to activate the PLB is for the antenna to be extended,

the protective cover flipped up, and the button pressed. The retractable antenna and flip-up cover have been specifically designed to prevent inadvertent use.

When activated, the rescueME PLB1 will transmit accurate position data from its 66-channel GPS, using the designated 406-MHz search-and-rescue satellite communication system as well as transmitting a 121.5-MHz homing beacon that will be received by search-and-rescue helicopters or vessels for a minimum of 24 hrs while the integrated strobe light ensures maximum visibility.

As with all Ocean Signal products, battery life has been a primary consideration in the development of the rescueME PLB1 with the product's 7-year battery life reflected in the 7-year warranty.

For more information, visit www.oceansignal.com.

Seatronics secures £400,000 contract to supply RTS Gen 5 MUX systems

Seatronics, an Acteon company, and its Norwegian partner, RTS, have secured a contract to supply six Gen 5 multiplexer systems to Bibby Remote Intervention Ltd. (BRIL).

The Gen 5 is the most versatile survey multiplexer system available on the market offering unprecedented communication links and 850 W of power capacity subsea. The system enables a complete survey spread, including, but not limited to, dual head multibeam echosounder, side-scan sonar and subbottom profiler, inertial navigation system, 2D real-time sonar, and up to three HD cameras—all to be run over one single mode fiber simply with the addition of a 110 Vac power supply from the ROV. Additional features such as PPS timing subsea and diagnostics on each channel with a 3,000-m rated titanium bottle as standard made this the ideal choice for BRIL's requirements.

The first two systems are already in operation onboard the Toisa Warrior where they are being employed to provide a 2.5-Gbps link per HD channel for a high-definition camera inspection of a caisson for BRIL's client Nexen UK.

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





OCTANS 3000M IXSEA GYRO FOR RENT



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Wireless subsea video camera

Viewtooth® is a subsea video camera for use in underwater environments. This camera offers a unique feature because it transmits video wirelessly and gives support to ROV operations anywhere a second frame of reference is required.

The camera is based on Seatooth®, a subsea wireless platform, to transmit and receive data at high bandwidth through water. Seatooth® is based on radio frequency (RF) technology and can communicate data and video reliably in the challenging offshore environments where there may be ambient noise or biofouling present and also in shallow, congested, or turbid waters – all known issues in the performance of traditional underwater communications.

The latest version of Viewtooth offers extended communication range and full ocean-depth deployment capability down to 4,000 m. The system is compact and portable, can be fixed or ROV-mounted, and can be integrated with leading underwater vehicles via standard interfaces. With a rechargeable battery, the camera also has a wire-



less switch to put it into ultra-low power or “sleep” mode and can provide approximately 6 to 8 hrs of continuous bottom time recording. Pan-tilt-zoom (PTZ) capability enables wide area coverage and the ability to zoom in on detail. H.264 as standard, Viewtooth® delivers video at 10 frames-per-second and output is in .asf format (a Microsoft streaming format associated with Windows Media Player).

For more information, visit www.wfs-tech.com.

iXBlue launches next generation underwater global acoustic positioning system – GAPS-NG

GAPS-NG, like its predecessor GAPS, is a truly portable and pre-calibrated ultra-short baseline positioning system (USBL) that incorporates INS

and GPS technologies. GAPS is designed to work in demanding environments, notably acoustically challenging and/or extremely shallow waters, where other systems commonly fall down.

“iXBlue has improved GAPS principally by providing the system with new, generic I/Os, Ethernet connectivity, and its standard webbased MMI—a man-machine interface already available across the product range that enables the system to be interrogated via the web and its operating parameters very simply modified on screen.

The enhancements make GAPS-NG compatible with more underwater transponders and easier to interface with a variety of peripheral systems and sensors. The result is a more practical underwater positioning system that can be quickly adapted to a variety of applications. GAPS is widely used for towfish and diver tracking and ROV and AUV navigation and positioning. GAPS-NG pushes the user envelope and opens up the possibility of applications involving telemetry and dynamic positioning.

For more information, visit www.ixblue.com.



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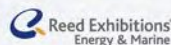
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Do you want eyes underwater?

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"With any project that mostly takes place underwater, there is the issue of sight," states Leonard Pool, managing director at SIDUS Solutions. "Us humans rely heavily on signals we pick up with our eyes. Not being able to see what we do, how our construction is holding, or if external influences are

causing problems can significantly affect any project—especially underwater. It can cause delays, budget problems, and even serious safety issues. Having eyes underwater is the best way to stay ahead of the game and on track, time- and budget-wise, while also ensuring safety for your workers and the surroundings."

This simple truth is at the heart of SIDUS Solutions, a company that creates underwater eyes: cutting-edge subsea video cameras, lighting, and robotic positioning devices for extreme environments in search of efficiency and safety for all subsea activities.

Underwater eyes

One of SIDUS Solutions' systems, the SS420 HR Color Zoom Camera, has an integrated pressure/depth sensor that, when used in combination with the SS109 pan and tilt camera, can be used to inspect and monitor underwater activities and constructions such as dams, cranes, trash bins, etc. The system features a high-resolution, color zoom camera and a

high output LED light, both remotely positioned by a pressure-balanced pan and tilt device. The underwater portion of the system is attached to a large steel frame that can be precisely placed against vertical concrete surfaces by a winch or crane to inspect the construction (e.g., for structural joints and cracks). An integrated pressure sensor provides precise, real-time depth position feedback via an LCD display located on the topside control interface.

"The system monitors work progress and goes on down below the surface that could affect the operation or construction. For example, elevation information can be crucial when working with a variable waterline," Pool explains. "Amongst other things, the system can closely observe dye release near cracks and joints to determine leakage rates through the concrete, giving you the information you need to take action and prevent worse."

More than hardware

Stressing the importance of a safe work environment, Pool continues, "SIDUS has put its focus on individual project engineering and after-sales support. Many people think of assets only as being materials or financial vehicles. At SIDUS, we feel the most important assets are our clients' hard-working people who show up to the jobsite day in and day out. We want to make sure they have the best tools to do their job and keep their people safe. Having the right hardware is a good start, but only when the hardware can be put to work in the most efficient way will the video system truly show its value, allowing safety and security to be guaranteed."

"Tailoring systems to each individual applicant's demands enables our customers to get the eyes looking in the right direction," Pool explains. "Having a rich source of after-sales support to draw from keeps the system and its operators on the right path as well as ensures their safety and security for the future."

"SIDUS Solutions can give you eyes underwater", Mr. Pool concludes. "To improve safety and efficiency you will only have to trust your eyes, above water. Let us worry about the rest."

For more information, contact Leonard Pool, Managing Director of SIDUS Solutions by telephone at 619-275-5333 or e-mail info@sidus-solutions.com or visit the company website at www.sidus-solutions.com or www.topsideoffshore.com.





Yale's Unitrex™ XS Max Wear

Our newest parallel core rope is 3 times stronger, size for size than our Uniline. It stretches only to 1 1/2 percent at break, and eliminates about 80% of the elasticity you have with Polyester ropes at their working loads. Unitrex's core is Spectra® fiber while its outer layers are the same as Uniline, durability is assured. It's spliceable at 100% of catalog strength, and really tough as nails.



Unitrex XS-8™

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Product News

TRIAXYS buoys for Ecuador's coastal wave monitoring program

AXYS Technologies Inc. (AXYS) has recently delivered two TRIAXYS™ Next Wave Directional Wave Buoys to Instituto Oceanográfico De La Armada (INOCAR) of Ecuador. These TRIAXYS buoys will be deployed along the Ecuador coastline for its developing coastal wave monitoring program. The AXYS Services Team traveled to Guayaquil to provide system training and will return shortly to continue instructing INOCAR personnel on managing and operating the network.

INOCAR chose to use the TRIAXYS wave buoy based on its success in other coastal monitoring networks for similar clients in South America. "INOCAR's choice to use the TRIAXYS buoys builds on our foundation of success in South America to date. It's great to see customers referring AXYS systems and services to colleagues in governmental institutions across South America for the development and upgrade of buoy networks," says Chad MacIsaac, international business development, marine systems at AXYS. "We have strong agent representation throughout South America that provides local customer support in addition to the service available from our office in Canada. This support is critical during the early phases of implementing an operational buoy network."

The mission of INOCAR is to plan, direct, coordinate, and control the technical and administrative activities related to hydrographic service, navigation, oceanography, meteorology, marine sciences, marine signaling, and administration of specialized equipment to its activity.

For more information, visit www.axystechnologies.com.

Xsens showcases next generation Xsens MTi® technology

Xsens, the leading innovator in 3D motion-tracking technology and products, showcased the entire range of its next generation MTi® technology for the first time at Ocean Business in Southampton. Xsens recently finalized its new product portfolio with a high-performance Inertial Navigation System (GPS/INS), the MTi-G-700. The new Xsens MTi portfolio consists of seven distinctive models, including Inertial Measurement Units (IMU), Vertical Reference Units (VRU), and Attitude and Heading Reference Systems (AHRS).

The new product portfolio has already been adopted for several series production programs. One of the cus-



tomers is Tarka Systems that designs measurement and monitoring solutions. Tarka's first product with the new Xsens MTi technology is a monitoring system at a Barge Master vessel where the MTi monitors the movement of a wave-compensated crane. Another solution that contains the Xsens MTi® is the Vessel Black Box by BMO Offshore. The Vessel Black Box provides data for sea state assessment and vessel movements when operating at rough seas.

For more information, visit www.xsens.com.

Seatronics invests £1.7M in Teledyne TSS products

Within the past 3 months, leading electronics rental company Seatronics Ltd has placed orders totalling £1.7 million with Teledyne TSS. The purchases cover no fewer than 56 top-of-the-range Meridian Surveyor gyrocompasses and four of the highly-regarded TSS 440 pipe and cable tracking systems.

In explaining his reasons for the purchases, David Currie, group managing director of Seatronics Ltd said, "Seatronics and Teledyne TSS have enjoyed a close working relationship for many years, and, as we are now seeing a pick-up in international activity, there is a need for us to increase our rental fleet. Seatronics is also going through a phase of expansion with new premises in Singapore and Brazil so we need additional units to support these offices. We already have the largest fleet of rental equipment in the industry and plan to ensure that it is also the most up-to-date, which means that we always maintain a long term plan of fleet renewal. With the recent appointment of a new international product sales manager, we have also secured a number of orders for sales of equipment packages and vessel fits. A few of the gyros will form part of these packages while the continuous demand for the industry standard TSS 440 pipe and cable trackers creates a need for us to expand our inventory in this sector."

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

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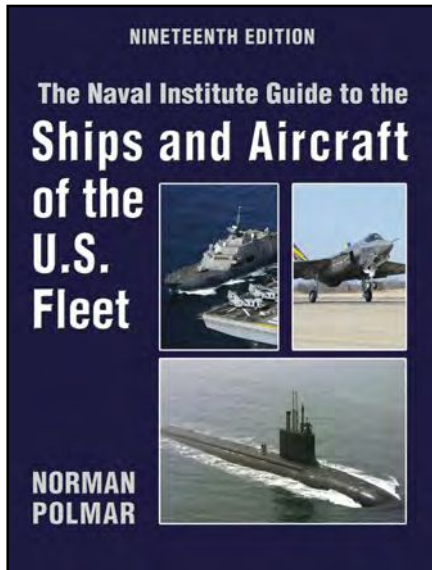
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The Naval Institute Guide to the Ships and Aircraft of the U.S. Fleet Nineteenth Edition

By Norman Polmar



This fully updated, 19th edition of The Naval Institute Guide to the Ships and Aircraft of the U.S. Fleet meets the high expectations and exacting standards of those who rely on this volume to stay informed and to make related policy, force level, technological, and weapons decisions related to the U.S. Navy.

Packed with comprehensive information, up-to-date photographs, line drawings, and useful appendixes, this timely volume describes the U.S. Navy, Marine Corps, and Coast Guard during a period of intensive transformation while engaged in combat operations.

In describing the Navy's "ships and aircraft," extensive coverage is given to the new littoral combat ships (LCS), joint high-speed vessels (JHSV), Gerald R. Ford-class aircraft carriers, and other new ships as well as developments in ship-board ballistic missile defense. At the same time, the convoluted path in surface combatant construction is "deciphered," while the belated decision to cancel the Marine expeditionary fighting vehicle (EFV) is explained. Also addressed in detail is the new F-35 series Joint Strike Fighter (JSF) and other aviation programs. Similarly addressed are Navy personnel, Marine Corps issues, Coast Guard forces, marine mammals, unmanned underwater and aerial vehicles, and other aspects of U.S. naval forces.

Naval Institute Press; ISBN/SKU: 9781591146872
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MATE ROV competition news

The 2013 competition season is upon us! Two regional events have already taken place, with many more to come in the next few months. The international competition is being held 20-22 June at the Weyerhaeuser King County Aquatic Center in Federal Way, Washington.

Please visit www.marinetech.org/rov-competition-2/ for more information.

Diversified Business Communications acquires Intelligent Exhibitions Ltd.

Diversified Business Communications UK are delighted to announce the acquisition of Intelligent Exhibitions Ltd, who organize one of the UK's most important ocean technology events—Ocean Business—for an undisclosed sum.

The bi-annual trade event which was launched by Intelligent Exhibitions in 2007, has rapidly established itself as one of the most successful events for the sector. The acquisition also includes Offshore Survey and Ocean Careers, which will continue to be organized by the Intelligent Exhibitions team, headed up by Versha Carter, from their offices in Nailsworth, Gloucestershire. The acquisition also includes LIDAR International and LIDAR Europe, which will be transferred to Diversified's offices in Portland, Maine.

Ocean Business attracts over 4,000 visitors from the UK and internationally and over 300 exhibitors

Diversified UK's Carsten Holm commented, "We are delighted to be welcoming Intelligent Exhibitions and their fantastic team headed up by Versha Carter to Diversified Business Communications. We have known Versha for many years and feel that their personal approach and attention to detail is very similar to our own way of doing things. With the same team in place and a shared vision but with the added resources of Diversified, I hope the industry will enjoy working with us as much as you have enjoyed working with Intelligent Exhibitions over the years."

Versha Carter, Managing Director of Intelligent Exhibitions, added, "We are very proud of what we have achieved with Ocean Business and this is an exciting new chapter for our event. Diversified share our passion and enthusiasm for creating exceptional events with a reputation for delivering a great visitor and exhibitor experience. With the Intelligent Exhibitions team being transferred to Diversified and the show continuing to be organized from our offices in Nailsworth, it really is business as usual and great news for the show."

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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

May

Editorial: UW Imaging & Processing, Marine Salvage

Distribution: EnergyOcean, Oceans '13 Bergen, Sea Work Intl, UDT

Product Focus: Cameras, Lights & Imaging Sonars

June

Editorial: Workclass ROVs, Deepwater Pipeline & Repair & Maintenance

Distribution: TBA

Product Focus: Subsea Tools & Manipulators

July

Editorial: AUVs & Gliders, Marine Construction

Distribution: AUVSI

Product Focus: Tracking & Positioning Systems, Seismic Monitoring

August

Editorial: Defense & Naval Systems, Corporate Showcase

Distribution: TBA

Product Focus: Multibeam & Side Scan Sonars

September

Editorial: Ocean Observing Systems, Ocean Renewables

Distribution: Oceans MTS IEEE, SPE ATCE, MREC, MTS Dynamic Positioning,

Product Focus: Buoys & Monitoring Instrumentation

October

Editorial: Offshore Vessels, Offshore Communications

Distribution: International Workboat, LAGCOE, Oil Comm, OTC Brazil, North Sea Decommissioning, AWEA/Offshore Windpower

Product Focus: Acoustic Modems, Releases & Transponders, Marine Communications

November

Editorial: Subsea Inspection, Monitoring, Maintenance, Repair; Subsea Telecom

Distribution: SUBSEA Survey IMMR, Clean Gulf

Product Focus: Handling Equipment, Winches & Control Systems, Battery Technology

December

Editorial: Light Workclass ROVs, Commercial Diving

Distribution: Subsea UK, Underwater Intervention

Product Focus: Diving Equipment & Buoyancy Materials

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Knowledge Reservoir appointed **Charles (Chuck) Severson** to vice president of reservoir management. He will lead the firm in all aspects of technical consulting and resourcing projects that deliver reservoir management solutions to its global client base. In addition, he will serve as the technical lead and QC manager for the company's ReservoirKB and CompassKB knowledge base product lines. Severson joined the company from Hyperdynamics Corp., where he held the position of chief reservoir engineer, actively assessing prospects, projects, and assets in West Africa, Russia, Eastern Europe, and South America. Prior to that, he worked as an independent oil and gas consultant delivering projects in Alaska, the Ukraine, Oman, Hungary, Russia, and Malaysia. Starting his career with Shell Oil, Severson subsequently worked for Arco in Alaska, the Middle East, and Central Asia as well as BP in Abu Dhabi before pursuing independent consulting. He earned his bachelor's degree in geological engineering from the University of Arizona, Arizona School of Mines, and his masters in petroleum engineering from the University of Houston.

Superior Performance, Inc. promoted

Benjamin Roth to sales representative. Operating from Houston and Lafayette, Louisiana, Roth will be responsible for sales internationally and domestically in the Gulf of Mexico. His role will have him managing and overseeing the growth of existing accounts as well as calling on new business prospects. Roth gained sales experience in his previous role as a field service representative. He also worked as a field service supervisor with superior performance for 10 years, performing thread inspection on tubing and casing, laser measurement of pipe, digital identification caliper, and pipe management for deepwater drill ships. He is a participating member of the Lafayette chapter of the American Association of Drilling Engineers.



Roth

Oilfield Instrumentation (OI) hired oil and gas exploration industry veteran **Scott Patton** for the Houston area sales of OI's industry leading Rig Vision, EMS IV, and gas detection software solutions as well as MWD/LWD labs. Patton's work with previous employers

Halliburton Baroid and Champion Technologies included such positions as mud engineer, technical professional, and operational leader. In his work for previous employer Halliburton Baroid, Patton experienced the ease-of-use of real-time web monitoring using Rig Vision. Patton started his oilfield career 32 years ago with Champion Chemicals as a technical representative after attending Texas A&M University.

José C. Grubisich was named to Halliburton's board of directors. He will serve on the audit and the health, safety, and environment committees. The appointment was effective 20 March, and Grubisich will stand for election at the annual meeting in May with all of the other directors. Since 2012, Grubisich has been the chief executive officer of Eldorado Brasil Celulose and is also a director of Vallourec S.A. Previously, Grubisich served as president and chief executive officer of ETH Bioenergia S.A. from 2008 to 2012. Grubisich, a chemical engineer, is a graduate of Oswaldo Cruz Chemical College in Brazil. He has extensive experience in chemicals, petrochemicals, and renewables as well as in the upstream energy and service sectors.




In-Depth Market Analysis

Corrosion Resistant Steels and Alloys in the Oil & Gas Industry



Alloy Steels | Stainless Steels | Nickel Alloys

Source: Butting



Source: SBO



Source: Baker Hughes



Source: FMC Technologies



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Corrosion Resistant Steels & Alloys in the Oil & Gas Industry

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FMC Technologies promotes **Hamish Stewart** to senior sales manager, and he will now be managing client relationships and ROV product sales throughout the Eastern Hemisphere. Bringing over 25 years of experience in the subsea sector, his career began in shipbuilding as a mechanical engineer and then moved into the oil and gas sector.

EdgeTech has hired marine industry expert **Les Ford** as a consultant for the company on a number of business development activities focused on a range of growing sectors, including side-scan sonars, sub-bottom profilers, swath bathymetry systems, hosted platform products, and underwater positioning and tracking solutions. Ford has over 30 years in the industry with extensive operational and managerial experience with EdgeTech equipment and other respected marine technology solutions.

BMT Group Ltd announced that **David Bright** has been appointed sector director for defense following the retirement of David Rainford who contributed significantly to BMT's growth in defense markets. Bright has been with BMT since 2001 as director of operations at BMT Sigma since 2003 and managing director of BMT Hi-Q Sigma since 2010. Bright has

played a key role in driving business improvement and supporting the delivery of high value, complex program for the UK Ministry of Defense and has chaired reviews of some of the largest UK defense program and was responsible for developing and advising on the partnering approaches used during the second refit period of HMS Illustrious, recognized as being the Gold Standard by the National Audit Office.

Dan Conti and **Maureen Kelly** have joined Hydroid, Inc., a Pocasset-based, world-leading manufacturer of AUVs. Conti brings 4 years of experience as a field technician, performing scheduled and unscheduled maintenance on over 70 avionic systems on the Navy's P-3C Orion anti-submarine patrol aircraft. He has worked on systems, including inertial navigation units, satellite communication systems, and advanced



Bright



Conti

sonar communication systems. Conti will be responsible for the testing, evaluation, repair, and maintenance of the REMUS 100, 600, and 6000 vehicles and training customers on the operation, maintenance, and data interpretation.

Kelly has over 20 years of experience as a customer service manager with manufacturing and service firms, where she managed client services, project management, and business integration for U.S. and international clients. Her focus at Hydroid will be on client communication, improving processes and client training programs. Kelly is a graduate of Tufts University and holds an MBA from Boston University.




Kelly

The **MacArtney Underwater Technology Group** is delighted to have been selected to host the 52nd Marine Measurement Forum. The event will take place on 1 May 2013 at the MacArtney Group's UK facilities in Aberdeen and will devote a day to the informal sharing of new knowledge and ideas within the realm of marine scientific measurement.


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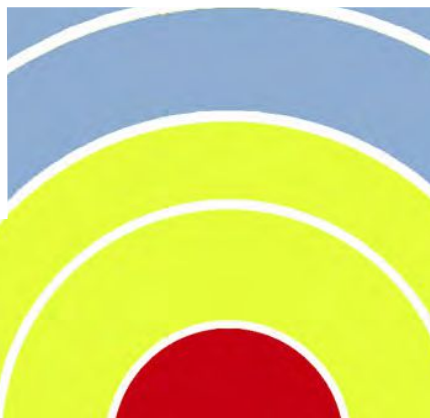
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North America
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mac-usa@macartney.com
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E-mail: ODI_marketing@teledyne.com
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OCEAN INDUSTRY DIRECTORY

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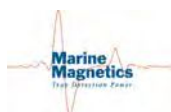
MAGNETOMETERS



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2190 Fortune Drive, San Jose, CA 95131
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E-mail: sales@geometrics.com
Website: www.geometrics.com
Contact: Ross Johnson

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Contact: Tony Martin

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E-mail: km.seatex@kongsberg.com
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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.



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Unique System, L.L.C.
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 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.

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 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.

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 BC, Canada, V3C 4Z1
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 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.



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Marine Sonic Technology, Ltd.

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UNDERWATER VEHICLES

AUVS



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Contact: Graham Lester

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ROVS



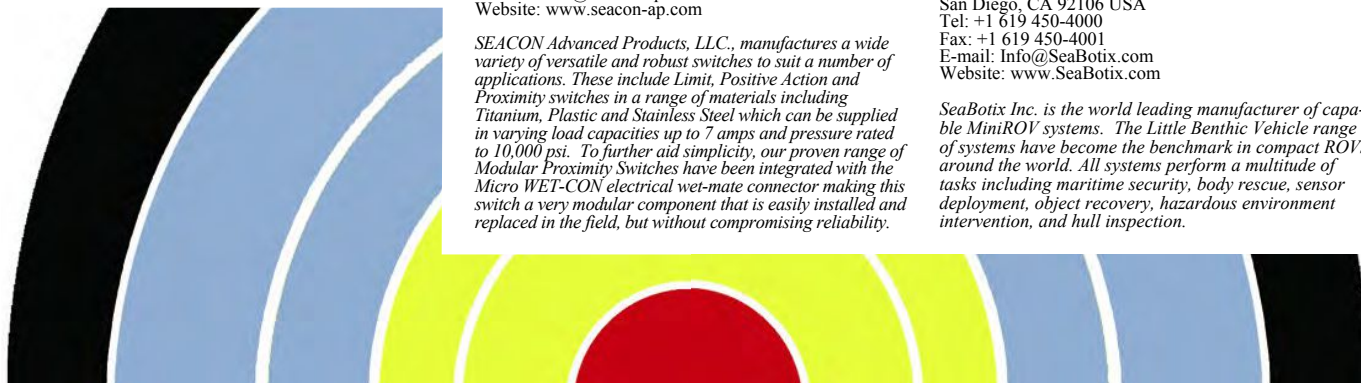
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UNDERWATER VEHICLES

Continued ■

ROVS



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Houston, Tx, 77041-4014, USA
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



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UNDERWATER VIDEO EQUIPMENT



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

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O. ___ DIVING EQUIPMENT / SERVICES

B. ___ U/W VEHICLES / COMPONENTS

P. ___ CONSULTING, DATA SERVICES

C. ___ NAVIGATION / POSITIONING

Q. ___ MARINE ELECTRICAL / ELECTRONICS

D. ___ RESEARCH & DEVELOPMENT

R. ___ COMPUTER SERVICES / SOFTWARE

E. ___ OCEAN INSTRUMENTATION

S. ___ OCEAN RENEWABLES

F. ___ OFFSHORE OIL & GAS

T. ___ SUBSEA IRM

G. ___ COMMUNICATIONS / UTILITIES

U. ___ OCEAN OBSERVING

H. ___ SCIENCE, ENVIRONMENTAL

V. ___ SHIPPING / TRANSPORTATION

I. ___ EDUCATIONAL INSTITUTION / LIBRARY

W. ___ SUBMARINE TELECOM

J. ___ GOVERNMENT MILITARY

X. ___ EQUIPMENT RENTAL

K. ___ GOVERNMENT CIVILIAN

Y. ___ MANUFACTURERS' REPRESENTATIVE

L. ___ MARINE HARDWARE / DECK EQUIP.

Z. ___ OTHER (Please specify below)

M. ___ FISHING INDUSTRY, AQUACULTURE

N. ___ SURVEY, MAPPING, EXPLORATION

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

1. OWNER / EXECUTIVE

5. BUYER

2. MANAGEMENT / PROFESSOR

6. SALES

3. ENGINEER / SCIENTIST

7. OTHER (Please specify below)

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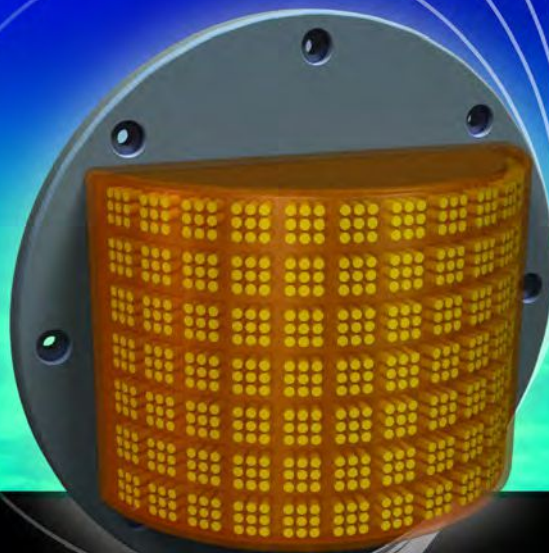
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