

News for the Ocean Industry

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December 2013



VideoRay ROVs Give OCEARCH New Perspective for Marine Research

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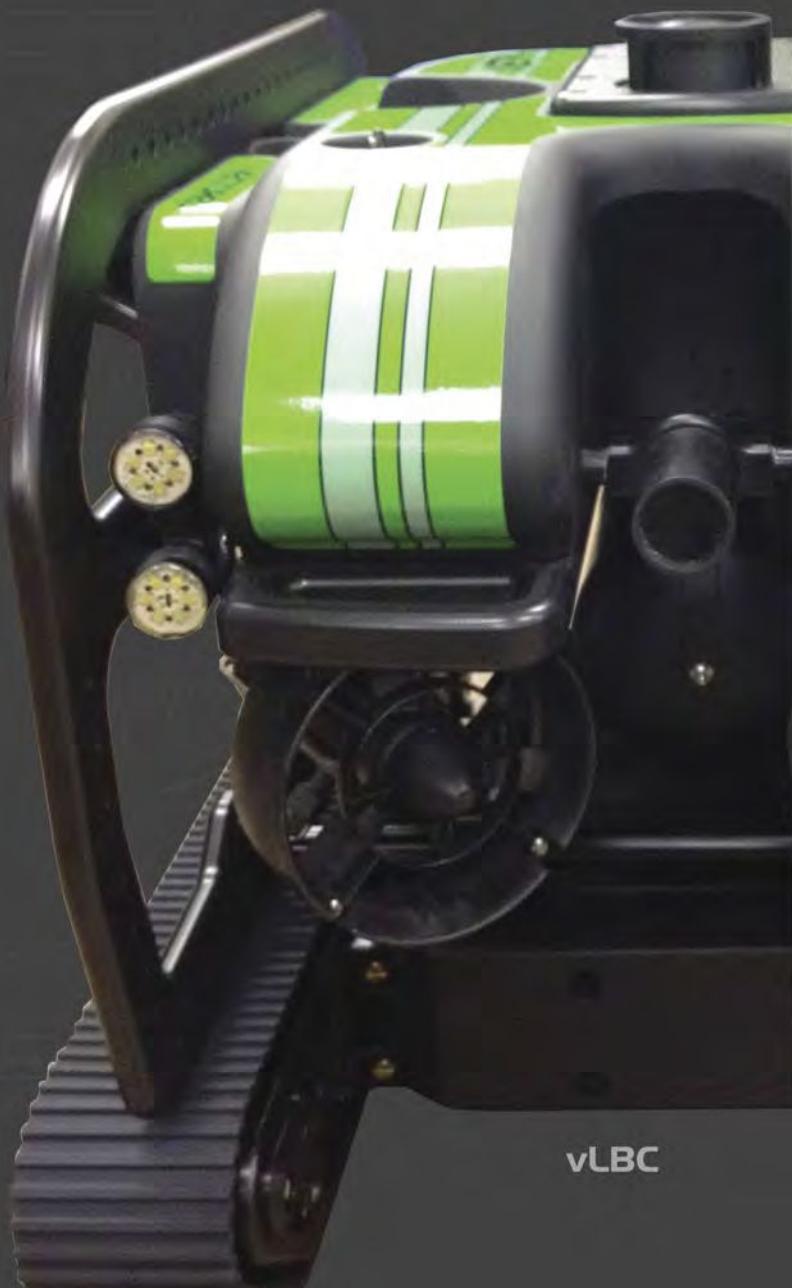
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Offshore Industry



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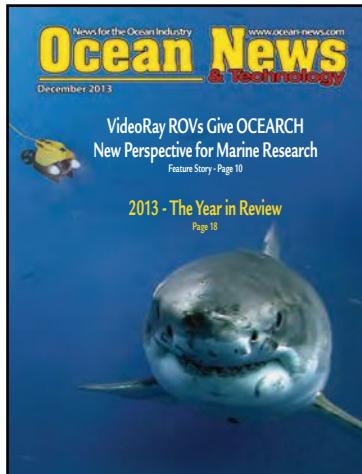
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A still image captured from the VideoRay Pro 4 of a great white shark

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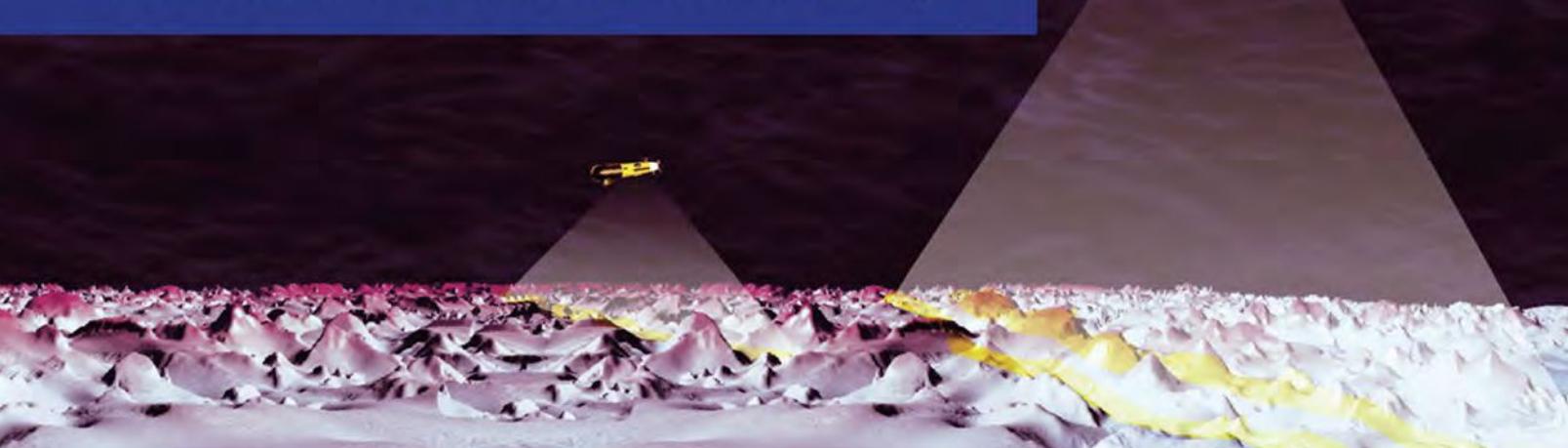
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By Ladd Borne



Ocean News & Technology

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Highlights from Subsea Survey IMMR 2013

The 8th annual Subsea Survey IMMR conference was held in Galveston, Texas 11-13 November 2013 with three keynote speeches and 26 technical papers given. The conference also featured many exhibitors showcasing their technologies. Wrapping up the conference was a panel session that was a continuation of the previous panel session held last year.

Opening the show was Don Ross of Petrobras America who delivered an overview on the relationship between Integrity Management and Subsea IMMR. Mr. Ross stressed the need for documentation and using the data collected for integrity management rather than simply collecting it for the sake of collecting.

Also speaking the first day was Mike Haney of Douglas-Westwood who shared his rosy outlook for the future of offshore operations. With oil consumption set to rise and supply coming more and more from offshore, capital expenditures in subsea hardware, subsea vessels, and ROVs are all projected to rise.

Opening the second day was Pierce Cohen of Chevron Energy Technology. Mr. Cohen spoke about Chevron's future vision for AUVs. While originally seeing AUVs as a means to perform geophysical and environmental surveys — currently mature capabilities — Chevron has identified several IMR tasks in which AUVs could potentially play a valuable role in the future. These tasks include full visual pipeline inspection; structural and facility inspection, including post-hurricane surveys; field resident vehicles; and light intervention tasks. Chevron views a long-term goal of the AUV to be a subsea resident, multi-functional AUV that will be capable of performing a variety of IMR tasks, owing to the benefits of improved operational safety, increased frequency of inspections, decreased OPEX, and improved data quality.

The panel session this year titled "Unmanned Maritime Vehicles for Oil and Gas Applications" was once again moderated by Donna Kocak with the Harris Corporation. Whereas previous panel sessions focused on AUVs, this year's program was expanded to include all autonomous vehicles, including hybrid ROV/AUVs and surface vehicles.

The panel consisted of representatives from C&C Technologies, Inc., Lockheed Martin, SAAB Seaeye, OneSubsea, Chevron, and Liquid Robotics Oil & Gas. Initially, the vehicle manufacturers were asked how they were using unmanned vehicles. The answers paralleled the benefits presented in the morning by Mr. Cohen of Chevron — reducing the need for surface vehicles, costs, and risks.

Additional questions were woven into the discussion, and then the panel was opened up to questions from the audience. One topic discussed was the near-term use of unmanned vehicles. Most agreed that hovering vehicles capable of heavy intervention that would replace traditional ROVs are a long way off (if ever), but tasks such as data mining and pipeline survey are currently feasible. The key developments needed to achieve this are better sensors for data collection and navigation. Lockheed Martin said it is working on a sensor to allow its AUV to fly along a pipeline and detect cracks. Problems associated with detecting buried pipeline sections have not been completely solved, but approaches to overcome this are being developed with more sophisticated software and acoustic beam-forming methods.

A major factor limiting autonomous vehicles is their lack of adequate power to perform for extended periods of time. Lockheed Martin found it ironic that in the energy industry, autonomous vehicles' lack of energy is a major concern. To which Liquid Robotics pointed out that the WaveGlider requires no refueling as it harvests the endless wave and solar energy available.

A potential solution to this lack of energy is resident vehicles that can recharge autonomously at subsea charging stations. But before operators allow autonomous vehicles to ply the waters around their rigs and subsea structures, there needs to be adequate standards set in place and, even then, it will take years of incremental steps required to gain the confidence needed. In all, the audience seemed to particularly like hearing more about the current needs and direction of the industry rather than what is currently achievable.

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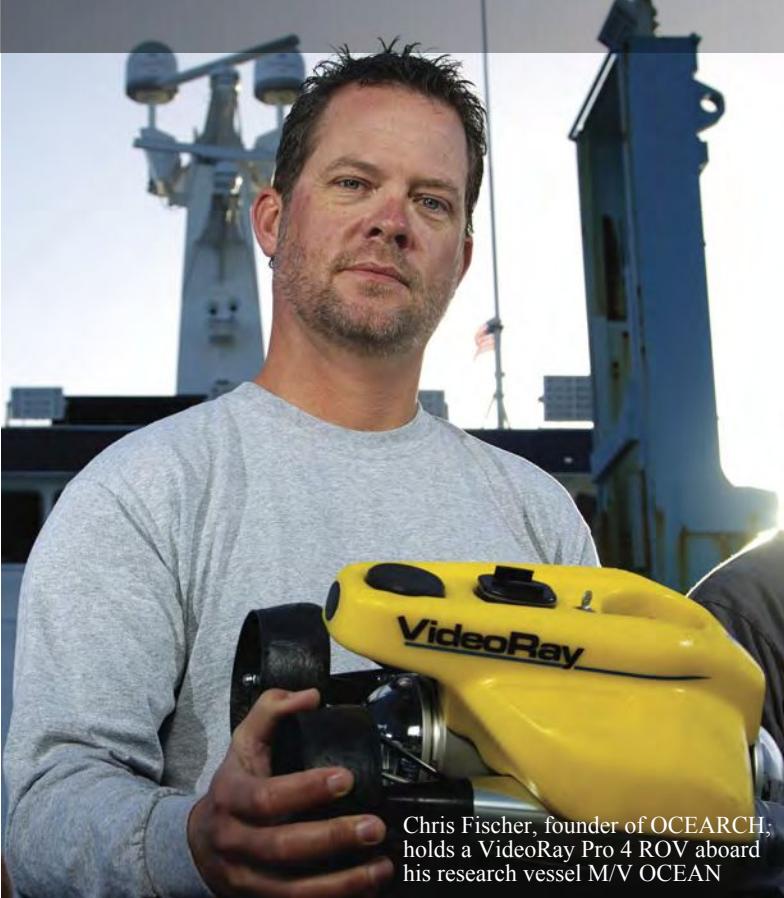
VideoRay ROVs Give OCEARCH New Perspective for Marine Research

By VideoRay

Sharks

The mere idea of a great white is enough to evoke a visceral reaction from beachcombers, coastal dwellers, and sci-fi moviegoers around the world. Violent portrayals in news stories and films like Jaws and Sharknado do little to help these giant fish overcome their undeserved status as the villains of the ocean. However, sharks serve a much greater purpose than terrorizing swimmers—sharks are an integral part of the ocean's sustainability. The misplaced fear of sharks has led to a widespread distrust and even disinterest in the ocean. More than 73 million sharks are killed every year by people who do not understand their essential role in our ecosystem. Scientists and activists around the world are tasked with overcoming this misunderstanding and educating the public about sharks, their true nature, and why they desperately need protection.





Chris Fischer, founder of OCEARCH, holds a VideoRay Pro 4 ROV aboard his research vessel M/V OCEAN

Chris Fischer is one of these advocates. Many may recognize Fischer from the small screen. From 2002 to 2009, he hosted ESPN's two-time Emmy® Award winner Offshore Adventures. He later showcased OCEARCH's great white shark research expeditions on the National Geographic Channel series Shark Men and History Channel series Shark Wranglers. Now, his entire focus is on growing his non-profit, OCEARCH.

Fischer founded OCEARCH in 2009 as a non-profit conservation foundation to support the social, economic, and environmental benefits of researching and protecting great white sharks and other apex predators. With the help of corporate sponsors, 17 OCEARCH research expeditions have been conducted to date, with 7 more scheduled through the end of 2015. Plans are in place to expand data collection to species other than white sharks in the future, and a STEM Education Curriculum based on the Global Shark Tracker was launched for grades 6 to 8 this fall.

In 2009, Fischer, eager to obtain a different and essential perspective of his underwater research subjects, contacted VideoRay, a popular Remotely Operated Vehicle (ROV) manufacturer outside of Philadelphia, Pennsylvania. VideoRay already had some television notoriety with National Geographic, History Channel, and other outlets at that point and had proven itself as the go-

to versatile ROV for this type of video production and research. Fischer's production team very quickly realized that the VideoRay was "not just another underwater camera." The VideoRay ROV, originally on board the OCEARCH research vessel M/V OCEAN as another camera point of view, was quickly repurposed and used to monitor bait hooks while safely capturing imagery of the sharks' behavior, travel patterns, habitats, and health status after the sharks were tagged onboard and released.

OCEARCH is revolutionizing the way that oceanic research is conducted and shared. The organization brings together marine scientists, institutions, and corporations, combining their knowledge, efforts, and funding for expeditions. "[OCEARCH's] approach is mutually beneficial for everyone involved: the scientists get the necessary funding and support for their research, the sponsoring companies get a PR boost and earned media exposure, and the public gets free, unfettered access to our data, methodology, and findings. We are taking marine research out of the hands of an elite few and bringing it to the entire world much more efficiently than ever before."

A Vocus report done at the end of October reported that OCEARCH's research had over 2 billion impressions worldwide, based on constant coverage from 4,000 news outlets. "We have transitioned from being on a television show for a few hours to becoming our own channel. Now our coverage begins immediately after we finish tagging a shark."

By tracking sharks' every movement, Fischer hopes we can begin to understand and protect these often vilified creatures.

Scientists can study breeding habits and migratory patterns to find the best methods and policies to protect the "lions of the ocean," while also alerting residents and tourists in coastal regions that may not be aware of nearby sharks. OCEARCH also offers students, teachers, and shark enthusiasts around the world unprecedented access to the underwater world. "When people think of sharks, they usually think of 'Jaws.' But sharks are so much more than just a sci-fi villain. Sharks are the balance-keepers of the ocean. Without them, the entire marine ecosystem would experience a devastating domino effect."

In order to gather as much information as possible, OCEARCH cannot rely solely on their crew above deck. The best place to find, observe, and learn about sharks is their natural habitat—the ocean. Rather



Launching the VideoRay Pro 4 ROV into the water during an OCEARCH expedition from the M/V Ocean

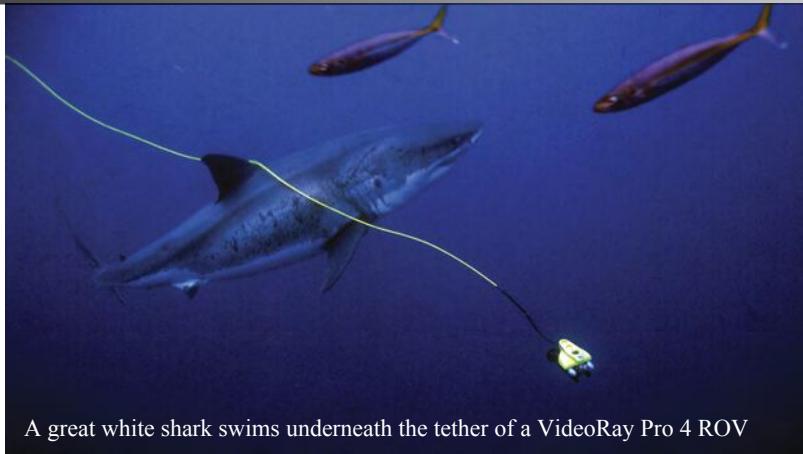
than risking divers to territorial or hungry sea creatures, OCEARCH deploys the VideoRay ROV to scout locations, monitor bait hooks, follow tagged sharks after their release, and record high-resolution underwater video and still images. The ROV offers OCEARCH a unique underwater perspective for

FEATURE STORY

their missions around the world from South Africa to Mexico, Florida to San Francisco. The VideoRay has caught dozens of different shark species on film, including great whites, ragged tooth, Galapagos, tiger, white tip, black tip, bull, and great hammerheads, just to name a few.

VideoRay ROV pilot Craig Thorngren of Submerged Recovery & Inspection Services LLC has completed eight OCEARCH expeditions and filmed the tagging of more than 100 sharks. "Using the VideoRay allowed us to monitor the sharks and collect data and high-quality imagery without disrupting their natural environment," said Thorngren. Thorngren also added that the VideoRay's non-invasive nature helps OCEARCH uphold its "Ocean First" philosophy during expeditions. "The sharks are sometimes curious about the bright yellow 'fish' swimming near them. Luckily, they don't taste very good."

The ROV also avoids disrupting the environment above water as well. When hoisting 3,500-plus lb sharks aboard a vessel, time and space are precious. The ROV system's minimal mass allows it to be easily transported by hand between expedition sites. The VideoRay can be deployed in minutes from anywhere that can accommodate a small table for the control box, and missions can last as long as there is a willing operator. OCEARCH missions can sometimes take hours, even days of patient observation before quickly springing into action. The VideoRay's powerful thrusters and fluid maneuverability, even in swift currents, allow the OCEARCH crew to monitor sharks steadily even while they swim away erratically. "Much of the footage we aired in the episodes came straight from the



A great white shark swims underneath the tether of a VideoRay Pro 4 ROV



VideoRay ROV Pilot Brian Luzzi operates the submersible during the filming of an episode of *Shark Men* while Fischer looks on



A still image captured from the VideoRay Pro 4 of a tiger shark hanging around the bait

VideoRay's camera feed," said Thorngren. "The ROV's HD camera was able to capture stable and broadcast-ready video. It glides through the water just as smoothly as any sea creature, which helps us catch a glimpse of what it's truly like to swim with the sharks."

OCEARCH has been using VideoRay Pro 4 ROVs since their early missions in 2009. "VideoRay has been amazing and an essential part of our project since we started," said Fischer. "Even when we had very little backing, VideoRay stepped up and helped us gain a new perspective. Their initial support helped us realize the capacity of our project as well as the enormity of the task at hand. Without a VideoRay, I'd feel like I was going in blind."

For Fischer, the purpose of OCEARCH goes way beyond tagging sharks. He views the organization as a catalyst for change in the way people view, maintain, and experience the ocean. "It's been two generations since Jacques Cousteau brought the ocean into people's living rooms. We're trying to take a page out of his book and bring the ocean to life again for people by

delivering it where they already are—on their laptops, televisions and smart phones. We hope that by raising awareness and offering unrestricted access to the realities of what's going on underwater, we can inspire a new generation to embrace the ocean and help us ensure it stays clean and sustainable."

For more information visit www.OCEARCH.org and www.videoray.com.



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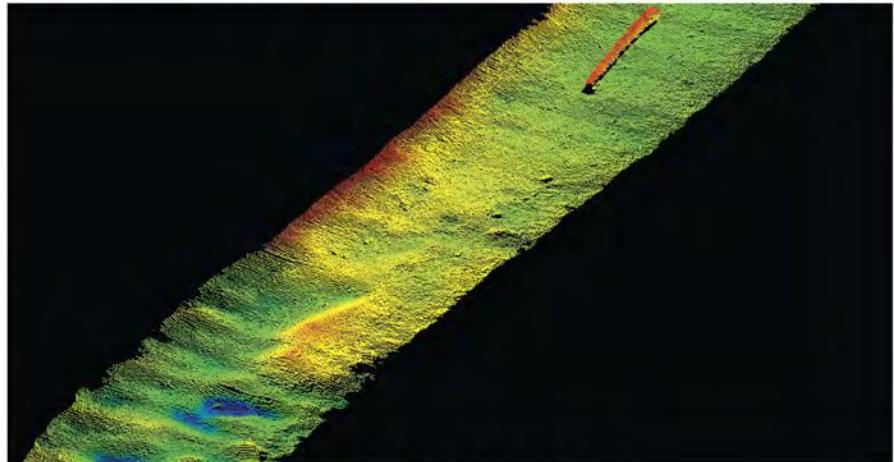
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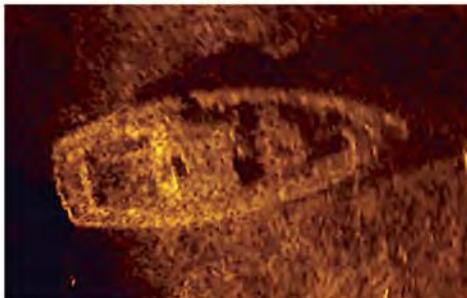
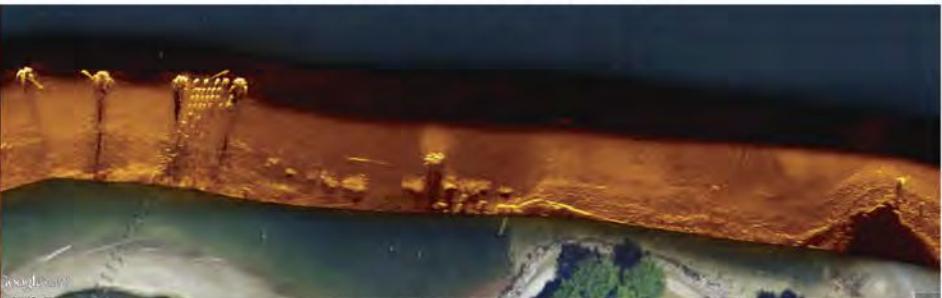


Image of a sunken boat



Mosaic image of pilings

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OCEAN INDUSTRY

NOAA takes delivery of new fisheries survey vessel



Fisheries Survey Vessel Reuben Lasker following delivery from Marinette Marine Corporation to NOAA on 8 November 2013 in Norfolk, Virginia (Credit NOAA)

NOAA has taken delivery of Reuben Lasker, the agency's newest high-tech fisheries survey vessel from Marinette Marine Corporation, a Fincantieri company. The 208-ft ship will primarily support fish, marine mammals and turtle surveys off the U.S. West Coast and in the eastern tropical Pacific Ocean.

Built at MMC's shipyard in Marinette, Wisconsin and funded through the American Recovery and Reinvestment Act, Reuben Lasker is the fifth in a series of Oscar Dyson-class ships built for the agency. The ship is equipped with the latest technology for fisheries and oceanographic research, including advanced navigation systems, acoustic sensors, and scientific sampling gear.

The ship is also engineered to produce much less noise than other survey vessels, allowing scientists to study fish populations and collect oceanographic data with fewer effects on fish and marine mammal behavior. The ship's comprehensive environmental sampling capabilities will enable researchers to gather a broad suite of marine life data with unprecedented accuracy.

"The fisheries survey vessel Reuben Lasker is designed to produce so little sound that our scientists can survey marine species without disturbing the animals' behavior or compromising the capabilities of our most sensitive acoustic equipment," said Richard Merrick, chief scientist for NOAA Fisheries. "The vessel will support research that is essential to sustain and rebuild our nation's marine resources." The ship is named after the late Dr. Reuben Lasker, a pioneering fisheries biologist who served as the director of the NOAA Southwest Fisheries Science Center's coastal fisheries division and as adjunct professor at Scripps Institution of Oceanography, University of California San Diego. Lasker directed a renowned research group that focused on the survival and transition of young fish to adulthood, a topic with implications for fisheries management throughout the world.

NOAA plans to commission Reuben Lasker in 2014. The ship will be homeported in San Diego, California. The NOAA fleet of ships and aircraft is operated, managed and maintained by the NOAA Office of Marine and Aviation Operations, which includes commissioned officers of the NOAA Corps and civilian wage mariners.

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

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Two Americans freed by pirates

The captain and chief engineer from the Edison Chouest Offshore owned C-Retriever were released by Nigerian pirates, according to the State Department. The two were taken from the 222-ft commercial vessel 23 October and reportedly taken ashore. Details were not released, but reports from the area indicate that a \$2 million ransom was paid for the return of the two Americans. Pirate attacks off Nigeria's coast have risen by 30% this year. West Africa's Gulf of Guinea has become a haven for gangs wanting to snatch cargoes and crew. Unlike the waters off Somalia on the east coast of Africa where ships typically have armed guards on board, ships doing business off west Africa have little protection and must anchor.

Teledyne acquires CDL, specialist in marine engineering

Teledyne Technologies Incorporated announced that its subsidiary, Teledyne Limited, has acquired C.D. Limited (CDL). Headquartered in Aberdeen, Scotland, CDL is a leading supplier of subsea inertial navigation systems and motion sensors for a variety of marine applications. Terms of the transaction were not disclosed. CDL designs and manufactures a variety of sensors including gyrocompasses, attitude and heading reference systems, and inertial navigation systems. In particular, CDL has pioneered the development of small form factor inertial measurement systems for use in subsea applications where space is at a premium, such as on-board remotely operated vehicles (ROVs). CDL also offers advanced control and monitoring technologies for subsea infrastructure and engineering activities. The acquired business will operate under the name Teledyne CDL Limited.

First ocean energy company joins World Ocean Council

Resolute Marine Energy (RME) has joined the World Ocean Council (WOC) as the first company from the emerging marine renewable energy sector in the global ocean industry leadership coalition. RME is developing and deploying technologies that harness ocean wave energy to produce electricity and fresh water in areas where there is a weak or non-existent electrical grid and where desalination can have a positive impact for coastal communities. RME's CEO Bill Staby stated, "We see the need and value to working with other ocean industries to tackle the policy and practical issues affecting the future of responsible use of marine areas and resources. For example, the WOC's efforts to engage industry in collecting and sharing ocean data through its 'Smart Ocean /Smart Industries' program provide an important role for ocean users to help with understanding marine ecosystems and planning for their responsible use."

BOEM announces \$2 Million in awards to the University of Florida and the Navy

As part of President Obama's continuing commitment to help coastal communities recover from Hurricane Sandy, the Bureau of Ocean Energy Management (BOEM) has signed two agreements that together total \$2 million for broad-scale environmental monitoring within offshore areas along Cape Canaveral (Brevard County), Florida. These areas have been identified to provide sand resources for areas damaged by last year's superstorm. The University of Florida has been awarded \$1.5 million and will contribute a match of \$500,000 for the study titled "Ecological Function and Recovery of Biological Communities within Dredged Ridge-Swale Habitats and in the South-Atlantic Bight."

Additionally, BOEM has awarded the Naval Undersea Warfare Center in Newport, Rhode Island \$500,000 through an interagency agreement for the study "Natural Habitat Associations and the Effects of Dredging on Fish at the Canaveral Shoals, East-central Florida."

"These studies are significant steps toward better understanding how marine life responds to and recovers from dredging," said BOEM director Tommy P. Beaudreau. "This information will add to a growing body of knowledge being collected as a foundation for future decision-making related to coastal resilience and restoration."

Dredging operations for the Sandy-related coastal restoration project are expected to take place from October 2013 to February 2014 within the BOEM sand borrow area Canaveral Shoals II, which is offshore Cape Canaveral.

The studies mark the first major action using part of the \$11.7 million allocated to BOEM through the Disaster Relief Appropriations Act of 2013, which BOEM announced in May. Combined, the research will increase our understanding of how offshore fish communities and benthic organisms that live on or near the seafloor use offshore ridge and sand bodies.

Both studies will examine the effects of dredging, with the Navy's work focusing on fish usage and the University focusing on all other aspects of habitat usage and alteration. The results of the monitoring studies will be utilized to help identify measures that may mitigate and reduce the impacts of future dredging activities. The project period is approximately 2 years.

For more information, visit www.boem.gov.

NOAA announces regulations to protect marine mammals

NOAA Fisheries announced final regulations requiring the United States Navy to implement protective measures during training and testing activities in the Atlantic Ocean and Gulf of Mexico to reduce effects on marine mammals.

The Navy requested an authorization under the Marine Mammal Protection Act because the sound generated by active sonar, the sound and pressure generated by detonating explosives, and other associated activities could affect the behavior of some marine mammals, or cause a temporary loss of their hearing sensitivity or other injury.

The Navy's current authorization expires in January 2014. The purpose of the Navy training and testing is to ensure the readiness of naval forces. Under the MMPA, this new authorization is limited to 5 years, and expires in November 2018.

NOAA Fisheries recently made a final determination that the effects of these Navy operations would have a negligible impact on the overall species or stocks involved. Based on that final determination, NOAA is requiring that the Navy use mitigation measures and, if properly followed, expects the exercises will not to result in serious injury or death to a large number of marine mammals.

Exposure to sonar and explosives in certain circumstances has been associated with the stranding of some marine mammals, and some injury or death may occur despite the best efforts of the Navy. Therefore, the final rule allows for a small number of incidental injuries to marine mammals from sonar as well as vessel strikes and explosions.

Under the authorization, the Navy will use the following mitigation measures to minimize effects on marine mammals:

- Establishing marine mammal mitigation zones around each vessel using sonar;
- Using Navy observers to shut down sonar operations if marine mammals are seen within designated mitigation zones;
- Using mitigation zones to ensure that explosives are not detonated when animals are detected within a certain distance;
- Implementing a stranding response plan that includes a training shutdown provision in certain circumstances and allows for the Navy to contribute in-kind services to NOAA Fisheries if the agency has to conduct a stranding response and investigation; and

- Using specific mitigation measures at certain times to reduce effects on North Atlantic right whales.

OceanGate Inc. names Neil McCurdy as chief operating officer

OceanGate Inc. (OGI), a global provider of deep-sea manned submersible solutions, has named Seattle native Neil McCurdy as chief operating officer. In his role as COO, McCurdy will be responsible for administering OceanGate's corporate strategy and coordinating operations and sales programs to reduce costs and increase profitability. In addition, managing the production and roll out of OceanGate's next-generation submersible, the 3,000 m Cyclops™, will be among McCurdy's chief responsibilities. His 15+ years of expertise in developing and managing high-performance worldwide sales and distribution channels for marine vessels and products will bolster the OceanGate executive management team.

"Neil McCurdy brings operational excellence as well as a customer-centric point of view to his new role as COO," states OceanGate's CEO Stockton Rush. "Under his leadership, OceanGate will expand sales programs in the defense and energy markets. In addition, as OceanGate's Cyclops goes from the manufacturing stage to deployment, Neil's strength in increasing operational efficiencies will be critical to our product delivery schedule. We're particularly excited to have Neil join us as we build out our next-generation manned submersible."

McCurdy, who reports directly to the OGI Board of Directors and CEO Stockton Rush, comes to OceanGate following an exemplary career in the marine industry. Prior to joining OceanGate, McCurdy held top-level management positions with Grand Banks Yachts Ltd. (GBYL.SI), a Singapore-based international manufacturer of recreational marine vessels. During his tenure at Grand Banks, he served first as vice president of worldwide sales and service, managing international sales, service, and distribution networks in America, Europe, and the Asia-Pacific region. He most recently held the position of vice president of sales administration and service, with executive-officer duties operating and administering Grand Banks' worldwide distribution network as well as profit-and-loss responsibilities for the company's North American operations.

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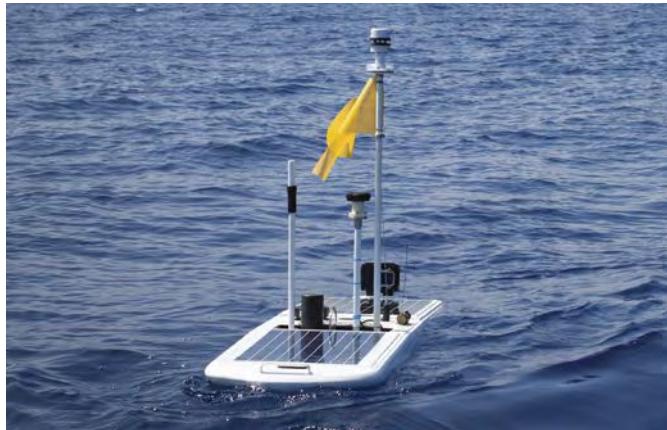
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Year in Review

Liquid Robotics®' marine robot completes 9,000 nmi cross-Pacific journey

U.S.-based Liquid Robotics®, announced that the first Pacific Crossing (PacX) Wave Glider, "Papa Mau," completed its 9,000-nmi (16,668 k) scientific journey across the Pacific Ocean to set a new world record for the longest distance traveled by an autonomous vehicle. Throughout its journey, Papa Mau navigated along a prescribed route under autonomous control, collecting and transmitting unprecedented amounts of high-resolution ocean data never before available over these vast distances or timeframes.



Numerical study suggests subsea injection of oil-dispersing chemical at Macondo well did not prevent oil from rising to the surface

This study is the first to examine the effects of the use of unpreceded quantities of synthetic dispersants on the distribution of an oil mass in the water column based on a modeling approach. A team of researchers developed and tested models to show that the application of oil-dispersing chemicals had little effect on the oil surfacing in the Gulf of Mexico. They estimated the distribution of oil droplet sizes with and without injection of dispersant at the wellhead. They then applied a novel oil-mass tracking model of the Connectivity Modeling System developed shortly after the Deepwater Horizon incident with a RAPID award from the National Science Foundation and presented a 3D simulation of the DWH spill showing the unfolding of the disaster to examine the effect the synthetic dispersant may have had on the oil transport in the water column. The model indicated that the dispersant injected at BP's Macondo wellhead was not necessary to break up the oil. The subsea application of dispersant did not have its expected outcome.

Deepest coral reef ever found on the Great Barrier Reef

A team of scientists from the Catlin Seaview Survey has discovered reef coral living at 125 m, the deepest ever found on the GBR. The remarkable find of a community of reef corals was made on the outer edge of the Ribbon Reefs off the north of the GBR.

BP spill settlement gets final U.S. government approval

A Federal judge has given final approval to BP's settlement with a bulk of businesses and individuals who lost money because of the 2010 oil spill in the Gulf of Mexico. BP has estimated it will pay \$7.8 billion to resolve economic and medical claims from more than 100,000 businesses and individuals hurt by the nation's worst offshore oil spill. The settlement has no cap; the company could end up paying more or less.

Giant squid finally revealed

Filmed for the first time in its natural habitat, the giant squid (*Architeuthis*) has finally been exposed to the world. This achievement has been a long time coming. There have been previous such expeditions — all failures. This time was different. There were many factors that came together to make this effort such a resounding success. One of these was a new approach to deep ocean exploration that pays heed to the natural visual environment of the vast midwater realm that is home to these Leviathans. This is a world of the very dimmest of lights — both sunlight filtered through hundreds of meters of ocean and bioluminescence, the living light that animals use to aid their survival in a light-limited world. The enormous eye of the giant squid — the largest in the animal kingdom — attests to how important vision must be to its survival. Using optical lures that imitate bioluminescence to attract the squid and far red light invisible to the squid in order to see without being seen proved to be the key to success.



Falling up: DARPA launches just-in-time payloads from bottom of the sea

Today, cost and complexity limit the Navy to fewer weapons systems and platforms, so resources are strained to operate over vast maritime areas. Unmanned systems and sensors are commonly envisioned to fill coverage gaps and deliver action at a distance. However, for all of the advances in sensing, autonomy, and unmanned platforms in recent years, the usefulness of such technology becomes academic when faced with the question, "How do you get the systems there?" DARPA's Upward Falling Payloads (UFP) program seeks to address that challenge.

The UFP concept centers on developing deployable, unmanned, distributed systems that lie on the deep-ocean floor in special containers for years at a time. These deep-sea nodes would then be woken up remotely when needed and recalled to the surface. In other words, they "fall upward."

New ECO Magazine launched

Seizing an opportunity to cover a growing global industry, Technology Systems Corporation (TSC) Publications has released the inaugural edition of Environment coastal & offshore (ECO).

Published bimonthly in print and digital formats, ECO reports on coastal and offshore regulation, assessment, mitigation, and restoration, with an emphasis on company and product news. Articles in the January 2013 release included contributions from two U.S. Federal agencies and multiple international firms. The second issue, due out in late March, will focus on ocean renewables, such as offshore wind and wave power.

Teledyne Technologies acquires RESON

Teledyne Technologies Incorporated (Teledyne) and the shareholders of RESON A/S (RESON) jointly announced that they have entered into a definitive agreement for the acquisition of RESON by a wholly owned subsidiary of Teledyne. RESON, headquartered in Slangerup, Denmark, provides high-resolution marine acoustic imaging and measurement solutions. Terms of the transaction were not disclosed.

U.S. Transportation Secretary LaHood establishes National Freight Advisory Committee

U.S. Transportation Secretary Ray LaHood announced the establishment of a National Freight Advisory Committee to provide recommendations aimed at improving the national freight transportation system. A strong freight transportation system is critical to the nation's economy and essential for helping meet President Obama's goal of doubling U.S. exports by 2015. The recent transportation bill, Moving Ahead for Progress in the 21st Century, (MAP-21), signed by President Obama in July 2012, established a national freight policy and called for the creation of a National Freight Strategic Plan.

Rapid changes in the Arctic ecosystem

Huge quantities of algae are growing on the underside of sea ice in the Central Arctic in 2012, the ice algae *Melosira arctica* was responsible for almost half the primary production in this area. When the ice melts, as was the case during the ice minimum in 2012, these algae sink rapidly to the bottom of the sea at a depth of several thousands of meters. Deep-sea animals such as sea cucumbers and brittle stars feed on the algae, and bacteria metabolize what's left, consuming the oxygen in the seabed. These short-term reactions of the deep-sea ecosystem to changes in sea ice cover and ocean productivity has now been published in *Science*.



Several groups take possession of the sea ice habitat of every ice station: water samples from the melting pools, the ice itself, and the water beneath—everything is investigated for plants, animals, and microorganisms. Photo: Mar Fernandez, Alfred Wegener Institute

CNOOC forecasts startup of 10 new oil, gas fields offshore China

CNOOC is targeting net production in the 338-348 MMboe range for 2013, which is slightly less than last year. The company also expects to bring 10 new oil and gas fields onstream offshore China, including the Liwan 3-1, the country's first large-sized deepwater gas field.

London Array — the world's largest operational offshore wind farm

In March 2013, London Array officially became the world's largest operational offshore wind farm. In total, 141 of the 175 3.6 MW Siemens wind turbines are now able to generate 507 MW of energy for UK homes and businesses. This is a significant achievement for everyone involved in the project that generated first power in October 2012. The final turbine was installed in December 2012, and the project is expected to be fully operational in the spring. London Array is arguably the most widely known UK offshore wind farm. When complete, it will be capable of generating enough energy to power nearly half a million homes and reduce harmful CO₂ emissions by over 900,000 tons a year.

Dr. Kathryn Sullivan named new NOAA acting administrator

Dr. Kathryn Sullivan assumed the role of acting under secretary of commerce for oceans and atmosphere and acting National Oceanic and Atmospheric Administration (NOAA) administrator on 28 February 2013, where she had been serving as assistant secretary of commerce for environmental observation and prediction and deputy administrator for NOAA, as well as performing the duties of NOAA's Chief Scientist. She is a distinguished scientist, renowned astronaut, and intrepid explorer. Dr. Sullivan's impressive expertise spans the frontiers of space and sea. An accomplished oceanographer, she was appointed NOAA's chief scientist in 1993, where she oversaw a research and technology portfolio that included fisheries biology, climate change, satellite instrumentation, and marine biodiversity. Dr. Sullivan holds a bachelor's degree in earth sciences from the University of California at Santa Cruz and a doctorate in geology from Dalhousie University in Canada.

Bezos Expeditions recovers pieces of Apollo 11 rockets

Jeff Bezos, founder and CEO of Amazon.com, recovered parts of the F-1 rocket engines that powered the Appolo 11 moon mission.

Bezos and his crew discovered the engines lying 14,000 ft deep using sonar. He recovered enough major components to restore and display two F-1 engines. He hopes that the hardware will inspire kids to invent and explore, just as the NASA missions inspired him.



Remains of USS Monitor sailors interred at Arlington National Cemetery

The remains of two unknown USS Monitor sailors, recovered by NOAA and the U.S. Navy in 2002 from the ship's gun turret, were buried with full military honors at Arlington National Cemetery. USS Monitor sank in a New Year's Eve storm just over 150 years ago, carrying 16 crew members to their deaths. For more than a quarter of a century, NOAA has forged and maintained an enduring bond to the legacy of USS Monitor and its crew. In addition to trying to identify the two sailors, NOAA has carried out numerous research expeditions at the site, including working with the Navy and other partners to recover important artifacts.

Year in Review

Oceaneering® ROV sets new deepwater drill support record

An Oceaneering® Magnum® Plus work-class ROV has set a new ROV ultra deepwater drill support depth record offshore India while working at 10,385 ft water depth (3,165 m). Magnum® 169 is supporting drilling operations onboard rig Dhirubhai Deepwater KG1 (DDKG1) for ONGC and has been in service since Q3 2009. The ROV is a 4,000-m rated system that has logged over 8,309 hours and 961 total dives so far.

The previous 2011 record of operating at 10,194 ft (3,107 m) water depth was also set in India by Oceaneering® Millennium® 77 while working onboard rig Dhirubhai Deepwater KG2 (DDKG2) for Reliance Industries Limited.



U.S. Navy funds four additional Littoral Combat Ships

The U.S. Navy has awarded contracts to Austal and Lockheed Martin for the construction of four additional Littoral Combat Ships (LCS). The award gives \$696 million to Lockheed Martin for two Freedom-class monohull ships and \$682 million for two Independence-class aluminum trimarans.

Ashtead Technology announces sale of North American Instruments business

Leading international subsea equipment solutions specialist, Ashtead Technology 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.

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, included \$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.

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 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.

Explorer and Filmmaker James Cameron forms partnership with WHOI

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. 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.

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

Brazil-based Petrobras 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.

Warming oceans are reshaping fisheries

For the first time, scientists have shown that ocean warming has had a global impact on the mix of species caught by fishermen. Previous studies indicated that some species are shifting location in response to temperature increases, with fish gradually moving away from the equator into cooler waters. However, research published in May 2013 in Nature shows that species from warmer waters have also been replacing those traditionally caught in many fisheries worldwide since at least since 1970.

Northrop Grumman, U.S. Navy conduct first arrested landing of X-47B unmanned demonstrator

Northrop Grumman Corporation and the U.S. Navy conducted the first fly-in arrested landing of the X-47B Unmanned Combat Air System (UCAS) demonstrator.

Conducted 4 May at the Navy's shore-based catapult and arresting gear complex, the test represents the first arrested landing by a Navy unmanned aircraft. It marks the beginning of the final phase of testing prior to carrier-based trials.

Lockheed Martin to build largest OTEC plant

The demand for clean, reliable energy continues to grow. Beijing-based Reignwood Group wants to meet that demand, and it plans to work with Lockheed Martin to do it.

Lockheed Martin recently entered into an agreement with Reignwood to develop and build a 10-MW Ocean Thermal Energy Conversion (OTEC) pilot power plant off the coast of southern China. The memorandum of agreement between the two companies was signed in Beijing on 13 April.

Offshore Technology Conference sees record number of attendees in 2013

Experts from the offshore energy industry around the world came together 6-9 May for the 2013 Offshore Technology Conference at Reliant Park in Houston. Attendance at the conference reached a 30-year high of 104,800, the second highest in show history and a 17% increase from last year.

The event had 2,728 companies representing 40 countries, including 244 new exhibitors in 2013. International companies made up 39% of exhibitors. This year's event featured nine panel sessions, 29 executive keynote presentations at luncheons and breakfasts, and 298 technical papers.

General Dynamics, Ingalls Shipbuilding win U.S Navy contract to build DDG 51 destroyers

The U.S. Navy has awarded General Dynamics Bath Iron Works a contract valued at \$2.8 billion for the construction of four Arleigh Burke-class destroyers, with an option for a fifth ship. The option for the fifth ship, if exercised, would bring the total value of the contract to approximately \$3.5 billion.

First-ever National Forum to shape a U.S. national ocean exploration program

Ocean Exploration 2020: A National Forum, brought together more than 100 ocean explorers and representatives from federal agencies, state governments, non-government organizations, universities, ocean institutions, and leading industries to shape a U.S. national ocean exploration program. The Forum, held at the Aquarium of the Pacific in Long Beach 19-21 July, gathered experts with the aim of developing a national program that will be fully implemented by 2020.

Major changes needed for coral reef survival

To prevent coral reefs around the world from dying off, deep cuts in carbon dioxide emissions are required, says a new study from Carnegie's Katharine Ricke and Ken Caldeira. They find that all existing coral reefs will be engulfed in inhospitable ocean chemistry conditions by the end of the century if civilization continues along its current emissions trajectory.

Coral reefs are havens for marine biodiversity and underpin the economies of many coastal communities. But they are very sensitive to changes in ocean chemistry resulting from greenhouse gas emissions as well as to coastal pollution, warming waters, overdevelopment, and overfishing.

Oil industry agrees to curb seismic surveys to help whales, dolphins

Oil and gas companies working in the Gulf of Mexico have agreed not to use seismic surveys for the next 2.5 years in three areas considered critical to whales and along the coast during the peak calving season for bottlenose dolphins. The agreement among environmental groups, trade groups, and the U.S. Interior Department was filed last June in federal court in New Orleans, Louisiana.

Some believe that surveys in which ships slowly tow arrays of air guns through the water, firing them every 10 to 12 seconds, reduce whales' eating and keep baby dolphins from bonding with their mothers. Research by the BOEM supposedly found that a moderate amount of "airgun noise" reduced sperm whales' feeding and foraging by an average of 20%, according to one environmental group.

Capitol Hill Ocean Week: Attendees call for action

From how to invest the billions of dollars slated for Gulf Coast restoration to the effects of climate change and how the media covers ocean issues, attendees at the 13th annual Capitol Hill Ocean Week (CHOW) had a lot to say about offshore and coastal ecology.

The 3-day (4 to 6 June) annual gathering in Washington, D.C. addressed lessons learned from Superstorm Sandy and other coastal disasters and emphasized the role of healthy coasts and oceans as the protector of people, communities, and economies.

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

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

Report: Cyber security becoming top concern for energy industry

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

IT security, particularly the threat to companies' operations and energy infrastructure, was a new entrant this year in the list of Top 10 risks to the oil and gas industry.

Alvin undergoes Navy certification tests

The R/V Atlantis left Woods Hole Oceanographic Institution (WHOI) carrying the newly upgraded submersible Alvin for tests off the west coast, marking a major milestone in the sub's \$41 million redesign. Both ship and sub are owned by the U.S. Navy and operated by WHOI for the benefit of the entire U.S. ocean science community.



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

Capital spending jumps despite huge decline in after-tax profits

U.S. oil and gas producers significantly increased exploration, development and acquisition spending in 2012 despite a 58% decline in after-tax profits that was largely driven by low natural gas prices, according to an Ernst & Young U.S. oil and gas reserves study. The study analyses U.S. upstream spending and performance data for the largest 50 companies based on 2012 year-end oil and gas reserve estimates.

Year in Review

LSC remote minehunting system reaches reliability milestone

The Navy successfully concluded the second and final phase of reliability testing of the littoral combat ship (LCS) remote minehunting system (RMS) off the coast of Palm Beach, Florida, 14 June, enabling the service to progress toward developmental testing.

The remote minehunting system, consisting of a semi-submersible remote multi-mission vehicle (RMMV) operating with the AN/AQS-20A variable depth minehunting sonar, was designed to detect, classify, identify and locate bottom and moored mines in shallow and deep water.

Odyssey Marine recovers 1.8 million ounces of silver from shipwreck three miles deep

Odyssey Marine Exploration, pioneers in the field of deep-ocean exploration, has recovered over 61 tons of silver bullion this month from a depth of nearly 3 mi.

This recovery of bullion from the SS Gairsoppa, a 412-ft steel-hulled British cargo ship that sank in February 1941, consists of 1,574 silver ingots weighing about 1,100 ounces each or almost 1.8 million troy ounces in total, sets a new record for the deepest and largest precious metal recovery from a shipwreck. The silver has been transported to a secure facility in the UK.



McDermott to restructure Atlantic operations

McDermott International, Inc. announced that it is substantially consolidating its Atlantic operations and restructuring. The restructuring plan includes the closure of the company's Morgan City fabrication facility and marine base in Louisiana, expected late 2013 or early 2014, once the company has completed existing projects in its current backlog at the yard. The Morgan City yard was originally developed to serve an offshore industry that has changed significantly over the past 50 years. As hydrocarbon production technology has advanced, McDermott's customers have increasingly focused on pursuing reserves in greater water depths. The yard's location and lack of deepwater quayside access are unable to support McDermott customers' project needs.

BOEM conducts first-ever auction for offshore wind site

The U.S. Department of the Interior and Bureau of Ocean Energy Management (BOEM) held the nation's first-ever competitive lease sale for renewable energy in federal waters on 31 July. The provisional winner of the lease sale, which auctioned two leases for a Wind Energy Area of 164,750 acres offshore

Rhode Island and Massachusetts for wind energy development, is Deepwater Wind New England, LLC. When built, these areas could generate enough combined energy to power more than one million homes. The Wind Energy Area is located 9.2 nmi south of the Rhode Island coastline and has the potential to support 3,395 MW of wind generation. BOEM will hold its next competitive lease sale for offshore wind on 4 September, which will auction nearly 112,800 acres offshore Virginia, and is expected to announce additional auctions for Wind Energy Areas offshore Massachusetts, Maryland, and New Jersey later this year and in 2014.

RigNet to acquire Inmarsat's Energy Broadband business

RigNet, Inc. announced a strategic deal with Inmarsat plc involving the sale of Inmarsat's Energy Broadband business to RigNet and the appointment of RigNet to become a key distribution partner to deliver Inmarsat's Global Xpress (GX) and L-band services to the energy sector worldwide.

RigNet has reached a definitive agreement to acquire Inmarsat's Energy Broadband business for \$25 million in cash, adding to RigNet's technology solutions, customer base, and geographic footprint. The business being acquired represents one of the largest pure play providers of remote communications to the oil and gas industry, making it a natural and strategic fit with RigNet's complementary business.

World petroleum use sets record high in 2012 despite area declines

The world's consumption of gasoline, diesel fuel, jet fuel, heating oil, and other petroleum products reached a record high of 88.9 mmbbl/d in 2012, as declining consumption in North America and Europe was more than outpaced by growth in Asia and other regions, according to an updated report compiled by the U.S. Energy Information Administration.

The rapidly industrializing economies of China and India fueled much of Asia's demand increase, growing 2.8 mmbbl/d and 800,000 bbl/d, respectively. If China's use of petroleum continues to grow as projected, it is expected to replace the United States as the world's largest net oil importer this fall.

China poised to become the world's largest net oil importer

The U.S. Energy Information Administration's August 2013 Short-Term Energy Outlook (STEO) forecasts that China's net oil imports will exceed those of the United States by late 2013 on a monthly basis and by 2014 on an annual basis, making China the largest importer of oil in the world.

The imminent emergence of China as the world's largest net oil importer has been driven by steady growth in Chinese demand, increased oil production in the United States, and a flat level of demand for oil in the U.S. market.

Archeological offshore map created of the five D-Day invasion beaches

6 June 2014 represents the 70th anniversary of the WWII D-day invasion. To commemorate this historic event, an expedition took on the monumental task of creating the largest and most accurate continuous archaeological map offshore of the five D-Day invasion beaches.

In just 27 days, 511 sq. km were initially surveyed using the Edgetech 4600 540 khz combined bathymetric and side-scan sonar with over 300 wrecks and obstructions identified. An R2Sonic 2024 700 kHz Ultra High Resolution (UHR) Multibeam Sonar was then used to highlight over 50 sites. During the survey, a SeaBotix ROV and a Deep Sea Power and Light drop camera were used to investigate and identify targets.

U.S. IOOS Summit report released

The Interagency Ocean Observation Committee (IOQC) and the U.S. Integrated Ocean Observing System (IOOS®) have released the U.S. IOOS® Summit Report, a culmination of the work leading up to the IOOS® Summit, held from 13-16 November 2012 in Herndon, Virginia, to assess ocean observing progress over the past decade and to develop plans for the next decade of ocean observations. To better protect life and property, sustain a growing economic vitality, safeguard ecosystems, and advance quality of life for all people, according to over 200 regional, national, and global ocean observing experts, now the U.S. needs a sustained and integrated ocean observing system.

Saab Seaeye acquires Hydro-Lek

Saab Seaeye, a wholly owned subsidiary of defense and security company Saab, has acquired Hydro-Lek Limited, a UK manipulator and tooling manufacturer for underwater vehicles. The acquisition strengthens Saab Seaeye's product portfolio of remotely operated, autonomous, and hybrid underwater vehicles with the ambition to further grow the company. Hydro-Lek is an established supplier of manipulators and tooling for the ROV industry and defense and research industries.

Sonardyne, Liquid Robotics, and NOAA collaborate on ocean observation

In early August off the east coast of America, a team from Sonardyne International Ltd., Liquid Robotics, and the National Oceanic and Atmospheric Administration (NOAA) concluded the second leg of an extensive ocean observation technology demonstration project. Using Sonardyne's Fetch and Tsunami sensor nodes and a Liquid Robotics Wave Glider®, the project was performed in collaboration with MARACOOS (Mid-Atlantic Regional Association Coastal Ocean Observing System) and NOAA National Data Buoy Center (NDBC) and managed by NOAA U.S. Integrated Ocean Observing System (IOOS®) Program Office with the objective to test new, long-endurance ocean observation instruments that have been designed to work in tandem. The results were displayed at the recent MTS/IEEE Oceans 2013 conference and exhibition in San Diego, California.

U.S. Energy Department invests \$16 million to harness wave and tidal energy

The U.S. Energy Department announced \$16 million for 17 projects to help sustainably and efficiently capture energy from waves, tides and currents. Together, these projects will increase the power production and reliability of wave and tidal devices and help gather valuable data on how deployed devices interact with the surrounding environment. Tidal and wave energy is a clean, renewable resource that can be harnessed wherever changing tides, waves or currents move a significant volume of water — including off the coasts of many U.S. cities where there is high electricity demand.

Bluefin acquires SeeByte

Bluefin Robotics, a leading provider of Autonomous Underwater Vehicles, announced that it has acquired SeeByte, Ltd., a leading provider of autonomous platform software that enhances the user experience and the capabilities of underwater sensors, vehicles, and systems. SeeByte, headquartered in Edinburgh, Scotland, will operate as a wholly-owned subsidiary of Bluefin, which is owned by Battelle, a leading independent science and technology organization committed to solving some of the world's toughest challenges in national security, energy, the environment, and healthcare. The combined companies will offer a complete suite of autonomy products for surface and

underwater vehicles, both remotely-operated and unmanned. Together, Bluefin Robotics and SeeByte will have full life-cycle capability from R&D through design and manufacture to field operations and will operate globally in both defense and commercial markets.

Court allows Navy to build undersea training range

A federal appeals court cleared the way for the U.S. Navy to build its Undersea Warfare Training Range off the coast of Georgia and Florida. In August 2009, the U.S. Navy announced that it would construct its Undersea Warfare Training Range near the only known calving ground for the endangered North Atlantic right whale. Right whales gather in the calving ground off southern Georgia and northern Florida each winter through spring to give birth and raise their calves. It is designated as critical habitat for the species of which only 350 to 400 individuals remain.

Huntington Ingalls Industries announces closure of the Gulfport Composite Center of Excellence

Huntington Ingalls Industries (HII) announced the closure of its Gulfport Composite Center of Excellence (the "Gulfport Facility") in Gulfport, Mississippi. Current work being performed at Gulfport is expected to be completed by the end of the first quarter of 2014, with closure expected by May 2014.

India's first indigenous aircraft carrier launched

Amidst chanting of hymns from the Atharva Veda, Vikrant, India's first aircraft carrier, decommissioned on 31 January 1997, was reborn as Smt Elizabeth Antony, wife of the Defence Minister Shri AK Antony, christened India's first Indigenous Aircraft Carrier (IAC) as Vikrant meaning "courageous" or "victorious" in Sanskrit.

Vikrant marks a special feather in indigenous defence capabilities — this being the first-ever aircraft carrier to be designed by the Directorate of Naval Design of the Indian Navy, the first warship to be built by Cochin Shipyard Limited, and the first warship to be built entirely using indigenously produced steel. The construction of the ship is a truly pan Indian effort with active participation of private and public enterprises.



China to invest 80 billion yuan in oil and gas exploration this year

China will invest 80 billion yuan (\$13.07 billion) in oil and gas exploration in 2013, state media reported recently, as it tries to boost energy supplies and reduce its dependence on energy imports.

Gas imports are important to China because domestic production is not sufficient to meet growing demand. Imported gas is delivered via pipeline from Central Asia and by ship from countries such as Australia, Indonesia, and Qatar.

Britain's new gateway to global trade

Britain's new global shipping port welcomes its first scheduled vessel, the 'MOL Caledon' from South Africa. After more than a decade of planning and construction across 3 sq. mi of development, DP World London Gateway deep-sea port is now open, providing British exporters and importers with a more efficient way to ship globally at less cost. London Gateway is located closer to major population centres of London, Birmingham and Manchester than other ports that are capable of handling the world's biggest ships. The new port will reduce transport costs for exporters and importers by reducing millions of trucking miles from supply chains. The port also provides 21st century infrastructure for shipping lines that are building bigger ships. DP World, a leading global port operator with more than 65 marine terminals across six continents, including new developments, built Britain's new port for today's and the next generation of ships. Known as ultra large container ships (ULCS), they are up to 400 m long and can carry over 18,000 shipping containers. The first scheduled ship to dock at the port, operated by MOL Liner, received exports and delivered containers carrying a variety of cargo, including fruit and automotive parts, which will be distributed across the country over the coming days. The MOL Caledon is part of the South African Europe Container Service (SAECS), which is made up of a consortium of shipping lines including MOL, Maersk, DAL and Safmarine.

WOC and the Nautical Institute launch new guide to marine spatial planning for the shipping industry

The World Ocean Council (WOC) and The Nautical Institute (NI) have jointly produced a guide to assist maritime professionals to better understand and engage in Marine Spatial Planning (MSP). The guidance will also help MSP proponents understand shipping industry requirements in relation to management of ocean areas. With this guidance document, "The Shipping Industry and Marine Spatial Planning: A Professional Approach," WOC and the NI are working to ensure that maritime professionals can readily become more informed and involved in MSP, particularly at the local level. The guide provides an introduction to MSP and an overview of key shipping-related issues to be considered as MSP moves forward in various parts of the world. The jointly produced guide identifies each of the main steps involved in a typical MSP process and highlights how the shipping community might participate and offer its expertise. It also contains a number of case studies and annexes, providing useful information on issues such as risk assessment and space needed for maneuvering and collision avoidance.

DNV GL recommends ways to make LNG bunkering safe and efficient

One of the key hurdles to the increased global use of ships fuelled by liquefied natural gas (LNG) is the lack of harmonization of bunkering operations. "DNV GL is therefore launching a Recommended Practice for authorities, LNG bunker suppliers and ship operators which provides guidance on how LNG bunkering can be undertaken in a safe and efficient manner," says Lars Petter Blikom, DNV GL's LNG director. LNG-fuelled ships have logged over 130 ship-years of operation in Norwegian waters and LNG's attractiveness and stability as a fuel have been thoroughly demonstrated. Globally too, operators, suppliers and regulators have gained significant experience in all aspects of LNG-fuelled ship operations in recent years. However, the process for developing the required infrastructure has not been standardized—leaving the industry with many open questions. Currently, 83 LNG-fuelled ships are in operation or on order worldwide. These range from passenger ferries, Coast Guard ships and cargo vessels to tankers and platform supply vessels. Estimates put the global LNG-fuelled fleet at 3,200 by the year 2025. With the EU poised to invest in helping to equip 139 seaports and inland ports with LNG bunker stations by 2025, the time was ripe for standardizing development processes, designs and operations.

New KNRM rescue vessel passes capsize trials



The latest rescue vessel commissioned by the Royal Netherlands Sea Rescue Institution (Koninklijke Nederlandse Redding Maatschappij, KNRM) has passed one of the most important trials it had to pass at Damen Shipyards Group in Gorinchem before being entrusted to its crew. The capsize trials had to show that this youngest generation of rescue vessel is actually capable of righting itself. In four different tests, the rescue vessel righted itself to its normal position within a few seconds of capsizing. A life-saving feature in extreme conditions.

The KNRM's rescue vessels, which have to be deployable in all weather conditions, are being designed to the most rigorous standards. Seakeeping and stability are the most crucial factors in safety. For the crew, however, comfort and user-friendliness are also key features.

This NH1816 19-m long rescue vessel combines all of the technical, ergonomic and operational features the KNRM wanted in a remarkable new design.

The rescue vessel's self-righting capability was created by the vessel's low point of gravity and the air bubble in the wheelhouse, which enable the capsized ship to right itself quickly like a self-righting bath toy. The engines and equipment on board are designed to continue operating even after the vessel has capsized.

In its nearly 200-year history, the KNRM has lost 69 rescuers to drowning. Most of those drownings occurred when rescue rowboats capsized in the first 100 years. The advent of motorized, self-righting rescue vessels not only increased safety, but deployability as well. Nowadays, rescue missions under weather conditions that would have forced rowboats to abandon their mission can simply continue. This means that risks have increased as well.

Since 1990, at least 12 rescue vessels have capsized. Two of them, from Terschelling and Ameland, were examples of the largest category of rescue vessels and were able to handle extremely poor weather conditions. Thanks to their unique features, the rescue vessels were able to continue sailing and bring their crews of volunteers safely back to shore.

After completion, the KNRM will deploy the SAR NH 1816 from IJmuiden, with a permanent captain and an on-call crew. Sailors along the entire coast will carry out trials and familiarize themselves with the vessel.

For more information, visit www.damen.com.

Imtech Marine introduces SeaPilot 76

Imtech Marine introduced the new multifunctional SeaPilot 76. The SeaPilot 76 can be turned into a fully approved combined sea and river pilot and can be connected to both proportional and on/off valves. This makes the modernized Seapilot 76 a good addition to the Sigma-line of Radio Zeeland. The SeaPilot 76 is suitable for the fishing industry as well as inland, coastal and deepsea shipping.

The SeaPilot 76 is designed with clear graphical displays and easy to use control buttons. A large and clear LCD display presents all functions and information in a well-organized way. The pilot complies with the requirements of the Marine Equipment Directive and the Shipping Inspectorate. By connecting a rate of turn indicator and a FU steering handle, the SeaPilot76 becomes an approved riverpilot system. The SeaPilot76 is suitable for different kinds of steering or rudder systems and heading sensors and has an integrated pilot watch alarm output.

The Seapilot 76, as well as its predecessor SeaPilot75, was developed in

close co-operation with Radio Zeeland DMP. The collaboration between Imtech Marine Netherlands (formerly Radio Holland) and Radio Zeeland DMP started 20 years ago. "Our partnership is based on the complementary qualities of the two companies," says Joost Bloemsaat, sales manager at Imtech Marine Netherlands. "Radio Zeeland DMP is well known for the development and production of navigation equipment". Willem Blommaart, CEO of Radio Zeeland DMP, says, "Imtech Marine, and its network of offices and dealers, is an expertised sales and service organization along the main European rivers and global shipping routes."

For more information, visit www.imtech.com.

DLR and AWI test satellite-based methods for improving maritime navigation

The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) is working on a satellite-based system for substantially improving ship navigation in ice-affected waters. The Earth observation satel-

lites TerraSAR-X and TanDEM-X provide the high-resolution images needed to make this possible. Scientists from the Alfred Wegener Institute (AWI)—the Helmholtz Centre for Polar and Marine Research based in Bremerhaven—are currently on their way to Antarctica on board the research vessel Polarstern to test the practicality of this technique.

The decline of Arctic sea ice during the summer period will open new routes for the shipping sector, permitting the development of fossil fuel resources and also cutting the travel time for navigation by commercial vessels. But the risks presented by these new maritime routes are high; freezing temperatures, storms and icebergs pose a challenge for both crews and ships. In the event of an emergency situation, search and rescue missions would be significantly set back by the lack of marine infrastructure in these regions. In addition, there is insufficient real-time data that ships could use for navigating through polar oceans.

DLR is developing satellite-based systems geared towards enhancing safety along maritime routes. They are based on high-resolution images provided by the radar satellites TerraSAR-X

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and TanDEM-X. The satellites transmit the images directly to the DLR ground station in Neustrelitz where they are processed in near real time. "We are developing a suitable processing chain," says Egbert Schwarz from the Real-Time Data Center at the DLR site in Neustrelitz. An algorithm developed at the DLR research center in Bremen automatically analyzes the data for the presence of ships. "The integrated solution includes a fully automated delivery system that sends the data products directly to the ship after processing. It also classifies icebergs and marks them as potential hazards," Schwarz adds.

For more information, visit www.awi.de.

Sea School Alabama unveils their new NAUTIS Full-Mission Bridge Simulator

Sea School Mobile, part of Ocean and Coastwise Educational Services Inc. family, located in Bayou La Batre has just acquired a NAUTIS Full-Mission Bridge Simulator and Instructor Station to enhance the training curriculum for its maritime students. The NAUTIS simulator is being installed by VSTEP and its U.S partner,

Annapolis Simulation.

Sea School's new DNV Class B certified NAUTIS Full-Mission Bridge Simulator features a 180° external view angle, which exceeds the minimum 120° exterior view angle required for DNV Class B simulators. This simulator allows Sea School to now offer the highest quality of competency training, including Advanced ship handling & maneuvering, ECDIS Model Course 1.27, Radar/ARPA Model Course 1.07, VHF Radio Communications, Navigational Instruments (GPS, AIS, Echo Sounder, and Speed Log), and GMDSS Radio Communications Model Course 1.26.

For more information, visit www.seaschool.com.

DeepOcean charters new build SURF installation vessel

DeepOcean AS, a subsidiary of DeepOcean Group Holding BV, has entered into a 5.5 year charter agreement starting March 2016 for a new build installation vessel. This key enabler will enhance DeepOcean's current service offerings in the SURF (Subsea Umbilicals Risers & Flowlines) segment in the Greater North Sea area.

The new vessel will be owned by Østensjø Rederi and is of SALT 304 design. Key vessel dimensions are a length of 149.8 m, a width of 27 m, and 2,300 sq. m of total deck space. The vessel is specially designed and equipped to suit the Greater North Sea market with the fuel-saving environmentally friendly Siemens BlueDrive PlusC propulsion control technology and DP3 positioning system. The mission equipment will be a 150T dual tensioner vertical lay system and a 3,000-ton carousel situated below deck.

The 400-tons active heave compensated knuckle boom main crane has extended reach and can lift 600 tons in double fall mode. The accommodation facilities will have a capacity of 140 persons.

For more information, visit www.deepoceangroup.com.



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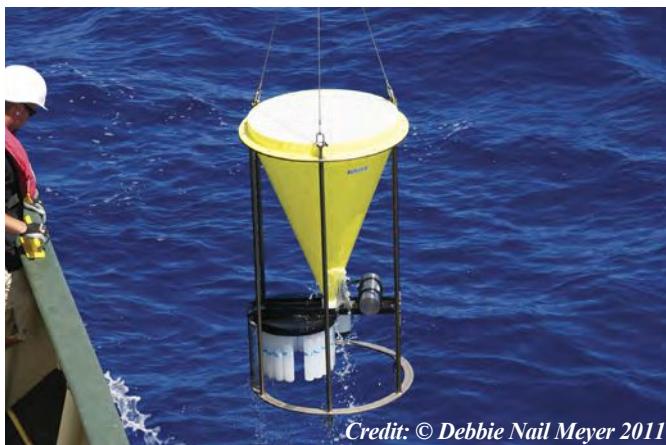
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Ocean acidification may increase 170% this century

In a major new international report, experts conclude that the acidity of the world's ocean may increase by around 170% by the end of the century, bringing significant economic losses. People who rely on the ocean's ecosystem services—often in developing countries - are especially vulnerable. A group of experts have agreed on 'levels of confidence' in relation to ocean acidification statements summarizing the state of knowledge. The summary was led by the International Geosphere-Biosphere Programme and results from the world's largest gathering of experts on ocean acidification ever convened. The Third Symposium on the Ocean in a High CO₂ World was held in Monterey, California (September 2012) and attended by 540 experts from 37 countries. The summary will be launched at the UNFCCC climate negotiations in Warsaw, 18 November, for the benefit of policymakers. Experts conclude that marine ecosystems and biodiversity are likely to change as a result of ocean acidification, with far-reaching consequences for society. Economic losses from declines in shellfish aquaculture and the degradation of tropical coral reefs may be substantial owing to the sensitivity of molluscs and corals to ocean acidification. One outcome emphasized by experts is that if society continues on the current high emissions trajectory, cold water coral reefs, located in the deep sea, may be unsustainable and tropical coral reef erosion is likely to outpace reef building this century. However, significant emissions reductions to meet the two-degree target by 2100 could ensure that half of surface waters presently occupied by tropical coral reefs remain favorable for their growth. The summary for policymakers is published by the International Geosphere Biosphere Programme, one of the sponsors of the symposium that was organized by the Scientific Committee on Oceanic Research, IGBP and the Intergovernmental Oceanographic Commission of UNESCO.

CSA GeoSpatial Services maps the environmental sensitivity index of shorelines in the Eastern Mediterranean Sea

CSA Ocean Sciences Inc. (CSA) GeoSpatial Services (GS) Business Line is using remote sensing and Geographic Information System (GIS) technology to map shoreline sensitivity to oil spills in the eastern Mediterranean Sea. The Environmental Sensitivity Index (ESI) is a widely used system for ranking and classifying shoreline sensitivity based on characteristics such as degree of wave energy, potential penetration of oil into the substrate, and natural oil retention times of the shore type. This type of information is crucial to mitigate the potential impact of an oil spill. With increased offshore energy exploration and development activities in the eastern Mediterranean, shorelines in this region are increasingly at risk of exposure to oil spills and other incidents. The challenges of security and accessibility in these countries makes traditional approaches of aerial and ground surveys difficult, particularly for the considerable length of these Mediterranean shorelines. CSA GS has developed a technique to acquire, examine, and interpret high-resolution, geo-referenced satellite imagery and assign ESI Shore Types to digital shoreline segments in GIS. The technique can be applied to any shoreline in the world for which an understanding of coastal environments is of interest. Because the work occurs within the spatial framework of GIS, it enables the integration of other layers of spatial data such as sensitive resources, oil spill model trajectories, environmental sampling designs, and response plans. Once integrated into GIS, the shoreline classifications can also be made available online through a secure, web-accessible GeoPortal that is designed and operated by CSA, without the need for third-party web publishing. Keith VanGraafeiland, Manager of the CSA GeoSpatial Services Business Line, offers, "CSA has previously completed ESI Shore Type mapping in the eastern Mediterranean as part of an Environmental Baseline Survey and Environmental Impact Assessment conducted for oil and gas interests. CSA GeoSpatial Services has plans to expand the analysis to benefit other countries in the region, and potentially in other parts of the world."

Feast and famine on the abyssal plain

Credit: © Debbie Nail Meyer 2011

Animals living on the abyssal plains, miles below the ocean surface, don't usually get much to eat. Their main source of food is "marine snow" — a slow drift of mucus, fecal pellets, and body parts — that sinks down from the surface waters. However, researchers have long been puzzled by the fact that, over the long term, the steady fall of marine snow cannot account for all the food consumed by animals and microbes living in the sediment. A new paper by MBARI researcher Ken Smith and his colleagues shows that population booms of algae or animals near the sea surface can sometimes result in huge pulses of organic material sinking to the deep seafloor. In a few weeks, such deep-sea "feasts" can deliver as much food to deep-sea animals as would normally arrive over years or even decades of typical marine snow.

For over 20 years, Smith and his fellow researchers have studied animals living on the abyssal plain at Station M — a deep-sea research site about 220 km (140 mi) off the Central California coast. The muddy seafloor at Station M—4,000 m (13,100 ft) below the surface — is home to a variety of deep-sea animals, from sea cucumbers and sea urchins to grenadier fish. In addition, a myriad of smaller animals and microbes live buried within the mud.

Researchers have long wondered how all these animals and microbes get enough food to survive. The slow trickle of marine snow sinking down from above does not provide nearly enough food to support all the organisms that live down there. However, in a new paper in the Proceedings of the National Academy of Sciences, Smith and his co-authors show that occasional feasts could provide enough food to support deep-sea communities for years at a time.

Smith and his colleagues used several instruments to study the amount of marine snow arriving at Station M, as well as its impacts on life in the deep. They suspended conical "sediment traps" above the seafloor to collect and measure the amount of marine snow falling through the water. They also used automated camera systems to take time-lapse photographs of the seafloor. This allowed them to track the behavior, numbers, and sizes of larger deep-sea animals such as sea cucumbers. Finally, they used a seafloor-crawling robot, the Benthic Rover, to measure the amount of oxygen being consumed by animals and microbes in the sediment. Such oxygen measurements allowed the researchers to estimate how much food these organisms were consuming.

For more information, visit www.mbari.org.

Marine Conservation Institute announces the Global Ocean Refuge System

The Marine Conservation Institute announced the Global Ocean Refuge System (GLORES), a comprehensive science-based strategy for advancing marine protected areas worldwide. Oceans are essential to human survival and prosperity, and yet human activities are pushing many critical marine species toward extinction. Marine protected areas are generally recognized as the best way to protect the diversity and abundance of the oceans' ecosystems, yet less than 2% of the oceans' area is now protected. Progress in establishing effective marine protected areas has been hampered by lack of agreement on protection levels needed to meet conservation goals and lack of clarity on how well existing sites are protected. GLORES (pronounced glôr-ees) will develop and manage objective criteria that incentivize and accelerate the creation of strongly protected marine areas.

In the first phase, Marine Conservation Institute will gather and incorporate the best thinking of marine

biologists, oceanographers, fisheries scientists, geographers, economists, market researchers, business people and others to create the GLORES criteria. Existing and proposed marine protected areas will then receive one of three different grades: Gold, Silver or Bronze Global Ocean Refuge status or no status if they do not meet a minimum standard. Increases in international prestige, economic return and access to funding will be the incentives for meeting the criteria.

For more information, visit www.marine-conservation.org.

NSF awards grant to measure changes in ocean circulation

Oceanographers from University of Miami, Duke University, and the Woods Hole Oceanographic Institution have received \$16 million in grants from the National Science Foundation to deploy a new observing system in the subpolar region of the North Atlantic. The observing system will measure the ocean's overturning circulation, a key component of the global climate system.

The 5-year initiative is part of the \$32 million, U.S.-led Overturning in the

Subpolar North Atlantic Program (OSNAP). International collaborators include scientists from Canada, the United Kingdom, Germany, France and the Netherlands.

The overall goal of the program is to simultaneously measure the surface ocean currents that carry heat northward toward the Arctic Ocean and the deep ocean currents that carry cooler waters southward toward the equator. Together, these currents form the overturning circulation that plays a role in redistributing heat from the equator to the poles. Recent modeling studies have shown a change in strength in this circulation would have a critical impact on temperatures and precipitation in North America, Europe and Africa.

In addition, the OSNAP array affords the opportunity to study how overturning changes impact the environment. OSNAP measurements will facilitate the study of how changes in the northward flow of warm water affects the reduction of Arctic sea ice and the shrinking of the Greenland Ice Sheet.

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

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Electrical engineering graduate students Hovannes Kulhandjian and Zahed Hossain in the lab (boat) of Tommaso Melodia's WINES Lab Research on Lake Erie. Photographer: Douglas Levere

are both doctoral candidates in his lab, dropped two, 40-lb sensors into the water. Kulhandjian typed a command into a laptop. Seconds later, a series of high-pitched chirps ricocheted off a nearby concrete wall, an indication that the test worked.

Funded by the National Science Foundation, the project is a collaborative effort that includes UB researchers Stella N. Batalama and Dimitris A. Pados, professors of electrical engineering; Weifeng Su, associate professor of electrical engineering; and Joseph Atkinson, professor of environmental engineering.

For more information, visit www.buffalo.edu.

International community fails to protect marine life in Antarctic

A meeting of 24 countries and the European Union has failed to designate vitally needed marine reserves in Antarctica's Ross Sea, one of the world's most significant, fragile, and beautiful ocean environments.

This was a third attempt since 2012 by the Commission for the Conservation of Antarctic Marine Living Resources, or CCAMLR, to protect large areas in the Southern Ocean. The proposals will be reconsidered at CCAMLR's 2014 annual meeting next October.

Andrea Kavanagh, director of The Pew Charitable Trusts' Southern Ocean sanctuaries project, expressed disappointment at the outcome.

"Protecting the Southern Ocean has far-reaching consequences for the world's oceans and all those who rely on them for food, jobs, and a multitude of other services. Three-quarters of all marine life is maintained by a Southern Ocean current that pulls nutrient-rich waters from the deep ocean to the surface and then around the world."

For more information, visit www.pewenvironment.org.

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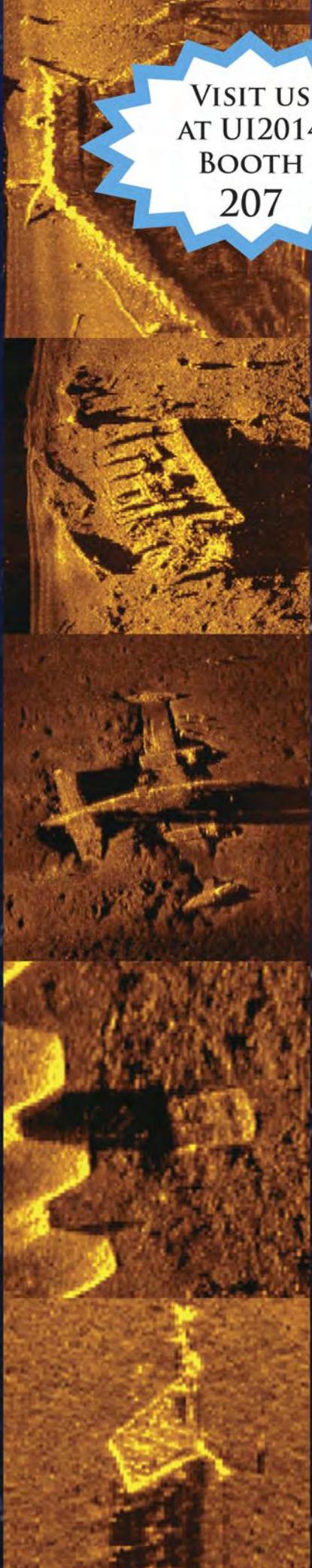
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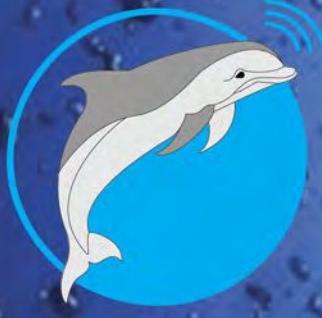
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Perth wave energy project foundation manufacture complete

Carnegie Wave Energy Limited has announced that the manufacture of the pile foundations for the Perth Project is complete. Keppel Prince Engineering Ltd, who was awarded the contract to supply and fabricate the materials for the structural pile foundations in July 2013, has completed the manufacture of these items. The installation of the pile foundations is on track and scheduled for the fourth quarter of 2013. Carnegie's installation contractor, Fugro Seacore (Australia) has also now confirmed the safe arrival of the foundation installation vessel, the Ensung – a self-elevating platform – to the Australian Maritime Complex (AMC) in Henderson, Western Australia. The Ensung will be fitted out over the coming weeks in preparation for the foundation installation. Additionally, Carnegie has received payments totaling \$387,810 from the Western Australian and Australian Federal Governments for the completion of foundation milestone 4a under its LEED and ARENA grants, respectively.

Areva, Entrepose and Foure Lagadec sign offshore wind agreement

AREVA, Entrepose Projets, a subsidiary of Entrepose Contracting, and Fouré Lagadec have signed an industrial partnership agreement for the manufacturing of AREVA's offshore turbine masts destined for the future offshore wind farms in France and in the south of United Kingdom. Already selected in 2012 for the Saint-Brieuc Bay offshore park, AREVA is currently part of the GDF Suez-EDPR-Neoen Marine consortium for the tender of the Tréport and Noirmoutier-Yeu offshore wind farms. Under the terms of this agreement, Entrepose Projets will manufacture, through CMP Dunkerque, its subsidiary specialized in high-technology welding located in Dunkirk, the two upper part sections of the turbine mast. Fouré Lagadec, a company based in Le Havre, will manufacture the lower section of those masts, made possible by an investment of several million euros in new industrial equipment. This agreement will create almost 200 jobs and will support the long-term establishment of the offshore wind sector in France through the development of industrial expertise in the regions of Haute Normandie and Nord-Pas-de-Calais.

Vestas receives 129-MW order for Dutch offshore wind project

Vestas will supply 43 V112-3.0 MW offshore turbines for the Eneco Luchterduinen offshore wind farm off the coast of The Netherlands. Eneco Luchterduinen is owned by Dutch energy company Eneco and Mitsubishi Corporation. Construction of the project will begin in July 2014. The partnership behind the Eneco Luchterduinen offshore wind farm has placed an order for 43 V112-3.0 MW wind turbines for the offshore wind farm. The order with a total capacity of 129 MW includes supply, installation and commissioning of the turbines as well as a 15-year full-scope AOM 5000 service and maintenance agreement. The Eneco Luchterduinen offshore wind farm will be located 23 km off the coast between the cities of Zandvoort and Noordwijk. The construction of the project will begin in summer 2014 and will be completed in 2015. When completed, Eneco Luchterduinen will generate green electricity for almost 150,000 households. The announcement confirms that the partnership behind the Eneco Luchterduinen project consisting of Eneco and Mitsubishi Corporation is moving ahead fast with its plans to build a secure, affordable and sustainable future energy supply for The Netherlands. Adding to the competitive business case for the V112-3.0 MW for offshore, the turbines for the Eneco Luchterduinen project will utilize Vestas' innovative pre-assembly concept. At Vestas' pre-assembly facility at the port of Esbjerg, Denmark, the 43 turbines will be pre-assembled and pre-commissioned onshore before being shipped directly to the Eneco Luchterduinen offshore wind farm. This marshalling concept significantly lowers the cost of offshore wind energy because it reduces unnecessary transport of turbine components overland and avoids commissioning hours while at sea.

Alstom's 6 MW Haliade offshore wind turbine loaded at Ostend



Courtesy of the Port of Ostend

The various components of Alstom's 6-MW offshore wind turbine, currently one of the most powerful on the market, are in the process of being loaded onto the liftboat or self-elevating wind turbine installation and crane unit, "Bold Tern," in the port of Ostend, Belgium. The vessel, owned by Fred Olsen Windcarrier, specialists in the transport and installation of offshore wind turbines, will then carry out its installation in the Belwind wind park, 45 km off the Ostend coast.

It is because of the exceptional dimensions of its new 6-MW offshore wind turbine that Alstom has contracted the services of the latest generation of liftboats. With its 73.5-m long blades, the rotor has a diameter of 150 m.

Built in 2012, the Bold Tern entered into service with Fred Olsen Windcarrier in February 2013 to manage the installation of the newest offshore wind turbines. In addition to its open deck area of 3,200 sq. m the vessel is equipped with extremely robust cranes to cope with loading 800-ton components as the ship is at sea. The Bold Tern is equipped with a DP2 dynamic positioning system for increased safety. These specific features enable the vessel to cope with challenging weather conditions.

The 6-MW Haliade 150 is adapted to sites where the wind reference speed is 50 m/s (average over 10 minutes) and with gusts that could reach 70 m/s (average over 3 s), in other words, the highest speed registered over the past 50 years.

For more information, visit www.alstom.com.

Chile to develop marine energy pilot programs with IDB support

Chile will launch two marine energy pilots on the southern coast of the country, an initiative that aims at supporting the development of this energy source, contributing to foster the country's energy security and the diversification of its economy. The initiative will explore the potential of this clean technology, which so far has not been utilized in Chile and that, according to a study commissioned by the Inter-American Development Bank (IDB), could have a significant impact on the country's energy matrix if only a small amount of the available resource is used.

The project, funded by a \$2.95 million technical cooperation grant from the Inter-American Development Bank, includes \$2.4 million in investment funding for two pilot programs. The first pilot will focus on tidal energy while the second will use the power generated by waves. The investment funding will be complemented by a total of \$550,000 in technical support to accompany the implementation of these pilot programs.

"In terms of energy needs, Chile is the second least self-sufficient country in Latin America after Panama, and currently imports 75% of its energy resources. So far, the potential of tidal and wave power has not been used in the country or elsewhere in Latin America, but has a huge potential," said Christoph Tagwerker, consultant at the Climate Change and Sustainability Division of the IDB. "Chile now has a great opportunity to change its dependency on foreign energy and to reduce their greenhouse gas emissions. In fact, it is one of the countries with the highest marine and solar energy resources of the Latin American region."

Two companies that will be selected by the Chilean Government will benefit from this technical cooperation and will be responsible for the design, construction and operation of these pilot programs. Since tidal and wave energy are new in Chile, the IDB will provide technical assistance to the government throughout the entire execution of the program, from the bidding process to the operation of these new marine energy facilities. The Bank's contribution is expected to help attract the participation of other sources of financing to the program.

For more information, visit www.iadb.org.

Alstom teams up with GDF Suez to equip tidal power pilot farm

Alstom and GDF Suez will prepare a common project to respond to the call for expressions of interest for pilot tidal farms announced by the French President, François Hollande in Cherbourg. Jérôme Pécrèsse, Alstom's renewable power president and Gérard Mestrallet, CEO of GDF Suez, signed a cooperation agreement concerning this, in the Lower Normandy Region in France.

As part of this cooperation, Alstom and GDF Suez will establish the various technical parameters to effectively harness the marine currents at the raz Blanchard site where the pilot farms will be installed, near the port of Cherbourg coast. The partners will also

propose an operation and maintenance strategy for the pilot farm, as well as a roadmap to maximize the positive socio-economic benefits of this new activity throughout the region and the country. This is an important step to support the development of larger commercial farms.

Alstom is successfully testing its 1-MW tidal turbine under EMEC waters, off Scotland's Orkney Islands. The turbine has reached the full nominal

power of 1 MW, generating over 10 MWh of electricity on the grid. Trials performed in pilot farms will test the performance of the turbine under real operating conditions.

Alstom also announced an agreement with Ports Normands Associés (PNA) that could allow the Group to perform the final assembly of the turbines, the erection of the foundations and all maintenance operations from Cherbourg, if it is awarded the raz

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Blanchard pilot farms. The port offers many benefits, including, in particular, a development plan covering 40 hectares for infrastructure devoted to tidal power as well as the proximity of the raz Blanchard site and the British coastline, which represents a substantial potential market.

For more information, visit www.alstom.com

Vestas, Mitsubishi Heavy Industries join on offshore wind energy

Vestas Wind Systems A/S and Mitsubishi Heavy Industries Ltd. (MHI) have agreed to form a joint venture dedicated to offshore wind energy.

The JV will combine Vestas' and MHI's current capabilities within off-

shore wind turbines. Vestas will transfer the development of the V164-8.0 MW, the V112 offshore order book, existing offshore service contracts and approx 300 employees to the JV. MHI will inject EUR 100 million in cash into the JV and will inject another EUR 200 million based on certain milestone achievements reflecting the natural early product life cycle of the V164 turbine. As part of the JV, it has been agreed between the parties that Vestas is contracted by the JV to finalize the planned development of the V164-8.0 MW on behalf of the JV. In addition, Vestas and MHI will provide various services to the JV. The JV will start its business with the current V112 offshore and the V164-8.0 MW turbines. At a later stage, the JV will explore the possibilities of integrating the MHI hydraulic DDT technology into the 8-MW platform that would make the JV positioned to offer a product line-up variety that best suits customer demands.

Leveraging on the respective strengths of each organization, the JV will be well positioned to win an expanding share of the offshore wind

turbine market and become a global leader in this attractive and high-growth market; with Vestas' comprehensive technological capabilities and long-standing track record within the overall wind power market and the offshore wind segment specifically as well as MHI's strong and long-standing presence in global power markets and related technologies, the JV will benefit from significant synergies.

The head office of the JV will be located in Aarhus, Denmark, from where the company will handle all aspects from design, further development, procurement and manufacturing related to the V164-8.0 MW turbine as well as all marketing, sales and after-sales service related to offshore wind. Vestas will continue to manufacture and supply the V112 turbines that the JV will offer for offshore projects.

The transaction is subject to customary closing conditions, including approval from relevant competition authorities in Europe and Asia and closing is expected to take place around the end of March 2014.

For more information, visit www.vestas.com.

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Huntington Ingalls awarded work for submarines

Huntington Ingalls Inc., Newport News, Virginia, was awarded a \$155,682,919 modification to previously awarded contract (N00024-10-C-2102) for engineering, technical, design, configuration management, Integrated Logistics Support, database management, research and development, modernization, trade and industrial support for nuclear submarines. Work will be performed in Newport News, Virginia and is expected to be completed by September 2014. Fiscal 2012 and 2013 other procurement, Navy and working capital funds in the amount of \$560,635 were obligated at time of award. Contract funds in the amount of \$63,263,861 expired at the end of fiscal year 2013. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Lockheed Martin awarded \$95M

Lockheed Martin Mission Systems and Training, Syracuse, New York, was awarded a \$95,727,501 modification to previously awarded contract (N00024-07-C-5201) for definitization of the Navy's FY12 AN/SQQ-89A(V)15 Surface Ship Undersea Warfare System production requirements and exercise of Fiscal 2013 production options. The AN/SQQ-89A(V)15 is a surface ship combat system with the capabilities to search, detect, classify, localize and track undersea contacts and to engage and evade submarines, mine-like small objects, and torpedo threats. Work will be performed in Lemont Furnace, Pennsylvania (56%), Syracuse, New York (23%), Clearwater, Florida (14%), and Owego, New York (7%), and is expected to be completed by December 2015. The Naval Sea Systems Command, Washington Navy Yard, D.C. is the contracting activity.

General Dynamics receives \$18M for submarine planning services

The U.S. Navy has awarded General Dynamics Electric Boat an \$18.2 million contract modification to perform reactor-plant planning yard services for nuclear submarines and support yard services for moored training ships. Electric Boat is a wholly owned subsidiary of General Dynamics. Initially awarded in November 2011, the contract has a potential cumulative value of \$121.2 million through 2016 if all options are exercised. Most of the work will be performed in Groton, with the remainder taking place in Charleston, South Carolina, where the moored training ships are based. The submarine North Dakota is the 11th ship of the Virginia class, the first U.S. Navy combatants designed for the post-Cold War era. Unobtrusive, non-provocative and connected with land, air, sea and space-based assets, North Dakota and the other Virginia-class submarines are equipped to wage multi-dimensional warfare around the globe, providing the Navy with continued dominance in coastal waters or the open ocean. This work will engage Electric Boat's engineering and design organization, which comprises more than 4,000 employees. Possessing proven technical capabilities, these employees work on all facets of the submarine lifecycle, from concept formulation and design through construction, maintenance and modernization, and eventually to inactivation and disposal.

OSI Maritime Systems signs contract to provide a portable warship-AIS and situational awareness system

OSI Maritime Systems Ltd. (OSI) is pleased to announce that it has signed a contract to provide a Portable Warship-AIS and situational awareness system for immediate deployment across the entire UK submarine flotilla. According to the terms of this contract, OSI will provide a portable system that will allow a submarine to benefit from the AIS picture as well as providing an advanced situational awareness and navigation system deployable in the conning tower of all UK submarines. OSI has been supporting the UK Royal Navy warship integrated navigation system requirements since 2005, and this recent contract confirms their on-going commitment to the company's technology.

First Zumwalt class destroyer launched

General Dynamics Bath Iron Works successfully launched the Navy's first Zumwalt-class destroyer at their Bath, Maine shipyard.

The future USS Zumwalt (DDG 1000) will be the lead ship of the Navy's newest destroyer class, designed for littoral operations and land attack.

The ship began its translation from Bath Iron Works' land-level construction facility to a floating dry dock. Once loaded into the dry dock, the dock was flooded and the ship was removed from its specially designed cradle and the ship was floated off and tied to a pier on the Kennebec River.

Construction began on DDG 1000 in February 2009, and the Navy and its industry partners have worked to mature the ship's design and ready their industrial facilities to build this advanced surface combatant. Zumwalt is currently more than 87% complete, and the shipbuilder will continue remaining construction work on the hull prior to planned delivery late next year.

Because of the complexity of the first-of-class ship, the Navy will perform a two-phase delivery process. Bath Iron Works will deliver the ship itself to the Navy in late 2014. Upon delivery, the Navy will then conduct combat systems activation, tests and trials, to include multiple underway periods. The ship is expected to reach its initial operating capability in 2016.

The ship, the first of three Zumwalt-class destroyers, will provide independent forward presence and deterrence, support special operations forces and operate as part of joint and combined expeditionary forces. The Navy has incorporated many new technologies into the ship's unique tumblehome hull, including an all-electric integrated power system and an Advanced Gun System designed to fire rocket-powered, precision projectiles 63 nmi.

The shape of the superstructure and the arrangement of its antennas significantly reduce the ship's radar cross section, making the ship less visible to enemy radar at sea. The design also allows for optimal manning with a standard crew size of 130 and an aviation detachment of 28 sailors thereby decreasing lifecycle operations and support costs.

The lead ship and class are named in honor of former Chief of Naval Operations Adm. Elmo R. "Bud" Zumwalt Jr., who served as chief of naval operations from 1970 to 1974.

For more information, visit www.navy.mil.

National Security Cutter Hamilton christened

Huntington Ingalls Industries' Ingalls Shipbuilding division christened the National Security Cutter (NSC) Hamilton (WMSL 753) in front of nearly 1,000 guests. Hamilton is the fourth NSC Ingalls has built for the U.S. Coast Guard.

The ship is named in honor of Alexander Hamilton, who is credited with establishing the Revenue Cutter Service, the forerunner of today's U.S. Coast Guard. It is the third Coast Guard cutter to bear the name Hamilton.

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

NSCs are the flagship of the Coast Guard's cutter fleet, designed to replace the 378-ft Hamilton-class High-Endurance Cutters, which entered service during the 1960s. Ingalls has delivered three and has three more under construction, including Hamilton. Keel laying for Ingalls' fifth NSC, James (WMSL 754), took place on 17 May.

The Legend-class NSC is capable of



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

For more information, visit www.huntingtingalls.com.

Northrop Grumman to supply polar ice breaker navigation support

Northrop Grumman Corporation has been awarded a service contract for navigation systems and software to support the polar ice breakers for the U.S. Coast Guard.

The \$5 million, 5-year contract covers support for two Coast Guard vessels, the Polar Star and the Healy. These polar ice breakers are used to clear pathways for supply ships and support research missions. Northrop Grumman has provided comparable support for the Coast Guard's polar ice breakers since 1999.

Northrop Grumman will supply hardware configuration management, remote technical support and training classes. The company will also participate in the maintenance "grooms" performed on the two ice breakers prior to each polar deployment. This will include tuning integrated bridge system (IBS) equipment, upgrading autopilots, adjusting tolerances, improving software and replacing parts as needed for maximum system performance.

For more information, visit www.northropgrumman.com.

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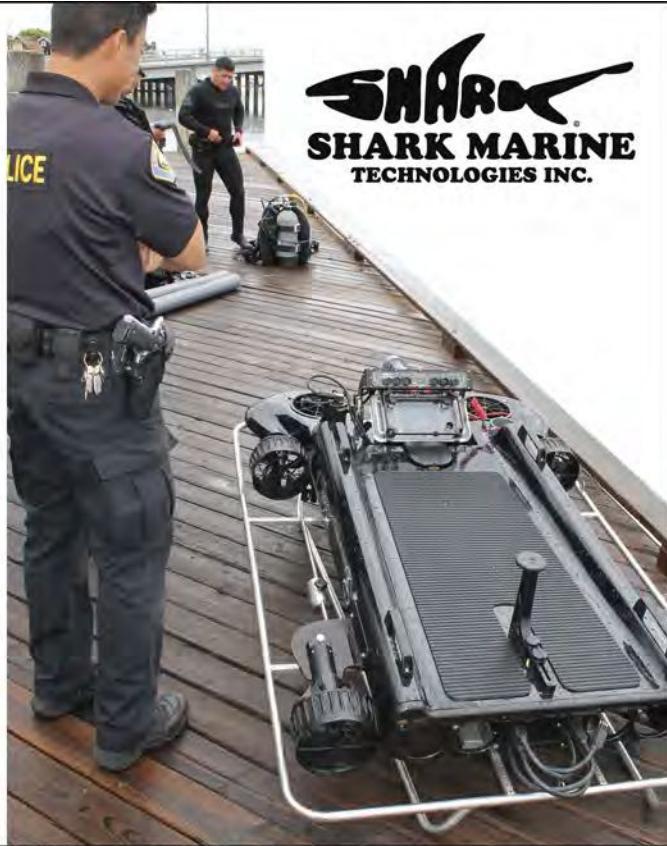
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Kongsberg Defence Systems to supply One Shot Mine Disposal Weapon System

Kongsberg Defence Systems has signed a contract for supply of the MINESNIPER Mk III One Shot Mine Disposal Weapon System to the Royal Norwegian Navy. The contract was won in an international competition and made between the Norwegian Defence Logistics Organisation and Kongsberg, represented by the Naval Systems & Surveillance division.



The MINESNIPER Mk III System will support the needs of the Armed Forces by introducing new and flexible capabilities for inspection and disarmament of Sea-Mines in the Royal Norwegian Navy. The System consists of a number of MINESNIPER Mk III combat vehicles, inspection/training vehicles, logistics, and services for integration into the Command and Control

System on-board the Navy's six Mine Countermeasure Vessels (MCMV).

For more information, visit www.kongsberg.com.

Bluefin and NRL complete long-endurance UUV mission

Bluefin Robotics, a leading provider of Unmanned Underwater Vehicles (UUVs), announced that the company, in support of the Naval Research Laboratory (NRL), has successfully completed a long-endurance UUV mission from Boston to New York totaling over 100 hrs with NRL's Reliant "Heavyweight" UUV. The multi-day mission exercised UUV autonomy methods and demonstrated the capability of a high-capacity energy configuration. Further, the endurance test was designed to push the boundaries of traditional UUVs with the objective to uncover the challenges and requirements for significantly extending UUV endurance for new applications. The exercise is part of a series to support NRL's research in UUV-based technology for the US Navy.

Reliant is an advanced version of the

Bluefin-21 vehicle and, when equipped with a Low Frequency Broadband (LFBB) sonar payload, is the prototype SMCM UUV Knifefish system for the U.S. Navy. The vehicle navigates using a fiber-optic gyro-based INS along with supplemental data from a GPS and a Doppler Velocity Log (DVL) to enable precise navigation underwater for long-endurance missions. Reliant utilizes Bluefin's modular vehicle design that enabled the team to easily remove the payload section and add additional energy sections increasing the system's energy capacity to nearly 40 kWh of power.

The team mobilized the vehicle on the Boston Harbor Cruise's M/V Matthew J. Hughes and deployed it outside Boston Harbor. To optimize for endurance and range, the vehicle traveled at an average speed of 2.5 kts at 10 m water depth, resurfacing every 20 km for navigation updates over GPS. Team members on M/V Matthew J. Hughes and onshore were able to receive vehicle status information over the Iridium satellite system.

For more information, visit www.bluefinrobotics.com.

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THE FULL PICTURE



Harkand set to become a leading global name in subsea inspection, repair, maintenance (IRM) and light construction for the oil and gas industry worldwide.

Harkand is one of the few IRM world players able to provide clients with a true one-stop shop service including engineering, project management, ROV services, diving, survey and operating a fleet of high-quality offshore support vessels.

With many assets now operating beyond their design life, these mature oil provinces need regular IRM to sustain themselves. While the major, more established companies will continue with the construction and the installation of subsea infrastructure, Harkand can offer a bespoke service-orientated approach, proactively addressing light construction and IRM at different stages of field life.

Harkand was launched in February 2013 through the merger of Iremis, Integrated Subsea Services (ISS), and Andrews Survey. The latest acquisition of Veolia Marine Services in August 2013 brings the group close to 1,000 people across the globe in Houston, Aberdeen, Dubai, Singapore, Perth, Paris, and London. Harkand is working on projects in the Gulf of Mexico, North Sea, Brazil, West Africa, India, the Caspian, Australia, and Southeast Asia.

The Harkand global fleet is currently made up of the diving support vessel Swordfish, two new generation DSVs (the Harkand Atlantis and Harkand Da Vinci), two DP3 multipurpose support vessels (Normand Pacific and Viking Poseidon), and versatile DP2 multi-purpose support vessels (Loch Roag and Relume). Earlier this year, the latest ROV support vessel Harkand Harmony was christened in Singapore. The company's 30-plus modern work-class and inspection ROVs are suited for shallow water, platform-based support through to ultra-deepwater intervention off our state-of-the-art support vessels. Harkand also has a fleet of six mobile air diving systems, three systems of which are zone rated and suitable for use on oil and gas production facilities.

By bringing together Harkand's fleet of vessels and ROV and diving services as well as Harkand Andrews Survey's capabilities, the company can ensure its service is enabled by its fleet rather than being driven by availability of vessels, providing a truly flexible service to the major subsea construction players, especially as projects increase in scale and move into harsher environments. Harkand North America has been focusing on deepwater activities for clients such as BP, Chevron, Petrobras, BHP Billiton, and Hess.

Driven by its team of highly experienced personnel, Harkand successfully executes the most complicated subsea light construction projects. Company chairman Tom Ehret recently appointed John Reed as CEO. David Kerr is managing director Europe, Ashit Jain is managing director of Harkand North America, and Frédéric Fumey is managing director of Africa/Asia Pacific. Harkand Andrews Survey's global managing director is Stuart Reid.

The company's proven track record in subsea contracting, its experienced and motivated staff, quality equipment and HSEQ accreditations combine to make it one of only a few companies with the resources and know-how to meet the challenges now and in the future.



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OFFSHORE INDUSTRY

Voters strongly support offshore drilling in the U.S., polls show

Sixty-seven percent of U.S. voters nationwide support offshore drilling for domestic oil and natural gas resources, according to a recent poll conducted by Harris Interactive for the American Petroleum Institute's "What America is Thinking on Energy Issues" series. This support bridged party lines, with clear majorities of Republicans (79%), Democrats (57%) and Independents (67%) all supporting offshore drilling.



Erik Milito

Milito, director of upstream and industry operations for API. "Our country is now firmly positioned as an energy superpower, and most Americans want our nation to seize opportunities to build upon that status."

Four state-specific polls showed similar levels of support for offshore oil and natural gas development in Virginia (67%), North Carolina (65%), South Carolina (77%), and Florida (64%). Nationwide, 90% of voters say producing more oil and natural gas here at home is important. Increasing domestic oil and natural gas production is also important to 88% of Virginians, 89% of North Carolinians, 91% South Carolinians, and 87% of Floridians.

U.S. oil and gas jobs soar to new milestone, says TIPRO report

The U.S. oil and gas industry added new jobs faster than the total private sector during the year that ended in June, jumping 2.6% over the previous year and pushing the industry's roster past 1 million jobs nationwide, according to a new report.

During the first half of 2013, the industry netted 23,700 jobs, driven mostly by extraction, drilling and support sectors, according to the Texas Independent Producers & Royalty Owners Association's report. Overall, the industry grew 2.4% in that 6-month period.

Eight out of nine oil and gas sectors measured by the Bureau of Labor Statistics expanded this year. Only jobs in

the oil and gas field machinery and equipment sector have appeared sluggish so far in 2013, according to TIPRO.

The Austin trade group credited the advent of horizontal drilling and advances in hydraulic fracturing with a surge in oil and gas production that has levitated payrolls in the industry. Unlocking new resource plays has pushed U.S. oil production to a 15-year high at 6.5 mmbbl per day, according to the Energy Information Agency.

Oil and gas companies also climbed past the private sector in the 18 months before June, up 5.7% on a jump of activity in the industry's support sector, which is typically ushered in by higher investment from U.S. exploration and production companies. Of the 54,900 workers added to oil and gas payrolls between January 2012 and June 2013, about half fell in the support sector.

BP opens largest commercial research supercomputer lab

BP has opened a new facility in Houston, Texas to house what the company described as the world's largest supercomputer for commercial research.

The new Center for High-Performance Computing (CHPC) will serve as the company's hub for processing and managing geophysical data across BP's portfolio. The 110,000-sq. ft center, located on the campus of BP's U.S. headquarters, houses computing capability of over 2.2 petaflops, total memory of 1,000 terabytes and disk space of 23.5 petabytes.

"This facility is the foundation upon which we will continue to find and produce energy that would have gone untapped just a few years ago," said Jackie Mutschler, BP's head of upstream technology, at a ceremony marking the opening.

BP said the enhanced computing capability will allow the company to better appraise new finds and manage complex reservoirs.

"It is the largest supercomputer for research in America, and it's going to take seismic to the next level," said James Dupree, BP's chief operating officer of research and technology.

CHPC Manager Keith Gray said the complex would foster "vital" collaboration among the company's research teams and seismic experts.

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Saudi Arabia increasing rig count, accelerating offshore development

Saudi Arabia has reportedly dramatically increased the number of drilling rigs in recent months while boosting exploration and development of costly offshore fields, suggesting the kingdom is struggling to maintain stable output from existing wells amid growing domestic and international demand, according to Offshore magazine.

This year, the total number of rigs is set to hit a record of 170, nearly double the 88 rigs in October 2012. But Saudi oil minister, Ali al-Naimi, has said that the kingdom would not increase production capacity beyond 12.5 mmbb/d for the next 30 years, in contrast to earlier calls to increase output to 15 mmbb/d to meet global demand.

Offshore contends that with proven reserves of 260 Bbbl and a production capacity of 12.5 mmbb/d, Saudi Arabia has taken up the role of "swing" producer. That is, it has ensured stability of global output by making up for unexpected shortfalls in other countries, as happened during the Gulf War of 2003 or the unrest in Libya in 2011.



Manifa project involves artificial islands

Offshore points out that some analysts have warned that the rapid development of shale oil poses a significant threat to Saudi Arabia's key position in the oil market. As global production of oil is set to increase, its reserve production capacity will become less vital in maintaining price stability.

Saudi Arabia's largest offshore oil fields are Safaniya, Zuluf, Manifa, Marjan, and Abu Safah, which together hold a total 76.1 Bbbl in reserves with a combined production capacity of 3.42 mmbbl/d. These offshore fields represent roughly 30% of total Saudi reserves.

OFFSHORE INDUSTRY HEADLINES

Research & Development • Environmental Assessment • Discovery

North Sea remains investment focus despite pause in Q3 drilling

North Sea drilling activity eased during the third quarter of 2013 following an encouraging second quarter, according to a report into offshore activity from Deloitte, a business advisory firm.

The report, compiled by Deloitte's petroleum services group (PSG), found that although the number of new wells drilled on the UK Continental Shelf (UKCS) fell by around one third in comparison to the second quarter, the outlook for the North Sea remained positive.

A total of 11 exploration and appraisal wells were drilled in the UK during the third quarter of 2013, five fewer than during the second quarter and six fewer than the same period last year. Despite the fall in figures for the UKCS, the Norwegian Continental Shelf (NCS) has produced eight more wells during the third quarter than the same period last year.

Graham Sadler, managing director of Deloitte's PSG, said a number of factors may have affected the UK drilling figures over the summer months.

"While the summer is often a peak period for drilling, the UKCS is a complex region, with a natural ebb and flow of activity across the North Sea industry," he said. "When bidding for exploration licenses, companies make a commitment to the government to drill a certain amount of wells within a certain time-frame. Many companies have commitments from recent licensing rounds which are yet to be fulfilled, so we may well see these materialize in the coming months, drawing a more positive conclusion to the end of the year."

However, while drilling offshore UK slowed, deal activity saw an upturn. During the third quarter, there were 14 deals reported, two more than during the same period in 2012. Farm-in style agreements, where one company takes a stake in another company's field — often to assist with drilling or development costs — accounted for more than half of the third quarter's UKCS deal landscape.

U.S. Gulf production expected to surge on heels of increased activity

Oil companies that operate in the U.S. Gulf of Mexico are expected to unleash a backlog of drilling and development work in 2014 after years of deepwater exploration with advanced seismic technology, potentially pushing the Gulf's daily oil production up by 180,000 bbl to 1.55 mmbbl next year. That follows a 19% decline over the previous 3 years, according to the U.S. Energy Information Administration.

"Companies still see it as a place for

production growth and where there are still fields to be discovered and developed," said an analyst with Wood Mackenzie, adding that big integrated producers also are attracted to the region's easy access to markets and refineries.

Wood Mackenzie expects the Gulf to beat its 2009 daily production peak of 1.8 mmbbl in 3 years, when the bulk of this decade's new production will be online. Output could exceed that level in 2016 and



ENSCO 8500 is currently at work at Anadarko's Lucius field in Gulf of Mexico

1.9 mmbbl/d by 2020, according to Wood Mackenzie projections.

Some of the biggest oil fields in the Gulf — the Dalmatian, the Lucius, the Big Foot and the Jack St. Malo oil fields — are expected to come online next year, according to Wood Mackenzie. And by 2020, 12 to 15 new fields are slated to start up, containing 78.86 Bboe in undiscovered, recoverable resources, according to Bloomberg.

International oil companies, including BP, Chevron and Shell, dominate the Gulf with deep pockets and 24 of the 38 deepwater rigs operating in the Gulf.

Large oil reserves discovered off northeastern Brazil

Brazil's National Petroleum Agency said large reserves of oil are located off the coast of the northeastern state of Sergipe, representing a new frontier in petroleum development in Latin America's biggest country.

Agency director Magda Chambriard recently said that numbers on how much oil is in the reserves would not be announced before 2016. Most of the country's oil production is concentrated in southeastern Brazil where, over the past several years, billions of barrels of oil have been discovered in offshore reserves, mostly in deep, pre-salt fields.

A consortium including Shell, Total, two Chinese firms and Brazil's state-run petroleum company Petrobras won the right to develop a field off the coast of Rio de Janeiro that could hold up to 12 Bbbl of oil.

Seismic delay won't preclude U.S. Atlantic offshore lease sale: BOEM

U.S. officials expect to have sufficient information to decide whether to include an offshore Atlantic lease sale in the 2017-2022 5-year plan, even if fresh seismic data are not available, Tommy Beaudreau, director of the Bureau of Ocean Energy Management (BOEM), told energy publication Platts in an interview.

Beaudreau said a lease sale off Virginia or elsewhere in the mid or south Atlantic could be included in the later years of the next leasing plan on the assumption that seismic companies would be able to complete new surveys by then.

"We have a strategy for evaluating whether and, if so, under what configuration to have sales, but not all of that has to come together before you start scoping the next 5 year plan, which we're going to start in 2014," Beaudreau said.

The assurance comes even as BOEM expects another delay in the completion of a study on the environmental impacts of seismic activity in the mid and south Atlantic.

BOEM in April said it expected to complete the multi-year process by October. That target was later changed to 3 January. But because of the 16-day government shutdown, the programmatic environmental impact statement (PEIS) is now expected to be finished sometime in January or February, Beaudreau said.

Industry groups, including the American Petroleum Institute, had expressed concern that the current timetable for completing the PEIS would not allow enough time for actual data to be ready by next year, when planning for the next 5-year plan begins.

"We are concerned," Erik Milito, API's director of upstream told a group of reporters recently. Milito said that delays in releasing the PEIS for geological and geophysical activities on the Atlantic Outer Continental Shelf could close the window for data to be available in time to influence a decision on a possible lease sale off the coast of Virginia.

A Virginia sale had been included in the 2008-2012 lease plan, but was canceled after the 2010 Deepwater Horizon disaster. BOEM did not include Virginia in the current leasing plan in part because seismic data for the area are decades old and not as reliable as seismic surveys shot using newer technology.

"Because of these delays, it's becoming more and more imperative that the lease sale is included," Milito said. But Beaudreau said it would be a mistake to assume that BOEM would need actual seismic studies in hand.

Shell Oil launches formal bid to resume drilling in Alaska Arctic

Shell Oil Co. has filed a broad drilling blueprint with federal regulators in Alaska, officially launching its bid to resume drilling in Arctic waters north of the state next summer.

The company is at least temporarily scaling back its ambitions, with a 2014 exploration plan that focuses solely on its potentially more lucrative leases in the Chukchi Sea. It also has acreage in the neighboring Beaufort Sea.

The plan filed with the BOEM envisions that Shell would use the contracted drillship Noble Discoverer to bore several wells in the Chukchi Sea in coming years. But there are still many steps before Shell could begin drilling in the Arctic, following a 2012 season that was marked by high-profile mishaps, including the grounding of its conical drilling unit, the Kulluk, last December.

Even Shell isn't sure it will be drilling. In a statement the company noted it had filed the exploration plan "to keep the company's 2014 exploration options viable."

"We will continue to take a methodical approach to this exploration phase and will only proceed if the program meets the conditions necessary to proceed safely and responsibly," said Shell spokesman Curtis Smith.

The Interior Department last March issued a report questioning whether the company had the "ability to operate safely and responsibly in the challenging and unpredictable conditions" off the coast of Alaska.

Activity surge putting pressure on U.S. industry workforce

Increased onshore unconventional activity combined with a surge in activity in the Gulf of Mexico is going to put further pressure on the industry's workforce, according to international jobs board OilCareers.com. During his address to LAGCOE 2013 delegates in October, Joe Jones, business development executive at OilCareers.com, stressed the industry's need for skilled personnel in order to meet demand and maximize the potential of one of the world's most diverse and innovative oil and gas regions.

"The U.S. is on course for energy independence with unconventional and increased offshore exploration and production leading the charge," he said. "Drilling activity in the Gulf of Mexico has increased dramatically over the past 12 months, with current rates hinting that by this time next year there could be up to

U.S. to be world's largest oil supplier: PIRA Energy Group

The United States is expected to overtake Saudi Arabia as the world's biggest total supplier of oil this year, when including natural gas liquids (NGLs) and biofuels, reports PIRA Energy Group, a New York-based energy markets consulting firm. United States total supply for 2013 is expected to average 12.1 mmbbl/d. In 2012, the U.S. overtook Russia to become the second largest supplier of oil and was just behind Saudi Arabia. Both the U.S. and Saudi Arabia increased their supply in 2013, though production in the U.S. grew at a faster pace. U.S. total supply in 2013 is larger than that of Saudi Arabia by 300,000 bbl/d and ahead of Russia by 1.6 mmbbl/d. The fourth through 10th largest suppliers are China, Canada, UAE, Iran, Iraq, Kuwait, and Mexico.

Total oil supply counts all forms of liquids supply. The largest part is crude oil, including condensates. In this category, the U.S. is expected to produce 7.4 mmbbl/d, which is less than that produced in Saudi Arabia and Russia by roughly 3 mmbbl/d each. But the U.S. has substantial other forms of supply, including NGLs at 2.5 mmbbl/d, biofuels at 1 mmbbl/d, and "refinery gain" at almost 1.3 mmbbl/d. Refinery gain measures the ability of a refinery to optimize its output through sophisticated high conversion capabilities.

The U.S. is surging to be the world's lead oil supplier because of growth in shale oil. Shale crude and condensate production at 2.5 mmbbl/d in 2013 is now slightly over one-third of total U.S. crude production, and shale NGL at 1.2 mmbbl/d is almost half of total NGLs. Shale crude is seen growing by 800,000 bbl/d this year, while shale NGL grows 300,000 bbl/d versus 2012. The U.S. shale liquids growth of 3.2 mmbbl/d over the last 4 years has been nearly unparalleled in the history of world oil. Only Saudi Arabia in 1970-74 raised its production faster.

U.S. total supply growth in 2013 is seen at 1 mmbbl/d and about the same as last year's growth. Its growth rate is greater than the sum of the growth of the next nine fastest growing countries combined and has covered most of the world's net demand growth over the past 2 years.

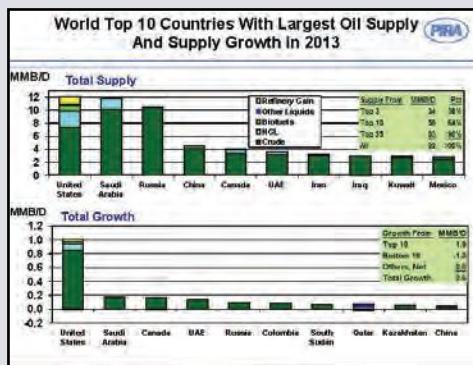
The U.S. position as the largest oil supplier in the world, looks to be secure for many years. Although growth rates of U.S. shale liquids are expected to become smaller in the future, PIRA's forecast sees the U.S. increasing the lead over the next two largest countries until after 2020 and retaining the lead to at least through 2030.

54 deep water semi-submersibles and drillships working in the region."

According to Jones, the increase in activity can be attributed to two main factors. "Technological advances which enable drilling at extreme depths and temperatures have revolutionized the process by which oil is extracted in the region," he said.

Such advances have seen Technip announce plans to lay the world's deepest gas pipeline in the second half of 2014 in the Gulf of Mexico at a water depth of approximately 9,500 ft.

Jones added, "Secondly, the safety measures now in place as a result of investigations since Macondo mean deep-



water drilling has never been safer. The implementation of the Drilling Safety Rule has helped confidence return to local communities affected by the disaster. These changes have brought with them a newfound confidence in U.S. offshore activity, one that is creating significant movement in the North American oil and gas jobs market."

Shell's announcement in May 2013 that it is to drill the world's deepest offshore well in the Gulf of Mexico at the unheard of depth of 2 mi has been seen as proof of this newfound confidence. The company is looking at ways to capitalize on new technology as a means of combatting lower reserves at shallower depths.

Tullow orders FMC subsea equipment for TEN project

FMC Technologies has received an order from Tullow Ghana Ltd. to supply subsea systems for its Tweneboa-Enyenra-Ntomme (TEN) development offshore Ghana. The order has an estimated value of \$340 million. FMC will supply subsea trees, manifolds, tooling, associated subsea control systems, and systems integration. TEN is in the Deepwater Tano contract area, 37 mi off the coast of Ghana and around 19 mi west of the Jubilee field. Operator Tullow Oil expects to deliver first oil in 2016, and peak at 80,000 bbl/d. Development involves drilling and completion of up to 24 wells connected via subsea infrastructure to an FPSO moored in 4,921 ft of water.

Technip to perform turnkey contract for Qatar Petroleum

Technip was awarded by Qatar Petroleum an engineering, procurement, installation, and commissioning contract for a strategically important offshore project comprising a living quarter platform, an utility platform, with a bridge connecting the two platforms. The project location is within QP offshore facilities. Technip will be responsible for the execution of the entire project. The topsides for both platforms will be installed using the floatover technology, which Technip pioneered. This installation method enables large integrated topsides to be installed, thereby minimizing offshore hook-up and commissioning without the use of large crane vessels. Technip's operating center in Abu Dhabi, with the support from the group's operating centers in Paris, France and Doha, Qatar, will execute the project.

Subsea mooring connectors for largest spar platform

Subsea mooring specialist First Subsea was awarded a contract by Hyundai and Technip to supply the mooring line connectors for Statoil's Spar platform in the Aasta Hansteen gas field, in the Norwegian Sea. The platform will be the world's largest Spar platform and the first of its kind on the Norwegian continental shelf. The Spar platform will be moored with 17 Series III Ballgrab subsea mooring connectors at 4,290 ft water depth about 300 km west of Bodø in northern Norway. The connector's male mandrels are manufactured in compliance with American Bureau of Shipping (ABS) 2009 Approval for specialist subsea mooring connectors.



First Subsea is the only manufacturer of offshore mooring connectors to achieve ABS-type approval for the design and manufacture of large-scale forgings over 500 mm in diameter. The Aasta Hansteen Spar platform will be the largest Spar ever built, with a total hull length of 198 m. When in production in 2017, it is expected to be capable of producing 23 mmcm per day. It has a storage capacity of 160,000 bbl of condensate. The topside dry weight will be 23,000 mt, with accommodation for 100 personnel, and the hull dry weight will be 46,000 mt. This is the 11th spar platform mooring using First Subsea's ball and taper mooring connectors. "The ease with which they can be deployed has always been an important factor. It will be even more so for the Aasta Hansteen Spar platform mooring in the Norwegian Sea," said Michell Beals, package engineer, offshore business unit, Technip (US). Statoil serves as the operator, holding a 75% interest; OMV holds 15%; and ConocoPhillips holds the remaining 10% interest.

Consortium scoops up rights to huge Libra field

A consortium of companies, including Royal Dutch Shell, Petrobras, Total, CNPC, and CNOOC, has won a 35-year production sharing contract to develop the giant Libra pre-salt oil discovery located in the Santos Basin, offshore Brazil. The Brazilian regulator, Agencia Nacional do Petroleo (ANP), estimates Libra's recoverable resources of between 8 to 12 Bbbl of oil. The Libra discovery is one of the largest deepwater oil accumulations in the world.

"We look forward to applying Shell's global deepwater experience and technology to support the profitable development of this exciting opportunity," said Peter Voser, chief executive officer, Royal Dutch Shell.

Shell holds a 20% stake in the consortium, with Petrobras (40%) as operator. Total holds 20% of the discovery, CNPC 10%, and CNOOC 10%. The consortium will work together to support Petrobras, considered to be the most experienced operator in the Brazilian pre-salt play, and will incorporate each company's deepwater skills, people, and technology.

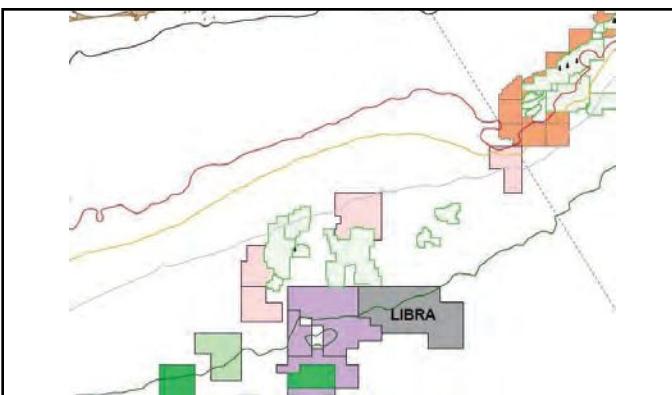
The production sharing contract was expected to be signed in November 2013. As part of the winning bid, Shell will pay its 20% share of the total signing bonus of \$1.4 billion and fulfill the minimum work program no later than the end of 2017.

The ultra-deep water Libra accumulation is located in Santos Basin, approximately 105 mi off the coast of Rio de Janeiro. The block covers 1,550 sq. km in water depths of around 2,000 m (6,500 ft). The reservoir depth is around 11,500 ft below the sea floor. The ANP estimates that total gross peak oil production could reach 1.4 mmbbl/d. Further appraisal is required to firm up this estimate, the development concept and a first oil date.

Shell has worked in Brazil for more than a century, with 65,000 boe/d of operated production in 2012. Shell is currently operating two floating, production, storage, and offloading vessels off Brazil — the Espírito Santo at Parque das Conchas and the Fluminense at the Bijupira/Salema fields — and has recently announced projects to expand production at both fields. Shell also operates and owns an 80% interest in the BM-S-54 block, where the Gato do Mato discovery is being appraised.



Royal Dutch Shell CEO Peter Voser



W&T Offshore to acquire GoM deepwater fields from Callon

Oil and natural gas producer W&T Offshore has signed an agreement to acquire all of Callon Petroleum's exploration and production deepwater field properties in the Gulf of Mexico for \$100 million.

The transaction includes a 15% working interest in the Medusa field, including deepwater Mississippi Canyon blocks 538 and 582, plus a 10% membership interest in Medusa Spar, which owns a 75% interest in the field's production facilities.

According to W&T, the transaction also includes various interests in 12 non-operated Gulf of Mexico fields.

W&T Offshore will acquire total net proved reserves, including 2.4 mmboe, all of which are classified as proven developed reserves.

Probable reserves of 2.3 mmboe and possible reserves of 2 mmboe will also be acquired, as part of the transaction.

Based on SEC reserves definitions and recent NYMEX pricing, the reserves were determined by Netherland, Sewell and Associates as of July 2013.

Average gross daily production from the interests being acquired in the

Medusa field during September stood at 7,000 boe, of which 88% is said to be oil. From the remaining properties, average net daily production being acquired was approximately 5.1 mmcf of natural gas equivalent, of which 98% is natural gas.

W&T Offshore chairman and chief executive officer Tracy Krohn said acquisition will add another deepwater field to its growing portfolio.

"The addition of reserves, production, and infrastructure from this acquisition, coupled with the significant exploration opportunities in addition to our 3P reserve estimates, supports our ongoing efforts to expand the deepwater footprint of the company," Krohn added.

The transaction is expected to close 30 November 2013.

BOEM schedules Central Gulf Lease Sale 231 for March 2014

The U.S. Bureau of Ocean Energy Management (BOEM) plans to conduct Central Gulf of Mexico Lease Sale 231 on 19 March 2014 in New Orleans, Louisiana.

Thirty-nine million acres will be made available offshore Louisiana, Mississippi, and Alabama, encompassing 7,508 unleased blocks covering 39.4 mil-

lion acres. The locations of the blocks range 3 to 230 mi offshore in 9 to 11,115 ft of water. BOEM said the proposed lease sale could net 1 Bbbl of oil and 4 tcf of natural gas in production.

This is the fourth lease sale to be held in the 2012–17 Outer Continental Shelf leasing program during Central Gulf Lease Sale 227, held in March 2012; industry only bid for 4.4% of the blocks offered with a total high bonus of \$1.2 billion.

November 2012's Western Gulf Lease Sale 229 saw 13 companies submit bids for 116 of 3,873 blocks offered, accounting for just 3% of 20.75 million acres. Apparent high bids totaled \$133.7 million during that sale. In August, Western Gulf Lease Sale 233 received 61 bids for 53 tracts covering just 301,006 acres out of nearly 21 million available acres. High bids totaled \$102,351,712, the smallest amount so far in the leasing program.

Proposed terms and conditions for Sale 231 will be finalized when the Final Notice of Sale is published at least 30 days prior to the sale.

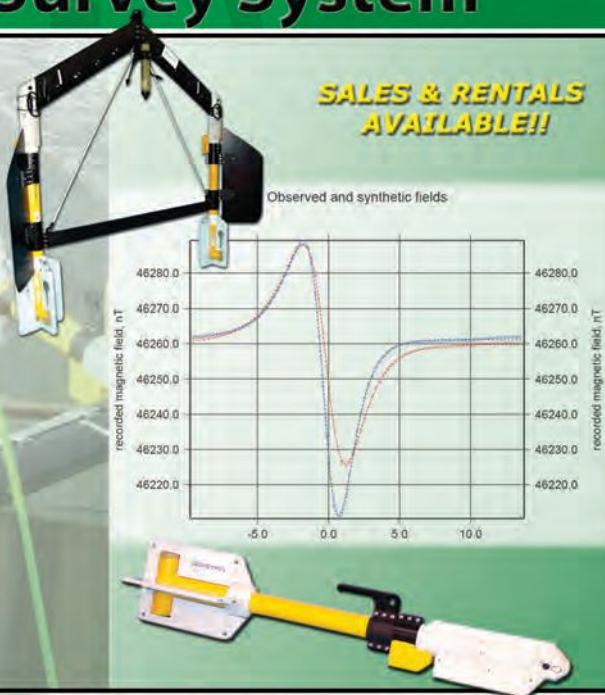


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Hercules Triumph moved to India

GAC rig move brings Hercules Triumph from Sri Lanka to India

GAC Sri Lanka has completed the movement of offshore drilling rig Hercules Triumph from the port of Trincomalee to India. The rig, owned by Hercules Offshore, Inc., USA, is now safely anchored at Kakinada and ready to start drilling operations for Cairn Energy at the Ravva offshore oil field.

GAC Sri Lanka, part of global shipping, logistics and marine services provider GAC Group, chartered three anchor-handling tug boats — Sci Urja, Sci Ahimsa and Mahaweli — to off-load the Hercules Triumph from heavy-lift vessel Target at Trincomalee Anchorage and worked in close liaison with the harbor master and port officials throughout the complex operation.

GAC also provided a range of port services including using its own fleet of supply boats for the transfer of crew and other personnel to and from the rig. Further, GAC Sri Lanka supplied provisions, stores, fresh water, and bunker fuels to the rig and anchor-handling tugs.

As part of its task to oversee the entire project, GAC Sri Lanka was also responsible for domestic air transfers of Hercules Offshore officials to and from the site. After 4 days of servicing at Trincomalee, the Hercules Triumph was then towed by two tugs over 700 nmi to Kakinada, arriving 8 days later.

Chevron taps Transocean for newbuild ultra-deepwater rig

Transocean Ltd. was awarded a 5-year contract for a newbuild dynamically positioned ultra-deepwater drillship by Chevron USA, Inc. Shipyard delivery is scheduled for the second quarter of 2016. After customer acceptance, the contract is expected to commence in the fourth quarter of 2016, contributing an estimated

revenue backlog of about \$1.1 billion, excluding mobilization. Excluding capitalized interest, the capital investment for the newbuild drillship is an estimated \$725 million. Capital costs include the shipyard contract, project management, all owner-furnished equipment, capital spares and inventory, and all costs associated with operational readiness.

Featuring state-of-the-art equipment, the newbuild drillship will include Transocean's patented dual-activity drilling technology that allows for parallel drilling operations. The vessel will be outfitted with two 15,000-psi blowout preventers (BOPs), which are expected to reduce non-productive time between wells. The drillship will be able to accommodate a future upgrade to a 20,000-psi BOP when it becomes available from the suppliers.

The rig will also feature an industry-leading 2.5-million-pound hook load capacity, a variable deckload capacity of 23,000 mt, enhanced well-completion capabilities and diesel engines configured to comply with anticipated Tier III International Maritime Organization emissions standards. The drillship is designed and outfitted to operate in water depths of up to 12,000 ft and drill wells to 40,000 ft. In addition, the drillship will have accommodations for 240 people.

Construction of the newbuild drillship is expected to commence during the fourth quarter of 2014 at the Daewoo Shipbuilding and Marine Engineering Co., Ltd. facility in Okpo, South Korea, where Transocean's five enhanced enterprise-class rigs were built and where the company currently has six other ultra-deepwater drillships under construction.

Keppel wins \$1.1B contract for five Transocean jack-up rigs

Keppel Offshore & Marine's (Keppel O&M) wholly owned subsidiary Keppel FELS has landed a \$1.1 billion contract from a subsidiary of Transocean to build five KFELS Super B Class jack-up rigs. Transocean also has options to build up to another five similar jack-up rigs with Keppel FELS in addition to the five rigs, which are scheduled to be delivered from the first quarter of 2016 to the third quarter of 2017.

KFELS Super B Class rigs have been tailored to suit Transocean's requirements and are designed to operate in 400 ft of water depth and drill to 35,000 ft. Equipped with good horsepower during drilling operations, the rig has a 2,000,000 lb drilling system and a maximum combined cantilever load of 3,700 kips.

The rig, which can drill at a 75 ft outreach, will also be installed with

offline stand building features in its drilling system package, allowing drilling and preparation of drill pipes to take place simultaneously. Recently, Keppel FELS delivered three jack-up rigs, including Transocean Siam Driller, Transocean Andaman, and Transocean Ao Thai to Transocean.

The company's other projects include upgrades and conversions of the Sedco 700-series semi-submersibles to enable better positioning and the repair of various Transocean rigs.



Paradise 400, a high-specification KFELS B Class jackup rig

In 2013, Keppel O&M has secured 20 newbuild projects, worth about \$6.4 billion, including the latest order from Transocean. Keppel FELS, which has already delivered 17 rigs in 2013, is on track to complete 20 to 21 rigs by the year's end.

Adriatic to acquire DP-1 OSVs from former Abdon Callais fleet

Raceland, Louisiana-based Adriatic Marine LLC has entered into a contract with Harvey Gladiator LLC, a wholly owned subsidiary of Harvey Gulf International Marine LLC, for the purchase of six 205 ft DP-1 offshore supply vessels (OSVs). The transaction is expected to close in the early fourth quarter of 2013. The purchased vessels are a subset of a larger acquisition by Harvey Gulf of substantially all of the assets of Abdon Callais Offshore LLC.

With the acquisition of the six OSVs, Adriatic Marine will have a fleet of 17 DP-1/DP-2 OSVs, ranging in length from 170 ft to 205 ft and having an average age of 4 years, making the fleet one of the newest and most sophisticated in the Gulf of Mexico. Adriatic Marine also has five 200 ft DP-2 OSVs and one 260 ft DP-2 OSV on order, with all deliveries expected to be completed within 2 years.

Additionally, Adriatic Marine owns and operates a fleet of ABS-classed, ocean-going deck barges, the oldest of which was built in 2011. Adriatic Marine has ordered two new 72 ft wide barges.

Rolls-Royce wins Samsung contract for rig equipment

Rolls-Royce will supply thrusters and deck machinery for two semi-submersible drilling rigs to be built by Samsung Heavy Industries in Korea for Stena Drilling as part of a contract. According to Rolls-Royce the contract, valued at around \$35.4 million, includes options for deliveries to three additional rigs.

To be built for worldwide operations, including in the rough North Sea, the two Moss CS60 harsh-environment, semi-submersible drilling rigs are set to be delivered in 2016. Rolls-

Royce offshore president Anders Almestad said Samsung is the company's largest yard customer when it comes to propulsion.

"This contract confirms our solid footprint in the exploration and production market, and we are very pleased that Samsung and Stena Drilling chose to place another order with us," Almestad added.

Each drilling rig will be equipped with six underwater mountable UUC 455 FP thrusters, eight point-mooring systems and control systems provided by Rolls-Royce. Said to be part of the rigs' propulsion systems, the thrusters

are used to propel the rigs to and from drill sites and maintain their positioning properly during drilling operations.

Underwater mountable thrusters are easily mounted and dismantled without drydocking the rig and enable a reduction in downtime.



Maersk newbuild drillship bound for Gulf of Mexico

Maersk Drilling's first ultra-deepwater drillship, Maersk Viking, will be deployed to the U.S. Gulf of Mexico under a 3-year, \$610 million contract with ExxonMobil. The newbuild vessel is the first in a series of four ultra-deepwater drillships to enter Maersk's fleet in late 2013 and early 2014. Samsung Heavy Industries will deliver the rigs at a total cost of \$2.6 billion. At a naming ceremony in Samsung's Geoje, South Korea shipyard, Maersk Drilling chief executive officer Claus Hemmingsen said the vessel would further the company's goal of "establishing ourselves as a significant drilling contractor in the U.S. Gulf of Mexico." The ultra-deepwater semi-submersible Maersk Developer has been active in the Gulf of Mexico since 2009.



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Cairn Energy set for offshore Morocco deepwater drilling debut

Cairn Energy expected the semi-submersible Cajun Express to start drilling on the Foum Draa block offshore Morocco. The well will test a slope fan prospect, FD II - A. The prime target is a late Jurassic-early Cretaceous deepwater turbidite slope fan and channel complex.

According to Cairn, it will be the first penetration of this objective by any deep-water exploration well to date along the Moroccan margin. Drilling is estimated to last 60 days, with a planned TVDSS of 18,044 ft.

Subject to approvals, the rig then will drill the JM III - A (6) structure on the Juby Maritime III block, targeting a mid-Jurassic carbonate prospect more than 3,281 ft below Esso's 1969 heavy-oil Cap Juby discovery at upper Jurassic level. Operations could start late this year or early in 2014.

Offshore Senegal, Cairn aims to start drilling the first of two proposed exploration wells in the first quarter of 2014, after the rig has finished its program off Morocco. One well will be on the North Fan composite prospect in 4,921 ft of water. The other will likely be drilled on a shelf edge composite prospect in 3,609 ft



The semi-submersible Cajun Express

of water. Off Greenland, Cairn and its partners were to decide whether to drill the Pitu prospect next year. Off Norway, a second appraisal well was under way on Wintershall's Skarfell discovery (Cairn 20%), according to the company.

Cobalt International Energy scores two discoveries offshore Angola

Cobalt International Energy disclosed a pair of discoveries at the Lontra and Mavinga pre-salt prospects offshore Angola. The Lontra 1 exploratory well, on Block 20, reached total depth and encountered oil and gas.

Cobalt said evaluation was under way and that more information would be

released by the end of 2013. When tests are complete, the company plans to move the Petroserv-managed SSV Catarina semi-submersible to the Orca prospect, formerly known as Baleia, to drill an exploratory well. Orca is also in Block 20, where partners are Sonangol and BP.

On Block 21, the Mavinga 1 well encountered around 100 ft of net oil pay but failed to reach a sustained flow rate from a full drill stem test.

"Cobalt is in the early stages of determining what operational issues may have prevented the production from the oil reservoir during the drill stem test," the company said.

Cobalt and its Block 21 partners, including Sonangol, Nazaki Oil and Gaz, and Alper, plan further drilling in the Mavinga structure, which the company estimates could contain a gross oil column of up to 650 ft updip of the exploratory well. The field will eventually be developed as a tieback to the planned Cameia development, according to Cobalt.

The Mavinga-1 well was temporarily abandoned, and Diamond Offshore's Ocean Confidence rig was mobilized to begin drilling the Bicuar 1 well, also in Block 21.

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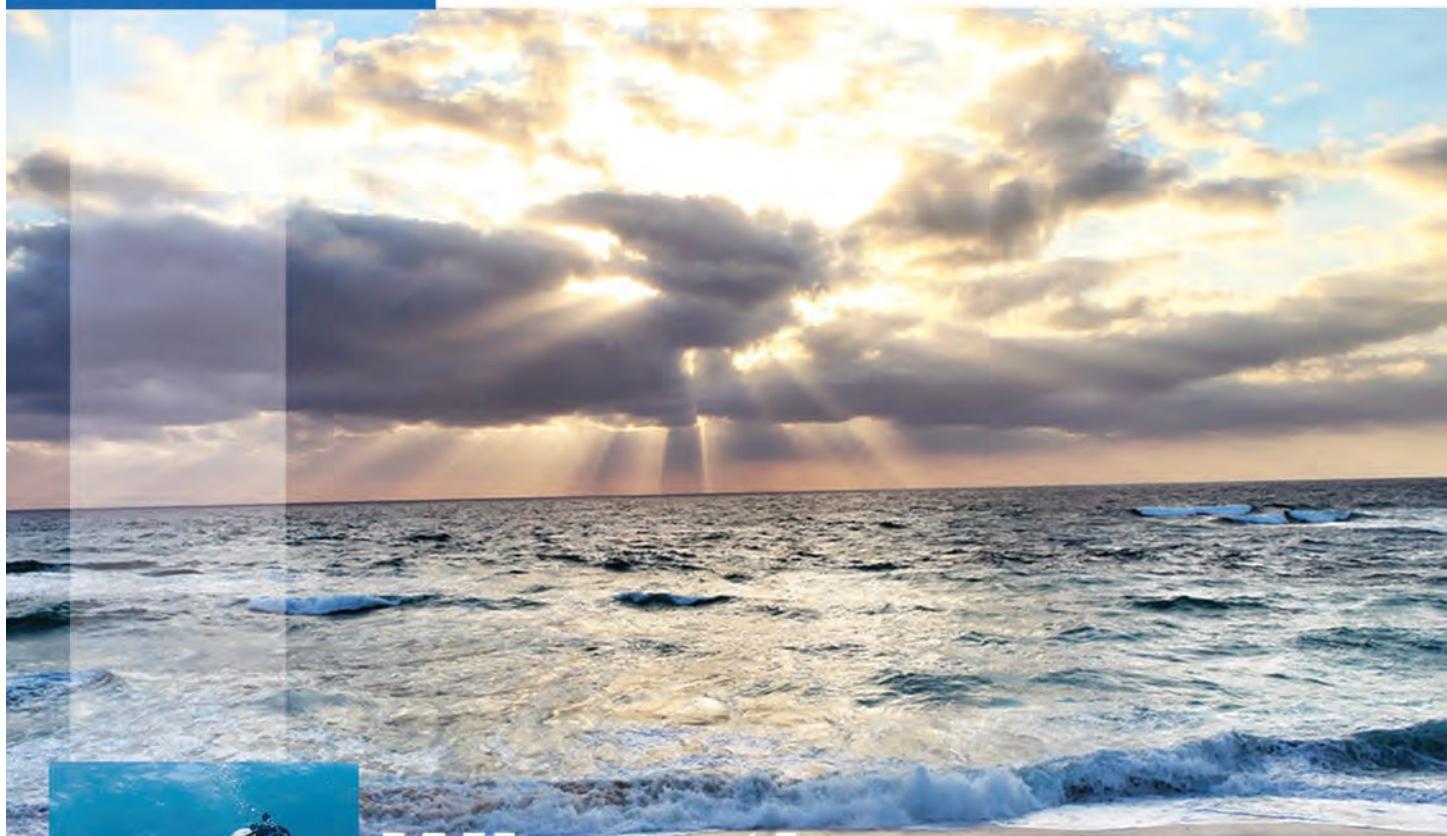
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Woodside's North Rankin redevelopment project

Woodside completes North West Shelf program

Production has started from the Woodside-operated North Rankin redevelopment project offshore northwest Australia. Gas has already been exported to the onshore Karratha terminal.

The \$4.7-billion scheme involved construction and installation of a second platform, North Rankin B, and modification and refurbishment of the existing North Rankin A facility. The new platform, installed 84 mi offshore Karratha, is designed to recover around 5 tcf of low-pressure reserves from the North Rankin and Perseus fields.

"Start-up is a major milestone given the complexities of integrating a new 65,000-metric ton [71,650-ton] facility next to an existing offshore production platform," said Peter Coleman, Woodside's chief executive officer. "The redevelopment maxi-

mizes the value of Australia's largest operating oil and gas project by extending the resource life and supporting the North West Shelf project's onshore gas commitments."

Other partners in the project are BHP Billiton Petroleum (North West Shelf), BP Developments Australia, Chevron Australia, Japan Australia LNG (MIMI), and Shell Development (Australia).

Ekofisk platform offshore Norway gets early startup

ConocoPhillips has started production from the Ekofisk 2/4 Z platform in the southern Norwegian North Sea, about 2 months ahead of schedule, according to the plan for development and operation (PDO) approved by Norway's parliament in June 2011.

Ekofisk South, one of various projects designed to prolong production from the Greater Ekofisk Area for another 40 years, comprises the Ekofisk 2/4 Z wellhead platform with 35 production wells and a seabed installation for eight water injection wells. Water injection started in May and is controlled from an operations center at ConocoPhillips' offices in Tanger. Aker Solutions in Egersund, Norway, built the platform.

Earlier, the operator completed the comprehensive Ekofisk I cessation project, which involved removal of nine redundant platforms and transportation of a total of 132,277 tons of material to shore for disposal.

The new 552-cabin accommodation platform and field center for Ekofisk were installed in August, and the facility is currently being commissioned. This replaces two existing accommodation platforms and a chartered accommodation rig. It was assembled at the SMOE yard in Singapore, with Kværner Verdal building the steel jacket and bridge.

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Brazil expecting oil production to jump by 1 mmbbl/d in 2013

Brazil state-owned Petrobras is expecting to raise oil production by 1 mmbbl/d in 2013, essential for the company to double current production and achieve a target of 4.2 mmbbl/d for 2020. The company said it will receive nine production units this year for the first time ever. Three already are onstream.

The information was highlighted by the company's president, Maria das Gracas Silva Foster, during a lunch lecture at the Offshore Technology Conference (OTC Brazil 2013) in Rio de Janeiro.

"In 5 or 6 years time, The 'P' for production will be more important for us than the 'E' for exploration," she said, comparing the effort and investment used to increase the oil company's production with exploration activities aimed at new discoveries.

The president also highlighted the growth of the shipbuilding industry in recent years, noting that in addition to 17 stationary production units currently under construction in Brazil, Petrobras has 28 rigs and 41 transport ships being built in Brazil.

"To meet this (production) curve, we have 12 more contracts to do," she said, adding that one of the reasons for the success of the Brazilian shipyards is the association with experienced foreign companies, a criterion that has become a Petrobras demand to sign contracts.

The president celebrated the success of pre-salt exploration, which reached 100% in 2013. She revealed that 13 wells have been drilled in the pre-salt this year, and the company has found oil in all of them, which the executive rated as "spectacular."

Altogether, 144 exploratory wells have been drilled in the pre-salt attaining an 82% success rate.

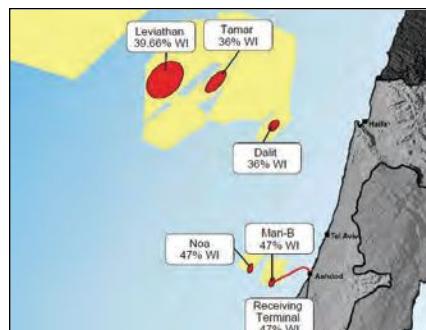
Deepwater Tamar field lifts gas production to new high off Israel

U.S.-based Noble Energy said the deepwater Tamar field in the Levantine basin offshore Israel has delivered more than 1 bcf/d of gas during peak demand periods. This has helped lift Israel's production to a record 255 mmcf/d, up 16% from the second quarter.

Currently, a rig is drilling the Tamar SW exploration prospect offshore Israel and the well should reach total depth by the end of the year. Noble estimates

Tamar SW's potential resources in the 500 to 900 bcf range.

Elsewhere in the region, Noble puts gross mean resources at its Cyprus A discovery offshore southern Cyprus at 5 tcf of natural gas, following the recently completed Cyprus A-2 appraisal well. The well also encountered high-quality sands and confirmed strong deliverability. Earlier, a 3D seismic survey over the block covered 1,500 sq. mi to better define additional exploration potential.



*Maria das Gracas
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InterMoor secures contract with LLOG in U.S. Gulf

Subsea service provider InterMoor will design, fabricate, and install 12 suction pile anchors as well as look after pre-set installation of 12 chain, polyester, chain mooring lines, and hook-up for LLOG's Delta House semi-submersible floating production system (FPS) on Mississippi Canyon Block 254 in the Gulf of Mexico.

Weighing about 150 mt each, the piles will be 85 ft long and 16 ft in diameter and have been designed to be used as permanent anchors for the project. Installation activities of the piles are planned for mid-2014.

LLOG's second Exmar-designed Opti deep-draft, semi-submersible production system Delta House will be moored in 4,500 ft of water.

InterMoor president Tom Fulton said the company paid attention to the client's needs, which included comprehensive engineering, design, fabrication and installation procedures, and plans, plus preparing a detailed proposal describing each phase of the work scope.

"This project will add to InterMoor's already strong track record for permanent moorings, which includes some of the largest deepwater mooring projects around the world, including Kikeh, Shell Auger, ATP Mirage, and the Williams Gulfstar FPS," Fulton added.

The 12 suction piles for the LLOG Delta House will be fabricated at InterMoor's 30,000 ft² Morgan City, Louisiana, facility. The site is ISO 9001:2008 and ISO 14001-certified and includes two fabrication buildings complete with engineering and design capabilities.



InterMoor's fabrication shop with suction piles at its Morgan City, Louisiana facility

Total to develop offshore field south of Argentina with \$850M

French firm Total plans to invest \$850 million to develop a deepwater natural gas field off the southern coast of Argentina. The company will partner with German crude oil and natural gas producer Wintershall and Pan American Energy to develop the Vega Pleyade field.

The field is located in south Atlantic waters near the Patagonian province of Tierra del Fuego. Total official Javier Rielo told Reuters that the field is expected to commence gas production towards 2015's end.

As part of the project's first phase, three wells will be drilled, with initial gas production expected to be 6 million cmd, increasing up to 10 million. When at full production, the field would bring the company's overall production to 18 million cmd.

Owing to the growing demand for energy in Argentina, the latest development is said to confirm Total's proposal to provide Argentina with gas in the long-term. The project received the green light as Argentina aims to reduce its energy deficit, which stood at \$5.4 billion through August, based on data provided

by the National Statistics Agency. The project will be operated by Total with a 37.5% stake. A 37.5% interest will be owned by Wintershall, while the remaining 25% will be held by Pan American Energy. UK firm BP owns 60% of Pan American Energy and Bridas Energy in Argentina and China-based CNOOC share the remaining 40%.

Lukoil commissions additional platforms for Vladimir Filanovsky

Lukoil has awarded contracts for the second-stage development of the Vladimir Filanovsky field in the Russian sector of the Caspian Sea.

OAO Globalstroy-Engineering will be responsible for engineering documentation, purchase of equipment and materials, construction and commissioning, and start-up of ice-resistant stationary platform No. 2 (IRP-2).

The IRP-2 drilling complex will be used to drill 15 directional wells with horizontal borehole completions, comprising nine production wells and six injectors.

The Astrakhan OAO Krasnye Barrikady shipyard will be responsible for development of engineering documentation, purchase of equipment and

materials, construction and commissioning, and start-up of living quarter module platform No. 2 (LQP-2) and a connecting bridge to IRP-2.

LQP-2 will accommodate 55 people and will include a helicopter pad. The IRP-2 will be connected to the first-stage riser block via a 3.7 mi multi-phase subsea pipeline. Both complexes are due to be commissioned in fall 2016.

Aker wins Murchison North Sea platform decommissioning contract

CNR International (UK) has contracted Aker Solutions for first-phase decommissioning of the Murchison platform in the northern North Sea. Under the 3-year contract, Aker Solutions will manage engineering design, procurement, and offshore execution to ensure the facilities are safely prepared for subsequent removal.

Around 150 new jobs will be created in Aberdeen as a result of the award. Since 1980, Murchison has produced more than 390 mmboe. The field is in UK block 211/19 and extends into Norwegian block 33/9 in the northern North Sea. The platform is installed in 512 ft of water.

Aker's previous decommissioning work in the North Sea includes the Maureen A platform removal and the Frigg cessation project.

Statoil to build \$6.79B drilling platform at North Sea Snorre field

Norway's Statoil has announced a \$6.79 billion project to build a new drilling and processing platform at its Snorre field in the North Sea in a bid to extract another 300 mmbbl of oil.

Total investments include platform, infrastructure and drilling of wells, while the latest announcement is also aimed at extending the improved oil recovery (IOR) project lifetime to 2040.

With a capacity of 140 single cabins, the new platform will drill 40 new wells for production and injection of water and gas, and the drilling facility will have a reach of 7,000 m.

Statoil evaluated the Snorre 2040 project with detailed examination of two development concepts, which include a subsea development with continued use of the Snorre A and B platforms or a development with a new platform that is tied to them.

Snorre field reserves are estimated to be 1.55 Bbbl of oil at present. Statoil holds 33% in the Snorre license and other partners include Petoro (30%), ExxonMobil E&P Norway (17.44596%), Idemitsu Petroleum Norge (9.6%), RWE Dea Norge (8.57108%), and Core Energy (1.1074%).

State draws 92 bids, \$5.4M in high bids for Northern Alaska lease sales

Investors demonstrated significant, continuing interest in obtaining new, Alaska state-owned oil and gas leases for exploration on the North Slope during the annual oil and gas lease sales.

"The robust participation we've seen in our lease sales over the last 4 years is a critical step in reaching our long-term goal of boosting oil production in Alaska," Acting Commissioner Joe Balash said.

Division of Oil and Gas deputy director Jonne Slemons opened bids at the Dena'ina Civic and Convention Center in downtown Anchorage on 6 November. Preliminary results show that the division received 90 bids from eight bidding groups on 89 tracts in the North Slope Areawide sale, and two bids from one bidding group on two tracts in the Beaufort Sea Areawide sale. No bids were received for the North Slope Foothills Areawide sale, the state said.

Preliminary results show that winning bonus bids totaled approximately \$5.4 million for the North Slope and Beaufort sales combined. The amount of land leased was 162,163 acres in the North Slope and 5,120 acres in the Beaufort. The most active bidder was Nordaq Energy Inc., which submitted bids on 52 tracts on the North Slope.

In the past several years, bidders have obtained leases on much of the state-owned acreage on the North Slope and in the Beaufort Sea that is considered highly prospective for oil and gas development.

"It is a clear sign that investors have great confidence in the future of development on the North Slope when they invest in additional oil and gas leases. They continue to see opportunities on our North Slope lands for new oil production to increase oil flowing through the trans-Alaska pipeline to market," Balash said.

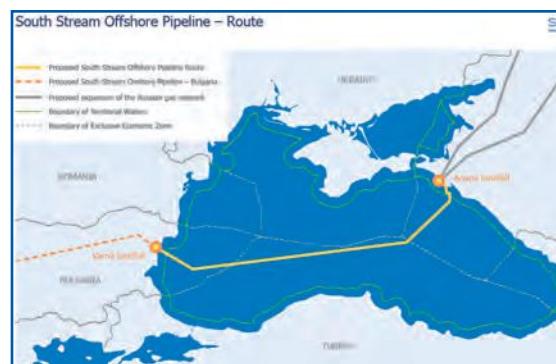
South Stream to consist of four Black Sea natural gas trunklines

Shareholders of South Stream Transport B.V. have confirmed a decision to build four offshore gas trunklines with throughput capacity of 2.22 tcf per year. The South Stream project will take gas from Russian onshore fields through the southern part of the Black Sea to southern and central Europe.

The 559 mi Black Sea section will run from the Russkaya compressor station on the Russian coast to the Bulgarian coast. Maximum water depth along the route will be more than 6,562 ft. Gazprom has a 50% stake in the project, with Eni holding 20%, and Wintershall and EDF 15% each. Last December, construction started

of the onshore section near Anapa in Russia's Krasnodar Territory. The first string of the offshore gas pipeline is due to be commissioned in late 2015.

South Stream will run also through Hungary, Slovenia, and northern Italy with offshoots potentially to Greece, Croatia, Montenegro, and Macedonia. The South Stream pipeline project was announced on 23 June 2007. The preliminary agreement between Russia and Bulgaria on Bulgaria's participation in the project was signed in January 2008.





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Ocean News & Technology

TDW unveils remote-controlled pipeline clamp installation tool

T.D. Williamson (TDW) recently introduced the Clamp Installation Tool (CIT), a new remote-controlled system that makes it possible to install any proprietary clamps or fittings on subsea pipelines in need of repair or to prepare for tie-ins to new pipelines.

The lightweight CIT is operated via remote control through a laptop by an experienced technician on board a platform or a diving support vessel (DSV). As a result, operational safety is enhanced and control over clamp installation operations is greatly improved, according to the company.

The introduction of the new CIT comes on the heels of the remote-controlled Subsea 1200RC Tapping Machine, which was launched by TDW in 2012 to offer a diverless solution to subsea hot tapping in depths of up to 3,000 m (9,842 ft).

Because the most critical part of the hot tapping process is the point at which the drill penetrates a live pipeline, TDW was keen to remove divers from the process and provide a remote-controlled diverless solution. The development of the CIT and the Subsea 1200RC Tapping



Machine is the culmination of a concerted effort by TDW to provide a safer, more efficient method.

Subsea hot tapping is necessary to facilitate tie-ins, pipeline repair, and flow assurance. Nearly all subsea hot tap operations — as many as 98% — involve the use of a post-installed mechanical tee with elastomeric pressure sealing elements, while only 2% use hyperbaric-welded tees or pre-installed tees, due to the expense. To offer pipeline operators a cost-effective way to remotely install mechanical tees prior to the hot tap or as part of an integrated hot tap assembly, TDW developed the CIT.

The CIT is small, lightweight, and easy to deploy. As with the Subsea 1200RC Tapping Machine, it is a top-

side-driven tool with a passive remotely operated vehicle (ROV) interface. The installation package consists of four basic units: a control skid, ROV, clamp or fitting, and the installation tool.

First, the TDW proprietary control skid is attached to the belly of a standard, workclass ROV. The assembly, which consists of the clamp and a proprietary TDW installation frame, is assembled on the deck of the DSV.

The entire system is pre-tested to verify that each function performs properly before being lowered (with the clamp halves in closed position) into the sea by the crane on the DSV. The control skid is transported by the ROV traveling alongside the assembly.

Upon arrival at the pipeline, the ROV connects a hot stab to the frame and the installation tool opens the clamp using cylinder actuation. Technicians on board the DSV then carry out the bolt engagement program from the laptop. Every function is achieved with a dedicated stab that the ROV picks up from the skid and stabs into the interface panel.

For more information, email business development business manager George Lim at George.lim@tdwilliamson.com, or visit www.tdwilliamson.com.



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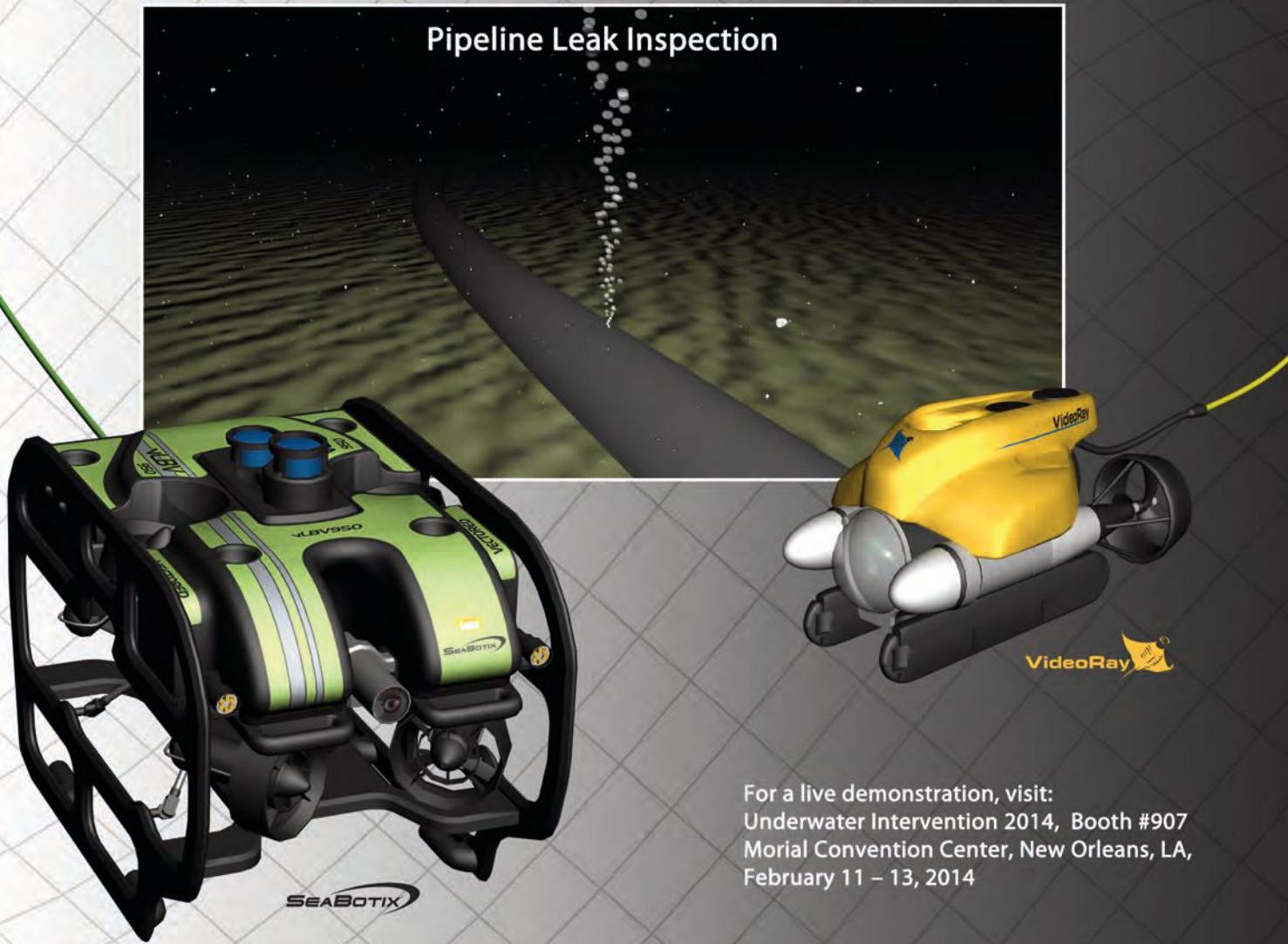
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RGU develops software preventing potential faults in subsea technology

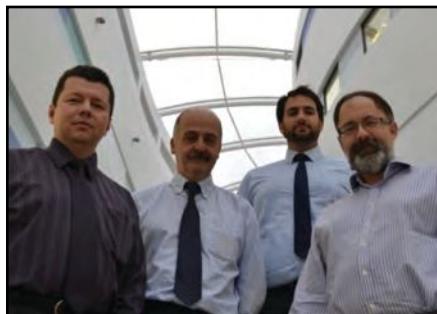
Robert Gordon University (RGU) researchers have developed new software that helps anticipate and prevent potential faults in subsea technology.

Created as part of a knowledge transfer partnership (KTP), the technology, dubbed V-Sentinel, has been designed to provide autonomous condition monitoring of subsea control systems and allow operators to take preventative action by flagging up potential faults.

Commenced in October 2011 in partnership with Viper Subsea Technology, the project aims to develop a new solution, allowing operators to carry out predictive maintenance of subsea control equipment to reduce repair costs while reducing the risk of serious accidents.

Based on this, a pattern recognition system has been developed looking at abnormal changes in the data collected from operators. Research student Frederic Bouchet said subsea assets in the oil and gas industry, and in particular in the North Sea near Aberdeen, are a vital part of oil and gas production.

"However, the environment surrounding these constructions makes main-



From left: Dr. Andrei Petrovski; Viper Subsea operations manager Jeremy Edwards; Research student Frederic Bouchet; and Professor John McCall

nance and surveillance difficult and costly," Bouchet added.

The project is led by Dr. Andrei Petrovski and Professor John McCall, members of the Computational Intelligence Group at RGU.

Viper Subsea operations manager Jeremy Edwards said oil and gas operators in the North Sea and globally will see the potential of the techniques developed as delivering a major reduction in lost production that can result from subsea control system failure.

"The KTP project with RGU succeeded in producing a proof of concept demonstrator to show oil and gas companies at the Offshore Europe 2013 exhibition how artificial intelligence techniques can be used to help identify incipient faults in subsea production control systems before they escalate to the point where hydrocarbon production is impacted," Edwards added.

Empreinte software speeds pipeline damage assessment

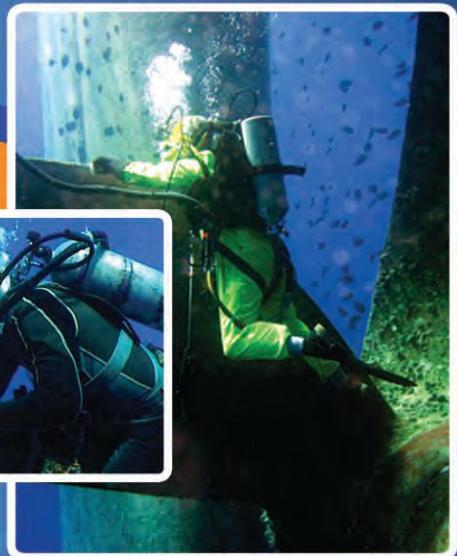
Tecnicas, Bureau Veritas' marine advisory division, has developed with Total a new simulation system for pipeline damage assessment. The Empreinte software suite allows pipeline operators to determine safe operating pressures if a pipeline is damaged. Offshore pipelines can suffer dents and gouges. These can be caused by external injuries, internal or external corrosion due to a corrosive effluent and failure of coating or cathodic protection, and weld defects and straining linked to ground movements. Empreinte provides Level 3 assessments of the damage based on calculations such as finite element analysis.



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OceanGate Inc. dives on oil platform for Black Elk Energy

OceanGate Inc. (OGI), a global provider of deep-sea manned submersible solutions, has completed a series of dives in the Gulf of Mexico to observe the ecological impact of decommissioned oil platforms on ocean life using the five-person manned submersible Antipodes. This expedition was part of an initial study related to the “Rigs to Reefs” program, a critical issue in the decommissioning of platforms in the Gulf of Mexico and around the world, and highlighted the unique ability of manned submersibles to collect a wide range of data, environmental information, and assessments around oil platforms. OGI’s ability to work alone or in tandem with AUVs and ROVs facilitates work in offshore environments



for a variety of operations, including structural surveys, pipeline inspections, bottom debris surveys, and subsea facility inspections.

OceanGate’s expert crew took leading researcher and coral expert Dr. Paul W. Sammarco and CBS news reporter Chip Reid to South Timbalier 185 B, owned by Black Elk Energy Offshore Operations LLC. Black Elk Energy CEO John Hoffman was also on board with his team to help guide the effort and ensure data observation efforts were aligned with inspection and safety requirements.

Dr. Sammarco remarked that the ability to conduct visual reconnaissance on the platform and its environment was unparalleled and far surpassed the capabilities of scuba diving or even ROVs. The 180° horizontal/180° vertical viewport offered a broad perspective on the plants and animals present — including, corals, soft corals, algae, bottom fish, and open-water organisms such as dolphins, cobia, sharks, etc. The potential to run ecological surveys for long periods of time at one atmosphere and collect specimens at depth represents a tremendous asset, particularly with sites like decommissioned oil platforms.

Known as “Idle Iron,” retired platforms in many sites across the Gulf of Mexico have evolved into the perfect hosts for a complex and diverse set of species that are thriving and re-establishing underwater footprints, much as they do around artificial reefs. Along with collecting data, the expedition allowed stakeholders, including researchers, media, and engineers, the chance to see the environment first-hand and in real-time with the flexibility to change mission operations on the fly.

For more information, visit www.oceangate.com.

UTEC Geomarine announces successful fieldwork campaigns

UTEC Geomarine has announced the completion of a series of notable geotechnical survey campaigns that have included several deployments of new technologies.

On behalf of a client operating in the West of Shetland region, a program was performed using UTEC Geomarine’s innovative ROV-deployed geoROV™ CPT and sampling system. A total of 111 Cone Penetration Test (CPT), 44 cyclic T-bar, and 32 high-quality push samples test locations were successfully investigated.

During the project, UTEC Geomarine’s new suction anchor tooling skid geoREACT was successfully deployed for the first time and was used to quickly and effectively enhance seabed reaction and stability available for the tests, thus maximizing data quality.

Also deployed for the first time recently was UTEC Geomarine’s new generation, high performance, variable frequency vibro-core system geoVC. A marine geotechnical and environmental survey was conducted in Dublin Bay, and a total of 21 cores up to 6 m length were successfully recovered during the investigation. The geoVC system incorporates several innovations that improve the coring energy and control available, helping to maximize sample and data recovery.

UTEC Geomarine’s heavy duty Roson CPT system has also been successfully used recently for wind farm geotechni-

cal survey works at the Humber Gateway project. The work saw 147 CPT tests performed to assist with jack-up rig location analysis. The high production rates achieved meant that CPT data of a total penetration length of 783 m was gathered in 10 days despite high currents.

For more information, visit www.UTECsurvey.com.



Bluestream boosts fleet of SAAB Seaeye ROVs

Bluestream has taken delivery of the third of four ROVs ordered from Saab Seaeye in the last 12 months.

Their new 2,000 m-rated Cougar XT is the second of this model to be added to the 11-strong ROV fleet operated by the Netherlands-based offshore services company.

Managing director, Rolf de Vries, sees the Cougar as further investment in Bluestream's ROV resources and its commitment to remote technology.

"We are ready to meet the needs of diverse clients across different market sectors," he says.

He added that the Cougar XT was chosen as a proven system that is ideal for light work-class jobs and survey tasks. It can also be adapted to receive a wide variety of sensors, ancillary equipment, and tooling.

Bluestream's model comes with an array of cameras, sonar, five-function manipulator, and hydraulic disk cutter. A detachable bare skid is also supplied ready for different tooling options.

Bluestream has a reputation for finding imaginative tooling solutions to cut operating costs and improve safety — they were first to adapt a Saab Seaeye Surveyor ROV for Christmas Tree installation work.

Their solution included an innovative torque tool that could operate delicate needle valves within torque tolerances without needing the dexterity of a diver's hand.

For more information, visit www.seaeye.com.



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Ocean News & Technology

EdgeTech 4600 provides wide swath survey for Project Contour

The team of Project Contour has already captured stunning underwater photos, videos, and acoustic images in the beautiful area of Western Crete. The group has taken on the task of mapping and exploring an area not previously charted or dived using today's high tech underwater imaging or diving equipment. Searching the area for shipwrecks and other items of archaeological interest, the team is providing daily updates and commentary on this remarkable mission of underwater exploration.

On the survey side to make the most of the underwater dive missions, it is important to cover a lot of ground in an efficient manner. Enabling the fast wide swath acoustic imaging needs is the EdgeTech 4600. As noted by Project Contour, "Our survey vessel is up and running with an EdgeTech 4600, combined bathymetry and side-scan sonar system. The vessel and electronics are functioning flawlessly and over 100 GB of seafloor information



was mapped, mostly at a speed of 4.5 kts. Such a tool is a dream."

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

Tritech Gemini assists Reef Subsea dredging and excavation operations

Tritech's latest product in the Gemini Multibeam range, the Gemini Narrow Beam Imager (NBI), has been proven to provide invaluable data when working in extremely limited visibility conditions.

The Gemini NBI provides operators with real-time, high-speed acoustic images from a narrow vertical beam

covering a 130° swath. Operating at 620 kHz, the NBI provides imagery at a 10-mm range resolution and with a 0.5° horizontal angular resolution delivers sharp sonar imagery.

A field-proven technology, the Gemini NBI was successfully used by Reef Subsea to monitor the trenched installation of 6-in. and 2-in. cables while using controlled flow excavation techniques. The seabed conditions around the site varied considerably; however, even where there was high turbidity, Reef was able to clearly monitor the cables using the Gemini NBI.

With the increasing level of cables being laid in shallow water, where turbidity can be at its worst, the Gemini NBI has proven to be highly effective at visualizing targets that are typically hidden from view to conventional multibeam sonars.

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International Submarine Engineering Ltd. builds and delivers HYSUB ROV

International Submarine Engineering Ltd is pleased to deliver a new ROV and Tether Management System (TMS) to Fukada Salvage and Marine Works Co. Ltd.

Fukada's HYSUB 100HP ROV is a multi-purpose vehicle that will be used for scientific and commercial purposes as well as inspecting and salvaging seafloor items.

Designed to operate from one of Fukada's new research vessels, the ROV has a 2,000-m depth rating. The ROV is equipped with thrusters, sensors, six lights, eight cameras, ISE's Magnum Manipulator, and other auxiliary equipment needed to carry out the vast requirements for Fukada's subsea operations.

The new HYSUB ROV complements Fukada's existing fleet of ISE ROVs, renamed HAKUYO, that includes a 150 HP 3,000-m depth ROV as well as their recently built Explorer AUV.

To accommodate their expanding fleet of ROVs, Fukada received a new



ROV handling system built by Hawboldt Industries out of Nova Scotia, Canada.

Their fleet includes the MV Musashi, which has the world's largest class floating crane, capable of lifting 3,700 tons. Fukada's fleet of ISE ROVs cover all operations required for the company, including cable burial, salvage, research and survey, making Fukada one of Japan's largest full service subsea equipment and service suppliers.

For more information, visit www.ise.bc.ca.

Sea Owl reborn

The first 360° ROV to work in any orientation — even upside down — has been re-launched by Saab Seaeye.

The Sea Owl concept, successfully introduced by Saab in the 1980s, has been completely re-engineered with new chassis, advanced technology content, and increased work capability.

Now named Sea Owl XTi, the new design combines acclaimed features from Saab Seaeye's stable of successful vehicles, with the added feature of 360° orientation.

The result is a vehicle made for hard-to-reach places and hostile environments that combines the characteristics of a highly maneuverable observation vehicle with the versatility of a larger ROV.

Core features that define the new Sea Owl XTi concept include the iCON intelligent control architecture for smarter operation, a doubling of the payload for handling a wide range of work-skid options, extreme maneuverability coming from seven thrusters, and a new depth rating to 2,000 m.

For more information, visit www.seaeye.com.

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Gemini NBI sonar image of a cable being trenched >

Image courtesy of Reef Subsea Dredging & Excavation



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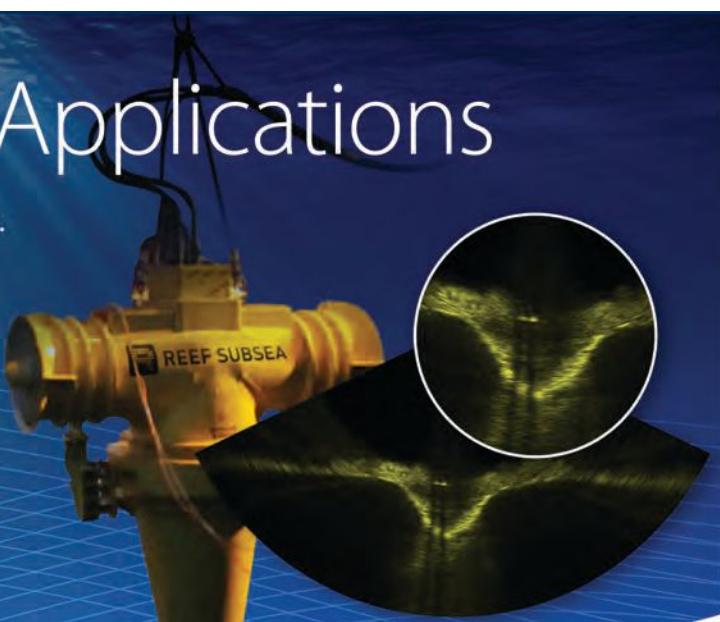
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Veson Nautical announces cloud-based IMOSLive

Veson Nautical now offers a hosted option for Integrated Maritime Operations System (IMOS), the company's flagship solution. The new IMOSLive option eliminates up-front IT infrastructure investment and management, in-house installation of software, and internal hardware and software upkeep. With secure hosting and software maintenance by Veson Nautical, IMOSLive clients are able to host their IMOS applications on regional cloud server instances, connect to IMOS from anywhere in the world by launching the full application via a web portal, automate server monitoring, with regular checks performed by Veson Nautical as well as the option for Veson-managed upgrades, protect data with 256-bit SSL encryption IMOS is built around the way people work, enabling users to make better business decisions that ultimately maximize profits. The solution is composed of core chartering, operations, and financials modules, plus optional add-on functionality for bunker management, cargo scheduling, trading and risk management, demurrage, pooling, reporting lightering, Veslink, and LNG. The IMOS solution also interfaces flexibly to third-party systems and market data feeds to suit client requirements.

Cobham announces SAILOR FleetBroadband

Push-to-Talk solution

Cobham introduced a new technology at the International WorkBoat Show 2013. The new SAILOR FleetBroadband Push-to-Talk (SAILOR PTT) system integrates Inmarsat's leading L-band satellite service with GSM services to enable long-range, secure and interference free multi-user/group communication. The solution is expected to be popular within the work boat, OSV, and fishing fleets where group communication can enhance vessel safety and operational efficiency. SAILOR PTT will operate similar to VHF but brings with it numerous advantages, not least unlimited range and over-the-horizon communication. Whereas radio is an open broadcasting network, SAILOR PTT is a secure solution that can link vessels together in a flexible and private network. Other advantages will include improved voice quality with IP-based digital voice instead of analogue VHF voice, no radio interference or background noise and global coverage, without the need for VHF infrastructure. Additionally, all connectivity aspects of the SAILOR FleetBroadband terminal that powers PTT are available to provide connectivity and voice for crew welfare and operations. This intelligent new system will offer exceptional physical and transmission robustness, which secures reliable, high-quality communication while keeping transmission costs as low as possible. SAILOR PTT is a true hybrid solution, with automatic least-cost routing over FleetBroadband and 2G/3G/LTE networks for full connectivity anywhere at any time. The system will use GSM wherever possible and seamlessly switch to FleetBroadband with no interruptions.

Harris CapRock to provide communications services for Carnival Corporation

Harris CapRock Communications has signed a 5-year contract with Carnival Corporation to provide communications services on board more than 100 cruise ships in its 10 cruise line brands. The dual-band satellite communications solution will enable the Carnival brands to reach dramatically improved bandwidth levels to meet the performance expectations of guests and crew onboard. To meet Carnival's needs, Harris will deploy a fully managed, end-to-end Very Small Aperture Terminal solution utilizing the latest generation of iDirect technology, via a hybrid C- and Ku-band solution. Carnival will receive equipment, installation, maintenance, service, and 24/7 proactive monitoring and support from Harris' customer support centers. Transition and installation work will occur globally in various ports, spanning across the U.S., Bahamas, Europe, South America, Australia, and Singapore. Each ship will be equipped with stabilized antenna systems to provide the optimal level of flexibility and availability. Bandwidth levels will be higher than what was previously delivered to each fleet, which accommodates new service requirements set by Carnival for its guests and crew as well as for new entertainment solutions across the 10 cruise line brands.

259 iDirect platform chosen for THOR 7



VT iDirect, Inc., a company of VT Systems, Inc., announced that Telenor Satellite Broadcasting A.S. (TSBC) has chosen iDirect's new Velocity® product line as the ground infrastructure solution for its new THOR 7 high throughput satellite (HTS). Using iDirect technology, TSBC will deliver a Ka-band HTS payload of up to 9 Gbps of throughput across 25 spot beams, providing capacity over the North Sea, Norwegian Sea, Mediterranean, and Baltic Sea as well as the Middle East. iDirect is a world leader in satellite-based IP communications technology.

TSBC chose the iDirect platform for several reasons. The platform will enable automatic, seamless spot-beam handover across all beams on the THOR 7 satellite, ensuring continuous mobile connectivity. The platform will also establish an integrated capacity pool that can be efficiently distributed and enables the development of service plans for individual terminals as well as for groups across the entire coverage area. This establishes a global bandwidth management system that enforces Service Level Agreements at the group level across all beams. Further, TSBC aims to leverage the iDirect platform to facilitate inter-network roaming with other Ku and Ka satellite operators, enabling end users to travel outside of their service providers' networks, while maintaining seamless coverage through a single service provider.

TSBC expects to launch the THOR 7 satellite in the second half of 2014. THOR 7 will increase capacity for current maritime and energy customers and enable TSBC to expand its business in the satellite news gathering, aeronautical, and governmental markets.

For more information, visit www.telenorsat.com or www.idirect.net

Pullmantur Cruises extends 11-year relationship with MTN Communications

MTN Communications (MTN) announced that Pullmantur Cruises, a Royal Caribbean International brand, is renewing and extending its long-term relationship with the company. Pullmantur chose to increase the breadth of communications services and support MTN will provide to its fleet, including an enhanced onboard suite of connectivity options for passengers and crew along with an expansion of its broadband satellite services.

Pullmantur has been an MTN customer since its founding 11 years ago in Spain. Known for the outstanding value it delivers to customers, Pullmantur's itineraries include the Mediterranean, Caribbean, and South American cruises. A leader in catering to the bring-your-own-device (BYOD) audience, Pullmantur tailors its vessel communications services to accommodate both passenger and crew connectivity demands. As such, Pullmantur will be updating the Wi-Fi infrastructure on its fleet. This enhancement will enable more existing and new MTN communication offerings ranging from specialized apps, enhanced Internet and social media access, and calling solutions.

Pullmantur has signed up for broadband communications, crew calling, and Internet Café services through its contract renewal. Throughout the term of this extended agreement, MTN will continue to roll out new product offerings related to its next-generation network, known as MTN Nexus™.

MTN operates a worldwide connectivity footprint through its combined satellite and terrestrial network across the globe. The pioneer in cruise industry communications, MTN continues to bring innovation, value, and service excellence to its customer base.

For more information, visit www.mtnsat.com.

DigiGone® approved for use on Thuraya network

DigiGone® announced that its innovative video communications system and software platform has been approved for use with Thuraya's IP terminals. A leading mobile satellite services operator, Thuraya is actively promoting the DigiGone® satellite communications solution across their distribution channels in all vertical markets.

Optimized for narrowband satellite channels, DigiGone® offers high-quality encrypted video and audio conferencing, video streaming, Voice over IP (VoIP), IM Chat, and file transfer using a small fraction of the bandwidth needed for other commercial video telecommunication solutions. The DigiGone® system can be customized, depending on users' bandwidth speed requirements and their choice of audio and video quality. The bandwidth can be raised or lowered by the user at any time during the call to meet user requirements for image resolution.

DigiGone® is especially well suited for maritime applications and is certified to work with Thuraya's Maritime Broadband terminal.

The system is currently being deployed on commercial ships for applications such as video conferencing, security, and ship-to-shore crew calling. The software can be installed on most PCs, laptops, tablets, or smartphones in just a few minutes.

DigiGone® has formed a strategic relationship with Maritime Medical Access (MMA) at George Washington University to offer a complete subscription-based telemedicine solution for ships at sea. The DigiGone® video link enables MMA emergency physicians to perform visual

inspections of shipboard crewmembers to improve diagnosis and treatment. In many cases, this can avert the necessity of an expensive ship diversion or at-sea evacuation.

For more information, visit www.digigone.com or www.thuraya.com.



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KVH products win NMEA awards

The National Marine Electronics Association (NMEA) honored KVH Industries, Inc. with its prestigious product awards in two categories, communications and entertainment, at its annual convention in San Diego, California. TracPhone V3 won the "Communications Product Award," and TracVision HD11 won the "Entertainment Product Award."

The awards recognize manufacturers and individuals for their innovation and leadership in the marine electronics field, according to NMEA, which is an industry group made up of more than 600 companies, including manufacturers, dealers,

and boat builders. This is the 16th consecutive year that KVH has won a NMEA product award for its satellite communications or television systems.

TracPhone V3, which won the "Communications Product Award," is an extremely compact Ku-band VSAT antenna that provides broadband connectivity to boats as small as 30 ft. Designed for today's era of increasing reliance on the Internet and social media, TracPhone V3 enables boat owners to stay connected no matter where they may be cruising. The system utilizes KVH's worldwide mini-VSAT Broadbandsm network, which is the only maritime network using spread spectrum technology (similar to that used in the high-powered 3G and 4G networks on land). This advanced technology makes it possible to offer broadband speeds at up to 2 Mbps from the

TracPhone V3 onboard system, which has an antenna that is only 14.5 in. in diameter. KVH built the mini-VSAT Broadbandsm

network to provide high-quality, affordable marine satellite phone and Internet service and offers airtime rates as low as \$0.49 per MB and phone calls for only \$0.49 per minute worldwide.

TracVision HD11, which won the "Entertainment Product Award," is the world's first truly global satellite TV



TracPhone V3



TracVision HD11

TracVision HD11

system with full HD support. Its advanced features include 4-axis stabilized tracking, which ensures superior reception in all locations and conditions, and KVH's TriAD™ technology, which enables simultaneous reception of Ka- and Ku-band broadcasts. A digitally programmable Universal World LNB provides full compatibility with nearly all direct-to-home standard and HD satellite TV services without swapping LNBs or other hardware. Simple to use, the TracVision HD11 system automatically tracks any of the more than 100 satellites contained in its worldwide TV satellite library. New satellites can be added to the library at any time, creating a future-proof system.

For more information, visit www.kvh.com.

KVH provides free satellite calls to Philippines for maritime customers

The devastation of Typhoon Haiyan has left many Filipino seafarers on vessels around the world desperate for news from home. To help these mariners, KVH Industries, Inc., announced on 13 November that all phone calls to the Philippines from vessels using its mini-VSAT Broadbandsm service will be free during this emergency.

"Filipino seafarers represent more than 20% of the world's mariners. In support of the many seafarers whose family and friends have been affected by the devastating typhoon in the Philippines, there will be no charge for calling the Philippines on any KVH TracPhone® system with mini-VSAT Broadbandsm service, on any vessel, anywhere in the world," said Martin Kits van Heyningen, KVH's chief executive officer. "We are also offering free digital daily Filipino newspapers from our NewsLink group so that seafarers can keep abreast of the situation. Not knowing if loved ones are safe is extremely difficult in any emergency situation, and it is particularly wrenching for a seafarer who may be halfway around the world from home."

The free Voice over IP (VoIP) calls will be for the vessel's operations/company phones as well as for crew calling phones. In cases where crewmembers currently use a prepaid KVH calling card, the toll rate for calls to the Philippines will be zero. The complimentary newspapers with local news from the Philippines will be provided to any vessels that request them, whether the vessels are KVH customers or not.



To receive NewsLink's Tagalog-language, digital daily newspaper free, Filipino seafarers are encouraged to send an e-mail to freenews@newslinkservices.com.

KVH's Crewtoo® social media network for seafarers is also providing up-to-the-minute information regarding relief efforts on the ground in the Philippines. Typhoon Haiyan, one of the most powerful storms to ever hit land, struck the central regions of the Philippines on 8 November with devastating impact.

For more information, visit www.kvh.com.

MCP and Gulf Offshore achieve mobile first in North Sea

Maritime Communication Partner (MCP) has signed a landmark 3-year contract with leading offshore shipping operator Gulf Offshore Norway, owned by GulfMark Offshore Inc. The deal provides three vessels, all of which operate on the Norwegian Continental Shelf, with solutions enabling seamless mobile phone coverage and Internet access. MCP is the first firm to offer this custom-made offshore solution to vessels operating in the North Sea.

MCP, an established leader in the mobile communications market for cruise and ferry operators, is now bringing its expertise and proven global network capabilities to the offshore segment. Its new solution allows crews to communicate at sea as they would on land. This is achieved thanks to an integrated offer that combines MCP's successful CellAtSea® network with other networks such as GSM, ICE, and VSAT. The result is easy and cost-effective communication, enhancing quality of life for crewmembers and improving communication channels between the vessels and the firms that charter them.

Speaking of the competitive nature of the offshore segment, where Gulf Offshore operates six vessels in total (including platform supply vessels, multi-purpose supply vessels, and anchor handling vessels), Gulf Offshore noted that competition is hard when it comes to

attracting and retaining the best crew on the market, and they increasingly expect their employer to provide good communication solutions. MCP's offshore proposition will help in this regard, which in turn impacts very positively on the company's profitability.

The first of the three designated vessels has already been fitted with MCP's unique offshore solution, which enables ships to connect to the most appropriate and rational network depending on location. This includes facilitating connections with both terrestrial networks, up to 50 nmi from land, and with networks based on installations in the North Sea. In addition, vessels will receive increased bandwidth from the most cost-effective, stable, and best network, while unique features also include data compression, web traffic filtering, and data traffic prioritized by importance.

For more information, visit www.mcp.com.

Crewtoo focuses on seafarers, gains 60,000 members in 12 months

Headland Media announced that more than 60,000 seafarers have joined its new Crewtoo® social media site, which is described as "the home of seafarers online." This significant milestone, achieved within 12 months of the site's introduction, highlights the demand among seafarers for greater social interaction. In addition to Crewtoo®, Headland Media is also known for its popular NewsLink™ newspapers, which are delivered to ships via satellite, and its Walport® blockbuster movies and training videos. The company was purchased in May 2013 by a maritime VSAT industry leader, KVH Industries.

On many of the world's commercial vessels, smaller, multinational crews often have language and cultural barriers that make it difficult for them to socialize. Shorter port calls and increased security regulations limit the traditional break of shore leave. A lack of communication options on board limits contact with family and friends on shore. And many vessels aren't equipped with adequate sources of news and entertainment. The issue has become serious enough to be addressed with new International Labour Organization (ILO) regulations known as MLC-2006, which set standards designed to improve the living conditions of seafarers onboard ships.

Headland Media's offerings, which include news, sports, movies, music, and training videos in addition to Crewtoo®, offer a comprehensive solution for commercial maritime companies striving to offer attractive working conditions and meet the new requirements of MLC-2006 that go into effect in August 2013.

An added benefit of combining KVH and Headland Media services is that large files such as Headland Media's Hollywood movies and training

videos can be transmitted efficiently and affordably using KVH's TracPhone® V-IP series terminals, mini-VSAT Broadband™ network, and new IP-MobileCast™ service, which is expected to be available later this year. This variety of services, provided in a convenient and affordable manner, is the ideal way for operators to improve crew welfare while maintaining focus on their economic wellbeing.

For more information, visit www.headlandmedia.com.



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Alcatel-Lucent to upgrade Asia America Gateway

Alcatel-Lucent and Asia America Gateway (AAG), the cable system owned by a consortium of operators, have reaffirmed their cooperation with the signature of a contract to upgrade the AAG submarine cable system, covering the route from Philippines to the United States. By leveraging Alcatel-Lucent's advanced coherent technology, the 20,000-km-long AAG system will add multi-terabit data capacity to cope with the rapid expansion of data traffic in countries along its route, while rapidly increasing its capability to meet cloud service requirements. Spanning almost half the length of the Equator, AAG connects Malaysia to the U.S. via Singapore, Thailand, Brunei, Vietnam, Hong Kong, the Philippines, Guam, Hawaii, and the U.S. west coast. When it was launched in 2009, the AAG represented a breakthrough in delivering the first terabit submarine cable network between southeast Asia and the U.S., being designed for an ultimate capacity of 1.92 Tbps. The advanced coherent technology to be used for this upgrade will deliver a capability to upgrade the system to over 8 Tbps and will contribute to further strengthen communications reliability over the Asia-U.S. route.

Hawaiki picks up customers for Pacific bandwidth

Hawaiki Cable, a venture planning to build a new submarine fiber optic cable system linking Australia, New Zealand, and the U.S., has signed letters of intent with two telecom operators interested in acquiring international bandwidth. New Zealand ISP Voyager confirmed its intention to acquire international bandwidth on the trans-Tasman and trans-Pacific segments of the Hawaiki system. The deal will see Voyager purchase substantial capacity over the next 10 years. The multi-million dollar deal with iiNet Limited, an Australian carrier, will involve fiber capacity on the Sydney-to-U.S. cable leg and the trans-Tasman leg linking Sydney to Whangarei in Northland, New Zealand. The 14,000-km Hawaiki cable system will initially provide up to 3 Tbps of capacity using the latest 100 Gbps wavelength technology.

PLDT investing in Bohol fiber network

Philippine Long Distance Telephone Co. (PLDT) said demand for telecommunication and data services was increasing in Bohol and it was planning to invest P1 billion in the province to expand its fiber network. The investment was deemed necessary given the expansion of the call center and outsourcing industries in the area and the implementation of major development projects in the province, such as the New Bohol International Airport in Panglao, PLDT said in a statement. The fiber optic cable expansion projects in Bohol include the roll-out of two legs of inland and submarine cables that will add more than 280 km of fiber to PLDT's network. One leg of the expansion that will run across Bohol's southwest coastal corner is set to be completed by March next year while the northeast corner leg is slated for completion in the fourth quarter of the same year.

Briggs Marine begins cable work in Scotland

Briggs Marine has begun the installation of a submarine power cable between two Scottish islands. The company began the lay of subsea cable on 15 September between the isles of Barra and Eriskay as part of their contract with Scottish and Southern Energy (SSE). This new cable installation will increase capacity on Barra. The marine operations were scheduled to last a total of 10 days, depending on the weather, and will use three vessels — Forth Guardsman, Forth Sentinel, and Forth Fighter. The Forth Guardsman performed the cable installation operations using a combination of spud legs near shore and a four-point mooring pattern offshore. Forth Guardsman was supported by the Forth Sentinel as anchor handling tug and the Forth Fighter as a dive support vessel.

Hawaiki awards supply contract to SubCom



New Zealand company Hawaiki Cable Limited, owner and developer of Hawaiki submarine cable system, has signed a turnkey supply and installation contract with submarine fiber optic cable vendor TE SubCom.

The agreement is a key milestone in Hawaiki's planned 14,000 km trans-Pacific cable linking Australia, New Zealand, and Hawaii to the U.S. west coast.

Under terms of the multi-million dollar deal, TE SubCom will design and lay an industry-leading coherent fiber optic cable system capable of 10 Tbps per fiber pair on the Australia/New-Zealand to U.S. trunk. A number of Pacific islands located next to the cable route will be able to connect to the main trunk.

Undersea cable system elements (wet plant) will be based on 100-Gbps wavelength technology and are designed for future upgrades as terminal equipment advances. The cable system will also include SubCom's Optical Add Drop Multiplexing (OADM) branching unit technology to connect multiple regional branches to the main cable.

TE SubCom will survey the cable route and use collected data to design and manufacture the fiber optic cable system in its New Hampshire factories. The company operates a fleet of cable ships that will lay the cables across the Pacific Ocean.

The Hawaiki cable system is planned for completion in late 2015.

For more information, visit www.hawaiki.co.nz or www.subcom.com.

CWC to upgrade BDSNi

Cable & Wireless Communications (CWC) is upgrading and expanding its submarine fiber optic cable network in The Bahamas, paving the way for the launch of a range of new broadband-enabled services.

CWC, which trades in The Bahamas as The Bahamas Telecommunications Company (BTC), will invest \$4 million to upgrade the Bahamas Domestic Submarine Network International (BDSNi) fiber optic network.

The 3,500-km subsea cable network connects more than 20 Bahamian islands between New Providence, the country's most populated island, and Haiti. The network is a vital link for the country's outer islands, known as the "Family Islands," delivering broadband and fixed line services. By upgrading and extending the network, the company will increase the number of ways it can route telecoms traffic, improving the network resilience in the event of damage to any part of the cable.

In addition, the upgrade will facilitate the delivery of faster, more cost-effective broadband to the islands it reaches. Over time, this will enable residents of the “Family Islands” to receive broadband-enabled services not available previously such as internet shopping, online education, and telemedicine.

CWC is currently introducing similar “social telecoms” (telecoms-enabled public services) to New Providence. The company has recently installed a telemedicine lab at a local hospital and is in the process of building a CCTV network.

The upgrade of BDSNi will be undertaken by Huawei Marine Optix and will be completed by the end of 2014.

For more information, visit www.cwc.com.

Indosat, SubPartners sign MOU

SubPartners Pty Ltd and PT Indosat Tbk. signed a Memorandum of Understanding (MOU) to enter into negotiations for SubPartners Pty Ltd to connect Jakarta to APX-West, SubPartners’ submarine cable system from Perth, Australia to Changi North, Singapore.

Under the terms of the MOU, Indosat will participate to build a branch connection from APX-West that will be landed at Indosat’s landing station at Ancol, Jakarta. Indosat will initially light capacity to Singapore, with future options for capacity to Perth. Importantly, as the owner of the Jakarta branch, Indosat will be the sole Indonesian licensed carrier on the system and will assist with the permitting requirements for APX-West within Indonesia.

Indosat director and chief wholesale and infrastructure officer, Fadzri Sentosa, said, “As a major telecommunications carrier in southeast Asia, our connectivity and infrastructure needs will only increase as we grow our subscriber base and our network. This growth will need to be supported with the latest technologies and future system flexibility. Working with SubPartners on APX-West gives Indosat access to the latest submarine technology and an additional diverse route from Jakarta to Singapore, which will not only benefit Indosat and our customers but Indonesia as a whole. It will complement the existing international submarine cable assets of Indosat such as JAKABARE, SMW3 and AAG as an additional link to our global network. This is part of our strategy to strengthen and to increase the quality of our international network infrastructure

by providing capacity along with network diversity.”

SubPartners CEO, Bevan Slattery, said, “It is my pleasure to confirm Indosat as our Indonesian partner for APX-West. Crossing Indonesian waters presented SubPartners with two key opportunities, one, to improve regional diversity with an additional landing to Jakarta, and two, to secure a major carrier-grade partner in one of the fastest growing markets in the world. I can

wholeheartedly say that our partnership with Indosat thoroughly exceeds any expectations I had, and I look forward to working with the Indosat team on APX-West.”

SubPartners and Indosat commenced initial discussions earlier this year, and, after several meetings and clarifications, agreed to execute the MOU to formalize their commitment to the project.

For more information, visit www.subpartners.net.

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Seaborn receives Coface financing guarantee

Seaborn Networks announced that Coface, the French Export Credit Agency, has issued, for the account of the French State, a "Promise of Guarantee" for a credit facility for the Seabras-1 Brazil-U.S. cable project subject to certain closing conditions.

Seaborn Networks intends to use the buyer credit to facilitate the manufacture and installation of Seabras-1, a new four-fiber pair Brazil-U.S. submarine cable system being built by Alcatel-Lucent for Seaborn Networks. Seabras-1 will be the first direct route between São Paulo and New York, and the system will also have a landing in Fortaleza, Brazil.

Seaborn Networks also announced that the maximum design capacity for Seabras-1 has been increased from 32 to 40 Tbps in response to market and customer demand for high bandwidth services.

This new submarine cable system will be based on Alcatel-Lucent's advanced 100-Gbps coherent technology, developed by Alcatel-Lucent in Villarceaux, near Paris. The ready-for-service date of Seabras-1 is in 2015.

For more information, visit www.seabornnetworks.com.

E-marine completes cable repair in Arabian Sea

E-marine has successfully completed a challenging cable repair in the Arabian Sea, despite battling with severe weather conditions, to restore service to the FLAG Europe-Asia network on behalf of Reliance Globalcom Limited.

The repair was carried out in water approximately 4,000 m deep. During recovery, the damaged cable parted at the joint between the main high-tension cable and the branching unit. Further investigation by E-marine and the on-board Reliance Globalcom representative revealed previous damage to the joint, which was very likely the cause of the original cable fault, according to a press statement from E-marine.

E-marine's assigned cable ship and on-board crew worked in extreme weather conditions for the duration of the repair. The damaged cable was quickly recovered and new cable, repeater and branching unit spliced in, tested and re-laid successfully, thanks to close coordination between the ship's crew and the Reliance Globalcom on-shore support teams. In total, the repair took approximately 40 days to complete.

The FLAG cable network provides a vital telecommunications link to the mar-

kets of Western Europe and Japan through the Middle East, India, southeast Asia, and China, but local services became impacted recently after a suspected repeater failure on the branch to Fujairah, UAE.

The cable owners, Reliance Globalcom Limited, engaged E-marine to replace the repeater, which required attending to a malfunctioning branching unit in the Arabian Sea. E-marine immediately deployed its largest cable ship, Niwa, which set sail from Sharjah, UAE, with a highly skilled crew and technical staff on board to fix the fault.

During the operation, the E-marine crew battled through extremely severe weather during the monsoon season, with winds almost always above 35 kts, and sea swells above 20 to 35 ft, which was well above the normal range of 8 to 12 ft. Despite the difficult conditions, the crew completed the operation with less than 20 hrs downtime, reducing any impact to local services.

For more information, visit www.emarine.ae.

Globe-SJC link-up heralds high-point in Philippines telecom

Globe Telecom has recently launched the South-East Asia Japan Cable (SJC), its fifth major investment in submarine cable systems. Operated by a global consortium of leading telecommunications and technology companies that Globe forms part of, SJC was successfully constructed after 2 years of careful groundwork and provisioning between Globe and its partners. The trans-Asian cable is now fully operational with available data traffic, streaming an initial design capacity of 28 Tbps deployed by six fiber pairs.

This groundbreaking technological development in east Asia will enable unmatched telecommunications services by Globe through its link-up with SJC, providing superior interconnectivity within the Philippines and its Asian neighbors. Spanning almost 9,000 km, the \$400 million submarine cable has one of the highest capacities in the world. It addresses bandwidth-intensive applications such as internet TV, online games, and enterprise data exchange. The cable's superior design capacity can support simultaneous streaming of up to 3 million high-definition (HD) videos. According to SJC officials, the cable's massive capacity can download the entire amount of content of the U.S. Library of Congress in 1.5 seconds.

The investment of Globe on SJC translates into significantly increased capacity and added geographic diversity

In the SJC project, NEC is in charge of the routes indicated below.



to the Philippines' international connectivity. The Philippine telco on the other hand will effectively increase its capability of meeting the growing telecommunications needs of its corporate clientele by providing resilient bandwidth.

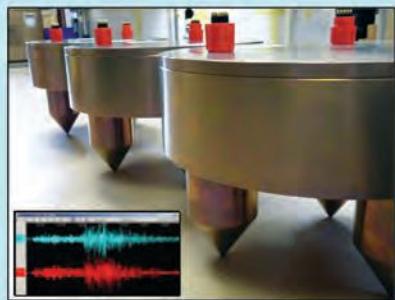
The SJC heralds a milestone for the seven Asia Pacific countries in the consortium, including the Philippines with Globe as its partner. It will set a new benchmark in global data and information connectivity. It is interconnected seamlessly with the latest transpacific cable, and, that together, will deliver the lowest latency connectivity between Asia and the U.S., specifically from Singapore to Los Angeles. As the SJC cable route avoids the earthquake zone in north Asia, it enhances the operators' network resilience by offering cable diversity and reliability in the event of a cable breakage in other undersea networks.

Globe and SJC officials confirmed that the submarine cable's huge bandwidth will be able to meet the capacity needs of future applications and innovative solutions, as well as spur the further development of information and communications technology in the region. As a preferred partner of enterprises, industries and companies, Globe, with its partnership in SJC, enhances the overall competitiveness of the Philippines to help achieve its goals of economic stability, financial robustness, and position it at par with the most technologically advanced countries of the world.

Aside from Globe Telecom, the SJC global consortium 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), Donghua Telecom Co., Ltd. (a subsidiary of Chunghwa Telecom, Co., Ltd.), Google, KDDI Corporation, Singapore Telecommunications Limited (SingTel), PT Telekomunikasi Indonesia International (Telin a subsidiary of PT. Telekomunikasi Indonesia, Tbk), and TOT Public Co., Ltd. (TOT).

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

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

Offshore Communications Backbone

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

JDR wins Petrofac contract

JDR has been awarded a contract by Petrofac, one of the world's leading oil-field service companies, for the design and manufacture of five subsea power and communication (composite) cables and associated accessories for the Satah Al Razboot (SARB) package 3 project, offshore Abu Dhabi.

Petrofac announced the contract for the development's offshore pipelines and platforms and associated facilities in April 2013. They have entrusted JDR, which has been involved since the early



stages of the project, to deliver a comprehensive system that will enable power and communication between the field platforms by the spring of 2014.

JDR's scope includes the delivery of five subsea power cable totaling 55 km, with the longest single length being 22 km. System accessories include custom-designed terminations, cable hang-offs, and pull-in heads. The field, located 120 km to the northwest of Abu Dhabi, is being developed by the Abu Dhabi Marine Operation Company.

JDR has already commenced work on the complex project at its state-of-the-art Hartlepool, UK facility. The power cable design incorporates numerous fiber optics that are specifically designed to operate in a high-temperature environment. JDR will also be providing comprehensive installation support and aftermarket services through its global network of highly experienced and fully certified AIMS technicians, which will include site acceptance testing.

For more information, visit www.jdrglobal.com.

Havyard to convert ship for cable laying

Havila Shipping has signed a contract with Deep Ocean who has chartered the subsea vessel Havila Phoenix for cable laying and trenching operations. The contract is for 7 years with four 1-year options and means that the vessel needs to undergo a major conversion before commencing the contract.

Havyard Ship Technology will do the conversion, which is scheduled to be finished in March 2014.

Havila Phoenix is a Havyard 858

design, delivered from Havyard's shipyard in Leirvik, Norway as a construction vessel in 2009. Since then, the vessel has had different charterers and executed several different operations in connection with subsea oil production installations. The contract with Deep Ocean includes cable laying and trenching for offshore windmill installations. To enable the vessel for these operations, it needs to be lengthened with 17.4 m to accommodate the new equipment. The lengthening means that close to 700 tons of new steel will be installed.

There will be installed a lot of new equipment both on and below the cargo deck. The stern will be reinforced and a 250-ton A-frame will be installed, operating together with the existing offshore crane for launching the biggest trencher. This trencher is the world's largest self-propelled trencher. Equipment for launching a smaller trencher over the side will also be installed.

A big part of the conversion will be to install the cable laying equipment. This includes installation of a horizontal cable drum with capacity to store 2,000 tons of cable.

Havila Shipping is in charge of the marine operations of the vessel while Deep Ocean controls the cable laying operations. Around 100 people will stay on board during the operations.

For more information, visit www.havyard.com.

Filing submitted for Alaska-Canada cable

In a move aimed at expanding the market for southeast Alaska's vast renewable hydro resource, Alaska Power & Telephone Company subsidiary Soule Hydro, LLC has applied for a presidential permit to construct and operate the first electric transmission line crossing the U.S. border delivering Alaska-based renewable electric energy into Canada.

On 18 March 2013, Soule Hydro filed an application with the Office of Electricity Delivery and Energy Reliability of the Department of Energy (DOE) for a presidential permit as required by Executive Order (EO 10485) to allow for the construction of international electrical transmission facilities between the U.S. and a foreign country.

Soule Hydro proposes to construct and operate a high-voltage alternating current (HVAC) hydroelectric transmission line that is to originate at the Soule River on Portland Canal in southeast Alaska and continue to the BC Hydro Stewart Substation on the north side of Stewart, British Columbia. It would occupy federal land administered by the

Ketchikan-Misty Fjords Ranger District of the United States. Forest Service and would be capable of transmitting up to 77.4 MW of power.

The Alaska portion of the project would be an 8-mi long, 138-kV HVAC 3-phase submarine cable that would be laid on the floor of Portland Canal before crossing the International Boundary off the community of Hyder, Alaska where it would extend another 2 mi to land at Stewart, B.C. Arrow Dock.

The transmission line would eventually transition to overhead and terminate at the BC Hydro Stewart Substation approximately 2.5 mi from the cable landing. Soule Hydro represents that the project's precise final route would be subject to a number of factors, including resource issues, permitting, land acquisition, and stakeholder agreement. The approximately 8-mi long portion of the project located within the United States as well as the approximately 4.5 mi of transmission infrastructure in Canada would be owned and operated by Soule Hydro. Soule Hydro is a limited liability corporation, organized and existing in the State of Delaware. Alaska Power & Telephone Company (AP&T) is the parent company and sole shareholder for Soule Hydro.

For more information, visit www.aptlaska.com.



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SUBSEA CABLES

Jan De Nul Group orders new multipurpose vessel

Jan De Nul Group has ordered a new vessel at the Uljanik Shipyard in Pula, Croatia. The vessel, with a deadweight of 10,500 tons and a total length of 138 m, will be a multipurpose vessel able to perform cable laying, subsea rock installation and trenching, and offshore support.

In the cable laying mode, the vessel will be able to install up to 10,000 tons of cable and will be equipped with a 5,500 tons capacity turntable above deck and a 4,500 tons capacity turntable below deck along with tensioners as required by the project, chute and auxiliary equipment.

In the subsea rock installation mode, the vessel will be able to install up to 10,000 tons of rock in a single load by using the aft stone hopper with a capacity of 3,000 tons and the midship hopper with a capacity of 7,000 tons along with the two excavators and the fall pipe for accurate rock installation at up to 200 m water depth.

In the combination mode, any combination of the above will be possible up to the carrying capacity of the vessel.

The vessel will be delivered in 2015 and will be the 76th vessel in the fleet of Jan De Nul Group.

For more information, visit www.jandenul.com.

Nexans umbilicals chosen by Statoil

Nexans has been awarded an €8 million contract by Statoil to supply the static umbilicals for the Gullfaks Rimfaksdalen project in the Norwegian North Sea. This is the fourth Statoil project in quick succession to feature the new standardized fast-track umbilical design developed by Nexans and follows the contracts awarded in 2012 for the Oseberg Delta field (North Sea), the Snøhvit gas field (Barents Sea), and the Smørrebuks Sør (Norwegian Sea).

Nexans' specialized facility in Halden, Norway will manufacture a total of 9 km of static umbilicals to be deployed at water depths of around 137 m to provide the subsea tie-back between the Rutil and Opal gas discoveries and the existing Gullfaks A platform. Statoil's new standardized umbilical design, that integrates hydraulic, data, and fiber optic services, is ideally suited to this project as it has been developed specifically by Nexans to provide a consistent and cost-efficient solution for fast-track projects, such as tie-ins to existing infrastructure as well as other kinds of subsea oil and gas projects.

The main Gullfaks field lies in the northern part of the Norwegian North Sea. It has been developed with three large concrete production platforms: Gullfaks A platform began production in 1986, with Gullfaks B following in 1988, and the Gullfaks C platform in 1989. Produced oil is loaded directly into shuttle tankers on the field, while associated gas is piped to the Kårstø gas treatment plant north of Stavanger and then on to continental Europe.

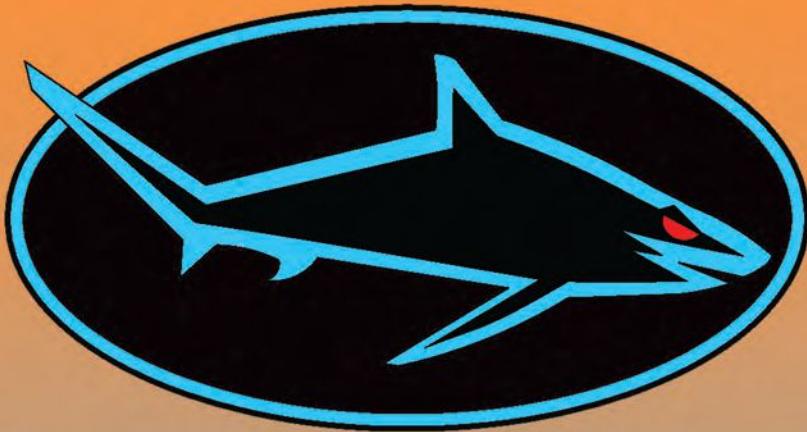
For more information, visit www.nexans.com.



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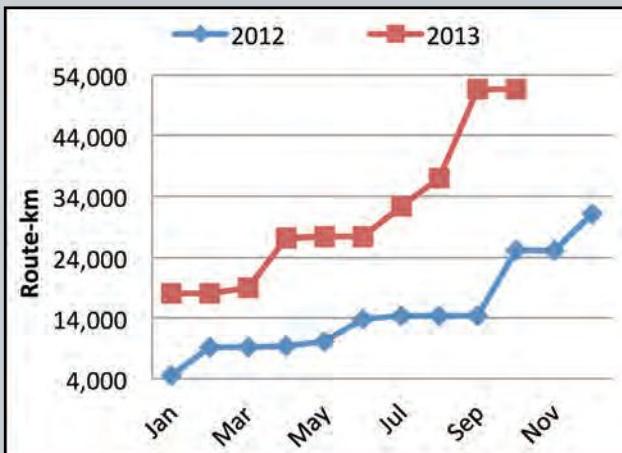
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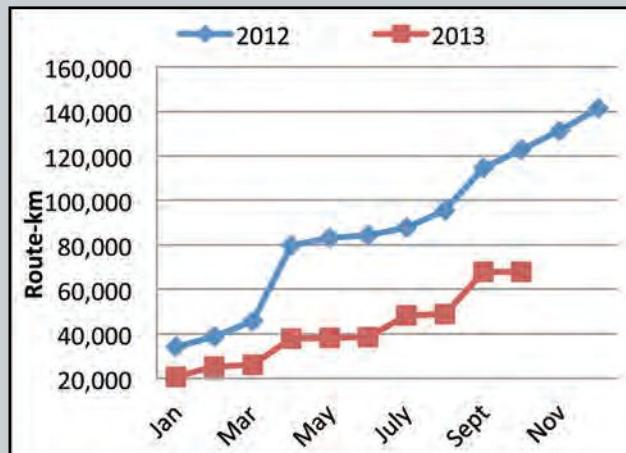


Subsea Telecom & Power Cable Data

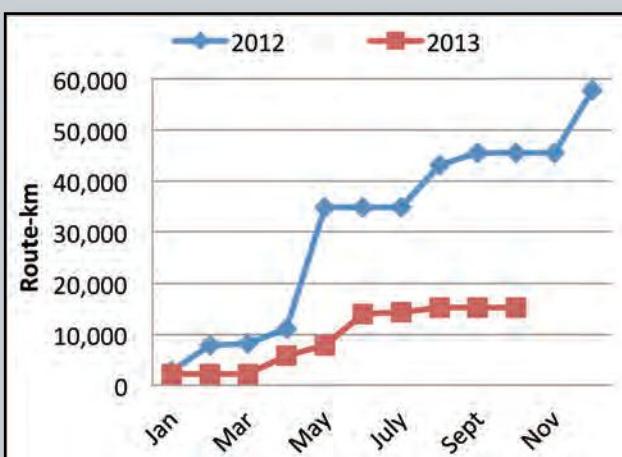
FO Cable Awards by Month



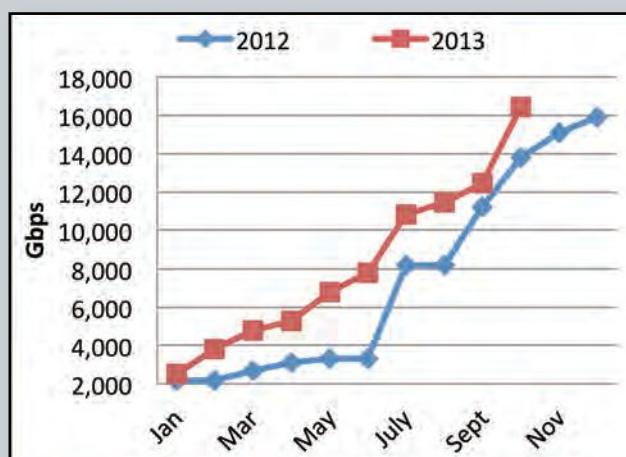
FO Cable Announcements 2013



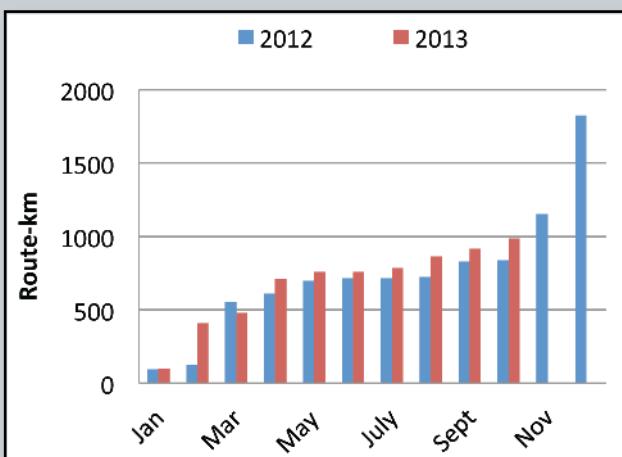
Submarine FO Cables Entering Service 2013 in Route-km



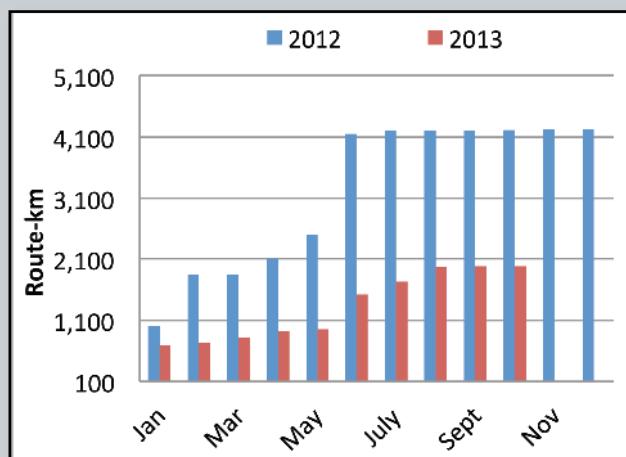
Upgrades of Existing Cable Systems in Gbps



Submarine Power Cable Awards 2013 in Route-km



Submarine Power Cable Announcements 2013 in Route-km



Gulf of Mexico Data

Current Deepwater Activity

Operator		OCS		Prospect Name	Water Depth (ft)
	Area	Block	Lease	Rig Name	
Petrobras America, Inc.	WR	425	G16987	VANTAGE TITANIUM EXPLORER	8,843
Shell Offshore Inc.	DC	843	G23540	NOBLE GLOBETROTTER	8,487
Marathon Oil Company	DC	757	G31570	ENSCO 8502	8,391
Petrobras America, Inc.	WR	206	G16965	ENSCO DS-5	8,147
Shell Offshore Inc.	AC	857	G17561	H&P 205	7,819
Exxon Mobil Corp.	KC	964	G21451	T.O. DEEPWATER CHAMPION	7,657
Chevron USA, Inc.	KC	953	G27770	T.O. DISCOVERER INDIA	7,030
BP Exploration & Production, Inc.	GC	743	G15607	T.O. DEVELOPMENT DRILLER II	6,824
Anadarko Petroleum Corp.	KC	875	G21444	ENSCO 8500	6,809
Noble Energy, Inc.	MC	782	G33757	ENSCO 8501	6,581
Chevron USA, Inc.	KC	829	G25814	T.O. DISCOVERER CLEAR LEADER	6,428
BP Exploration & Production, Inc.	MC	778	G14658	THUNDER HORSE PDQ	6,040
BP Exploration & Production Inc.	MC	383	G07937	ENSCO DS-3	5,741
Cobalt International Energy, LP	KC	163	G32606	ENSCO 8503	5,616
BP Exploration & Production, Inc.	GC	743	G15604	T.O. DEVELOPMENT III	5,414
BP Exploration & Production, Inc.	KC	93	G25780	SEADRILL WEST CAPRICORN	4,853
Anadarko Petroleum Corp.	GC	683	G16783	T.O. DISCOVERER SPIRIT	4,485
BP Exploration & Production, Inc.	GC	782	G15610	MAD DOG SPAR RIG	4,428
Hess Corp.	MC	725	G22898	STENA FORTH	4,328
Apache Deepwater LLC	MC	983	G34468	ENSCO 8505	4,326
Chevron USA, Inc.	GC	640	G20082	T.O. DISCOVERER INSPIRATION	4,298
Chevron USA, Inc.	GC	640	G20082	T.O. DISCOVERER DEEP SEAS	4,292
BHP Billiton Petroleum (GOM) Inc.	GC	610	G20084	GSF C.R. LUIGS	4,273
BP Exploration & Production, Inc.	KC	57	G25777	SEADRILL WEST SIRIUS	4,065
Anadarko Petroleum Corp.	GC	518	G21801	MAERSK DEVELOPER	4,049
Chevron USA, Inc.	GB	973	G32911	PACIFIC SANTA ANA	3,960
Shell Offshore, Inc.	MC	809	G09873	NOBLE DON TAYLOR	3,853
Shell Offshore, Inc.	MC	934	G07975	ATWOOD CONDOR	3,845
Anadarko Petroleum Corp.	EB	645	G32822	ENSCO 8506	3,798
Shell Offshore, Inc.	MC	894	G24122	NOBLE DANNY ADKINS	3,787
Marubeni Oil & Gas (USA) Inc.	EB	668	G23243	CAL-DIVE Q-4000	3,710
Shell Offshore, Inc.	GC	248	G15565	T.O. DEEPWATER NAUTILUS	3,233
Shell Offshore, Inc.	VK	956	G08475	COIL TUBING UNIT (N.O. DIST)	3,214
Shell Offshore, Inc.	VK	956	G08474	NABORS 202	3,214
Shell Offshore, Inc.	MC	762	G24112	NOBLE BULLY I	3,144
W&T Energy VI, LLC	MC	243	G19931	HYDRAULIC WORKOVER UNIT NO	2,816
Shell Offshore, Inc.	GB	427	G07493	NOBLE JIM TOMPSON	2,720
LLOG Exploration Offshore, LLC	MC	503	G27277	NOBLE AMOS RUNNER	2,648
Eni US Operating Co. Inc.	MC	546	G25098	T.O. DEEPWATER PATHFINDER	2,599
Shell Offshore Inc.	GB	372	G17355	NOBLE DRILLER	1,526
Dynamic Offshore Resources, LLC	GC	65	G05900	H&P 206	1,353
Stone Energy Corp.	MC	26	G31474	DIAMOND OCEAN VICTORY	1,116
Chevron USA, Inc.	GB	189	G06358	HYDRAULIC WORKOVER UNIT (L)	718
SandRidge Offshore, LLC	EB	110	G02650	NABORS S.D. IV	660

Deepwater prospects with drilling and workover activity: 44

Current Deepwater Activity as of Tuesday, 12 November 2013

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,571	35,287	2,569
201 to 400	116	1,117	20
401 to 800	293	864	10
801 to 1,000	373	576	9
1,000 & above	3,433	1,874	26

Rig Activity Report 15 November 2013

Location	Week of 11/15	Week +/- Ago	Week +/- Ago	Year Ago
Land	1685	6	1679	-55
Inland Waters	17	0	17	-2
Offshore	60	2	58	10
U.S. Total	1762	8	1754	-47
Gulf of Mexico	58	2	56	10
Canada	401	23	378	17
N. America	2163	31	2132	-30
				2193

Activity by Water Depth Information current as of Tuesday, 12 November 2013

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

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

Monthly Stock Figures & Composite Index

Industry Company Name	Symbol	Close(Mid) November	Close(Mid) October	Change	Change %	High	52 week	Low
Diversified, Production Support and Equipment Companies								
Baker Hughes, Inc.	BHI	58.15	50.63	7.52	14.9%	58.83	39.45	
Cameron Intl. Corp.	CAM	55.65	64.59	-8.94	-13.8%	67.42	51.63	
Drill-Quip, Inc.	DRQ	114.44	118.73	-4.29	-3.6%	121.97	65.73	
Halliburton Company	HAL	56.15	51.73	4.42	8.5%	56.52	29.91	
Tenaris SA	TS	45.65	47.26	-1.61	-3.4%	49.87	36.18	
Newpark Resources, Inc.	NR	12.74	13.14	-0.40	-3.0%	13.64	6.56	
Schlumberger Ltd.	SLB	92.81	91.99	0.82	0.9%	94.91	66.85	
Superior Energy Services, Inc.	SPN	27.87	25.85	2.02	7.8%	29.22	18.00	
Weatherford International, Inc.	WFT	16.93	15.95	0.98	6.1%	17.38	8.87	
Deep Down, Inc.	DPDW	2.20	2.35	(0.15)	-6.4%	2.70	1.17	
FMC Technologies	FTI	49.14	58.65	(9.51)	-16.2%	59.79	39.44	
Total Diversified, Production, Support and Equipment.....		531.73	540.87	-9.14	-1.7%	572.25	363.79	
Geophysical / Reservoir Management								
Dawson Geophysical Company	DWSN	30.74	31.89	-1.15	-3.6%	40.86	21.89	
Mitcham Industries, Inc.	MIND	15.97	15.71	0.26	1.7%	18.41	11.51	
Compagnie Gnrale de Gophysique-Veritas	CGV	21.02	21.19	-0.17	4.5%	31.12	20.00	
Total Geophysical / Reservoir Management.....		67.73	68.79	-1.06	-1.5%	90.39	53.40	
Offshore Drilling Companies								
Atwood Oceanics, Inc.	ATW	57.77	54.00	3.77	7.0%	59.49	43.21	
Diamond Offshore Drilling, Inc.	DO	61.34	62.77	-1.43	-2.3%	76.85	59.28	
ENSCO International, Inc.	ESV	61.37	54.41	6.96	12.8%	65.82	51.01	
Nabors Industries, Inc.	NBR	17.82	17.29	0.53	3.1%	18.33	12.75	
Noble Drilling Corp.	NE	40.18	37.35	2.83	7.6%	42.34	33.02	
Parker Drilling Company	PKD	8.19	6.35	1.84	29.0%	8.50	3.61	
Rowan Companies, Inc.	RDC	37.26	36.26	1.00	2.8%	38.65	30.05	
Transocean Offshore, Inc.	RIG	54.06	44.90	9.16	20.4%	59.50	43.65	
Total Offshore Drilling.....		337.99	313.33	24.66	7.9%	369.48	276.58	
Offshore Contractors, Services, and Support Companies								
Helix Energy Solutions Group, Inc.	HLX	23.76	24.16	-0.40	-1.7%	27.58	15.54	
Gulf Island Fabrication	GIFI	25.75	25.05	0.70	2.8%	26.82	18.76	
McDermott International, Inc.	MDR	8.20	7.18	1.02	14.2%	13.48	6.68	
Oceaneering International	OII	83.90	82.31	1.59	1.9%	87.64	51.52	
Subsea 7 SA	SUBCY.PK	20.62	21.53	-0.91	-4.2%	25.48	17.05	
Technip ADS	TKPPY.PK	26.46	29.89	-3.43	-11.5%	31.32	24.46	
Tetra Technologies, Inc.	TTI	12.72	12.80	-0.08	-0.6%	13.41	5.79	
Cal Dive International, Inc.	DVR	1.89	2.07	-0.18	-8.7%	1.27	2.38	
Total Offshore Contractors, Service, and Support.....		203.30	204.99	-1.69	-0.8%	227.00	142.18	
Offshore Transportation and Boat Companies								
Seacor Holdings, Inc.	CKH	97.63	96.38	1.25	1.3%	100.00	71.59	
Gulfmark Offshore, Inc.	GLF	51.25	52.39	-1.14	-2.2%	53.89	27.17	
Bristow Group	BRS	82.76	78.73	4.03	5.1%	85.70	48.26	
PHI, Inc.	PHII	37.54	37.41	0.13	0.3%	37.54	23.43	
Tidewater, Inc.	TDW	61.99	61.08	0.91	1.5%	62.22	42.33	
Trico Marine Services, Inc.	TRMAQ.PK	0.04	0.04	0.00	0.0%	0.11	0.01	
Hornbeck Offshore	HOS	53.63	58.00	-4.37	-7.5%	59.93	31.96	
Total Offshore Transportation and Boat		384.84	384.03	0.81	0.2%	399.39	244.75	

December 2013

Ocean News & Technology

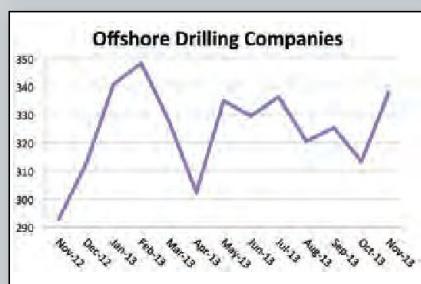
76

Monthly Stock Figures & Composite Index

Industry	Close(Mid) November	Close(Mid) October	Change	Change %	High 52 week	Low
Diversified, Production Support & Equipment Companies						
Total Diversified, Production, Support and Equipment	531.73	540.87	-9.14	-1.7%	572.25	363.79
Total Geophysical / Reservoir Management	67.73	68.79	-1.06	-1.5%	90.39	53.40
Total Offshore Drilling	337.99	313.33	24.66	7.9%	369.48	276.58
Total Offshore Contractors, Service and Support	203.30	204.99	-1.69	-0.8%	227.00	142.18
Total Offshore Transportation and Boat	384.84	384.03	0.81	0.2%	399.39	244.75
Total Offshore Source Index	1,525.59	1,512.01	13.58	0.9%	1,658.51	1,080.70

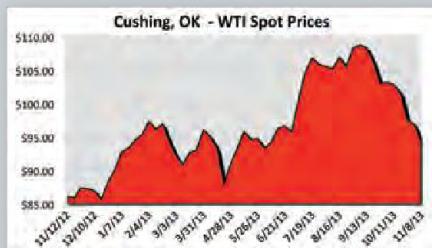
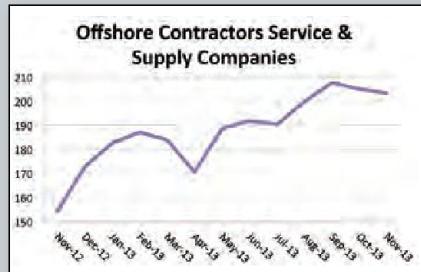
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Oil & Gas Industry Trends

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



Offshore At-A-Glance

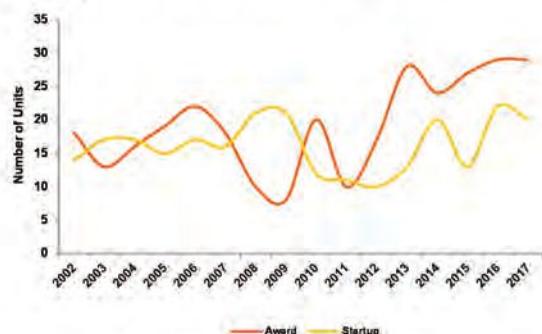
Quest Offshore Activity Report

December 2013

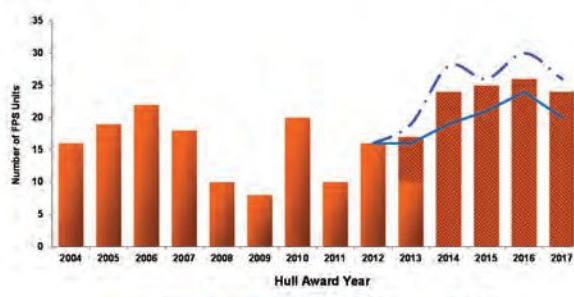
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Ocean News & Technology

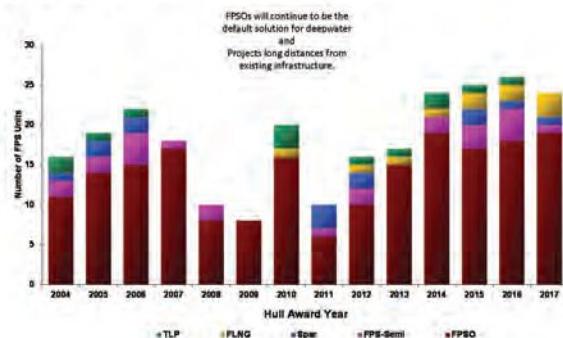
Worldwide Floating Activity by Year 2002-2017e
(Mean Case)



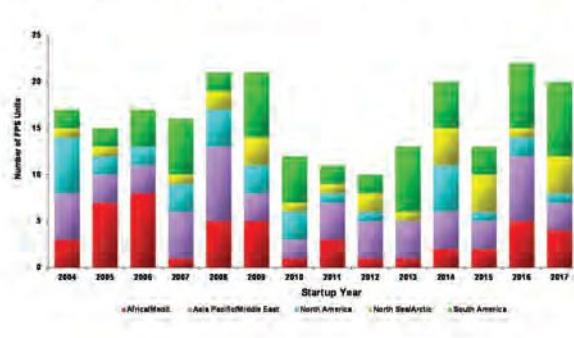
Worldwide Floating Awards by Year 2004-2017e
(Mean Case)



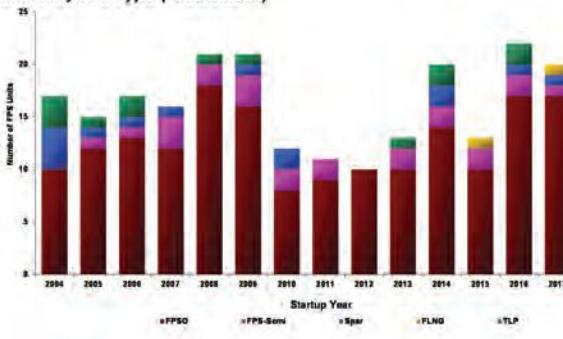
Worldwide FPS Awards 2004 – 2017 (e) Mean Case
By FPS Type



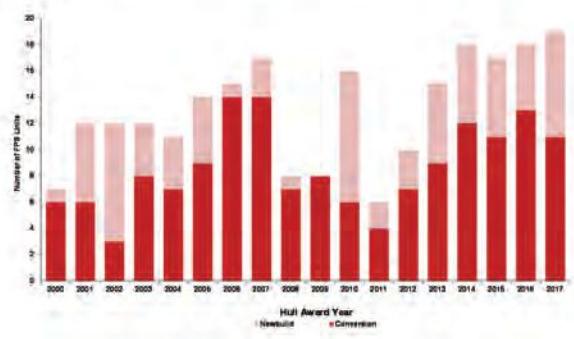
Worldwide Forecast Floating Activity by Startup Year 2004-2017 (e)
Area Activity Share By Region (Mean Case)



Worldwide Forecast Floating Activity by Startup Year 2004 - 2017 (e)
Share By FPS Type (Mean Case)



Worldwide FPSO New Build vs. Conversion
2000-2017 (e) (Mean Case)



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SeaBotix chooses MacArtney MERMAC winch solution for Containerized Delivery System

SeaBotix, San Diego-based leading MiniROV manufacturer and supplier, recently contracted MacArtney to supply an electric MERMAC ROV winch system with Active Heave Compensation (AHC) for use with the innovative SeaBotix CDSTM Containerized Delivery System.

Being the world's first 4,000-m capable, fully self-contained, rapid-response, ROV system—the SeaBotix CDSTM solution represents a truly innovative approach to deepwater observation and light duty work.

Traditionally, large and expensive work-class ROV systems that take days to mobilize have been used for these missions. The CDSTM is a simple, flexible and cost-effective alternative, offering a single container integrated deepwater observation package, including customizable control room, workspace, winch, Launch and Recovery System (LARS), Tether Management System (TMS), and a versatile 4,000-m rated vectored SeaBotix ROV system (vLBV4000).

With its single point lifting capability, the CDSTM container can be mobilised very quickly on vessels of opportunity. With only a small crew requirement, the CDSTM system is simple to deploy, operate and service. A host of features are included to comply with the demanding conditions that often form an inseparable part of the demanding offshore subsea inspection, disaster response and deepwater scientific research missions on which SeaBotix ROVs are often deployed. The included vLBV4000 is a stable, powerful, sen-



sor-rich ROV with the ability to inspect tight areas in complex structures at depth. However, in order to further empower this ROV, the CDSTM system is bound to feature an integrated purpose-developed MacArtney MERMAC Active Heave Compensation (AHC) electrical ROV winch, working to effectively filter out the effects of wave and vessel movement, allowing for deployment operation and retrieval in higher sea states and increasing equipment safety and reducing weather related downtime.

On several fronts, MacArtney MERMAC winches represent an ideal ROV handling solution for the SeaBotix CDSTM system. Like all the other elements that make up the CDSTM, MERMAC winches are designed to be self-contained, modular and compact, however, yet easy to operate and service.

Besides the intelligent AHC capacity, the MERMAC winch used with the SeaBotix CDSTM systems incorporates several ingenious features that contribute to a very effective winch solution. These include a space-saving right-angle winch configuration with the level wind sheave integrated within the protective frame, central grease points for easy system lubrication, a PC-based, user friendly Graphical User-Interface (GUI) for control and monitoring of the Tether Management System (TMS) deployment with speed and tension control. Finally, a wireless handheld controller is used for flexible tangle free operation.

For more information, visit www.macartney.com.

SBM Offshore Selects BMT for Stones IMMS

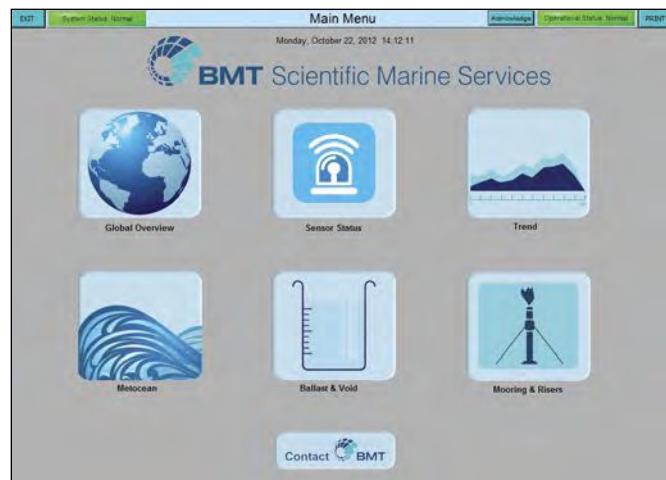
BMT Scientific Marine Services Inc (BMT) has been awarded a contract from SBM Offshore to provide an Integrated Marine Monitoring System (IMMS) for the Stones Floating Production Storage Offshore (FPSO) in the U.S. Gulf of Mexico.

The IMMS monitors, logs, and displays data in real-time to provide operational support functionality and archives data for assessing the facility's integrity over time. The Stones IMMS is composed of a set of subsystems including environmental and facility monitoring, mooring line monitoring, and subsea acoustic monitoring of the disconnectable turret buoy. The IMMS interfaces with other platform control systems and uses BMT's proprietary data acquisition system along with custom HMI user display screens.

BMT brings significant experience to this project, having previously provided a similar system to the Cascade Chinook field development, the first deepwater FPSO in the U.S. Gulf of Mexico. The company has a wealth of experience delivering many other similar projects involving various combinations of mooring line monitoring systems,

acoustic positioning, subsea motions measurement and integrated monitoring packages.

For more information, visit www.bmt.org.



Refillable and rechargeable battery pack

The developic battery containers are a flexible and easy-to-handle solution to submarine power supply requirements. developic offers refillable and, as of 2013, rechargeable battery containers.

The battery containers fit into the developic MCH composite and NG titanium pressure housings that are available for shallow water (up to 750 m depth) or deepwater purposes (up to 6,000 m depth).

Key features are the lightweight design and easy servicing. Depending on the requirements, developic offers housings made of fiber-reinforced synthetic, fiber-reinforced synthetic and aluminium and housings fully made of titanium. What is more, the battery containers are designed according to GL standard I-5-3 with safety factor 1.5.

Several standard battery housing sizes are available—also offering mounting space in the housing for custom electronics. The largest standard battery container accommodates up to 171 LR 20 cells. Custom solutions are available with capacities up to 30,000 Wh.

The user can easily replace the batteries due to the refillable battery containers. These containers are designed to accommodate LR20 (size D) standard batteries, either primary (Alkaline or lithium) or rechargeable cells.

The internal battery container is configurable to various output voltages. For example, a standard 49-cell container is available with 7s7p, 14s3p, 21s2p or 49s configurations. The parallel battery stacks are connected via a Schottky diode matrix.

In addition, intelligent connector boards are available-monitoring battery discharge, temperature and voltage, as well as providing programmable, resettable fuse functionality. The configuration and data interface for the smart connector boards is either RS232 or logic level serial.

As a further development, developic now offers also rechargeable battery solutions based on lithium iron phosphate cells. These rechargeable packs are available with capacities up to 2,000 Wh.

The system electronics incorporates a complete battery management system monitoring each cell individually, a smart

programmable fuse, and the charging sub system with peak charging power up to 400W. The developic lithium iron phosphate packs are rechargeable without opening the housing.

The battery management system data are available via either RS232 or logic level serial interface.

For more information, visit www.develogic.de.



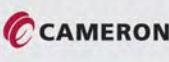
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PRODUCT NEWS

High capacity donut load cell designed for underwater applications

tecsis LP now offers the Model XLD Submersible, a robust compression load cell specifically designed for use in wet, splash down, or fully submersed applications. Donut load cells, also known as through-hole load cells, are available in a variety of sizes and are designed to fit around shafts or bolts to provide compression force data. The versatile, low-profile design is only 3.5 in. high, making this unit useful in offshore applications, reservoirs, locks, dams, or any wet and hostile environment.



This member of the XLD Series features an extra large inside diameter and is available in ranges from 0 to 5,000 to 0 to 50,000 lbs with a 150% safe overload rating. Standard nominal output is 2.0 mV/V, and other outputs are optionally available. With hermetic, fully welded 17-4ph stainless steel construction and an underwater pluggable MCBH4M-SS SubconTM connector, this load cell holds an IP69k rating for water resistance, which allows for completely submerged service.

Full-scale linearity and hysteresis is $\pm 0.25\%$ and $\pm 0.15\%$, respectively, and the operating temperature ranges from -65°F to $+200^{\circ}\text{F}$ (-54°C to $+93^{\circ}\text{C}$). The unit delivers excellent thermal effects on zero (FSO) and span (reading) of $\pm 0.002^{\circ}/^{\circ}\text{F}$ ($\pm 0.0036^{\circ}/^{\circ}\text{C}$).

Available accessories include internal amplification, metric units of calibration, and a variety of electrical connections. Available now from tecsis LP and priced from \$4,500.

For more information, visit www.tecsis.us.

KONGSBERG launches new laser-based reference system for offshore applications

Kongsberg Seatex is launching SpotTrack, an advanced multi-target laser-based relative position reference system. SpotTrack delivers accurate range and bearing measurements and is primarily intended for Dynamic Positioning (DP) operations. Novel technical solutions provide users with a range of benefits.

SpotTrack is a highly robust, yet lightweight, motion stabilized rotating laser sensor offering precision range and bearing readings to one or multiple retro-reflective targets. As a multi-target sensor, SpotTrack uses an advanced detection system and tracking algorithms for true target recognition—minimizing lock-on to false reflections. Motion stabilization provides improved target lock on a moving platform. SpotTrack can utilize already established, optical targets.

"Laser based reference systems represent an established technology, but SpotTrack introduces a new level of reliability and ease of operation for this type of product. The sensor itself is a completely sealed unit, with all moving parts housed inside, so the system is less prone to mechanical wear from exposure to the elements. By this approach, we have created a more durable product well adapted to the requirements of critical operations, and with the benefit of less costly maintenance," explains Vidar Bjørkedal, VP sales & customer support, Kongsberg Seatex AS.



The SpotTrack is based on a proven DP reference system technology and is typically used in conjunction with satellite positioning, microwave-based systems and subsea positioning. It can act as one of the three position reference systems required for the DP3 Class.

"With the addition of SpotTrack to our extensive reference systems portfolio, KONGSBERG Dynamic Positioning customers now have the choice of a complete range of above surface and subsea reference systems developed by KONGSBERG," adds Gard Ueland, president of Kongsberg Seatex AS. Though SpotTrack will primarily be used as a DP reference system, it can support other operations, including automatic docking systems and vessel traffic monitoring. By utilizing roll and pitch stabilization from a motion reference unit, (KONGSBERG MRU) SpotTrack can track targets even at high elevation angles. This makes it suitable for close-by operations, such as 3D positioning for maritime construction.

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

Sherwin-Williams launches interactive marine coatings app

Sherwin-Williams Protective & Marine Coatings launched SeaGuard, an app that provides users with protective coating recommendations for VLCC/VLBCs, chemical tankers and OSV/PSVs. The app is optimized for both iOS and Android.

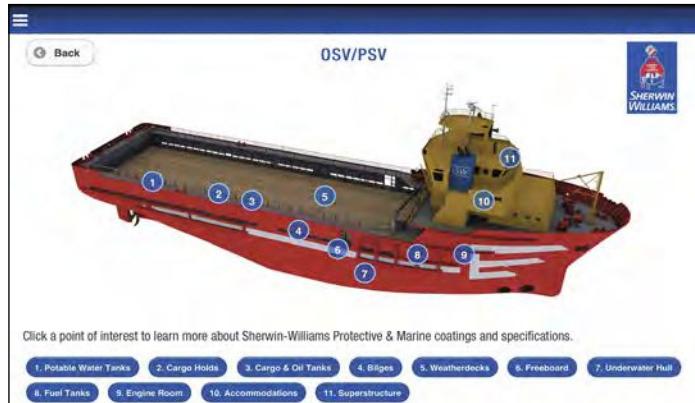
The app is designed to help port engineers and fleet managers access accurate and up-to-date coatings information via mobile technology. It's a convenient alternative to bulky binders stuffed with outdated product data sheets. If a new product is introduced or an old product is no longer manufactured, SeaGuard has the updated information.

SeaGuard's home screen allows the user to select the type of vessel in need of coating. Once the vessel has been selected, labeled areas of the vessel appear. SeaGuard recommends the coating system for each area.

The recommendation includes both a primary and alternative system, providing information on the generic coating system (primer, intermediate and top coat), stripe coat (if needed), dry film thickness for each coat and total mils for the system. Surface preparation and application equipment tips are included in the recommendation. Clicking on a product name brings up a detailed product data sheet.

The SeaGuard app evolved from Sherwin-Williams' long association with its marine customers and deep familiarity with their specific needs. It demonstrates Sherwin-Williams' commitment to service and logistical support for its customers. No other coatings manufacturer has an app designed to walk technicians through the coatings selection process on the go.

To download the app for iOS or Android, visit itunes.apple.com/us/app/seaguard/id708335813?mt=8 or play.google.com/store/apps/details?id=com.sherwin.SeaGuard&hl=en.



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Kraken announces AquaPix® MINSAS – world's first synthetic aperture sonar under \$150,000

Kraken Sonar Systems Inc. announced the development of AquaPix® MINSAS – a next generation Miniature Interferometric Synthetic Aperture Sonar designed for operation to depths of 3,000 m. The system integrates the latest electronics, transducer arrays and signal processing software and is optimized for the demanding size, weight, power and cost constraints of AUVs, USVs, and high-speed towfish platforms.

MINSAS uses a subset of Kraken's award-winning AquaPix® INSAS transducer array, but has the addition of an innovative SAS gap filler transmitter that produces high-resolution data in the nadir region. A lower frequency transmit element, unique to MINSAS, provides a SAS resolution gap fill directly under the platform. The transmitter and receiver elements are integrated into single monolithic arrays that are mounted close to the electronics module. The system also uses two rows of identical receiver elements to deliver precision bathymetry data.

The system will be provided in two configurations. MINSAS 60 uses a transducer array assembly that measures 60 cm in length and is designed for AUVs with body diameters as small as 6 in. MINSAS 120 uses a transducer array assembly that measures 120 cm in length and is designed for larger AUVs as well as for high-speed towfish operations. Both systems produce ultra-high resolution, real-time image quality with unparalleled sharpness. Advanced 3D motion compensation and beamforming technologies nullify blurring caused by platform motion.

For more information, visit www.krakensonar.com.

Life saving the sMRT way

Marine Rescue Technologies introduced its latest man overboard technology in October, which has been designed and developed to meet new international standards that could be introduced as early as February 2014.

The company's new sMRT V100 has been described as the world's most advanced alerting and tracking MOB device. As soon as it reaches the water it sends an alert to the vessel's VHF DSC radio. And if the vessel does not acknowledge the alert it will resend the alert to all VHF DSC radios nearby.

The GPS position is updated every minute via AIS and the sMRT V100 has a 150 mi transmission range.

sMRT alerting units are able to operate with existing VHF DSC and AIS equipment or a sMRT 121.5 receiver, and can also interact with the sMRT Dial to generate an alert by GSM telephone systems. This is particularly useful in the aquaculture industry where work is often in remote areas with little or no support.

Another new product is the Maritime Survivor Locating Device - sMRT AU10 - which automatically alerts on 121.5MHz and tracks casualties via AIS to within 10 m.

For more information, visit www.mrtso.com.

Multi-SeaCam® camera now available in HD

DeepSea Power & Light is proud to announce the HD Multi-SeaCam® camera, its first high definition video camera. Derived from the Multi-SeaCam camera, an industry workhorse, this general purpose camera has been widely used for over 16 years in offshore oil, oceanographic, academic, and military applications around the world. The new HD Multi-SeaCam® video camera builds on the same rugged design as the original, with a 6,000 m rated Titanium housing and scratch-resistant sapphire port, while providing SMPTE 292M compliant HD-SDI 1080p/30 video output in 106.4 mm (4.19 in.) long, 48 mm (1.9 in.) diameter housing.

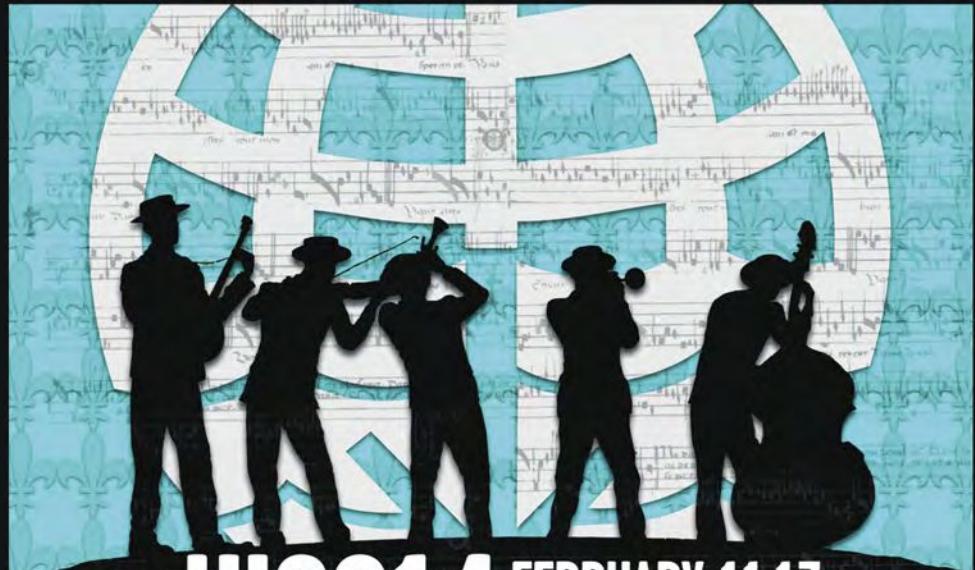
New optics provide a low distortion 74° horizontal field of view with a 2-in. to infinity depth of field providing a full context view in vivid HD picture quality. Initially available with industry standard hybrid coax bulkhead options, the overall compact design brings HD to a whole new range of applications previously out of reach in the subsea industry. The enhancements to the widely popular, compact, and nearly indestructible Multi-SeaCam® camera not only brings high-definition video to our customers, but allows for HD cameras to be brought to some of the harshest and most unforgiving environments on Earth.

For more information, visit www.deepsea.com.



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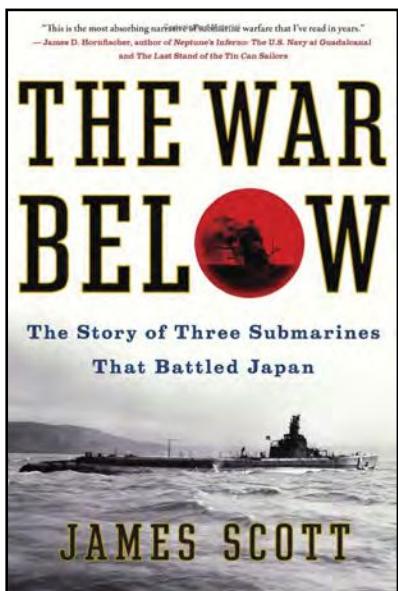
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The War Below: The Story of Three Submarines That Battled Japan

By James Scott



The War Below is the riveting story of the submarine force that helped win World War II in the Pacific by ravaging Japan's merchant fleet and destroying the nation's economy.

Focusing on the unique stories of three of the war's top submarines - Silversides, Drum, and Tang - James Scott takes readers beneath the waves to experience the determination, heroism, and tragedy that defined the submarine service. From the thrill of a torpedo hit on a loaded freighter to the terror of depth charge attacks that shattered gauges and sprang leaks, The War Below vividly re-creates the camaraderie, exhilaration, and fear of the brave volunteers who took the fight to the enemy's coastline. Scott recounts incredible feats of courage - from an emergency appendectomy performed with kitchen utensils to the desperate struggle of sailors to escape from a flooded submarine trapped on the bottom - as well as moments of unimaginable tragedy, including an attack on an unmarked enemy freighter carrying 1,800 American prisoners of war.

The casualty rate among submariners topped that of all other military branches. The war claimed almost one out of every five subs - and a submarine crewman was six times more likely to die than a sailor onboard a surface ship. But the submarine service accomplished its mission: Silversides, Drum, and Tang sank a combined 62 freighters, tankers, and transports. So ravaged from the loss of precious supplies due to the destruction of the nation's merchant fleet were the Japanese that by the war's end, hungry civilians ate sawdust while warships lay at anchor due to lack of fuel and pilots resorted to suicidal kamikaze missions. In retaliation, the Japanese often beat, tortured, and starved captured submariners in the atrocious prisoner of war camps.

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Hardcover, 448 pages, May 2013

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Chevron Corp. said it is making three key appointments to its executive team and realigning its existing technology and services organizations. Effective 1 January, 2014, **Jay Johnson** becomes senior vice president, upstream, and **Joe Geagea** becomes senior vice president, technology, projects and services. The new roles will report to George Kirkland, vice chairman and executive vice president, upstream. Also effective 1 January, **Pierre Breber** becomes corporate vice president and president, Chevron gas and midstream, reporting to John Watson, chairman of the board and chief executive officer. Following Kirkland's planned retirement in 2015, consistent with the company's mandatory retirement policy, Johnson and Geagea will report to Watson. "These appointments ensure a smooth transition in our upstream business and simplify the delivery of technology and services to all of our businesses," Watson said.

Intertek appointed **Jill Rennie** as associate director to lead its environmental consultancy team in Aberdeen, Scotland. Rennie takes up the post, bringing environmental experience as Intertek focuses on integrating its energy services offering to the global oil, gas and renew-

ables industries. With over 12 years' experience in the energy industry, Rennie was with Wood Group PSN from 2007 to 2012 and held previous roles with Maersk Contractors, DNV and Lloyds Register. She is currently undertaking a Ph.D. in Marine Technology at the University of Newcastle-upon-Tyne and has an M.Sc. in Offshore Marine Technology and a B.Sc. in Marine Biology. Rennie is founder of the E-Reps Forum, which recently hosted its annual event at the Aberdeen Exhibition and Conference Centre.

BP said it will appoint **Richard Herbert** as its new head of exploration. Herbert will succeed Mike Daly who has chosen to retire from BP at the end of 2013 after a career of 28 years with the company, 8 leading BP's exploration function. Herbert will rejoin BP from Talisman Energy where he has held the position of executive vice president, exploration since 2009. Before joining Talisman, Herbert spent 6 years with TNK-BP in Russia, serving first as vice president of exploration and then execu-

tive vice president of technology. Prior to TNK-BP, Herbert had a 19-year career with BP. He first joined BP as an exploration geologist in 1984 and held a number of senior technical and leadership positions in operations across the world.

T.D. Williamson said **Chad C. Fletcher** joined the company's executive management team as vice president of western hemisphere operations. Fletcher is responsible for overseeing the fulfillment of strategic initiatives as well as driving day-to-day execution of all business in the western hemisphere. He has more than 25 years of experience in the energy business, beginning his career in the pipeline industry as an engineer and technical services manager for Tenneco Gas Corp. Fletcher later founded a technology solutions firm, Enginuity International, Inc., that became the dominant market share leader for combustion and emission solutions for the pipeline industry. Enginuity was purchased by Dresser-Rand in 2008, where Fletcher was retained and made responsible for creating a new global business unit serving the midstream market. Fletcher's most recent position was vice president of marketing and global business solutions for Dresser-Rand.



Rennie

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The screenshot shows the homepage of the Ocean E-News website. At the top, it says "OCEAN E-NEWS™ brought to you by Ocean News & Technology magazine TSC". Below that is a banner for "SUBSEA SURVEY IMM" with a "CALL FOR PAPERS" section for Galveston, Texas, November 11-13, 2013, and a link to www.subseasurvey.com. The main content area features a news article about Rutgers findings predicting coral reef futures, followed by another about Ocean Specialists Inc. achieving a major milestone in Thailand's offshore fiber network. There are also links for "QUICK LINKS" like Industry Events, Subscriptions, Advertising, and Contact, as well as a "SUBSCRIBE" button.

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

ABS announced the appointment of **Joseph "Joe" Riva** to the position of ABS vice president and chief surveyor. This role is responsible for guiding and overseeing all ABS survey activities, applying a strong knowledge of ABS rules and guides and international regulations to create consistency and quality in service delivery.

Riva has previously served as assistant chief surveyor for the ABS Americas and ABS Europe Divisions. He is the ABS program manager for the U.S. Coast Guard Alternative Compliance Program and has represented ABS on the IACS Survey Panel. During his 32 years with ABS, Riva has held field surveyor positions around the world for both new construction and in-service assets across the marine and offshore sectors.

Teledyne Marine Systems is delighted to welcome **Chris Ordonez** and **Eyjolfur Bjarnason** to the company. Ordonez joins Teledyne Gavia as senior field support engineer. He will be based out of the Teledyne Marine Systems facility in North Falmouth, Massachusetts, to support the expanding global Gavia AUV markets. His experience includes over 10 years in the commercial survey industry, including work as an offshore project engineer in the Gulf of Mexico, project management roles with AUVs and ROVs, and research work on subsea gliders at Oregon State University. Many in the industry will also know him from his active involvement in the Marine Technology Society in the Pacific Northwest. Bjarnason joins the team in Reykjavik as a field service engineer. With his background as a party chief in the oil survey industry in Alberta, he brings an understanding of industry safety, work procedures and survey methods, and field service engineer experience to the Gavia team.

Nautronix is pleased to announce three new appointments within the sales team. **Bob Barrett**, joins Nautronix as sales manager at the company's global headquarters in Aberdeen. He will be responsible for developing awareness and understanding of all Nautronix products, including NASNet® positioning technology. Prior to joining Nautronix, he gained his experience in sales through previous positions within the aerospace and Oil & Gas industry. Nautronix has identified a skills gap in the oil & gas industry for good quality sales people. Keen to address this, they have appointed **Ashley Anderson** and

Scott Williams in the role of sales engineer, and they will both embark on Nautronix' sales training program. Anderson is based in the company's headquarters in Aberdeen, and Williams is based in the company's Houston office; both will support the efforts of the sales team.

DeepOcean AS (DeepOcean), a subsidiary of DeepOcean Group Holding BV, announced that **John Baxter** has been named DeepOcean's director SURF. Baxter has 24 years of international oil & gas contracting experience. He joins from DOF Subsea Norway AS, where he has served as executive vice president for business acquisition. Previously, Baxter has had several managing positions in Acergy, latest as technical director in Acergy's Singapore office. Prior, he held the position as chief operating officer at NKT Flexibles. Mr. Baxter earned an MBA from the Stockholm School of Economics in 2002 and also has a Bachelor of Science in Mechanical Engineering from the University of Abertay Dundee.

Murchison Drilling Schools, Inc. (MDS) is pleased to announce the following staff addition to the Houston Training Center (HTC). **Tom Cowper** has been hired as a Lead Instructor. Tom has a B.S. in Civil Engineering from Texas Tech University and has over 30 years of operational experience on both the contractor and operator side. He worked as a Roughneck while earning his engineering degree. After graduating, he held the following positions: assistant driller, driller, construction engineer, division engineer, drilling engineer, rig design supervisor, rig supervisor, drilling supervisor, district drilling engineer, drilling foreman senior drilling advisor, and consultant. He has varied experience, working on land rigs, jack-ups, semi-submersibles, and drill ships. Cowper is certified in IADC and IWCF. He will be teaching Well Control and Drilling Operations courses at the MDS Houston Training Center.

MacArtney has welcomed **Dr. Ole Aarup Mikkelsen**, as a new System Sales Manager, to its specialist ocean science team at the Group headquarters in Denmark. Mikkelsen holds a Ph.D. in physical geography (2001) from the University of Copenhagen, written on the topic of suspended sediment dynam-

ics in coastal waters. He has spent 3 years as a post doc at the Department of Oceanography, Dalhousie University and Bedford Institute of Oceanography in Halifax, Canada. Here, his work has focused on the development and deployment of an instrumented tripod — INSECT — for sediment transport studies in the Adriatic Sea and the Nova Scotia Shelf. After finishing his post doc, he took a position as research officer at Bangor University, Wales, UK, where he continued his work on sediment dynamics. During his scientific career, Mikkelsen has spent more than half a year at sea onboard research vessels, published almost two dozen peer-reviewed scientific papers in scientific journals and presented his research at numerous conferences around the world.

CSA Ocean Sciences Inc. (CSA) has formally launched its GeoSpatial Services Business Line to serve a rapidly increasing need for geospatial services and applications. CSA GeoSpatial Services provides comprehensive solutions in spatial planning, field data collection, GIS and remote sensing analysis, 2D and 3D visualization, data management, and web-delivered mapping applications. CSA's GeoSpatial Services Business Line is built on the capabilities of CSA's long-standing GIS team, which has a proven track record of exceeding the unique GIS, GeoScience, spatial analysis, and data management needs of a broad spectrum of public and private entities. **Keith VanGraafeiland**, former manager of CSA's GIS Group, brings over 12 years of professional geospatial experience and education to his new position as manager of the CSA GeoSpatial Services Business Line.

As part of its continuing global growth strategy, subsea installation contractor **Bibby Offshore** has announced the opening of a new division and international base in Houston. The company, that also has bases in Aberdeen, Liverpool, Singapore and Trinidad, has initially invested over £3million into the new division, Bibby Subsea Inc. As part of the expansion plan, Andrew Duncan will relocate to Houston, from his existing position of business and commercial director at the company's Aberdeen HQ, to president and managing director of Bibby Subsea. He will be responsible for establishing the Bibby Subsea brand in the U.S. and implementing Bibby's robust corporate framework within this new area.



Cowper

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Subsea UK
Aberdeen, UK
www.subseauk.com

February 10-12, 2014
OTC Arctic Technology Conference
Houston, TX
www.arctictechnologyconference.org

February 11-13, 2014
Underwater Intervention
New Orleans, LA
www.underwaterintervention.com

February 23-28, 2014
Ocean Sciences Meeting
Honolulu, HI
www.aslo.org/meetings/sessions

March 3-6, 2014
10th ONR/MTS Buoy Workshop
San Diego, California
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March 5-7, 2014
Subsea Tiback
San Antonio, TX
www.subseatibackforum.com

March 9-13, 2014
NACE Corrosion
San Antonio, TX
www.nace.org

March 10-12, 2014
Decommissioning & Abandonment Summit
Houston, TX
www.decomworld.com

March 11-13, 2014
Oceanology International
London, UK
www.oceanologyinternational.com

March 25-28, 2014
OTC Asia
Kuala Lumpur, Malaysia
www.otcasia.org

March 29-May 1, 2014
IDGA Maritime Homeland Security
Baltimore, MD
www.maritimehssummit.com

April 7-10, 2014
Oceans '14 Taipei
Taipei, Taiwan
www.oceans14mtsieetaipei.org

April 8-10, 2014
European Offshore & Energy
Birmingham, UK
www.europeanoffshoreenergy-expo.com

April 15-17, 2014
GMREC
Seattle, WA
www.globalmarinerenewable.com

April 28-30, 2014
National Hydropower Association
Washington, D.C.
www.nationalhydroconference.com

May 5-8, 2014
Offshore Technology Conference
Houston, TX
www.otcnet.org

May 12-15, 2014
AUVSI's Unmanned Systems NA
Orlando, FL
www.auvshow.org

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Ocean News & Technology 2014 EDITORIAL CALENDAR

JANUARY

Editorial: Forecast: 2014 and Beyond; GIS/Mapping
Distribution: GOM Oil Spill & Ecosystem; Subsea EXPO;
OTC Arctic Technology Conference
Product & Services Focus: Multibeam & Side Scan Sonars; Research & Development Services

FEBRUARY

Editorial: Oceanology & Meteorology; Decom & Abandonment
Distribution: NACE Corrosion; Decommissioning and Abandonment Summit;
Oceanology International
Product & Services Focus: Buoys & Monitoring Instrumentation; Environmental Monitoring/Testing Services

MARCH

Editorial: Subsea Fiber Optic Networks; Maritime Security
Distribution: GMREC
Product & Services Focus: Connectors, Cables & Umbilicals;
Diver Detection Systems

APRIL

Editorial: Offshore Technology; Ocean Mapping & Survey
Distribution: OTC; AUVSI
Product & Services Focus: Subsea Tools & Manipulators;
Offshore Risk Assessment; Training/Safety

MAY

Editorial: UW Imaging & Processing; Marine Salvage/UW Archeology
Distribution: Energy Ocean; Seawork International
Product & Services Focus: Magnetometers; Water Dredges & Airlifts;
Diving Services

JUNE

Editorial: AUVs & Gliders; Defense & Naval Systems; *Industry in Action*
Distribution: UDT
Product & Services Focus: Tracking & Positioning Systems; Seismic Monitoring Equipment Leasing/Rental Services

JULY

Editorial: Workclass ROVs; Deepwater Pipeline/Repair/Maintenance
Distribution: Offshore Northern Seas
Product & Services Focus: Cameras, Lights & Imaging Sonars;
Oil Spill Clean-Up Services

AUGUST

Editorial: Ocean Observing Systems; Subsea Telecom
Distribution: Oceans'14 MTS/IEEE
Product & Services Focus: Water Sampling Equipment; Cable Installation Services

SEPTEMBER

Editorial: Ocean Engineering; Marine Construction; *Corporate Showcase*
Distribution: SPE ATCE; AWEA Offshore Windpower; Sea Tech Week
Product & Services Focus: Navigation, Mapping & Signal Processing;
Data Processing Services

OCTOBER

Editorial: Offshore Communications; Subsea Inspection, Monitoring, Repair and Maintenance
Distribution: OilComm; North Sea Decommissioning
Product & Services Focus: Acoustic Modems, Releases & Transponders; Marine Communications; Survey & Exploration Services

NOVEMBER

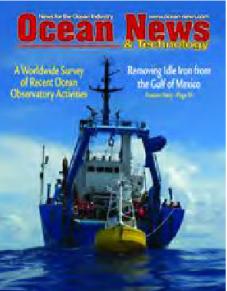
Editorial: Offshore Support, Supply & Emergency Vessels; Deep Sea Mining
Distribution: Clean Gulf; International Workboat
Product & Services Focus: Ship Protection Systems; Winches & Control Systems;
Vessel Charter/Leasing Services

DECEMBER

Editorial: Light Workclass ROVs; Commercial Diving; *Year in Review*
Distribution: Clean Pacific; Underwater Intervention
Product & Services Focus: Diving Equipment & Services; Buoyancy Materials;
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Ocean News & Technology

OCEAN INDUSTRY DIRECTORY

ON&T's Product & Service Directory

MARINE ENVIRONMENTAL CONSULTING SERVICES

Continued ■

CSA Ocean Sciences Inc.
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Fax: +1 772-219 3010
E-mail: tmartin@conshelf.com
Website: www.csaocean.com
Contact: Tony Martin



CSA Ocean Sciences Inc. (CSA) is a marine environmental consulting firm specializing in multidisciplinary projects concerning potential environmental impacts of activities throughout the world. With extensive experience in environmental sciences and technical field operations, CSA is staffed and equipped to offer a complete range of services for projects in offshore, nearshore, estuarine, wetland, and freshwater environments.

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

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

Kongsberg Seatex AS

Prisenteret
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Fax: +47 73 51 50 20
E-mail: km.seatex@kongsberg.com
Website: www.km.kongsberg.com/seatex
Contact: Finn Otto Sanne at finn.otto.sanne@kongsberg.com



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

Teledyne TSS Ltd.

UK Office: 1 Blackmoor Lane
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Tel: +44 (0) 1923 216020
Fax: +44 (0) 1923 216061
E-mail: tsssales@teledyne.com
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Contact: Carolyn Jones



USA Office:
10801 Hammerly Blvd., Suite 128
Houston, TX 77043
Contact: Keith Pope
Tel: +1 713 461 3030
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Comprehensive family of motion sensors available; ranging from a heave sensor through to heave, pitch and roll, and at the top end of the range highly accurate position and heading systems.

OCEANOGRAPHIC INSTRUMENTS

ASL Environmental Sciences, Inc.

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



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

nke Instrumentation

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

Nortek AS

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Tel: +47 6717 4500
E-mail: inquiry@nortek.no



NortekUSA

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Email: inquiry@nortekusa.com
Website: www.nortek-as.com

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

RBR

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E-mail: info@rbr-global.com
Website: www.rbr-global.com



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

Sea-Bird Electronics, Inc.

13431 NE 20th St.
Bellevue, WA 98005
Tel: +1 425 643 9866
Fax: +1 425 643 9954
E-mail: seabird@seabird.com
Website: www.seabird.com
Contact: Calvin Lwin, Applications Engineering



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

Star-Oddi

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Fax: +354 533 6069
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Website: www.star-oddi.com
Contact: Baldur Sigurgeirsson



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

Turner Designs

845 W Maude Avenue
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Contact: Tom Brummett, Sales Engineer
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Website: www.turnerdesigns.com



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Stuart, FL 34997
Tel: +1 772 219 3033
Fax: +1 772 219 3010
Email: jbyous@oceanspecialists.com
Website: www.oceanspecialists.com
Contact: Jim Byous



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

ROV COMPONENTS

ROVSCO, Inc.

5263 Barker Cypress Road, Suite 600
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Fax: +1 281 858 6363
E-mail: sales@rovco.com
Website: www.rovco.com
Contact: Jessica McKenney



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

SONAR SYSTEMS

Imagenex Technology Corp.

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Tel: +1 604 944 8248
Fax: +1 604 944 8249
E-mail: imagenex@shaw.ca
Website: www.imagenex.com
Contact: Steve Curnew

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

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SHADOWS SAMS

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

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Marine Sonic Technology, Ltd.

P.O. Box 730
White Marsh, VA 23183-0730
Toll Free: +1 800 447 4804
E-mail: jdemille@marinesonic.com
Website: www.marinesonic.us



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

Sound Metrics

11010 Northup Way
Bellevue, WA 98004
Tel: +1 425 822 3001
E-mail: sales@soundmetrics.com
Website: www.soundmetrics.com
Contact: Jeanne Dorsey



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

Teledyne BlueView, Inc.

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E-mail: swa_info@teledyne.com
Website: www.blueview.com



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

SOUND VELOCITY PROBES/CTDS

SAIV A/S

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

• STD/CTD, Sound Velocity probes/recorder with optional multi-parameter facilities; Turbidity, Fluorescence, Oxygen etc.

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SUB-BOTTOM PROFILES

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Website: www.ixblue.com



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

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SUBSEA FABRICATION

New Industries

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E-mail: bill.new@newindustries.com
Website: www.newindustries.com
Contact: Bill New



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

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SUBSEA TOOLING

Seanic Ocean Systems

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E-mail: info@seanicusa.com
Website: www.seanicusa.com
Contact: Karen North



Seanic was formed to address the growing demand for simple, rugged and reliable subsea tooling for remote intervention. Along with engineered solutions, Seanic also offers experience in the design, manufacturing, storage, repair & maintenance of subsea products. Seanic provides a worldwide standard product line of ROV tooling such as torque tools, FLOT's, hot stabs, manifolds, buckets and ROV interface panels.

SWITCHES

SEACON Advanced Products, LLC.

1321 Nellus Road
P.O. Box 767
Bellville, TX 77418 USA.
Tel: +1 979 865 8846
Fax: +1 979 865 8859
E-mail: sales@seacon-ap.com
Website: www.seacon-ap.com



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

UNDERWATER VEHICLES/AUVS

Hydroid, Inc.

a subsidiary of Kongsberg Maritime
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Contact: Graham Lester



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

UNDERWATER VEHICLES/ROVs

Deep Ocean Engineering Inc.

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



Delta SubSea LLC.
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E-mail: sdngman@deltasubsea-rov.com
Website: www.DeltaSubSea-ROV.com
Contact: Scott Dingman, President / CEO

Delta SubSea is a leading integrated independent provider of ROV services and solutions. With the industry's newest ROV fleet and a deeply experienced ROV operations team, as well as ROV tooling, engineering and CAD, Delta is the global offshore oil and gas industry's choice for Best-In-Class solutions and Maximum Uptime.

i-Tech

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Website: www.interventiontechnology.com
Contact: Katarina Tehlirian



i-Tech is a global division of Subsea 7 delivering world class remotely operated vehicle (ROV) and intervention tooling support services to the offshore energy industry, operating from four regional centers: Europe & Africa, Asia-Pacific the Americas and Brazil.

Perry Slingsby

10642 West Little York, Suite 100
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Forum Energy Technologies' Perry Slingsby brand supplies deepwater work class ROVs, tooling solutions, burial systems, and control-system-based products to the oil, gas, and telecommunications industries. Providing the most advanced, robust and dependable ROVs and subsea products in the world, Forum's Subsea group has facilities in the US and UK and sales offices and agents around the world.

Schilling Robotics, LLC

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Davis, CA 95618
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Fax: +1 530 753 8092
Contact: Peter MacInnes
E-mail: peter.macinnes@fmcti.com
Website: www.fmctechnologies.com



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

SeaBotix Inc.

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Fax: +1 619 450 4001
E-mail: Info@SeaBotix.com
Website: www.SeaBotix.com



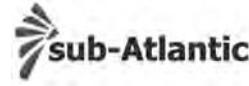
SeaBotix Inc. is the world leading manufacturer of capable MiniROV systems. The Little Benthic Vehicle range of systems have become the benchmark in compact ROVs around the world. All systems perform a multitude of tasks including maritime security, body rescue, sensor deployment, object recovery, hazardous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

Sub-Atlantic

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SUBSEA TECHNOLOGIES



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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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Fax: +1 610 458 3010
E-mail: info@videoray.com
Website: www.videoray.com
Contact: Brian Luzzi



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

UNDERWATER VIDEO EQUIPMENT

Kongsberg Maritime Ltd.

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Website: www.km.kongsberg.com/cameras
Contact: Mark Esslemont



KONGSBERG

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

SIDUS Solutions, Inc.

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E-mail: info@sidus-solutions.com
Website: www.sidus-solutions.com



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

WINCHES, HANDLING & CONTROL SYSTEMS

Hawboldt Industries

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Fax: 902 275 5014
E-mail: paul.phillips@hawboldt.ca
Website: www.hawboldt.ca
Contact: Paul Phillips



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

Markey Machinery Company

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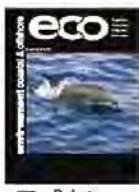
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 G. COMMUNICATIONS / UTILITIES
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U.S. Underwater Services	56	www.usunderwaterservices.com
Underwater Intervention	83	www.underwaterintervention.com
Unique System FZE	7	www.uniquegroup.com
VideoRay	2	www.videoray.com



UNDERWATER COMMUNICATION AND POSITIONING SOLUTIONS

Evo Logics®

S2C TECHNOLOGY: COMMUNICATION AND TRACKING COMBINED

- time, space and cost-saving solutions
- low power consumption for autonomous operations
- advanced data delivery algorithms, addressing and networking, remotely configurable settings
- extendable platform with multiple configuration options: power-saving Wake Up module, acoustic releaser, additional sensors, custom solutions, OEM versions available

USBL POSITIONING SYSTEMS

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

- SiNAPS – USBL positioning made simple and flexible
- reliable data transmissions
- range: up to 8000 m
- accuracy: up to 0.04 degrees

UNDERWATER ACOUSTIC MODEMS

reliable data transmissions even in adverse conditions, special edition available for network protocol developers

- range: up to 8000 m
- depth: up to 6000 m
- data rate: up to 31.2 kbps
- bit error rate: better than 10^{-10}

LBL POSITIONING SYSTEMS

highly accurate, precise and stable performance

- multiple target tracking
- range: up to 8000 m
- accuracy: better than 0.01 m

S2C communication
and positioning
emulator for FREE with
every purchase



SEA·BIRD
SCIENTIFIC

Integrated Solutions for Dredge-Monitoring Applications

*Providing accurate and stable conductivity, temperature,
depth, turbidity, PAR, and dissolved oxygen*

SBE 16plus V2 SeaCAT CTD
with SBE 18 pH & WET Labs
ECO-NTU with Bio-wiper™



*Photo by
WorleyParsons,
Perth, Australia*

WQM-Dredges with
Inductive Modem Modules & battery packs



Photo by DHI

SBE 16plus-IM V2 SeaCAT CTD with
SBE 63 Optical DO & WET Labs
ECO-NTU & ECO-PAR with Bio-wipers™



WQM prior to
deployment on buoy



Photo by DHI

WQM upon recovery;
significant bio-fouling along instrument but
clear optical window from use of Bio-wiper™



Photo by DHI

SBE 16plus V2 SeaCAT CTDs
with WET Labs ECO-NTU &
ECO-PAR with Bio-wiper™



Photo by Imbras

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