

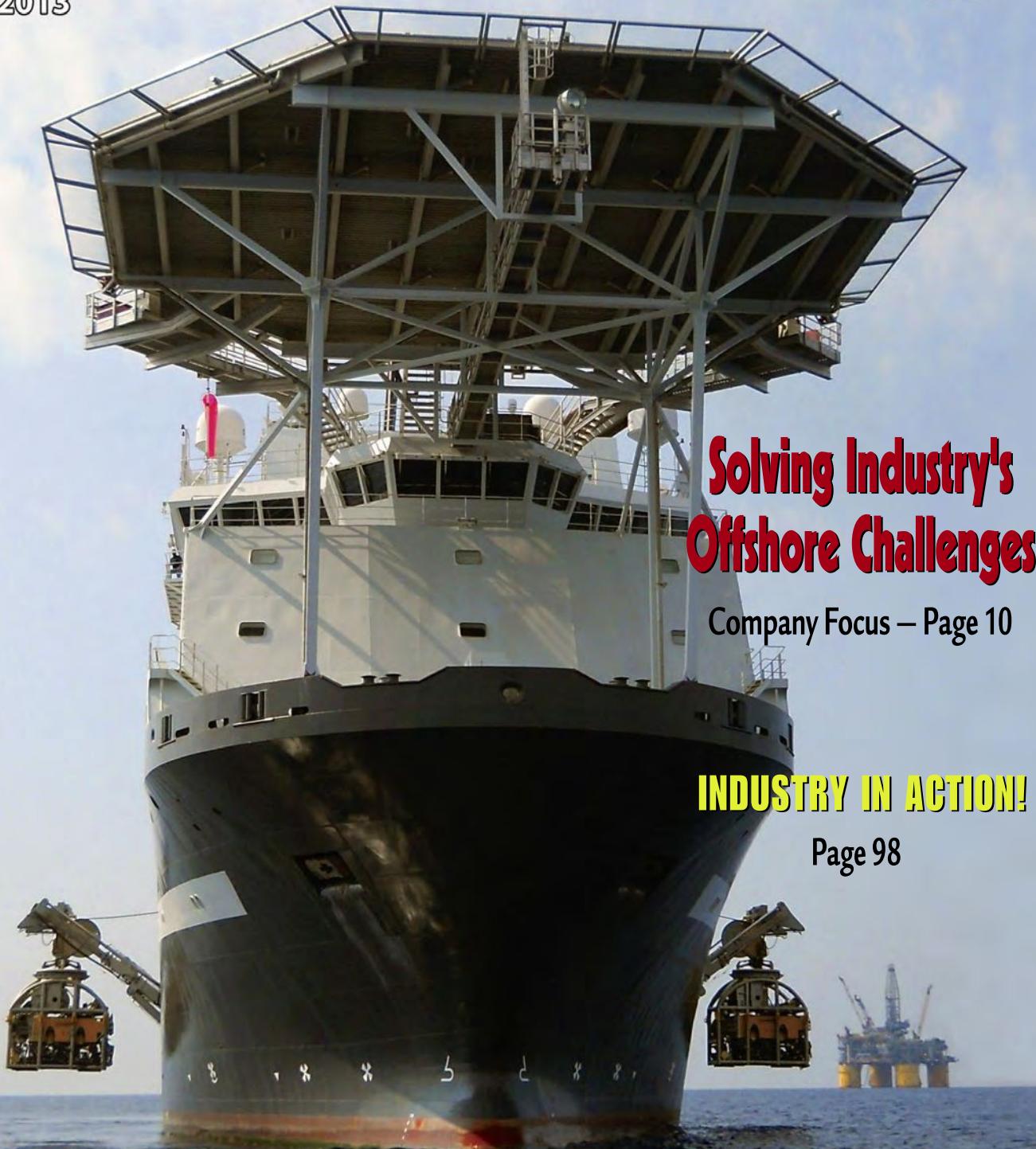
Ocean News

News for the Ocean Industry

www.ocean-news.com

News & Technology

June 2013



**Solving Industry's
Offshore Challenges**

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INDUSTRY IN ACTION!

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Remotely
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Products



Projects



Asset Integrity



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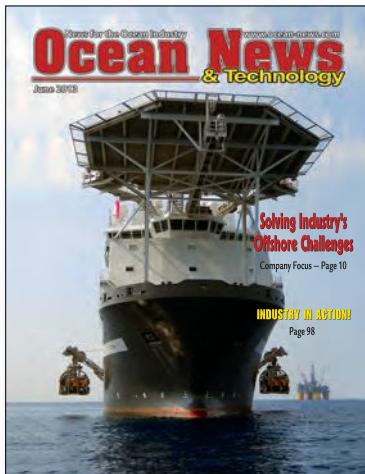
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Cover Photo



The Olympic Intervention IV, built in 2008 working in the Gulf of Mexico primarily inspection, maintenance & repair work. Light construction in Deepwater. Dual ROV that includes a backup system to take power away from the BOP to continue operations.



Technology Systems Corp.

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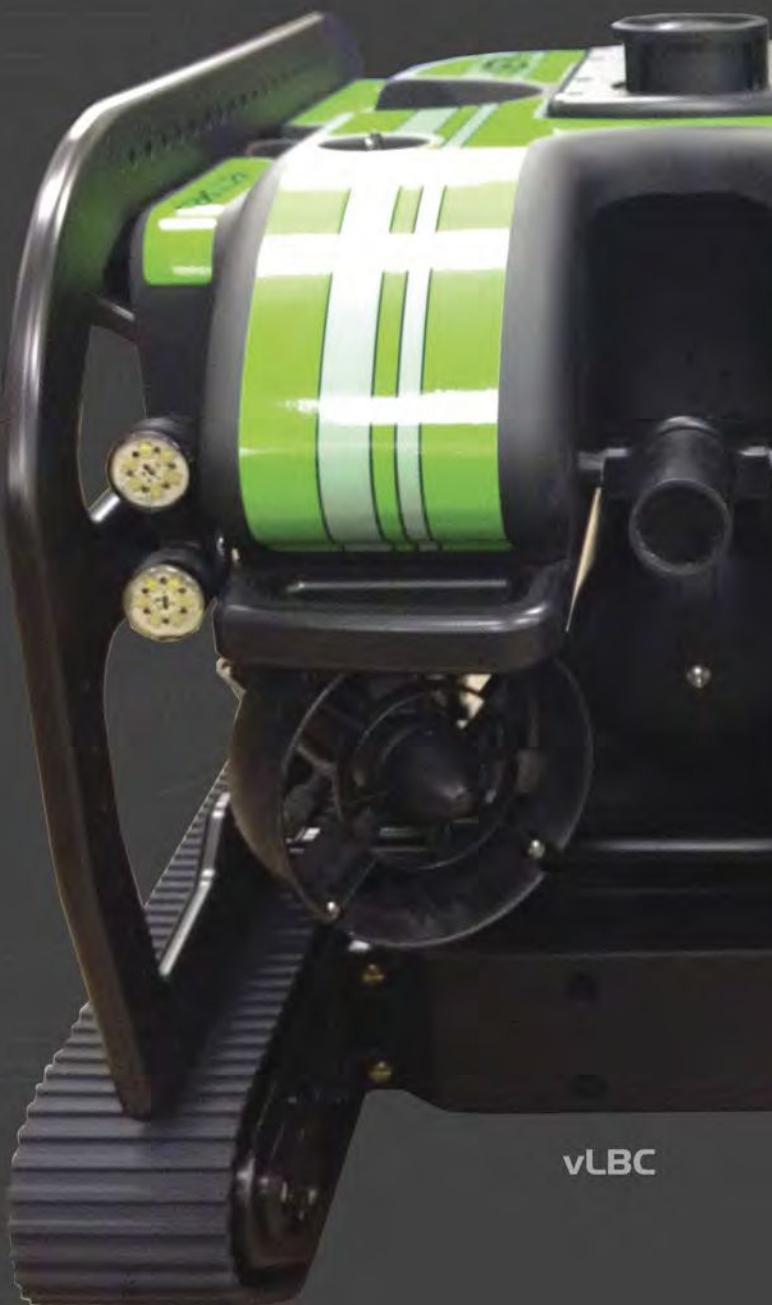
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The Ocean Acidification Problem

By Dr. Margaret Leinen

Ocean News & Technology

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During May, the NOAA Moana Loa Observatory reported the first measurement of CO₂ in the atmosphere exceeding 400 ppm. While the increasing atmospheric CO₂ is of great concern for climate impacts, about 26% of the CO₂ that we have added to the atmosphere over time is no longer in the atmosphere, but has been mixed into the ocean. The rate of addition has grown steadily and is now about 2.5 Pg C/yr (or about 9 Gt CO₂/yr). This increase in CO₂ going into the ocean is resulting in a small but significant change in the acidity, or pH, of the ocean in a process that has been called ocean acidification.

When CO₂ dissolves in water, it forms carbonic acid. Although this is a weak acid, it is acid nonetheless, and the CO₂ dissolving in the ocean has made it slightly more acidic. Oceanographers have now measured the progression of this acidification and can show that it is directly related to the increased CO₂ in the atmosphere. While the change is small, about 0.1 pH unit, the pH scale is logarithmic, so this is roughly a 30% increase in acidity. pH is very important to organisms that make skeletal elements and shells out of calcium carbonate. The acidification has made it more difficult for them to make this skeletal material. Oceanographers have observed changes in the ability of tiny organisms to make their shells, like pteropods (microscopic marine snails) that are part of the food chain in the North Atlantic Ocean. Changes are also clear in familiar organisms like corals, oysters, and clams.

The effects of ocean acidification are still restricted to the upper layers of the ocean. But when these more acidic waters upwell into the coastal zone, they can have a strong enough effect to harm oyster larvae and oyster aquacul-

ture sites—as is already happening in the Pacific Northwest. At some west coast sites, there has been a near failure in larval or developing oysters. Of great concern is the impact of an acidifying ocean on coral reefs, which are nursery grounds for many fish and often protect coastal lands from erosion. Substantial research efforts are underway to determine how and when corals will be affected by a more acidic ocean. We have already found that the story is complex. Corals in polluted regions or those under stress from a warming environment are more susceptible to damage from acidification than those in pollution-free areas.

While it is true that not every organism is harmed by the changes in pH that have been observed—some organisms appear to be unaffected and some have slightly higher reproductive success rates—we still have concerns:

- The oceans are still not at equilibrium with the CO₂ in the atmosphere, and acidification will continue during the next decades.

- Shellfish that we rely on for food are already being affected, and coral reef impacts are already being felt.

- We do not know the complete range of impacts that this acidification will cause.

- The rate at which the change is occurring is unprecedented in human history and is faster than most organisms will be able to adapt.

Oceanographers consider ocean acidification to be a substantial global problem for the future. They have begun extensive research programs and it is critical that we support funding for those programs.



Dr. Margaret Leinen is Executive Director of Harbor Branch Oceanographic Institute and Florida Atlantic University Associate Provost for Marine and Environmental Initiatives. She is an ocean biogeochemist and paleoceanographer whose research includes study of the history of ocean change. Dr. Leinen has been a professor and Dean of the Graduate School of Oceanography at the University of Rhode Island and served as the National Science Foundation Assistant Director for Geosciences from 2000 to 2007. Dr. Leinen also served as Chair of the U.S. Global Change Research Program; President of The Oceanography Society and Chair of the American Association for the Advancement of Science Section on Atmospheric and Hydrospheric Science; Vice Chair of the Research Board of the Gulf Research Initiative; and President Elect of the American Geophysical Union.



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Forum Energy Technologies Solves Industry's Offshore Challenges

By Graham Adair, Vice President Sales & Marketing – Subsea Technologies

Offshore operations are complex, and the stakes are high. Unpredictable and ever-changing subsea challenges demand high-performance products supported by reliable, cutting-edge technology and experienced professionals. Forum Energy Technologies is meeting these global needs with a comprehensive range of world-class, mission-critical subsea vehicles, products, and services for oil and gas companies and other underwater industries.

Forum offers two of the world's most well-respected ROV brands, Perry™ and Sub-Atlantic™, from its manufacturing and service centers in the UK, U.S., Brazil and Singapore. Customer feedback provides invaluable information that Forum uses to enhance its work-class and observation remote vehicle capabilities and functionality. This insight keeps Forum focused on the future, designing ever faster, more powerful ROVs with increasingly advanced sensor interfaces. Forum is also well known for its world-class trenching vehicles and submarine rescue systems.

But Forum is not just about remotely operated vehicles. Driven by customers requests, the company has created a full range of related products and services for the subsea industry.

VisualSoft™

Answering an industry need, Forum's VisualSoft team has developed a family of software products for subsea video inspections that record large volumes of data from one or more cameras, then synchronize it with other data sources. The VisualSoft Suite is a modular collection of software applications that acquires, edits and reviews subsea video and data using a common user interface.

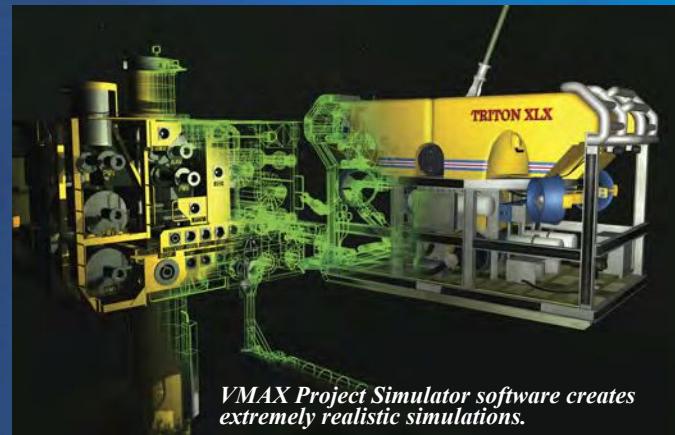
Online VisualSoft applications enable customers to record multiple channels of synchronized digital video, apply video overlay and online eventing, record and monitor survey data, and manage recorded file storage and backup. Offline modules include event editing and quality control, automated processing of survey data, and organizing and creating electronic reports. The VisualSoft Review module includes a GIS interface and free review software supplied with reports generated by the VisualSoft Suite.

With around-the-clock support and hands-on-training courses, VisualSoft has become a valued partner to many of the world's subsea construction, survey and inspection contractors as well as to Forum customers who own and operate subsea ROVs.

VMAX™

Another Forum technology that has a dramatic impact on offshore mission execution is VMAX simulation software. Successfully used by operators, service companies and engineering firms to avoid costly mistakes in the most challenging situations, VMAX Project Simulator Software gives customers the ability to create extremely realistic and accurate simulations of complex subsea scenarios before deploying expensive assets.

Engineering firms and ROV operators validate engineering designs with VMAX before systems integration testing, decreasing costly change orders and improving operating margins. In deep water, where ROVs and specialty tooling are used to perform complicated tasks, VMAX increases the probability of mission success and operational efficiency, substantially reducing exposure, expense, and risk.



VMAX Project Simulator software creates extremely realistic simulations.

Forum Subsea Rentals

Partnering with other Forum business units such as Perry, Sub-Atlantic and VisualSoft, as well as other well-known equipment providers, Forum Subsea Rentals supplies a complete range of subsea rental equipment for surveys and inspections performed by subsea contractors, independent survey companies, and ROV operators. Subsea Rentals is also one of the leading providers of environmental and survey sensor calibration services.

Available rental products include the latest ROV and trenching sensors, ROV tooling, subsea positioning equipment, geophysical and hydrographic equipment, oceanographic and environmental sensors, and Non-Destructive Testing equipment.

To support its global equipment rental service in Houston, Aberdeen, and Singapore, Forum supplies highly trained survey engineers for offshore operations.

GEMS

Forum's Geoscience Earth & Marine Services (GEMS) integrates geology and geotechnics to solve the industry's seafloor and subsurface technical issues in an accurate, timely, and cost-effective manner. GEMS gives Forum customers the insight to address their most critical issues in oil and gas exploration and development, especially in environments with complex geologic and engineering challenges.

Consulting services include planning and managing geophysical, coring, and deep-soil-boring site investigations; interpreting geophysical and geotechnical data; evaluating geohazards; analyzing slope stability and associated risks;

characterizing fault and earthquake hazards; mooring placement and anchoring analysis.

Rovdrill™

Rovdrill is a seabed drilling, coring and sampling rig that is integrated with a host work-class ROV. Designed and built as a collaborative effort between Perry and GEMS engineers, Rovdrill has a proven capability to perform applications for offshore geotechnical investigations and mineral explorations.

Rovdrill provides many advantages over standard drillship operations. Since it is compact, easy to deploy, operate and recover, Rovdrill can be operated from a variety of local vessels of opportunity without the need of specialized and expensive surface vessels or platforms. Rovdrill is client driven, rather than supplier driven, and capable of operating in all seabed environments with multiple, interchangeable foundation options available. This creates a stable seabed foundation that maximizes core sample quality since it is free from the influences motion induced by vessel or platform movement. Rovdrill is capable of operating in water depths up to 4000 m. The coring/sampling depth is a standard 90 m, but is expandable to 200 m. The Rovdrill/GEMS team has proven to be capable and qualified to provide competent, accurate and reliable geotechnical and mineral exploration services.



Syntech

Forum manufactures syntactic buoyancy foam modules for remote vehicles and has developed a range of syntactic materials for numerous other subsea and marine uses as well. The acoustic characteristics of Syntech materials—transparency, absorption, reflection and refraction—make them ideally suited for a variety of underwater applications, including acoustic windows, anechoic test tank linings, and transducer isolators and decouplers.

The Syntech product family's quality and reliability has made Forum a leading supplier for operators of many types of offshore equipment, such as work-class and observation ROVs, AUVs, trenchers, deep water moorings, torpedo target arrays, sonar arrays and scientific instrumentation.

DYNACON

DYNACON specializes in custom designing and manufacturing winches and handling systems supporting subsea activities for diverse ocean industry applications. DYNACON Traction Winch and ROV Cable Handling Systems have been used for many years to support remote vehicle deployment and retrieval operations.

Winches and handling systems developed and built by DYNACON range from D.C. electric drive drum winches for oceanographic applications to electro-hydraulic and diesel-hydraulic traction winch systems with motion compensated cranes for deep-water operations. In addition to winches and umbilical handling systems, the DYNACON product line features cable engines, overboarding sheaves, hydraulic power systems and other related products.

DYNACON equipment can be manufactured to the following standards or others as required: Det Norske Veritas (DNV), Lloyd's Registry of Shipping, American Bureau of Shipping, United States Coast Guard, and NAVSEA SS800-AG-MAN-010/P-9290.



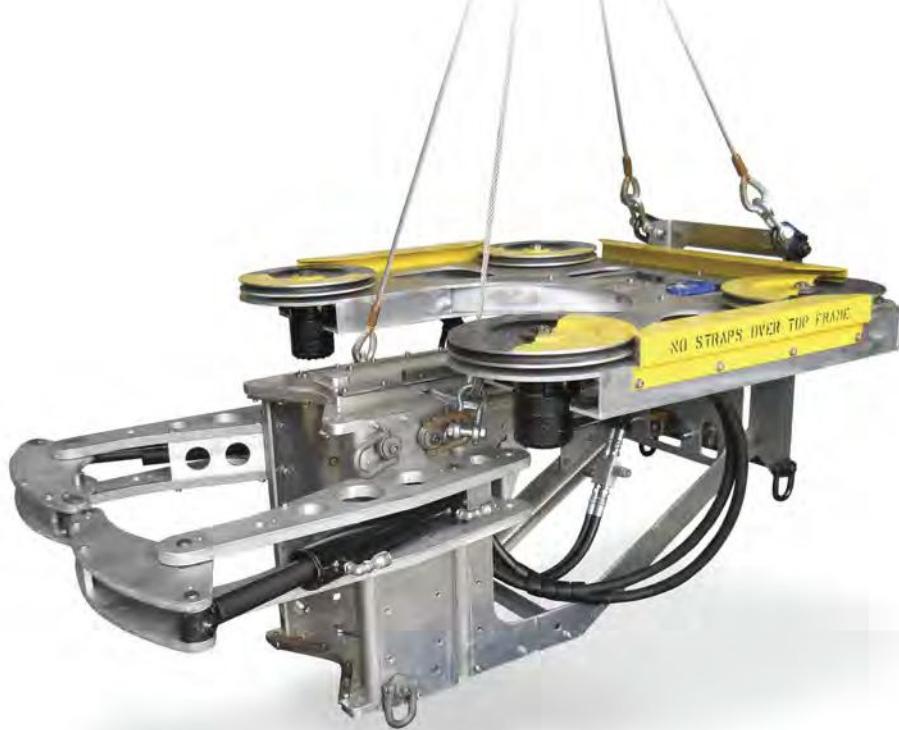
Offshore Joint Services

Subsea corrosion and thermal insulation systems integrity is growing in importance as offshore operations become more challenging. Systems today call for containment of higher-temperature oil and gas and higher hydrostatic pressure as well as longer tie-back distances, product shutdown durations, and SCRs with fatigue loadings. Investing in quality protective coatings can bring high returns and benefits to subsea facility operators during the life of the field.

Forum's Offshore Joint Services (OJS) is a world leader in applying protective coatings on subsea pipeline field joints, spools, and structures. Since 1986, OJS has completed more than 18,000 km of subsea pipeline installations, participating in numerous record-breaking projects -- including the Langeled Pipelay Project, completed in 2006 and still the longest subsea pipeline in the world.

OJS application services include anti-corrosion coatings, mechanical protection, thermal insulation coatings, and customized solutions. Designing its own equipment and chemical formulations, OJS ensures that protective coating material properties and applications are within operator and manufacturer specifications. With OJS, customers are assured of safe, fast and reliable protective coating systems that optimize performance and uptime.

Going forward, Forum will continue to incorporate customer feedback and leading-edge technologies in its new high-performance product development. Designed to meet the demands of today's complex issues and tomorrow's unpredictable challenges, Forum's subsea products and services will continue to evolve to support the offshore industry's quest for smarter, better, more effective solutions. Forum Subsea Technologies is everything remotely possible™.



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OCEAN INDUSTRY

"Flying" boat to try for world's record



Alain Thébault, designer and skipper of Hydroptere, the world's fastest sailing vessel, announced his intent to try and beat the transpacific crossing speed record between Los Angeles and Honolulu.

A year ago, Hydroptere was getting ready in the Mediterranean before being brought to California to try to beat the transpacific record. As she arrived in Los Angeles too late to benefit from the favorable weather window of June and July, Hydroptere headed to San Francisco to continue her training and greet her fellows of the America's Cup. The French trimaran was the first to fly in the bay at over 45 kts. Making boats fly has become a fashion in the new Mecca of sailing. The America's Cup teams have been working for several months now to make their AC72 take off and, in the racing world, they extended the foiling revolution initiated among others by Hydroptere, a pioneer in this sector.

This winter, Hydroptere gained two additional supports. The French investment company Capital Fund Management and the editor of driving assistance solutions Coyote System joined as official partners Lanson Champagne, the innovative companies CLIP Industrie and Atheos.

Hydroptere is currently based in Alameda, east of San Francisco Bay. Thanks to Warren Fitzgerald and Jeff Mearing, the trimaran was lifted ashore by crane where she will receive a complete check-up before being brought to Los Angeles where she will be positioned in standby for the record.

Crewing Hydroptere over the swell from Los Angeles to Honolulu are Alain Thébault, designer and skipper of Hydroptere, and Jean Le Cam, Yves Parlier, and Jacques Vincent, his faithful fellows who together hold some of the best records of ocean racing. "Jean and Yves participated in the first flights of Hydroptere in the 90s. We made the first trials together and experienced unforgettable moments," said Thébault. "Jacques Vincent joined me in 2005, and we crossed the 50 kt speed barrier together. He is an impressive helmsman."

The route between San Francisco and Los Angeles will be the opportunity to test the technical finetuning of the boat. The crew will then organize training sessions off Los Angeles until the best weather window to take off. "In June, the position of the Pacific anticyclone is ideal because it provides the most direct route to Hawaii. The thermal wind is active in this season, and we will quickly leave the California coast. Then we will surf the long Pacific swell downwind, and we will probably have to make a gibe close the Hawaiian Islands," said Yves Parlier.

For more information, visit www.hydroptere.com.

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ABS announces significant investments in Singapore

ABS, a leading provider of maritime classification services, announced significant investments in Singapore that will strengthen engineering and survey capabilities and lay the foundation for strategic global initiatives. Recognizing the growing role played by Singapore in the marine and offshore industries, ABS is expanding its operational workforce, increasing research and development (R&D) efforts, and establishing a Global Performance Center in Singapore. ABS will build on operational expansions that began in 2012 by increasing staff and capabilities in Singapore to address the challenging technology requirements of marine and offshore operations. Leveraging the success of the Singapore Offshore Technology Center established in 2006, ABS will add to its considerable research efforts with the creation of the Singapore Innovation and Research Center (SIRC). SIRC will expand R&D activity to include marine operations and performance management.

NOAA considers effects of Arctic oil and gas activities on marine mammals and Alaskanative communities

NOAA announced that it is seeking comments on a supplemental draft Environmental Impact Statement (EIS) for oil and gas activities in the Arctic Ocean. The draft, developed in collaboration with the Department of the Interior's Bureau of Ocean Energy Management (BOEM), includes analysis on how a broader range of potential offshore oil and gas activities could affect the environment, with a specific focus on marine mammals and the Alaskanative communities that depend on the animals for food and cultural traditions. The Obama Administration's priority is ensuring that any development activities in the Arctic take place responsibly; the administration will hold any future activities to the highest standards. The environmental review addresses potential effects from both exploratory drilling and geological and geophysical surveys, such as seismic surveys, in the Chukchi and Beaufort seas. After releasing the initial draft EIS for public comment in December 2011, NOAA and BOEM broadened the scope of analysis in light of comments from stakeholders. The initial EIS analyzed the effects of up to two exploratory drilling programs per year in both the Chukchi and Beaufort seas. The supplemental draft EIS analyzes the effects of up to four drilling programs per year in each area. The revised draft also expands discussion of mitigation measures designed to reduce the effects of offshore oil and gas activities on marine mammals and marine mammal subsistence users.

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.

Attendance surpassed the 2012 total of 89,400, and the sold-out exhibition was the largest in show history at 652,185 ft², up from 641,350 ft² in 2012. 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. Speakers from major IOCs, NOCs, and independent operators presented their views on the current challenges and future directions of the industry.

Governors (Texas, Alabama, Alaska, Mississippi, North Carolina, and South Carolina) from the Outer Continental Shelf Governors Coalition participated on a panel discussion on offshore energy development and the need for improved cooperation between the states and the Federal government.

U.S. Secretary of the Interior Sally Jewell toured the exhibition floor and held a press conference where she discussed her commitment to work with industry leaders to ensure safe and environmentally responsible offshore oil and gas operations.

OTC 2014 takes place 5-8 May 2014 at Reliant Park.

For more information, visit www.otcnet.org.

FMC Technologies recognized at OTC with two Spotlight on New Technology Awards

FMC Technologies, Inc. was recognized at the Offshore Technology Conference (OTC) with the presentation of two Spotlight on New Technology Awards. The awards, which honor innovative technologies that significantly impact offshore exploration and production, are in recognition of FMC Technologies' subsea boosting system developed in cooperation with Sulzer Pumps Ltd. and FMC Technologies' Condition and Performance

Monitoring (CPM) system.

"We are honored to once again be recognized by OTC with these prestigious awards," said John Gremp, FMC Technologies chairman and chief executive officer. "The Spotlight on New Technology Awards highlight the important role that innovation and technology play in our industry. The two technologies recognized by these awards are examples of how technology is being used to solve the complex challenges faced by our industry."

FMC Technologies and Sulzer Pumps were jointly recognized for their powerful, new high-speed, helico-axial multiphase subsea boosting system that is optimized for subsea applications. This system combines field-proven pump hydraulics from Sulzer Pumps with FMC Technologies' permanent magnet technology from Direct Drive Systems for less maintenance with greater speed, efficiency and power.

CPM is a surveillance system that enables proactive maintenance of subsea production and processing systems associated with a 24/7 collaborative expert environment for diagnosis and problem solving. CPM combines continuous monitoring of sensors and subsea instrumentation with a historic database to identify fault condition and deviations from normal operating conditions.

For more information, visit www.fmctechnologies.com.

Liquid Robotics®'s Wave Glider® wins 2013 Edison Award

Liquid Robotics®, an ocean data service provider and developer of the Wave Glider®, was named the 2013 Gold Medal winner for innovation in Power Generation and Utilization. Presented at the 26th Edison Awards™ Ceremony and Gala event, Liquid Robotics® was honored for the creation of the world's first wave-powered autonomous ocean robot, powered solely by the planet's endless supply of wave and solar energy. This revolutionary innovation transforms how the world can economically and pervasively observe, monitor, and protect the world's oceans.

"It's such a great honor for Liquid Robotics® to be recognized by an organization that is focused on innovation and that incorporates the spirit of Thomas Edison," said Bill Vass, CEO of Liquid Robotics®. "All of the innov-

vators recognized by this prestigious award today should be proud of their contributions to technology and the positive effects their hard work is having on the world."

The Edison Awards™ are one of the highest accolades a company can receive in the name of innovation and business success. This distinguished award symbolizes the persistence and excellence personified by Thomas Alva Edison and recognizes the world's outstanding innovations and innovators. The Edison Awards™ are judged by more than 3,000 senior business executives and academics across the nation and have honored some of the most world's most innovative new products, services, and business leaders. A few past award winners include the Falcon 9 rocket and spacecraft by SPACEX, OnStar for my Vehicle by OnStar, IBM Watson Solutions, and iPhone4s with Siri and iPad by Apple.

For more information, visit www.liquidr.com.

TITAN refloats grounded vessel from England's protected Farne Islands

TITAN Salvage successfully refloated the 262-ft containership M/V Danio from its stricken position on England's Northumberland coast despite challenging sea and weather conditions. Danio, which was carrying a load of timber and en route to Belgium from Scotland, ran aground at Farne Islands, an environmentally sensitive area, in early March. The onset of severe weather conditions prevented an immediate attempt to tow the Danio from the coastline.

Because the Farne Islands—home to thousands of puffins and grey seals as well as more than 20 bird species—is classified as a site of Special Scientific Interest (SSI), TITAN took extra precautions to safeguard the environment. Jason Bennett, commercial director of Titan, and his team of salvors took quick action to establish safety of the vessel, immediately deploy a tugboat, and prepare for a controlled and safe refloating operation. Danio was ballasted down to the rocky sea bottom while the TITAN team repaired damage to the vessel's skeg and other areas, which required cement boxing, shoring, and patching before the vessel could be refloated and towed away. Portable pumps were also installed and used dur-



ing re-float and transit to safety.

Salvage Master Mark Loughlin, of C Waves, a London-based independent maritime and engineering consultancy contracted by the TITAN alliance, transferred to Danio after the initial assessment and remained on board alongside the crew throughout the operation. He was joined by TITAN's salvage team, which worked in difficult conditions to ensure that the ship remained secure in the deteriorating weather conditions, which were marked by high seas and swells (up to 7 m), freezing rain, and gale-force winds.

During a brief window of suitable tides, Danio was successfully refloated without incident with the assistance of the TITAN-chartered tugboat Lomax.

For more information, visit www.titansalvage.com.

Shark's eye-a revolutionary tag and release tournament

Sport fisherman, scientists, conservationists, artists, tourists, and the curious will gather on 27-28 July for an all-release, satellite tag shark tournament at the Montauk Marine Basin, host to the longest-running shark tournament in Montauk. The 2-day tournament will be the first of its kind in Montauk.

With tens of millions of sharks killed by foreign commercial fishermen every year, many to fill the demand for shark fin soup in Asia, the goal of the tournament is to bring attention to the plight of sharks and to help bring back the large sharks that are disappearing from our waters.

All sharks caught in this tournament will be released. No sharks will be brought back to the dock. Instead, eligible mako, thresher, and blue sharks will be fitted with technologically advanced satellite tracking tags that will monitor their movements after release.

Tagged sharks will be named by the anglers who catch them. The public will be able to follow these fish online via

the OCEARCH Global Shark Tracker, the most followed shark tracking site and app in the world and provided free of charge—all to better understand the complex lives of these critical species.

For more information, visit www.marinebasin.com.

IOTC fails to protect vulnerable Indian Ocean albacore tuna, sharks

Greenpeace International condemned the lack of action by Indian Ocean Tuna Commission (IOTC) members to halt the decline of the region's most vulnerable tuna species and for adopting inadequate measures to protect sharks.

IOTC members meeting in Mauritius did agree to the introduction of precautionary fishing limits in principle, although the management scheme required to ensure this is achieved will not be negotiated until next year.

Measures were agreed upon for endangered whale sharks, cetaceans (such as whales, dolphins, and porpoises), and oceanic white tip sharks that protect them from being intentionally caught in purse seine and longline fisheries, but other destructive shark fishing practices were allowed to continue.

"Although a positive commitment was made—driven by the Maldives—to prevent stock depletion in the future, the current situation leaves little room for optimism. The Indian Ocean's tuna stocks hang in the balance as fishing intensifies and the region currently lacks the data needed to properly manage its fishing capacity and effort," Greenpeace International oceans campaigner Sari Tolvanen said.

"IOTC members failed to adopt a proposal to cut catches of albacore tuna by 30% to protect the most vulnerable tuna species in the region and to eliminate the wasteful practice of shark finning. Purse seining with destructive Fish Aggregation Devices (FADs) also continues with little control."

Greenpeace International warned that resistance from various coastal states to precautionary conservation measures and the creation of more exemptions for smaller-scale fleets will jeopardize the sustainability of tuna fisheries and the livelihoods and food security of fishing communities.

"Countries such as India, Sri Lanka, Indonesia, and Oman refuse to apply management measures to their smaller

fleets. This is detrimental to the sustainability of those fleets and the people who depend on them," Tolvanen added.

The Greenpeace ship Esperanza has been documenting fishing activities in the Indian Ocean since March, observing suspicious transfers of fish at sea and exposing suspected illegal fishing in the protected Chagos waters.

For more information, visit www.greenpeace.org.

Odyssey Marine Exploration publishes research from the Tortugas shipwreck excavation

Odyssey Marine Exploration, Inc., a pioneer in the field of deep-ocean exploration, has published a new series of scientific papers on the Tortugas shipwreck that was originally excavated in 1990 and 1991.

The Tortugas shipwreck is believed to be the remains of the 117-ton Buen Jesús Nuestra Señora del Rosario, one of the vessels sailing with the 1622 Tierra Firme treasure fleet bound for Spain. The papers are included in Oceans Odyssey 3: The Deep-Sea Tortugas Shipwreck, Straits of Florida: A Merchant Vessel from Spain's 1622 Tierra Firme Fleet, which was recently published by Oxbow Books, Oxford. This is the third volume of Oceans Odyssey detailing Odyssey's pioneering archaeological work.

"Oceans Odyssey 3 is a product of our ongoing commitment to publish quality archaeological reports," said Greg Stemm, Odyssey Marine Exploration's CEO. "The comprehensive archaeological excavation of the Tortugas shipwreck over 20 years ago paved the way for innovative advances in the methodology and robotic technology that we use to this day."

The Tortugas shipwreck was discovered in the Straits of Florida in 1989 at a depth of 405 m. The fieldwork commenced in 1990 and was the world's first comprehensive deep-ocean archaeological excavation conducted exclusively using advanced robotics and acoustic positioning. Nearly 17,000 artifacts, ranging from gold bars to silver coins, pearls, ceramics, beads, glassware, astrolabes, tortoiseshell, animal bones, and seeds, were recovered from the site during the 1990-1991 excavation seasons.

For more information, visit www.shipwreck.net.

ABS grants AIP for small LNG carrier design

ABS, the leading provider of classification services to the global offshore industry, has granted engineering company GTT Approval in Principle (AIP) for a 32,000-m³ capacity LNG carrier design. "While a few membrane LNG carriers in the 20,000-m³ capacity range were built in the 1990s, this is the first new design to be introduced since that time," says ABS vice president, LNG, Patrick Janssens. The reason for this innovation, Janssens says, is the development of new markets that have led to a keen interest in smaller LNG carrier designs. "Potential markets for these smaller carriers include inland transportation, bunkering, feeder trade, archipelago trade in regions such as the Caribbean and coastal distribution," Janssens says. and, "This will help balance regional demand, particularly in China, where several companies are evaluating LNG carriers in the range of 20,000 to 30,000-m³ for regional redistribution from large satellite terminals." According to Philippe Berterottière, GTT chairman and CEO, this state-of-the-art membrane vessel combines high cargo capacity with flexibility. "Proposing this innovative and efficient design affirms GTT's capability to be a key player over the full range of LNG carrier sizes," he says. "We are very happy with the technological partnership we had with ABS on this project."

Global Freight: Slow change in 2012

According to a report from the International Transport Forum, the overall picture for global freight shows continuing uncertainty in the EU27 and the U.S. Total external trade by sea (in tonnes) stagnates around the last peak (January 2011) in the U.S. (-6%) and EU27 (+1%), according to a preliminary estimate of tonnes of goods carried until December 2012. In contrast, air freight, considered a lead indicator for economic performance, suggests a possible turning point in the U.S. as air cargo (in tonnes) shows signs of recovery since October 2012. Air freight tonnes in EU27 declined further to -18% below the January 2011 level.

Large new build prices rose higher in April

A report from Market Realist on shipping purchase prices shows hope for the sea freight industry, despite the previous year's data shown in the story above. Purchase prices for ships are often good indicators of financial health in the shipping industry. When shipping demand is expected to grow more than the supply of ships, shipping companies will place additional orders, which drives up purchase prices. Additionally, when firms are able to charge higher prices for transporting goods across the ocean, this allows them to generate higher gross margins and returns, increasing the value of ships themselves. During April, new build prices for capesize, kamsarmax, and ultramax vessels rose higher from March. Capesize vessels, the largest ship class that primarily haul iron ore and coal across ocean, rose \$500,000 to \$47.5 million. Kamsarmax and ultramax also rose by \$500,000 individually. While kamsarmax and ultramax are smaller than capesize vessels, they also primarily carry iron ore and coal. While the higher new build price is most applicable to firms that primarily focus on large vessels, panamax and supramax class vessels should also rise. This is because global trade and shipping rates tend to be driven by macro factors as opposed to rates that are specific to a raw material.

PEM Offshore selects Kongsberg offshore vessel simulators for Nigeria's first offshore training center

PEM Offshore Limited has signed a multi-million dollar contract with Kongsberg Maritime for the supply of a full suite of offshore anchor handling, dynamic positioning, power management, and crane simulation systems. The new simulators will form the main infrastructure for a world-class offshore simulation training center and the first of its kind in Nigeria and West Africa.

The new training center will be located in Lagos and serve to support the training of local and foreign offshore personnel involved in offshore oil and gas operations, underpinning a growing market demand for highly competent and qualified personnel for this high-risk environment.

With operations in Nigeria, the USA, and Trinidad & Tobago, PEM Offshore has a proven track record as a reliable solutions provider offering a wide range of services aimed at improving safety, quality, and reliability in the marine and oil and gas sectors. The establishment of the new offshore simulation training center will create new high-value employment opportunities for the region and underpin the requirements for qualified marine personnel in this primary offshore supply hub for West Africa.

As part of the contract, Kongsberg Maritime will supply PEM Offshore with world-class simulation training technology identical to systems found on board many vessels in the world fleet as well as provide subject matter expertise to ensure the new training center meets or exceeds industry standards. The simulator delivery includes both DP Class B and Class C simulation trainers, allowing for advanced dynamic positioning training for certification in accordance with Nautical Institute (NI), Det Norsk Veritas (DNV), and International Marine Contractors Association (IMCA) standards.

The PEM Offshore Training Center will also be certified to DP Class A for use in sea-time reduction training where time spent in simulator training significantly reduces time required for live training at sea, enabling safer and more cost-effective DP training.

PEM Offshore's new training center is accepting course registrations now for training commencing 20 January 2014.

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

Damen Shiprepair Brest: 50 vessels in first year of operation

Since acquiring Sobrena, Damen Shiprepair Brest has serviced 50 vessels from leading shipowners and managers. The yard's work portfolio includes a large number of Afra/Suezmax tankers and LNG carriers. The latest project concerns the Höegh LNG-owned and MOL LNG Transport-managed 123,800M3 LNG LIBRA, which is presently at the yard.

Jos Goris, managing director of Damen Shiprepair Brest, says, "We are proud of this achievement and would like to thank all our clients who have demonstrated confidence in our ability to perform by bringing their vessels to our yard. Overall, we have received very positive feedback from our client surveys, but we endeavour to take swift corrective action where necessary on the less positive observations. In this way, we increase our service levels after each vessel and we see it pay off immediately."

Damen's French yard has made several improvements to its facilities, including implementing more efficient working hours under a new collective labour

agreement, investing in a state-of-the-art plasma cutting machine, and opening a canteen for more than 300 staff and subcontractors. "Building a canteen in the yard was necessary to facilitate the agreement on new working hours where the previous 2-hour lunch break has been reduced to 45 minutes," adds Mr. Goris.

For the larger projects, the yard has built dedicated and modern facilities to accommodate over 200 subcontractors as well as a separate office for specialist or service engineers, complete with 20 plug-and-play workstations.

"We aim to become a modern, clean, and efficient ship repair facility with a high level of process transparency and quality of service where each client feels safe and supported. This is not an easy task, but we are well underway."

For more information, visit www.damen.com.

DNV supports drydock-free operation of Mobile Offshore Units

Moving Mobile Offshore Units (MOUs) to sheltered waters or drydock facilities for surveys is disruptive and expensive. Using the experience gained

from several years of dealing with floating production units and surveying drilling units on location, DNV is now preparing a Recommended Practice (RP) to allow MOUs to operate on location by optimizing survey routines without compromising on quality, safety, and integrity.

More practical design and construction of the units, established condition monitoring technologies, effective corrosion management programs, emerging technologies for less intrusive or alternative means of inspections, ingenious maintenance, and continuous survey regimes are some of the elements that make this change possible.

DNV's recommended practice will be supported by explicit changes in the rules so that surveys carried out in an MOU's normal operating environment can be adopted as "normal" instead of treating them as "special" cases that require application for acceptance.

Realizing that elements of this regime require acceptance by statutory authorities (e.g., flag, shelf, and coastal state authorities), DNV has already initiated discussions with many of them so that

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such practices are not only acceptable to DNV, but also to relevant authorities who have oversight over the units under their jurisdiction.

For more information, visit www.dnv.com.

Herbert-ABS Releases LMP 2.1 for offshore vessels

Herbert-ABS Software Solutions LLC, a leading name in naval management software and ship design, has released the latest version of their Load Management Program (LMP) for offshore vessels.

For day-to-day weight management, stability evaluation, and regulatory compliance, LMP 2.1 provides an accurate and simple, yet feature-rich set of displays and entry tools for the offshore user. LMP 2.1 is customized for an individual vessel, including semi-subs, SPARs, TLPs, and jack-ups, and can account for all loads acting on a vessel.

LMP has been on the market for more than 10 years on a number of different drilling and production vessels and already boasts a strong suite of features, including automatic communications

with tank level systems, detailed deck survey tools, lightship modifications tracking, and customizable reports. LMP 2.1, however, includes calculation improvements focusing on robust multiple axis stability, calculation of wind, current, wave forces, 6-degrees of freedom calculations and advanced tendon, riser, SCR and mooring calculations. The program interface enhancements include unparalleled 3D graphics, enhanced integrity monitoring features, alarms summary, fully customizable displays, units and conventions, and improved communications with other onboard systems.

For more information, visit www.herbert-abs.com.

New fatigue model leads to more durable ships

Heikki Remes, a researcher at the Aalto University in Finland, has developed a model making it possible to determine how fatigue sets in with various welded steel materials. The model allows for the development of lighter structures and, as a consequence, more energy-efficient ships.

By utilizing modern manufacturing technology and new materials, it is possible to achieve more efficient structures than the ones that currently exist. In addition, better physical models are needed to ensure structural strength, Remes says.

At present, the fatigue measurements used by classification societies are based on the average quality of the weld. The same design guideline is used both with traditional and more advanced structures. However, through the development of manufacturing technology, it is possible to achieve characteristics for welded joints that are significantly better than average. With the models that have been developed, it is possible to consider the difference between traditional and advanced structural joints and the impact on fatigue resistance.

The study has been published in the International Journal of Fatigue. The findings of the study can be used extensively in establishing models for fatigue endurance of various developed welded steel structures.

For more information, visit www.aalto.fi.

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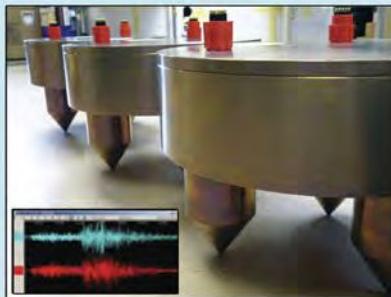
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Offshore Communications Backbone

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

Preparing for Pipeline Repair Emergencies on the Rise

By Rutger Schouten, General Manager, IRM Systems B.V.

In the wake of Macondo and Hurricanes Katrina and Rita, there is a rising trend among pipeline operators to more thoroughly prepare for natural disasters and potential pipeline disruption, especially subsea. Across the globe, operators dedicated to formulating the most effective and responsive preparedness contingency plan are seeking expert guidance.

For example, in a bid to be better prepared for emergency repair situations, pipeline operator BBL Company recently retained Independent Risk Management Systems B.V. (IRM Systems) to produce a Concept Proposal that will provide a thorough assessment of the organization's current pipeline contingency plans.

Key Offshore European Pipeline Focus of EPRS Analysis

Based in The Netherlands, BBL Company operates the BBL pipeline, which can provide the UK with approximately 15% of its total natural gas supply. The 36-in. export line transmits gas from Balgzand, near Den Helder in The Netherlands, across the Southern North Sea to Bacton Gas Terminal on the coast of Norfolk, England. The system extends 235 km (146 mi), 230 km (140 mi) of which are offshore. The system, which plays a central role in the supply of gas to the UK, features a section that is located in water depths of 30 to 55 m and is a very busy shipping lane.

IRM Systems, an independent supplier of emergency pipeline repair systems (EPRS) and pipeline repair services, is advising BBL as to whether the pipeline operator would benefit from a range of both established and emerging repair methods. IRM will also provide guidance on the best-in-class repair technologies available and the companies that provide them. Separate sections of the Concept Proposal will be dedicated to optimizing readiness, where appropriate, by situating EPRS hardware and tooling close to the asset. The main objective of an EPRS is to facilitate the earliest possible return to operations.

Central to the study is a cost-benefit analysis that addresses the idea of adopting an enhanced—or in some cases new—EPRS. By doing so, decisions as to how best to move forward will be based on how investing in an EPRS will reduce downtime, costs, and lost production in the event of an emergency repair. This analysis is conducted by reviewing existing capabilities, potential improvements, and the translation of all elements associated with emergency pipeline repair into an integrated system that is ready for use and easy to maintain.

Basing Decisions on Objective Advice

BBL Company's decision to seek advice reflects the increasing number of operators that are actively obtaining independent guidance as to which specific pipeline repair system best meets the pipeline and context criteria of the operator. The EPRS must also be as effective and cost-effective as possible.

"BBL Company seeks to continually improve its operations in every way. Our aim is to operate and maintain the BBL pipeline to the highest operational and safety standards in the industry, while achieving that aim in a cost-effective manner," said Hans Boersma, offshore asset manager for BBL Company. "Being fully prepared for emergency repairs under any circumstance is one of those subjects that requires continuous attention. In addition to the technical aspects, being organized is critical to acting decisively in emergency situations," he added.

The Concept Proposal is considered Phase 1 of IRM



Systems' overall program of EPRS consultancy services. A second phase should include a custom plan that will detail and optimize selected repair scenarios. For example, the repair scenarios should feature all details associated with front-end engineering and design and commercial and vendor requirements—each of which is a central component of an EPRS.

Respond, Don't React

"In the event of an emergency, the only way to ensure that response is rapid and that the pipeline is repaired safely and efficiently is to develop an EPRS that is completely tailored to the individual pipeline system. We can't stress how important it is to update the EPRS regularly in order to make adjustments for changing technologies, the environment, and in the pipeline itself," said Rutger Schouten, General Manager of IRM Systems. "To do otherwise means that, for example, in the case of a damaged offshore pipeline, a considerable amount of time will be invested in restoring throughput. In the wake of recent anchor drag incidents and incidents in the Gulf of Mexico, more and more pipeline operators and owners are taking steps to adopt a fully comprehensive emergency pipeline repair philosophy," he added.

Helping Pipeline Operators Understand, Mitigate, and Manage Risks

Once a pipeline operator requires an EPRS, we must first assess the context of the specific pipeline, including factors such as risks, drawings, and available hardware and software. Tailored repair scenarios are then developed, and the pipeline operator is supplied with a full response plan, timeline, and decision tree. This plan begins with the current circumstances of the situation and takes the client through a step-by-step plan of action until it reaches the desired outcome. Typically, the "action plan" provides the operator with a series of optimized repair scenarios. The repair scenarios feature the central components of an EPRS. As appropriate, guidance is also provided concerning, for example, the benefits of joining an EPRS "club" where operators pool their resources to purchase essential equipment to keep on hand to use in the case of emergency.

The action plan is followed by the implementation phase. IRM Systems provides support in the form of complete FEED, ITT, and contracting as well as vendor audits and inspections and Factory Acceptance Tests and System Integration Tests. After the system is created and the long lead items are obtained, an integration test is necessary to make certain that all elements are interlinked and that the operator is organizationally capable of operating the system. At this point, IRM Systems can provide continuous project management and emergency response as part of the operator's team.

IRM anticipates that operators with assets in high risk areas, such as the Gulf of Mexico where hurricanes remain a continuing threat and the North Sea with its heavy transportation traffic and aging assets, will require an EPRS.

Cooling ocean temperature could buy more time for coral reefs

Limiting the amount of warming experienced by the world's oceans in the future could buy some time for tropical coral reefs, say researchers from the University of Bristol. The study, published by the journal *Geophysical Research Letters*, used computer models to investigate how shallow-water tropical coral reef habitats may respond to climate change over the coming decades. Dr. Elena Couce and colleagues found that restricting greenhouse warming to 3 W/sq. m (equivalent to just 50 to 100 parts per million carbon dioxide, or approximately half again the increase since the Industrial Revolution) is needed in order to avoid large-scale reductions in reef habitat occurring in the future. Shallow-water tropical coral reefs are among the most productive and diverse ecosystems on the planet. They are currently in decline due to increasing frequency of bleaching events linked to rising temperatures and fossil fuel emissions. Dr. Couce said, "If sea surface temperatures continue to rise, our models predict a large habitat collapse in the tropical western Pacific, which would affect some of the most biodiverse coral reefs in the world. To protect shallow-water tropical coral reefs, the warming experienced by the world's oceans needs to be limited." The researchers modeled whether artificial means of limiting global temperatures—known as solar radiation "geoengineering"—could help. Their results suggest that if geoengineering could be successfully deployed, then the decline of suitable habitats for tropical coral reefs could be slowed. They found, however, that over-engineering the climate could actually be detrimental as tropical corals do not favor overly cool conditions. Solar radiation geoengineering also leaves unchecked a carbon dioxide problem known as ocean acidification.

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. Dr. William Cheung of the University of British Columbia and his co-authors used the temperature preferences of fish caught around the world to determine the relationship between fisheries catch and ocean warming. They first assembled data on the distribution of 990 marine fish and invertebrates. They assigned each species a temperature preference based on the average sea surface temperature in areas where that species was predicted to have occurred between 1970 and 2000. Next, to measure changes in the composition of marine fisheries, the researchers compiled data on the tonnage of each species caught in the 52 marine ecosystems that account for most of the world's fisheries. Then, for each ecosystem and each year from 1970 to 2006, they calculated the average temperature preference of the species, weighted by the amount caught. The authors found that, except in the tropics, catch composition in most ecosystems slowly changed to include more warm-water species and fewer cool-water species. In the tropics, the catch followed a similar pattern from 1970 to 1980 and then stabilized, likely because there are no species with high enough temperature preferences to replace those that declined. Statistical models showed that the increase in warm-water species was significantly related to increasing ocean temperatures.

New robotic instruments to provide real-time data on Gulf of Maine red tide



The ESP, shown here being deployed from the WHOI ship R/V Tioga, uses a robotic mechanism to carry out analyses, thereby eliminating the strict requirement for sending people to the sea to collect samples and process them manually. (Photo by Isaac Rosenthal, Woods Hole Oceanographic Institution & Northeastern University).

A new robotic sensor deployed by Woods Hole Oceanographic Institution (WHOI) in Gulf of Maine coastal waters may transform the way red tides or harmful algal blooms (HABs) are monitored and managed in New England. The instrument was launched earlier in the year, and a second such system will be deployed later this spring.

The results will add critical data to weekly real-time forecasts of New England red tide this year distributed to more than 150 coastal resource and fisheries managers in six states as well as federal agencies such as NOAA, the FDA, and the EPA. Researchers also plan to add data from the sensor to regular updates provided on the "Current Status" page of the Northeast PSP website.

"This deployment is a critical step towards our long-term dream of having a network of instruments moored along the coast of the Gulf of Maine, routinely providing data on the distribution and abundance of HAB cells and toxins. The technology will greatly enhance management capabilities and protection of public health in the region," says Don Anderson, WHOI senior scientist and the project's principal investigator.

The two sensors, known as Environmental Sample Processors (ESPs), are molecular biology labs packed inside canisters the size of kitchen garbage cans. In the Gulf of Maine, the ESPs are mounted to ocean buoys and will detect and estimate concentrations of two algal species that cause HABs or "red tides" and one of the potentially fatal toxins they produce.

The project scientists want the ESPs to become an integral part of the regional ocean observatory network managed by the Northeast Regional Association of Coastal and Ocean Observing Systems (NERACOOS), which currently consists of 12 instrumented buoys that measure currents, salinity, temperature, and meteorological variables at multiple locations in the Gulf of Maine and Long Island Sound.

For more information, visit www.whoi.edu.

President and Falcon help light up the brain with bioluminescence

Glowing and fluorescent deep-sea creatures could reveal how the mind works. Bright bioluminescent and fluorescent proteins found in marine life, when attached to human cells, become light-emitting markers that could help map the brain.

President Obama's newly announced "Brain Activity Map" project, gives impetus to the quest for understanding the human mind.

Alzheimer's and other diseases of the mind, along with cancer, could benefit from tracing otherwise invisible nerve damage.

Searching for the right bioluminescent organisms in the sea are Professor David Gruber at the City University of New York's Baruch College and Vincent Pieribone of The John B. Pierce Laboratory of Yale University.

They plan to send a Saab Seaeye Falcon ROV into the coral ecosystems deep in the mesophotic zones—first off the Florida coast, then in the Solomon Islands and the Red sea. They plan to study the biology of the deep coral reefs systems to better understand their ecology and genetics as well as to isolate novel glowing proteins.

The 1,000-m rated Falcon DR will be packed with the most advanced filming equipment ever fitted to an ROV.

Hollywood grade camera technology, used in making movies like Avatar, as well as low-light cameras that can see in the dark will be matched to single-mode fiber optics and a gigabyte Ethernet to give the fastest, highest grade images possible.

David Gruber's team has collaborated with Professor Chris Roman and Brennan Phillips at the University of Rhode Island and Saab Seaeye engineers to develop new systems that will advance ROV observation technology considerably.

Imbedding mammalian cells with the genes for light-emitting and fluorescing proteins provides the potential for living cells to be studied non-invasively without probing of the brain.

For more information, visit www.seaeye.com.

Biological activity alters the ability of sea spray to seed clouds

Ocean biology alters the chemical composition of sea spray in ways that influence its ability to form clouds over the ocean. That is the conclusion of a team of scientists using a new approach to study tiny atmospheric particles called aerosols that can influence cli-

mate by absorbing or reflecting sunlight and seeding clouds. By engineering breaking waves of natural ocean water under purified air in the lab, they were able to isolate and analyze aerosols from the spray and determine how life within the water altered the chemistry of the particles.

"After many decades of attempting to understand how the ocean impacts the atmosphere and clouds above it, it

became clear a new approach was needed to investigate the complex ocean-atmosphere system. Moving the chemical complexity of the ocean to the laboratory represented a major advance that will enable many new studies to be performed" said Kimberly Prather, Distinguished Chair in Atmospheric Chemistry at the University of California, San Diego and Director of the Center for Aerosol Impacts on

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www.energysubsea.com

Climate and the Environment, who led the team of more than 30 scientists involved in this project. They reported their findings in the early online edition of the Proceedings of the National Academy of Sciences on 22 April.

Tiny air bubbles form in the ocean when waves break, then rise to the surface and burst, releasing gases and aerosols into the atmosphere. Sea spray aerosols come in a wide variety of sizes and shapes, with chemical complexity ranging from simple salts to complex biological mixtures to bacterial cells.

For decades, scientists have been studying how the chemical make-up of aerosols affects their ability to take up water, seed clouds, and react in the atmosphere. Because aerosols from other sources overwhelm field measurements, it has been difficult to isolate and study marine aerosols over the actual ocean.

For more information, visit www.scrippsnews.ucsd.edu.

Sonardyne aids deepest undersea vent discovery

Sonardyne International Ltd.'s Ranger 2 USBL acoustic positioning system played an important role in the recent discovery of the world's deepest known undersea volcanic vents by a team from the National Oceanography Centre (NOC) in Southampton. The expedition used Ranger 2 to track the remotely operated vehicle (ROV) Isis from the RRS James Cook, 5,000 m beneath the surface as it recorded video and imagery while collecting samples from the newly discovered vents in the Cayman Trough.



The expedition, funded by the Natural Environmental Research Council (NERC), saw the researchers return to a set of vents—in the Beebe Hydrothermal Vent Field—that they discovered during an expedition in 2010. At the time, these were believed to be the world's deepest.

For more information, visit www.sonardyne.com.

Ocean ridges not home to more marine life

Undersea mountain ranges have long been thought to contain more marine life than other flat parts of the deep ocean, but now an international team of scientists—led by the University of Aberdeen and Institute of Marine Research in Norway—believe that this is not the case.

Their findings, published in the journal PLOS ONE, have implications for how these areas should be managed and fished.

Marine life gets sparser the deeper and further you go from land; however, sea mounts and ridges have been viewed as areas of the mid-ocean where marine life is plentiful. As such, they are attractive to high seas commercial fisheries, which operate in international waters beyond national jurisdiction.

Researchers have spent 8 years researching the Mid-Atlantic Ridge—the world's longest mountain range, which rises to around 3,500 m from the floor of the Atlantic Ocean, stretches from the Arctic to the Southern Ocean, and divides the ocean into eastern and western deep basins.

Using a range of sampling techniques and satellite imagery to study marine life, they concentrated on the Charlie-Gibbs Fracture Zone where two vast canyons cut across the Northern Mid-Atlantic Ridge, which has been declared a marine protected area.

Professor Monty Priede, Director of the University of Aberdeen's Oceanlab, said, "Mid-ocean ridges areas such as the Charlie-Gibbs Fracture Zone are rich feeding grounds. Many animals such as birds, dolphins, and whales feed here, and they are also used by deepwater fisheries."

"However our studies, which analyzed food production and availability, showed that the volume of life mid-ocean would be the same if there was no ocean ridge, although the type of animals that would live there would be completely different."

"The ridge has the effect of compressing all marine life together into a thin layer, so you have the attaching animals such as corals, sponges, and sea lilies; the burrowing and crawling animals, such as worms, sea cucumbers, brittle stars, star fish, crabs, and sea spiders; as well as the swimming animals such as fish—all crowded over the summits, slope, and terraces that make up the ridge."

For more information, visit www.oceanlab.abdn.ac.uk.

Scientists retrieve temperature data from Japan Trench observatory

With the successful retrieval of a string of instruments from deep beneath the seafloor, an international team of scientists has completed an unprecedented series of operations to obtain crucial temperature measurements of the fault that caused the devastating Tohoku earthquake and tsunami in March 2011.

Emily Brodsky, a professor of Earth and planetary sciences at UC Santa Cruz, helped organize the Japan Trench Fast Drilling Project (JFAST), which successfully drilled across the Tohoku earthquake fault last year and installed a borehole observatory nearly 7 km beneath the ocean surface. UCSC research scientist Patrick Fulton was on board the research vessel Kairei, operated by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), for the retrieval of the string of pressure and temperature sensors that was installed across the fault zone at about 800 m beneath the seafloor.

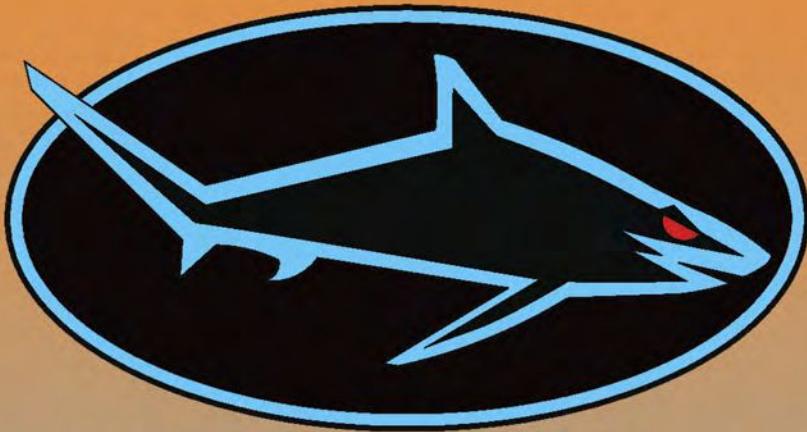
This was the last phase of operations for JFAST, designed to investigate the huge slip (50 m or more) on the shallow portion of the plate boundary fault that was largely responsible for the Tohoku earthquake and tsunami. The data recovered from the sensors provide a very high-precision record of temperature at 55 different depths across the plate boundary. Many of the sensors also recorded water pressure.

"We will be analyzing the data to characterize the amount of frictional heat on the fault during the Tohoku earthquake," Fulton said. "We'll also be closely investigating the effects of other processes within the subsurface, such as groundwater flow and seafloor movement due to aftershocks. It is exciting to finally have this amazing data in hand."

According to Brodsky, the entire project was unprecedented on many levels. "Nobody had done rapid-response drilling in the ocean, nobody had drilled anything substantial under 7 km of water, nobody had placed an observatory in a fault that deep, and nobody had retrieved a string of instruments from that deep," she said.

Initial results from the study are planned to be presented at the time of publication at the Japan Geoscience Union Meeting.

For more information, visit news.ucsc.edu.



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PUSHING THE LIMIT OF SUBSEA INSULATION

By Grethe Hartviksen

As the industry moves toward ever-more demanding subsea applications, the need for high performance, durable, and reliable products has never been greater. As a key element of many offshore drilling projects, subsea thermal insulation has an important role to play to ensure the smooth running of a facility. But as budgets get tighter, water depths get greater and fluids get warmer, can the industry keep up? Grethe Hartviksen, Innovation & Technology Manager at Trelleborg Offshore, says "yes" and argues that innovative, synthetic, rubber-based solutions not only address these issues and provide a reliable alternative, but are the only true option for subsea thermal insulation.

The oil and gas industry is renowned for continuously pushing the limits. The exploration of offshore gas/oil has been moving to more and more deepwater fields and demands that wells be drilled deeper and reach further in order to provide more cost-effective and safe well completions. Adding to the challenge is the requirement to extract more oil and gas than ever before, and exploit harsher reservoir environments in new locations around the world.

As the water depth becomes greater and the reservoir is located deeper underneath the seafloor, pressure is put on the performance of oil and gas products that must now be able to cope with much higher pressures and temperatures than shallow reservoir products.

As such, particularly in this difficult economic climate, customers require solutions that are not only superior when it comes to performance, but more cost-effective, focusing more on price and longer lifetime. Not long ago, customers required products that could last 20 years; now it is often up to 40 years.

When it comes to material selection to handle these challenges, rubber-based materials are, not surprisingly, becoming a more popular solution within the offshore industry as rubber is an extremely flexible and durable material. Compared to alternative materials, such as steel and fiberglass, rubber has an extensive temperature range and exceptionally high pressure resistance; is a flexible material that can damp, seal, and protect; and most of all, has an extremely long lifetime.

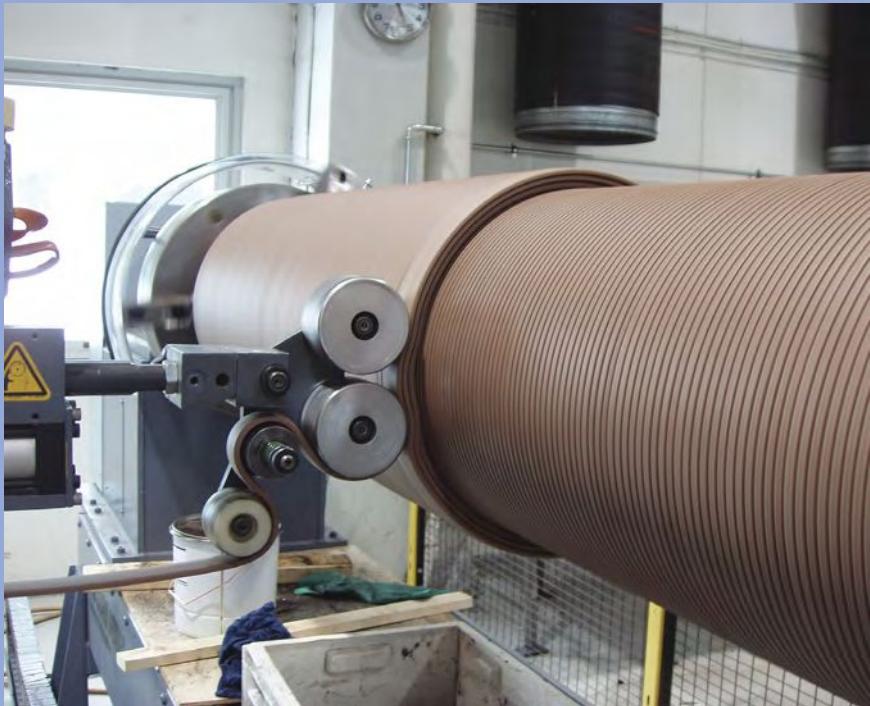
Why insulate?

As exploration and drilling go deeper, the need for reliable and efficient thermal insulation increases; flow assurance is a critical element of deepwater developments. Effective insulation of subsea structures helps maintain flow rates, optimize productivity, and reduce processing costs. It also provides optimum defense against wax and hydrate formations.

As part of the drilling process, hot oil or gas composition flows up at the wellhead and is transported through a combination of XMTs, manifolds, various critical instruments, spools, and flowlines before the riser finally brings it to the surface.

Insulation is a necessary part of this process in order to avoid formation of hydrate plugs and wax build-up (paraffin). The formation of wax and hydrates occurs when the oil or gas composition is depressurized and exposed to the low seawater temperature at the seabed.

A hydrate is formed when crystalline water is stabilized and light hydrocarbon molecules are captured in the crystal lattice. Hydrates can be formed at high pressures and at tem-



peratures around 68°F to 77°F (20°C to 25°C). Without insulation, the cold seawater would rapidly cool the oil, allowing the formation of hydrate and wax formations, and making it impossible for a safe flow of oil and gas.

Thermal insulation materials are applied in order to prevent formation of hydrate and wax during a shutdown scenario. During shutdown, the extra insulation gives sufficient time for inspection of the pipe and equipment so engineers can have time to solve production problems and for methanol or glycol injection.

Next-Generation Insulation Solutions

The increasing challenges faced by the offshore industry have spurred manufacturers to consistently push to develop products that can keep up with the demands of the offshore engineer.

However, it is not always about finding completely new solutions. Manufacturers must continuously look at their current product portfolios to find new ways to make existing products work even harder than they already do if they are to stay ahead of the game.

As such, some leading manufacturers are reassessing subsea thermal insulation materials that have been successfully installed throughout the subsea oil and gas industry for many years to see how best to enhance their performance in line with these growing demands.

The latest generation of subsea insulation solutions, an example of this dedicated improvement from one leading manufacturer, has a k-value of 0.13 W/mK, can be used up to 9,842 ft (3,000 m) deep and utilized in liquid temperatures up to 311°F (155°C), as well as external temperatures as low as -31°F (-35°C).

Editorial Focus

In order to provide even more flexibility when it comes to design and logistics, it now also allows for mobile production and can be installed on-site at a water depth of 9,842 ft (3,000 m).

A Layered Approach

These flexible insulation systems consist of a three-layer buildup. The First is an inner layer for corrosion and/or Hydrogen Induced Stress Cracking (HISC) protection; this could be a Neoprene compound that is qualified up to 203°F (95°C), or an EPM compound that is qualified up to 311°F1 (55°C). Both compounds provide excellent corrosion or HISC protection and have been extensively tested for adhesion, aging and cathodic disbondment.

The middle layer has been designed to provide the thermal insulation protection and various compounds are applicable depending on the specific requirements. The compounds provide a k -value of 0.13 W/m²K up to 0.19 W/m²K. The flexibility and stability of the rubber makes this an excellent choice with respect to thermal expansion.

The insulation layer is protected by the outer layer. This is a strong and robust layer that provides excellent seawater and mechanical protection and has a successful track record as far back as the early 1970s in the North Sea.

The insulative elastomer coating system used is a development based on ordinary rubber technology and consists of a rubber elastomer chemically modified to give a very high

Valve insulated with Trelleborg's Vikotherm II



Application of Trelleborg's Vikotherm II system



insulating property while maintaining its inherent rubber properties with respect to sea-water resistance, pressure resistance,

mechanical properties, and temperature. By utilizing a solid rubber-based coating, these new products have very good thermal insulation properties while providing maximum corrosion protection.

Peace of Mind

As the offshore oil and gas industry continues to push the limits when it comes to demanding subsea applications, the need for reliable and durable solutions that deliver proven performance for critical thermal insulation installations has never been greater.

With the formation of hydrate plugs and wax build up (paraffin), a real risk during operation shut downs, solid rubber-based coatings provide a practically incompressible seawater and impact-resistant solution that has very good thermal insulation properties and also provides maximum corrosion protection. They are designed to last the life of the subsea project (20 to 40 years), are maintenance free and will normally never be replaced—giving peace of mind to the offshore industry.



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DOE investment in MHK technology to grow

The Energy Department announced up to \$13 million in funding to develop and test advanced components and technologies to boost the performance of marine and hydrokinetic (MHK) energy systems. The Department plans to select up to 10 awards aimed at developing advanced controls, power systems, and device structures specifically for MHK applications, which harness energy from waves, tides, or currents. In the U.S., waves and tides represent a largely untapped renewable energy resource that could provide clean, affordable energy to homes and businesses across the country's coastal regions. The Energy Department estimates that U.S. wave and tidal resources could generate approximately 1,420 TWh annually, about one-third of the U.S.'s total annual electricity usage. The Energy Department intends to support projects that increase the power-to-weight ratio of MHK devices or improve system reliability through investment in advanced controls (up to six awards; \$500,000 to \$2 million each), next-generation power take-offs (up to two awards; \$3 million each), and optimized structures (up to two awards; \$1 million each).

Tocardo and Climex close agreement to sell tidal energy

Tocardo Tidal Turbines, the leading producer of tidal and free-flow water turbines, and Climex, the trading platform for renewable energy and carbon credits, have agreed to sell energy generated by Tocardo's turbines through Climex's green energy trading platform. The recently signed agreement will enable businesses and other large scale electricity users to add tidal energy to their renewable energy mix. The partnership of Tocardo and Climex is a major step in the development of the tidal energy market. Businesses and other organizations are increasingly committing to reducing their carbon footprint or seek to operate completely carbon neutral, fuelling demand for renewable energy. Wholesale customers use Climex's trading platform to purchase energy that is demonstrably green. Adding Tocardo's tidal energy to its portfolio significantly enhances Climex's offering. Tocardo recently secured investment from Huisman, specialists in offshore technology, and Spanish energy company Repsol, allowing the company to scale up its turbine production.

Greater Gabbard Offshore Winds and Fluor reach agreement

Greater Gabbard Offshore Winds Ltd (GGOWL), which is 50% owned by SSE, and Fluor Ltd have reached agreement on all of the outstanding claims relating to the construction of the Greater Gabbard offshore wind farm. The main claim related to the quality of up to 52 upper foundations (transition pieces) supporting turbines and the quality of up to 35 lower foundations supporting the same turbines. All 140 turbines at the Greater Gabbard offshore wind farm have been energized and operational since September 2012. In the 6 months to March 2013, the wind farm was operationally available to generate electricity for 87% of the time; this is forecast to increase to over 90% during 2013/14. GGOWL is now confident about the long-term structural integrity of the disputed foundations. The terms of the agreement between GGOWL and Fluor Ltd will not be disclosed.

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.

Following a formal signing ceremony, both companies also had the opportunity to meet with U.S. Secretary of State John Kerry during his first official state visit to the People's Republic of China (PRC). While in China, Sec. Kerry announced a new U.S.-China Climate Change Coalition, underscoring the importance of developing renewable energy technologies such as OTEC.

The offshore plant, to be designed by Lockheed Martin, will be the largest OTEC project developed to date, supplying 100% of the power needed for a green resort being developed by Reignwood. In addition, the agreement could lay the foundation for the development of several additional OTEC power plants, ranging in size from 10 to 100 MW, for a potential multibillion-dollar value.

Southern China is an ideal location for an OTEC plant, which uses the natural temperature differences found in the ocean of tropical regions to drive turbines that create electricity. The energy produced by an OTEC facility is clean, sustainable, and well-suited to the ocean conditions found near 80 countries around the world, including in the Asia-Pacific.

"The benefits to generating power with OTEC are immense, and Lockheed Martin has been leading the way in advancing this technology for decades," said Dan Heller, vice president of new ventures for Lockheed Martin. "Constructing a sea-based, multi-megawatt pilot OTEC power plant for Reignwood Group is the final step in making it an economic option to meet growing needs for clean, reliable energy."

Once the plant is operational, the two companies plan to use the knowledge gained to improve the design of the additional commercial-scale plants to be built over the next 10 years.

For more information, visit www.lockheedmartin.com.

Wales' first full-scale tidal energy generator receives funding

Wales' first full-scale tidal energy generator has been awarded a £1.6million EU grant to fund its deployment in Ramsey Sound, Pembrokeshire—First Minister Carwyn Jones announced at the Renewable UK Cymru conference in Cardiff.

The funding from the European Regional Development Fund, administered by the Welsh European Funding Office for Welsh Government, has been provided to Cardiff-based Tidal Energy Ltd for its DeltaStream tidal energy device.

Harbor trials of the device will be taking place in Milford Haven later this year, before the DeltaStream unit is deployed in Ramsey Sound in Pembrokeshire in 2014. Here, it will generate clean electricity for the homes of St. Davids over its 12-month demonstration period.

Invented by Pembrokeshire engineer Richard Ayre, the DeltaStream device, which sits on the seabed under its own gravity, is composed of three independent 400-kW turbines mounted on a triangular frame. For the first deployment in Ramsey Sound early next year, one 400-kW turbine will be installed in order to minimize operational and maintenance risk, with a view to scaling up to the full-scale device later in 2014/2015.

For more information, visit www.tidalenergyltd.com.

New report assesses potential improvements to U.S. hydropower production

The Energy Department announced a study outlining key improvements that can be made to hydropower production in the U.S. to provide more efficient and cost-effective electricity to homes and businesses. Developed with funding from the Energy Department, the Electric Power Research Institute's (EPRI) report, titled "Quantifying the Value of Hydropower in the Electric Grid," identifies and assesses the quantifiable benefits from potential improvements, such as installing turbines that can operate with lower water levels, utilizing new power plant designs that can increase revenue and efficiency, and monetizing the services hydropower provides to the nation's electric grid.

Hydropower supplies, on average, about 7% of U.S. electricity generation and is currently the nation's largest source of renewable electricity. In addition to producing clean, renewable energy, hydropower is widely valued for the ancillary services, or flexibility, it provides to the power grid—allowing storage capabilities, enabling fast stops and starts, and responding rapidly to imbalances of supply and demand to maintain power system stability. For example, pumped storage hydropower plants can pump water uphill when electricity supply exceeds demand, such as during nighttime hours or times when renewable energy sources are generating more power than consumers are using. This ability to store energy until it is needed—and to absorb excess renewable energy generation—lowers electricity prices and enables the generation of more renewable electricity.

The researchers looked at improvements that could boost the efficiency and output of hydropower plants and at

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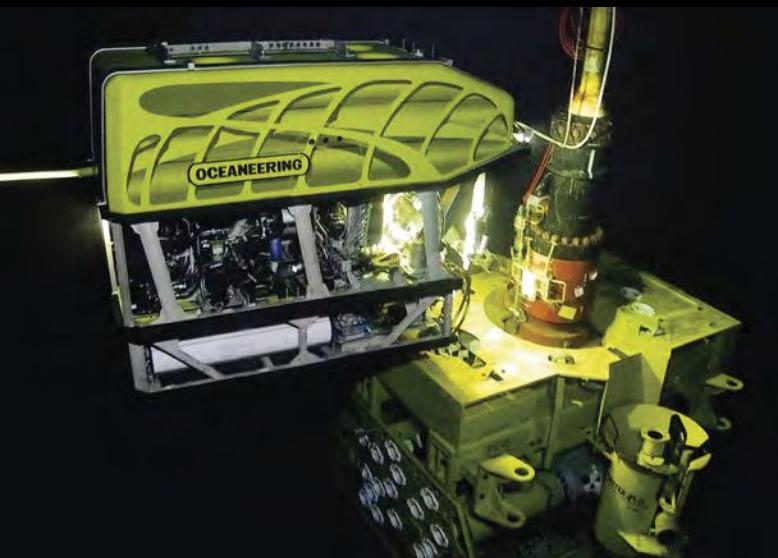
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ROV support services continue to transform, employing better technologies to reduce costs and improve reliability. Modern work class ROVs are configured with fiber optic telemetry, HD/3D cameras, spatially correspondent manipulators and a myriad of tools to survey, position, thrust, lift, connect, inject, power, pump and move subsea hardware, fluids and data to complete very complex assignments. All the while, the ROV pilot constantly communicates and controls the vehicle from his ergonomic designed chair on the surface with live video feed to the customer's offices both off and onshore.

An emerging trend is the increased use of two ROVs on Multi-Service Vessels (MSVs), construction vessels and even drilling rigs. In addition to redundancy to ensure uninterrupted operations, two ROVs facilitate simultaneous subsea activities thereby making the vessels or rigs more efficient. For complex and high integrity tasks the second ROV can provide a "bird's eye view" of the operation not available from the ROV performing the work. The two men and two machines effectively operate as a team.

The long term effects deeper water, higher pressures and temperatures have on complex subsea facilities and are not yet fully understood in the context of long field lives. Subsea Asset Integrity is one of the new and growing applications for ROV technology. ROVs can be used to monitor and log the condition of subsea assets using advanced subsea inspection techniques such as radiography, ultrasonics and cathodic

potential measurement. This information can be trended over time and analyzed to generate risk based preventive maintenance programs.



ROVs can also be utilized to supplement BOP control functionality. If certain levels of remote BOP control functionality are lost, normal BOP functionality may be restored using the ROV as a secondary source of BOP control.

While many principles of the oil and gas industry translate from onshore to offshore operations, subsea marinization of the production process has been dependent on the subsea adaptation of the ROV as a way forward. Onshore operations have colorful histories in the boom days of the gusher, a phenomenon of only slightly more than a century. The history of the subsea oil and gas industry is relatively young by comparison at around six decades. While some technologies in the industry have matured, the Remotely Operated Vehicle seems destined for a continued long life as Subsea's Great Enabler with continued frontiers, challenges and progress.

Oceaneering International, Inc. manufactures work class Remotely Operated Vehicles and globally operates the world's largest fleet of 289.



pumped storage hydropower systems, particularly in their potential to be integrated with variable renewable sources such as wind and solar power.

According to the report, hydropower plants could see their largest revenue and efficiency increases by deploying new hydropower technologies, making operational improvements, utilizing hydropower's flexibility more in grid resource planning, and monetizing the energy storage capability of pumped storage. The modeling results show a number of ways to increase the value of hydropower, and, while the value calculations do not take into account all of the site-specific environmental or operational constraints that individual plants may encounter, they do demonstrate the real potential for increasing hydropower revenues.

To view the report, visit www1.eere.energy.gov/water/pdfs/epri_value_hydropower_electric_grid.pdf.

Technology breakthrough in offshore wind design analysis

Previously, there has been no single software tool available on the market that covers both wind turbine and substructure design analysis in one analysis package. Now, Fedem Technology and DNV Software have joined forces with a new coupled analysis module available in Sesam Wind—used when performance of the wind turbine is influenced by wave loading.

The offshore wind turbine industry will benefit from this new and innovative, user-friendly software solution, including dynamic simulations, advanced fatigue calculation, and code check in one complete analysis package. The new module for coupled analysis is powered by FEDEM Windpower and is well integrated with Sesam. It is the most recent addition to DNV Software's product portfolio in Sesam Wind.

For more information, visit www.dnv.com.

Port of Ardersier submits plans to become manufacturing 'super-hub' for offshore wind

A renewables job boom could come to the Highlands of Scotland if plans to turn a former oil fabrication yard into a manufacturing "super-hub" for offshore wind get the go ahead.

The Port of Ardersier has submitted plans to Highland Council, Marine Scotland, and Transport Scotland for the consents needed to make the site a major European manufacturing port for the offshore wind industry.

With 138 hectares (340 acres) of vacant land and a deep water quay, the purpose-built yard—located on the Moray Firth, 15 mi east of Inverness—is ideally placed to take a slice of the estimated £70 to £80 billion UK offshore wind construction market.

There are very few deep water ports around the North Sea with this quantity of vacant manufacturing space—more than three times the size of London's Olympic stadium site—dedicated solely to renewables.

Once approved, the harbor revision order, onshore planning, and marine consents would permit major dredging later this year, which could enable the port to be open for business in early 2014—and ready to capture the once-in-a-generation opportunity offered by offshore wind.

It is estimated the £4.5 billion Moray offshore wind farm currently being developed jointly by EDP Renewables and Repsol Nuevas Energias UK could alone bring up to 3,000 jobs to the region.

For more information, visit www.portofardersier.com.



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U.S. Navy awards General Dynamics \$20 M for nuclear submarine services

The U.S. Navy has awarded General Dynamics Electric Boat a \$20 million contract modification for nuclear-maintenance work for submarines homeported at the Naval Submarine. Under the contract, Electric Boat will continue to operate the Nuclear Regional Maintenance Department (NRMD) at the submarine base. The company will provide project management, planning, training, and nuclear services to support maintenance, modernization, and repairs. A core group of about 25 Electric Boat employees are assigned to the NRMD, with surge groups of up to 100 shipyard employees assigned for short periods. The company has been awarded two initial contract modifications to date, valued at \$25 million. The contract has a total potential value of \$164 million over 5 years.

HMCS Windsor submarine hampered after \$209 M refit

The Royal Canadian Navy has confirmed that the HMCS Windsor is not able to operate as expected due to a broken 16-cylinder diesel generator. The Windsor had just completed a 5-year, \$209 Million refit. "We have restricted her in range of operations and her endurance," Captain Luc Cassivi, director of Canada's submarine force told CBC news in an interview. Once the new generator is available, the Windsor will be drydocked and the installed, which will bring her back up to full operational capability. Canada purchased four Victoria-class submarines from the British Navy in 1998 for \$750 million. Two of the four submarines are sidelined due to damage done by a fire and grounding, leaving just one fully operational submarine for the Navy.

Austal awarded additional LCS work

The U.S. Department of Defense has announced that Austal USA has been awarded a US\$19.987 million modification to a previously awarded Littoral Combat Ship (LCS) contract. The modification exercises options for class service efforts and special studies, analyses, and reviews for the LCS program. Austal USA will assess engineering and production challenges and evaluate the cost and schedule risks from affordability efforts to reduce LCS acquisition and lifecycle costs. Work is expected to be completed by March 2014. "This award is important as it aligns with Austal's strategy of expanding the level of support services we provide, in particular for the U.S. Navy's LCS and Joint High Speed Vessel platforms for which we are prime contractor," said Andrew Bellamy, Austal's chief executive officer. The Naval Sea Systems Command, Washington, D.C., is the contracting authority.

BAE Systems Norfolk Ship Repair awarded \$49,435,634 Navy contract

BAE Systems Norfolk Ship Repair, Norfolk, Virginia, has been awarded a \$49,435,634 firm-fixed-price contract for the fiscal 2013, USS Porter (DDG 78) extended dry-docking selected restricted availability. The contract includes options that, if exercised, would bring the cumulative value of this contract to \$61,289,100. All work will be performed in Norfolk, Virginia and is expected to be completed by April 2014. Fiscal 2013 Operations & Maintenance, Navy funds, and fiscal 2013 Research, Development, Test & Evaluation funding in the amount of \$49,435,634 will be obligated at time of award. Contract funds in the amount of \$44,509,472 will expire at the end of the current fiscal year. This contract was competitively procured via the Federal Business Opportunities website, with two proposals received.

Gerald R. Ford (CVN 78) primary hull structure reaches 100% completion



Huntington Ingalls Industries' Newport News Shipbuilding (NNS) division hoisted the last piece of primary structure onto the nuclear-powered aircraft carrier Gerald R. Ford (CVN 78) on Tuesday. The lift was the last of 162 superlifts and brings more than 3 years of structural erection work to a close.

The unit is the forward end of one of the ship's catapults, which are used to launch aircraft from the ship. Weighing 66 metric tons, the unit is 75 ft long and comprises four steel sections. Gerald R. Ford is being built using modular construction, a process where smaller sections of the ship are welded together to form large structural units, equipment is installed, and the large units are lifted into the dry dock using the shipyard's 1,050-metric ton gantry crane, one of the largest in the Western Hemisphere.

Remaining work on the ship prior to launch includes hull painting, shafting work, completion of electrical systems, mooring equipment, installation of radar arrays, and flooding of the dry dock. Ford has been under construction since November 2009.

"As the first new-design aircraft carrier in more than 40 years, the Gerald R. Ford class will begin to succeed Nimitz-class carriers when CVN 78 delivers in 2016," said Ye-Ling Wang Bird, Navy deputy program manager for future aircraft carriers. "She will provide the Navy with greater operational capability, built-in flexibility to accommodate future improvements, and improved survivability at reduced total ownership cost to the taxpayers."

Huntington Ingalls Industries (HII) designs, builds, and maintains nuclear and non-nuclear ships for the U.S. Navy and Coast Guard and provides after-market services for military ships around the globe. For more than a century, HII has built more ships in more ship classes than any other U.S. naval shipbuilder at its Newport News Shipbuilding and Ingalls Shipbuilding divisions. Employing about 37,000 in Virginia, Mississippi, Louisiana, and California, HII also provides a wide variety of products and services to the commercial energy industry and other government customers, including the Department of Energy.

For more information, visit www.huntingtoningalls.com.

Navy undersea warfare researchers to purchase additional REMUS 100 UUV from Hydroid Inc.

U.S. Navy undersea warfare experts are buying another REMUS 100 unmanned underwater vehicle (UUV) from Hydroid Inc. in Pocasset, Massachusetts, a wholly owned subsidiary of Kongsberg Maritime.

The Naval Undersea Warfare Center (NUWC) in Newport, Rhode Island needs the Hydroid REMUS 100 for continued development and testing, supplementing NUWC's existing inventory of REMUS systems acquired previously to support a variety of program efforts, NUWC officials say.

The NUWC is The Navy's primary research and engineering center for underwater and submarine warfare.

REMUS is short for Remote Environmental Measuring Unit S. The REMUS 100 slightly longer than 5 ft, is 7.5 in. in diameter, and weighs 85 lbs. It can operate to depths of 328 ft on missions lasting 8 to 10 hrs.

It can swim as fast as 4.5 kts and navigates by Doppler-assisted dead reckoning, Inertial navigation system, and GPS.

NUWC is buying the REMUS 100 UUV sole source because Hydroid is the only known source that can meet Navy requirements of a UUV that is man-portable, and has an energy density of at least 1.2 KWh, Navy officials say.

Researchers plan to use the REMUS 100 in exercises that require a UUV that can move as fast as 4 kts for as long as 10 hrs.

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

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

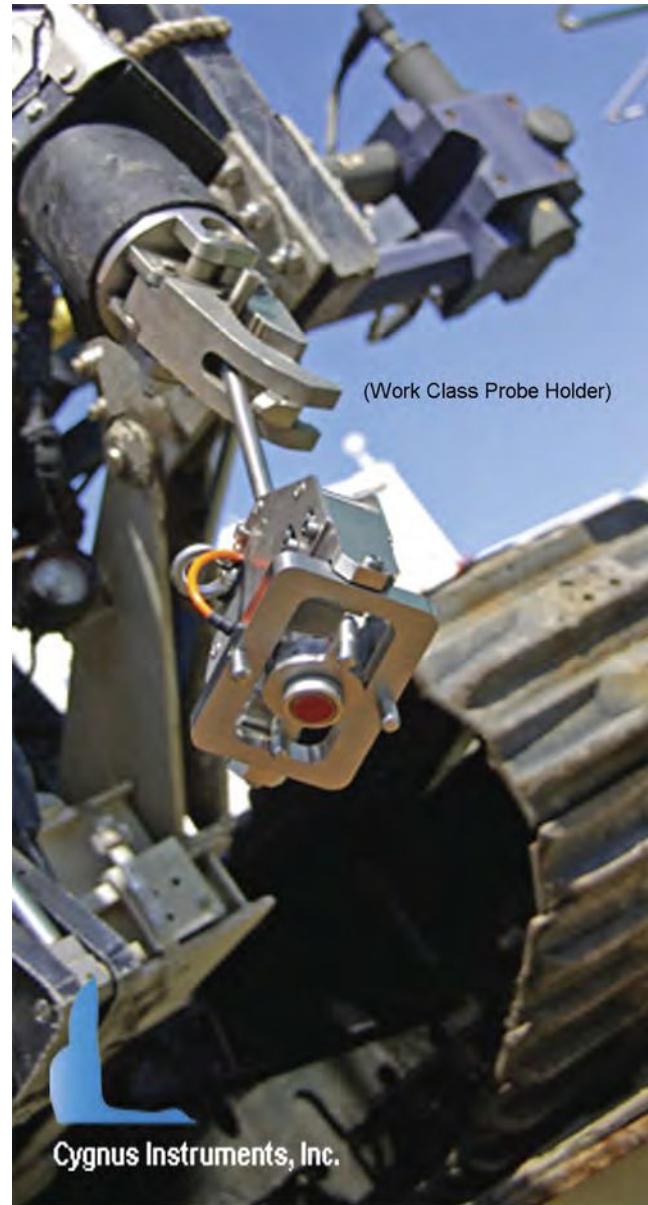
Northrop Grumman Corporation and the U.S. Navy have conducted the first fly-in arrested landing of the X-47B Unmanned Combat Air System (UCAS) demonstrator.

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.

"This precision, shore-based trap by the X-47B puts the UCAS Carrier Demonstration [UCAS-D] program on final approach for a rendezvous with naval aviation history," said Capt. Jaime Engdahl, the Navy's UCAS program manager. "It moves us a critical step closer to proving that unmanned systems can be integrated seamlessly into Navy carrier operations."

During an arrested landing, the incoming aircraft extends its landing hook to catch a heavy cable extended across the aircraft landing area. The tension in the wire brings the aircraft to a rapid and controlled stop.

Carl Johnson, vice president and Navy UCAS program



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manager for Northrop Grumman, said this first arrested landing reinforced what the team already knew.

"The X-47B air vehicle performs exactly as predicted by the modeling, simulation and surrogate testing we did early in the UCAS-D program," Johnson said. "It takes off, flies, and lands within a few feet of its predicted path."

The arrested landing test culminates more than 3 months of shore-based carrier suitability testing at Naval Air Station Patuxent River. The testing included precision approaches, touch-and-go landings, and precision landings by the X-47B air vehicle.

For more information, visit www.northropgrumman.com.

Minnesota (SSN 783) successfully completes first sea trials

Huntington Ingalls Industries (HII) announced that the newest Virginia-class submarine, Minnesota (SSN 783), successfully completed alpha sea trials. Alpha trials are the boat's first round of at-sea tests and evaluations. Minnesota is being built at HII's Newport News Shipbuilding (NNS) division.

All systems, components, and compartments were tested during the trials. The submarine submerged for the first time and operated at high speeds on the surface and under water. Minnesota will undergo two more rounds of sea trials, including one with the Navy's Board of Inspection and Survey, before delivery later this month. Minnesota is anticipated to deliver approximately 11 months ahead of its contracted delivery date.

"This submarine is the result of a lot of hard work by the shipbuilders here at Newport News, our teammates at Electric Boat, and the overall Navy organizational structure, including NAVSEA, SUPSHIP, and ship's force personnel," said Jim Hughes, NNS' vice president of submarines and fleet support. "It is incredibly gratifying for all of us to see this magnificent vessel operate so well during her first at-sea period. Minnesota clearly carries on the Virginia-class tradition of continuous cost and schedule improvement while also raising the bar on operational readiness and capability."

Minnesota, named to honor the state's residents and their continued support of the U.S. military, is the last of the block II Virginia-class submarines and is



in the final stages of construction and testing at NNS. Construction began in February 2008, and the keel was authenticated in May 2011. The boat was christened 27 October 2012.

For more information, visit www.huntingtoningalls.com.

NAWCAD scientists forge new path for underwater optics

Scientists from the Naval Air Warfare Center Aircraft Division (NAWCAD) recently brought to light a new approach for underwater optics that could enhance fleet activities, such as detecting underwater mines and seafloor mapping.

NAWCAD engineers Linda Mullen and Alan Laux invented a method to encode a laser with a radar signal to improve the performance of underwater imaging systems in murky water.

"We program the laser with information about how the laser is scanning the object," Mullen said of the project, which was developed 2 years ago and patented in February. "Therefore, the light reflecting off the object and the surrounding environment contains all the information needed to accurately create an image."

A typical underwater laser imaging system has the transmitter and receiver on the same platform. Mullen and Laux tailored their imaging system by placing the transmitter and receiver on separate platforms. The remote receiver wireless-

ly collects the radar-encoded laser light from the transmitter and translates the information, while an image processor turns the digitized signal into an image.

"It's a new way of thinking about things," Mullen said. "In acoustics and radar, they've been doing these kinds of approaches for a long time. This is very new for optics."

Their method allows for better image quality and larger operating ranges than traditional underwater optical imaging systems. With the separate platform approach, the receiver can potentially be airborne, shipboard, or on another underwater stand—a first for optics imaging. It also makes it possible to use a smaller platform, which allows the light source to get closer to the object in question without stirring up as much sediment. Less sediment means better visibility, an important factor in activities such as minesweeping, which depends on the ability to detect mines without inadvertently triggering them.



Naval Air Warfare Center Aircraft Division engineer Dr. Linda Mullen demonstrates a laser used in underwater optics at Naval Air Station Patuxent River, Maryland, on 6 March. Mullen patented a new encoding method for laser imaging, which offers possibilities for both fleet and commercial use. (U.S. Navy Photo).

Commercial uses for the technology exist as well. During one recent test, Maryland law enforcement officials expressed interest in using the technology to help with search and recovery efforts. Underwater laser imaging has the advantage of approaching objects from a single direction and has fewer limitations in shallow water than traditional sonar.

"There are scenarios when you have to start thinking out of the box," Mullen said. Otherwise, you are going to be limited. You won't be able to get to see what you want to see."

For more information, visit www.navair.navy.mi.

Royal Bahamas Defence Force contracts Damen for fleet of long-range patrol craft

Following a 6-year acquisition program, the Government of the Bahamas has announced the signing of a Letter of Intent to acquire nine vessels for the Royal Bahamas Defence Force and construction work for their naval bases. The contract has been placed with Damen Shipyards Group, headquartered in Gorinchem, The Netherlands.

In announcing the contract, the Minister of National Security, the Hon. Dr. Bernard Nottage, stressed that his Government was determined to protect the security and economic well-being of the people of the Bahamas and this order was a powerful endorsement of this commitment.

The project will include the acquisition of a fleet of various vessel types and the upgrading and construction of three bases in the Bahamas. There will be additional dredging works to facilitate the new long-range patrol craft and to provide the Defence Force with first-class facilities.

The fleet of vessels includes a dedicated roll-on, roll-off landing craft (a Stan Lander 5612) that will be fitted with a 25-tonne crane and demountable disaster relief equipment. Special containers will be acquired to provide emergency relief, medical facilities, desalinated water, and sanitary equipment that will rapidly be deployed in the event of a natural disaster. In addition, eight patrol vessels, four of the Damen Stan Patrol 4207 type and another four type SPA 3007, will join the Bahamas' fleet.

The specialized long-range patrol craft are designed to operate in the shallow waters of the Bahamas and will help to plug the gaps in the security network while addressing the concern of local fishermen who have been demanding more protection for this vital sector of the economy.

For more information, visit www.damen.com.



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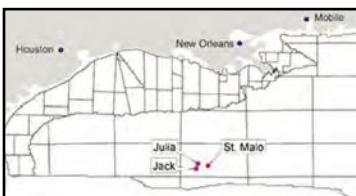


OFFSHORE INDUSTRY

ExxonMobil to begin developing Julia field in ultra-deepwater GoM

ExxonMobil said it will begin developing "one of the first large oil discoveries in the ultra-deepwater frontier of the Gulf of Mexico," about 265 mi southwest of New Orleans.

Developing the Julia oil field, which was discovered in 2007, is expected to cost more than \$4 billion. Oil production is scheduled to begin in 2016. The field is estimated to have nearly 6 billion barrels of oil resources, 1 billion barrels of which may be recoverable. The field is located in more than 7,000 ft of



water, some 30,000 ft below the ocean's surface.

The initial development phase is being designed for daily production of 34,000 bbl/d of oil and includes six wells with subsea tie-backs to the Jack & St. Malo production facility operated by Chevron U.S.A. Inc. Front end engineering design has been completed and the engineering, procurement, and construction contracts have been placed, Exxon said.

"The development of Julia will provide a new source of domestic energy and well-paying jobs over the next several years," Neil Duffin, president of ExxonMobil Development Co., said in a statement.

The Julia field comprises five leases in the Walker Ridge area. ExxonMobil is the operator of the project. It splits a 50% interest in the Julia unit with Statoil Gulf of Mexico LLC.

Subsea hardware spending to double to \$124B over 5 years

Subsea hardware expenditures are forecast to double from 2013-2017 to \$124 billion compared to the preceding 5-year period, according to Douglas-Westwood. Deepwater activity is booming in the "Golden Triangle"—Brazil, West Africa, and the Gulf of Mexico—which is forecast to account for 44% of total subsea hardware expenditure.

The downturn in offshore installation

activity between 2009 and 2011 is being followed by strong recovery and is expected to continue to 2017. Trunkline projects are of particular significance with major deepwater connections planned for and extending beyond the forecast period.

The report notes that with fewer conventional opportunities, high oil prices, and more advanced subsea hardware solutions more fields are being developed in deeper waters, in remote locations, and in more extreme metocean conditions. In addition, the offshore industry is challenged to recover smaller, more widely scattered reserves.

The growing use of subsea processing technology, such as subsea separation, multi-phase pumping, and gas compression, as an alternative to the use of fixed processing platforms will also tend to provide upside potential, the report says.

Industry pays more taxes, has less profit margin than other sectors

The U.S. oil and natural gas industry pays more in taxes and has a lower profit margin than other major industrial sectors, yet it continues to be the target of new tax increases, the American Petroleum Institute charged.

According to a new API white paper, the petroleum industry paid an effective tax rate of 44.6% from 2007 to 2012, compared to 21.3% for pharmaceuticals, 25.6% for the computer industry, 29.3% for banks and insurance companies, 30% for industrials, 32.6% for utilities, and 34.9% for health care.

The oil and gas industry's 2012 profit margin, meanwhile, was lower than many of the same sectors of the economy. The API said its industry had a 2012 profit margin of 7.3%, compared to 19.3% for beverage and tobacco products, 16% for pharmaceuticals, 9.7% for computers, and 8.6% for all manufacturing.

John Felmy, API chief economist, told reporters during a recent conference call that strong earnings are no excuse for "punitive, counterproductive tax treatment for our industry. The oil and natural gas industry's 2012 profit margins are less than those of many industries, and its effective tax rate is higher. It sends about \$85 million in revenue to the Federal government every day."

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Ex-army officer helps former military personnel find energy-related jobs

An ex-army officer has launched a pioneering initiative aimed at smoothing the path for former UK military personnel looking to transfer their skills into the energy industry. Having successfully made the move himself, Magnus Jeffrey, who works as a project engineer for Senergy Development Solutions (SDS), has set up The Network Aberdeen to help other former service staff interested in making a similar transition.

Jeffrey, 33, formed the group as a means of providing "leavers" with the information and contacts they need to get their foot in the door and learn how to adapt their knowledge to an industry crying out for skilled staff.

"The oil and gas industry is a dynamic and exciting industry in which to work and is in many ways similar to the military," he said. "However, many of these individuals struggle to get past the initial application stage. If the same individual is able to meet with someone and given the opportunity to explain what they can offer, the outcome can be very positive for both parties."

Jeffrey set up The Network Aberdeen in November 2011. The independent organization is attempting to gain charitable status and has already been successful in helping more than 10 people into work—more than one person per meeting thus far.

"It is about getting people into the room to network," he added.

In addition to supporting former military staff, The Network Aberdeen is also providing an increasing level of support to those leaving other uniformed services, including the police and fire brigade.

For further details about The Network Aberdeen, visit www.thenetworkaberdeen.org, or e-mail info@thenetworkaberdeen.org.



Magnus Jeffrey

North Sea oil and gas boom stalled in 2013 first quarter, says Deloitte

The UK's prolonged winter subdued drilling activity and deals in the North Sea after a robust finish to 2012, a report from American consulting firm Deloitte said, adding that industry should return to growth in the spring as new tax incentives encourage firms to invest.

In January, Deloitte fueled hopes that the UK oil industry would soon return to production growth as it reported a 33% rise in exploration and appraisal wells during 2012.

The sector enjoyed record levels of investment as the high oil price made even hard-to-reach fields attractive. Tax breaks announced last year helped persuade firms to start spending, and the investment is expected to hit new highs in 2013. But the strong finish to 2012 led to a winter lull in the first 3 months of this year. Nine new wells were drilled during that period, compared to 11 in the same quarter in 2012 and 19 in the final 3 months of last year.

The flattening off of activity was replicated across northwest Europe as a whole.

According to Deloitte, farm-in agreements, where a company takes a stake in another's field, were a key part of corporate activity in the UK continental shelf recently. They accounted for 36% of deals completed following the recent round of new licenses awarded by the UK government, which brought new firms to the North Sea.

First-quarter deal activity overall was slightly down on the sale period in 2012, with 19 deals compared to 23.

Crowley closes out \$1B, U.S.-flag ATB program with christening

Eleven years after the launch of its first Articulated Tug-Barge (ATB), Crowley Maritime Corp. christened its 17th ATB, the Liberty/750-3, 2 May, at the VT Halter Marine Shipyard in Pascagoula, Miss. The tugboat and 330,000-barrel petroleum tank barge are the final vessels to be built in a more than \$1 billion, decade-long ATB construction program undertaken by Crowley to expand the company's U.S.-flag petroleum services fleet.

The Liberty/750-3 is the third in its class to be built for Crowley. The first, the Legacy/750-1, was christened in November 2011 and the second, the Legend/750-2, was christened in Tampa last year. Both vessels are currently at work along the U.S. Gulf Coast. The 750-Class barges have a capacity of approximately 330,000 barrels and are 45,000 deadweight tons and 600 ft in length. All



"Liberty" christening with Tom Crowley, sponsors and vessel crew.

three barges were built by VT Halter Marine in Pascagoula. The 16,000 Hp tugs, Legend, Legacy, and Liberty, were constructed by Dakota Creek Industries, Inc. in Anacortes, Washington.

Crowley's ATB fleet also includes four 550-class, 155,000-barrel ATBs and ten 650-class, 185,000-barrel ATBs. In recent months, Crowley has also added two U.S.-flag, 330,000-barrel product tankers to its petroleum fleet.

Global offshore fabrication seen reaching record levels over 5 years

Over the next 5 years, Quest Offshore expects an 88% growth in floating production system (FPS) award levels, illustrating a strong resurgence of investment in high-capital, major deepwater developments. This growth coupled with current high levels of offshore rig construction will buoy oil and gas-related utilization of major offshore fabrication shipyards to record levels.

While demand within China and Brazil yards continues to grow, leadership from Korean yards will be status quo; drillships destined for the Golden Triangle, mega FPSOs, floating LNG, and platform topsides will continue to dominate demand.

Offshore oil and gas construction demand reached record levels in 2012 with an estimated 3 million tons of steel awarded to shipyards. This significant demand is driven mainly by 17 FPS, 14 drill-semis, 34 drillships, 24 jack-ups, and 20 plus major fixed platform awards. This momentum continues the most recent cyclical build out of deepwater drilling vessel in 2009 and will begin to flow into an increased demand of FPS systems in the next 5 years.

Drillships and drill semis have seen an average annual delivery count of 20 new builds over the last 5 years, following a trend of unprecedented demand within deepwater drilling. Utilization of floating rigs continues to remain high at ~90%, though Quest has noticed a

decline within the older, mid-water rigs due to the influx of higher-spec units. Future deliveries within the market remains elevated, as the average number of rigs expected to come online within the next 5 years will once again eclipse an average of 20 deliveries a year.

The effect of floating rig fabrication has presented a noticeable shift within major shipyard utilization away from commercial vessels and further into oil and gas-focused work, where higher margins are commanded.

With 51 floating drilling units contracted to Korean Yards, capacity of this group for drillships has become limited with first availability for new orders stretching into the second half of 2015. Given these deliveries and the one time call-off for 28 of Sete's Petrobras Brazil rigs, Quest expects demand for new orders to be reignited while the market digests 40 newbuilds that remain un-contracted alongside increased requirements of labor and associated equipment.

With drillship tonnage throughput for Korean Yards expected to peak in the middle of 2013, FPS awards are expected to fill demand, beginning in 2012 with 17 FPS awards representing U.S.\$14.7 billion—the most buoyant year for the market since 2007. Total hull orders for 2013 are projected at 23 to 28 units led by FPSOs, and demand is expected to stay strong through the forecast period.

Quest's mean case forecast for 2013-2017 anticipates 126 units, building on the 67 FPS orders from 2008-2012, and represents a 13% compound annual growth rate. Spending will increase accordingly, as Quest estimates \$14 billion was spent on FPS awards in 2012 and is expected to increase to \$26 billion by 2017 for a total FPS award investment of \$113 billion over the time period.

Alaska takes in \$4.5 million in Cook Inlet areawide lease sale

The Alaska Division of Oil and Gas took in \$4.5 million at its Cook Inlet areawide oil and gas lease sale in May. The dollar value was the third largest for Cook Inlet areawide sales, which began in 1999. The state received bids on 28 tracts, 145,739 acres. Hilcorp Alaska dominated the sale, taking 19 tracts for \$2.7 million, 60% of the dollar value of the sale and 70% of the acreage. Cook Inlet Energy, with \$871,200 in winning bids for five tracts, accounted for 20% of the dollar value of the sale and the 20% of acreage. Other winning bidders were Aurora Gas, William Crawford, NordAq, and Woodstone Resources.

NorSea Group invests in its first supply base in Scotland

NorSea Group, a supplier of base services and integrated logistics systems to the Norwegian oil and gas industry, and the Scrabster Harbour Trust in Caithness have signed an agreement that will result in major investment and new job prospects for the local economy. Under the agreement, NorSea Group will work with the Trust to bring in new business and develop Scotland's most northerly mainland port as a one-stop supply base servicing the oil and gas industry.

NorSea Group already operates nine supply bases along the coast of Norway that provide logistics support to companies operating offshore on the Norwegian continental shelf. The Scrabster base will be the company's first in Scotland and will combine the expertise, successful track record, and resources of NorSea Group with the benefits of Scotland's most northerly mainland port.

The bases in Norway each host between 40 and 60 companies in the oil and gas industry providing full range of services from warehouse and storage facilities to engineering, construction, lifting equipment and inspections, mechanical workshops, and machining to waste handling and storage. The new plans will see a similar model developed in Scrabster.

Scrabster is currently undergoing significant redevelopment that will support the development of the base. The first phase has created a modern deepwater quay with 11,573 sq. m of quayside and lay-down area that complement the existing harbor facilities and the port's strategic location.

"The vision and commitment of the Trust have been fundamental in our decision to establish NorSea Group there. We are committed to involving the local community in all aspects of our phased development, which will bring significant investment and job opportunities," said John E Stangeland, chief executive officer of NorSea Group.

He added, "NorSea Group is also very optimistic about opportunities which may arise from the emerging marine renewables sector as the company's skills, expertise, and operational model will be well suited to meet the needs of this sector."

William Calder, chair of Scrabster Harbour Trust, said Scrabster is ideally situated to support the major oil and gas developments emerging west of Shetland.

"I recently visited NorSea Group bases in Norway and was impressed by the operational excellence and supporting infrastructure at their bases, a model of which will be eminently transferable to the further development at Scrabster Harbor," he said.



Scrabster Harbour, Caithness, Scotland

Scotland records 9-year high in oil and gas exports: SCDI

Scotland's oil and gas supply chain exports rose by 8.4% in 2011-2012, to \$12.7 billion—almost double the rate of the previous year—according to the latest figures from Scottish Development International and the Scottish Council for Development and Industry.

The new figures, which are part of the latest annual survey of international activity in the sector, were announced by Scotland's Minister of Energy, Fergus Ewing, at the Offshore Technology Conference in Houston, Texas where the Scottish government hosted a delegation of more than 50 Scottish companies.

The types of services being exported from Scotland include project management, consultancy, construction, maintenance, resource management, software

design, drilling, access solutions, catering, logistics/transport, engineering, and design.

According to the survey, international activity accounted for a record 47.6% of total sales from the sector, an increase from 31% over the past decade. Total oil and gas supply chain sales, which includes sales through subsidiaries, increased by 5.8% to reach \$26.7 billion, with exports to over 100 markets across the globe.

North America remained the top region for exports with \$4 billion of sales targeted into this region, an increase of 2.8%, but strongest growth was reported in the Middle East.

Africa remained the second most important with a 5.9% increase in sales. Brazil, the United States, and Australia are reported to be the new markets of greatest interest, with sales in Australia alone increasing by 9.4%.

CEO says Brazil's Petrobras will double in size over 7 years

Brazil state-owned oil giant Petrobras will double in size by 2020, chief executive Maria das Graças Silva Foster declared in a lecture at last month's Offshore Technology Conference in Houston, Texas. Brazilian production, which was 2.2 million boe/d in 2012, will reach 5.7 million in 2020, she said, adding that the pre-salt will be largely responsible for the increase.

"We (Petrobras) have made 53 discoveries in Brazil during the last 14 months; in the pre-salt alone there were 15 discoveries," Gracis Foster said.

"Petrobras' reserves have the potential to double in size and reach 31.5 Bboe in the coming years." For her, there is no doubt that the results are due to the company's investments,



*Maria das
Graças Silva
Foster*

which have increased at a rate of 21.5% per year since 2000 and reached \$42.9 billion in 2012. Investments in research and development during the period were also significant and important in achieving the goals; over the last 12 years, investments in this area have grown 18.3% per year. Graças Foster also highlighted the Brazilian market's growing demand, which has been well above the world average.

Bill introduced to open area near maritime border to exploration

Legislation has been introduced that would open waters near the U.S.-Mexico maritime border to explorers. The House bill would amend the Outer Continental Shelf Lands Act by lifting a moratorium on drilling in the region. House Natural Resources Committee Chairman Doc Hastings, R-Wash., joined several Republicans in introducing the bill.

"Congressional approval of this agreement will provide much-needed certainty to U.S. energy companies that are interested in leasing and developing these areas, but up until now have been unable," Hastings said. A U.S.-Mexico agreement signed last year called for a joint inspection team to ensure compliance with applicable safety and environmental laws in the maritime area. It follows a 2010 commitment from the U.S. and Mexican governments to work in oil and natural gas developments along the shared maritime border. The region holds an estimated 172 mmbbl and 304 bcf of gas.

SMDs 2013 Work Class ROV range

SMD has been a leading manufacturer of subsea robotic systems since the 1980s and is well known for producing the world's most successful trenching machines. In 2003, SMD started manufacturing work class ROVs. This part of the business has grown steadily, and, today SMD is one of the world's largest producers of work class ROVs.

SMD's ROV division operates from a modern facility named "i19" in Newcastle Upon Tyne, UK. ROV sales personnel, project managers, engineers, and technicians are all located within the facility, and the company has the ability to manufacture up to 48 work class ROV systems per year. SMD also has offices in Houston, Singapore and Macau.

SMD introduced the original Q-Series range of work class ROVs in 2005. The range consisted of three vehicles—Quantum construction class, Quasar general purpose class, and Quasar Compact lightweight work class. Through market trends and customer feedback, SMD undertook its first range refresh in 2009. The refresh still retained three models of vehicle - to give customers choice and flexibility when building fleets - and updates focused on key attributes SMD felt were of absolute importance to clients:

- Dependability - Robust construction, stable control system and careful selection of sub components for maximum reliability.
- Performance – The ability to operate in high currents whilst remaining composed and offering precise control for operators.
- Flexibility – The ability to configure for any operation. Defined free spaces within the vehicles for tool fitment, powerful tooling hydraulics, broad choice of customer interfaces.
- Ease of use – Intuitive control software. Inclusion of automatic pilot aids. Good access for maintenance.
- Value for money – Use of off-shelf components, low through-life costs.

By 2012, SMD had delivered over 94 work class ROV systems and become the world's number one work class ROV manufacturer. Four years had passed since the last refresh, so SMD deemed it time to revisit the product range and the decision was made to develop the next generation Quantum, Quasar, and Atom (Quasar Compact replacement) for 2013 release.



SMD's new 2013 range of work class vehicles builds on the original key attributes. All aspects of each system were reviewed and updated with one of the main changes being the introduction of the DVECS-S control system. First successfully deployed on the i-Tech only, SMD manufactured QX Ultra ROV, the SCADA/PLC, based DVECSII system offering advancements in configurability, diagnostics, and graphical user feedback. Proven industrial PLC technology is employed to maximize reliability.

Pilot aids through dynamic position technology were available on previous generation SMD WROV systems, but were limited to relative positioning through seafloor lock technology.

The new ROVs have the option of a far more advanced dynamic positioning system - relative and absolute - co-developed by SMD and under-sea positioning experts Seabyte. The system allows SMD work class ROV operators to gain a unique advantage over the competition by offering a host of features allowing pilots to fly and position the ROV with greater speed and accuracy. Advanced flight modes such

as auto-position, navigation map trail, cruise-control, advanced waypoint tracking, chart overlay, auto fly follow and survey are all included with the latest DVEC-S system. Seafloor lock, mid water positioning and sonar lock and auto follow are available when relevant transducers are fitted to the vehicle. DVECS-S also sees the introduction of the multi-platform CORE pod which forms the control hub on the new Quantum, Quasar and Atom vehicles. SMD's distributed control architecture remains but the field maintainable and compact CORE pod offers increased instrument connectivity permitting operators to fit and control the latest HDTV cameras and high bandwidth sonars.

Improvements have also been made to the mechanical and hydraulic aspects of the new vehicles. Vehicle construction of previous incarnations employed aluminium alloy sections bolted in triangulated configurations to aid stiffness. SMD wanted to lighten, stiffen, and free up more space for tooling and access to components on the new range. Borrowing ideas from aerospace, The 2013 ROV models employ space frame construction that moves away from internal bolted sections.



This has resulted in very robust, stiff, yet light vehicle frames that retain bolted extremities for damaged section replacement. For the customer, this translates to better collision resilience, improved stability for manipulator work, and more space within the frame.

SMD designs and manufactures all of its work class hydraulic componentry under the well-known brand name Curvetech™. Many of the Curvetech™ components fitted to this latest vehicle range have been updated and improved. Quantum is now fitted with a new Curvetech™ HTE 430-mm thruster. Larger and more powerful than rival units, the thruster utilises a unique mono-strut design to minimize water flow disruption. Lighter and more compact hydraulic power units have been developed for the Quasar and Atom and a new range of smaller, lighter, and feature-packed Intelligent Hydraulic Control Units, are available for customers to configure their ideal system.

Atom is available in 60 hp and 100 hp guise, Quasar 125 hp and 150 hp and Quantum 200 hp and 250 hp. The first new Atoms, Quasars, and Quantums entered service at the beginning of 2013.

The 2013 vehicle range share a completely new topside control console design. Using client feedback and adhering to the latest IMCA and NORSO standards, the layout offers a pleasant ergonomic environment with space for a surveyor and observers. SMD offers customers a choice of screen and control desk configuration to suit requirements. The standard control setup can be either 20 ft cabin or vessel room installed.

A wide choice of SMD Tether Management Systems are available to complement the new vehicles. These include

small, medium, and large Tophat and Garage designs with options to fit thrusters if required. In addition, a range of SMD Launch and Recovery Systems are available in many different configurations, from fixed and telescopic A-frames to hanger-mounted gantries and rail launch cursor designs. The advantage of a full turn-key solution from SMD is that customers can have a system to suit even the most unusual deck installations.



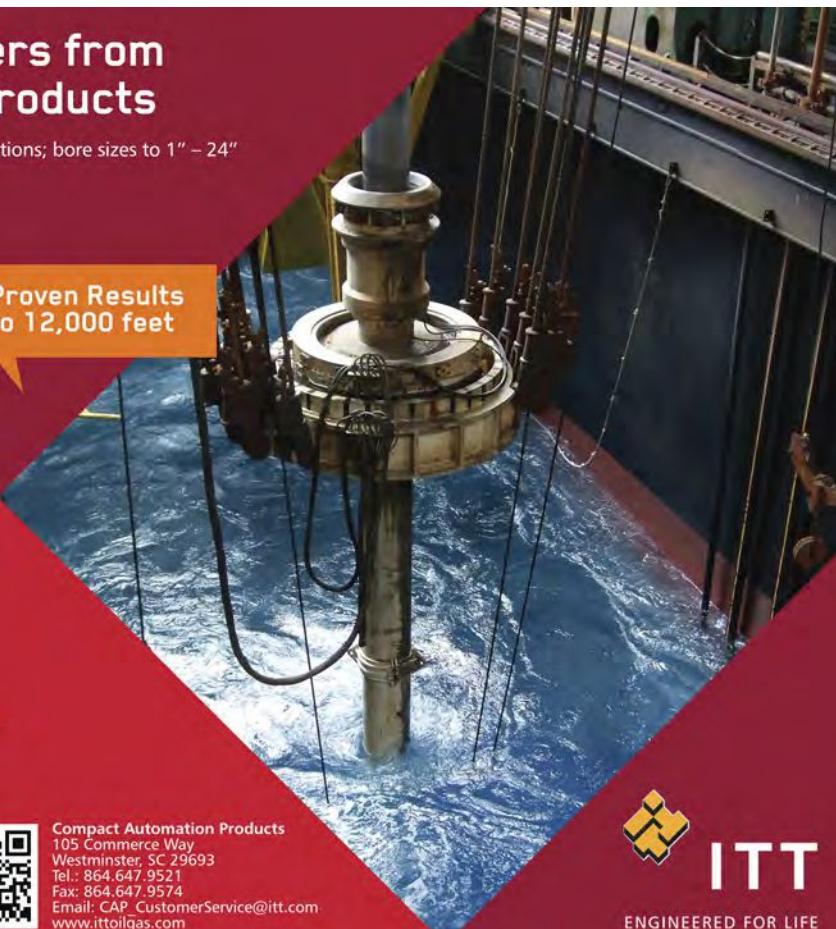
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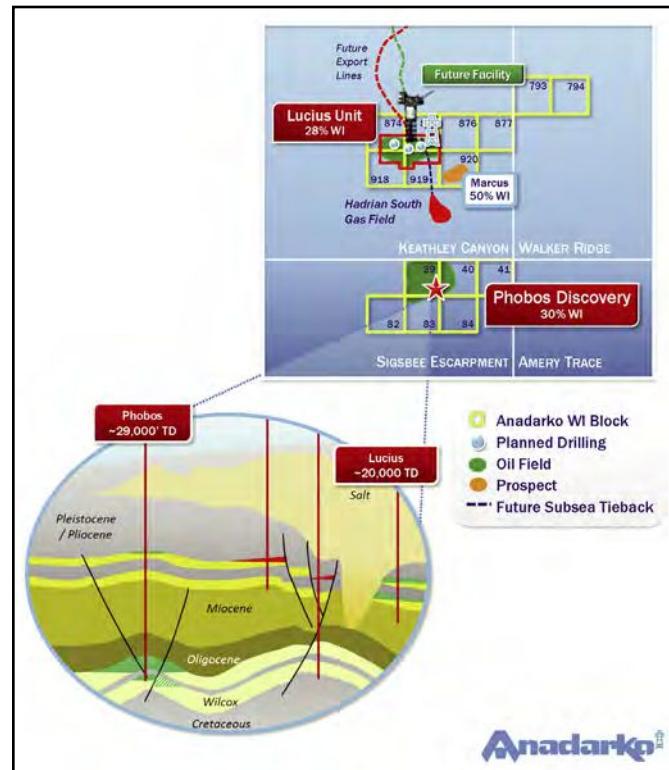
Petrobras inks contracts for new support vessels
 Petrobras signed contracts for 23 support vessels, as part of the 3rd Fleet Renewal Plan for Offshore Support Vessels. The units, type PSV 4500 and OSRV 750, fulfill 60% local content requirements and will be built in Brazil. Prices presented were competitive, given expected metrics and budgets. This was the 4th Round of the Fleet Renewal Plan. In July this year, Petrobras will go to the market for another 24 offshore support vessels (5th Round), thus fulfilling the 2014 contracting target of 146 vessels to be built in Brazil, as planned in the 3rd Renewal Plan Fleet.

McDermott to overhaul platforms in Middle East
 McDermott International won offshore Middle East contracts for two projects with a total value of \$900 million. One calls for engineering, procurement, construction, and installation of a new tie-in platform, with a 3,527-t topsides and six-pile jacket. Additionally, McDermott will provide two auxiliary platforms, jackets, and bridges; five observation platforms; 45 mi of pipelines; and 28 mi of subsea cables. Water depths range from 33 to 98 ft. All work is expected to be completed in summer 2015. The second contract involves fabrication, transportation, and installation of five drill support structures weighing a total of 8,811 t in water depths ranging from 98 to 213 ft. All work, including hookup and commissioning, is expected to be completed in the first quarter of 2014.

Total contracts Technip for deepwater Moho Nord
 Total has awarded Technip a lump-sum engineering, procurement, supply, construction, installation, and pre-commissioning contract for the Moho Nord project offshore Republic of Congo. It is located 46.6 mi offshore in water depths ranging from 2,132 to 3,609 ft. The project takes in two simultaneous developments, Moho Phase 1bis and Moho Nord, with first oil expected, respectively, in 2015 and 2016. Moho Nord is based around a new floating production unit and a new TLP, with an oil export line to the Djeno onshore terminal and a tie-in to the shallow water N'Kossa platform for gas exchange.

Royal Boskalis wins Shell installation contract
 Netherlands-based maritime infrastructure company Royal Boskalis Westminster has secured an offshore depletion compression platform installation contract for Shell Philippines Exploration's Malampaya Project, offshore the Philippines. Under the \$60 million contract, Boskalis will perform seabed preparation, rock installation, platform transportation, and installation work on the Malampaya gas field, which is situated off the coast of Palawan Island in the Republic of the Philippines. As part of the project, the gas field will be expanded with the installation of an additional compressor platform adjacent to the existing gas production platform. In the initial stage, Boskalis will prepare the seabed for the installation of the platform soils that will be excavated to a level of sufficient bearing capacity and deposited at a designated area. The company will also install gravel pads as a foundation for the platform footing, while the rock involved will be sourced from local Philippine quarries.

Anadarko strikes pay dirt in remote Sigsbee Escarpment



Anadarko Petroleum Corp. said one of the deepwater Gulf of Mexico oil wells it operates hit pay dirt in the remote and untested Sigsbee Escarpment region near the U.S.-Mexico border. The big independent oil and natural gas exploration and production company, which is based in The Woodlands near Houston, Texas, said the Phobos-1 well encountered roughly 250 ft of high-quality oil pay.

Bob Daniels, Anadarko's senior vice president of international and deepwater exploration, noted that the Phobos-1 discovery marks the company's third "significant deepwater success" this year in its Gulf of Mexico exploration program.

"Phobos is our first well in the previously untested Sigsbee Escarpment area of the Gulf of Mexico and successfully tested a significant four-way structure in the Lower Tertiary," Daniels said. He said Phobos' close proximity to the Anadarko-operated Lucius project is expected "to further enhance the economics of this potential future development."

Phobos, located in Sigsbee Escarpment Block 39 about 260 mi southeast of Houma, Louisiana, was drilled in 8,500 ft of water, about 11 mi south of the Lucius discovery, which is under development. A Phobos-Lucius tie-in likely would be one option considered by Anadarko and its regional partners.

Anadarko holds a 30% stake in the Phobos discovery. Plains Exploration & Production Co. has a 50% stake, and ExxonMobil Corp. has a 20% interest.

The \$2 billion Lucius project, in about 7,100 ft of water, is being developed with a truss spar floating production facility, with the capacity to produce in excess of 80,000 bbl/d of oil and 450 mmcf/d of natural gas. Lucius includes portions of Keathley Canyon blocks 874, 875, 918, and 919. Anadarko has a 35% interest in Lucius, followed by Plains (23.3%), Exxon (15%), Apache (11.7%), Petrobras (9.6%), and Eni (5.4%).

BP may delay Gulf of Mexico Mad Dog 2 field's development

BP is reviewing its biggest new oil project in the Gulf of Mexico due to rising development costs across the industry and could delay the \$10 billion scheme.

British oil major BP said that rising costs made the current plan, under which construction would start this year, difficult to justify, becoming the latest company to reconsider the economics of a major project.

"The current development plan for Mad Dog Phase 2 is not as attractive as previously modeled, due largely to market conditions and industry inflation," BP said in a statement.

The company wants to get its core Gulf of Mexico business, which accounts for around a tenth of its global output, back on track after the disastrous 2010 Macondo oil spill, which is still the subject of a court case in New Orleans.

It classes Mad Dog 2 as a "mega project," meaning it requires gross investment of more than \$10 billion.

BOEM schedules Western Gulf Lease Sale 233 for this August

The Federal Bureau of Ocean Energy Management (BOEM) will offer over 21 million offshore acres for exploration and production in Western Gulf of Mexico Lease Sale 233 in August in New Orleans, Louisiana.

The acreage, which includes 3,953 blocks located 9 to 250 mi offshore in water depths ranging from 16 to over 10,975 ft, will include all available unleased areas in the Western Gulf planning area.

The proposed sale is the third offshore auction under the current Outer Continental Shelf Oil and Gas Leasing Program for 2012 to 2017. The first sale under the plan, Western Gulf Lease Sale 229, was held in November 2012 and netted nearly \$134 million in high bids. The second sale, Central Gulf Lease Sale 227, was held last month, and attracted over \$1.2 billion in high bids.

LLOG contracts West Neptune to drill at Delta House in GoM

LLOG Bluewater Holdings LLC has contracted the newbuild drillship West Neptune for 3 years from Seadrill for \$662 million. There is a 1-year extension option.

Seadrill expected to receive the vessel from Samsung Heavy Industries in Geoje, South Korea in June 2014. It will be outfitted to drill in 10,000 ft of water and is capable of working in 12,000 ft with drilling depths to 37,000 ft.

"The West Neptune will be the first dual BOP (blowout preventer) rig in the Gulf of Mexico for LLOG, said Scott Guterman, president and chief executive officer of LLOG, noting that the company will initially utilize the rig to perform completions of the company's Delta House wells.

"Having two BOPs will allow LLOG to complete wells efficiently, saving up to 12 days per completion," he added.



West Neptune going to work for LLOG



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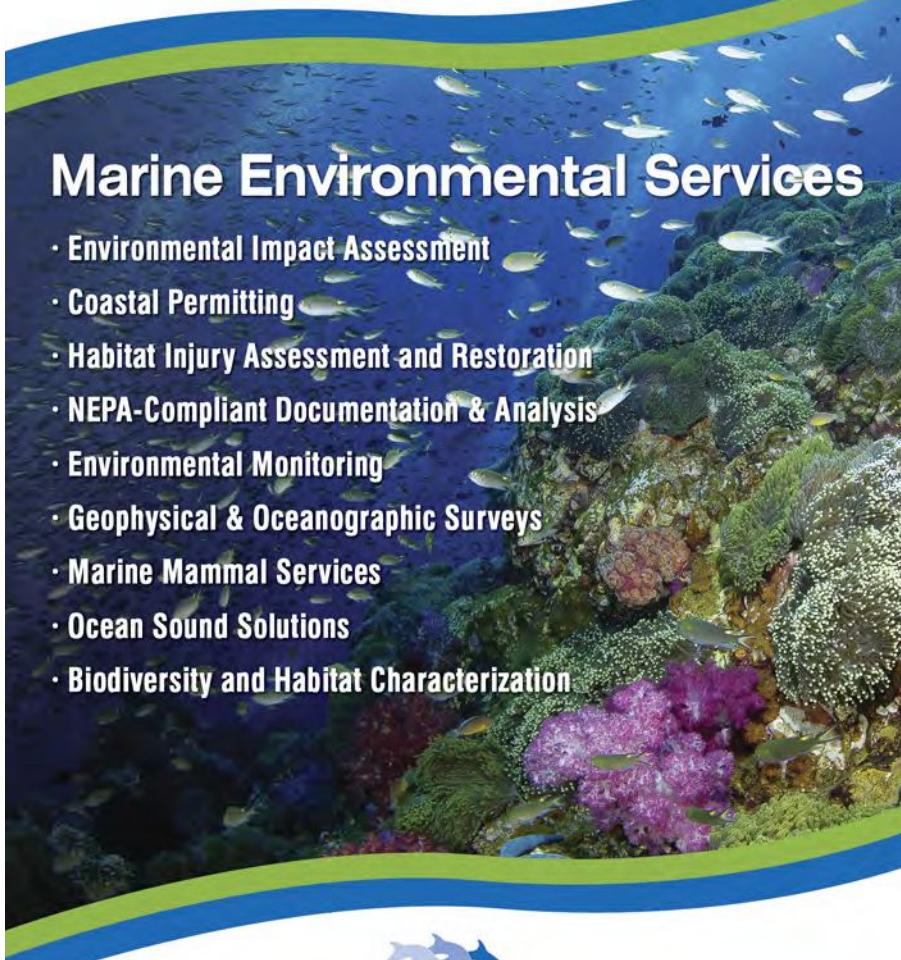
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Rigs & Vessels



Mitsubishi Heavy Industries secures contract for 3D sea bottom resource exploration vessel Ramform Titan

MHI secures contract for pair of seismic data acquisition vessels

Mitsubishi Heavy Industries (MHI) has secured a contract from Petroleum Geo-Services ASA (PGS) to deliver two vessels capable of three-dimensional (3D) seismic data acquisition for sea bottom resource exploration.

PGS has ordered two Ramform Titan-Class vessels, the latest generation in the Ramform series that features advanced 3D seismic data acquisition and analysis capabilities.

The 104-m long vessel has a wide breadth of 70 m, and it adopts diesel electric for the main propulsion system during quiet operation.

The vessel has been equipped to receive supplies at sea to allow a long-term exploration over an expansive area and can tow multiple streamer cables from its stern.

The Ramform vessel features cables that contain sensors to detect echoes of sound waves emitted from sound sources and bounced back from the sea bottom and stratum boundaries; subsequently, those detected echoes are used for 3D seismic analysis.

PGS has ordered Ramform Titan-Class vessels with a wider stern to allow deployment of streamer cables of up to 24 lines to enable exploration of a wider area at one time.

Under the contract signed in April 2013, MHI will deliver the vessels in the first and second half of 2015, respectively.

This also includes the latest order and a previous order for two same type vessels in April 2011. Japan-based MHI will build a total of four vessels to support PGS's deepwater natural prospecting services.

MHI is currently building two previously ordered Ramform vessels at its Nagasaki Shipyard & Machinery Works.

Based in Norway, PGS is a leading company in marine seismic and reservoir data acquisition, processing, and analysis—interpretation services.

Rigs & Vessels

The drillship Stena DrillMax

Ophir Energy prepares for first deepwater well offshore Ghana

Ophir Energy has contracted the drillship Stena DrillMAX to drill the Starfish prospect in the Accra block offshore Ghana. Starfish-1, due to spud in June, will be drilled in a water depth of 4,462 ft. The well is designed to test a stratigraphic onlap trap east of Kosmos and Tullow's major Jubilee-area discoveries.

Ophir estimates Starfish's mean prospective resources at 292 mmboe with a 20% chance of exploration success. Offshore Tanzania, the company continues its drilling program with partner and operator BG Group.

After completing a testing program on the deepwater Jodari and Mzia gas discoveries, the drillship Deep Sea Metro 1 will next drill the Ngisi prospect in block 4, which could hold in-place resources of 1.3 tcf (37 bcm).

Ngisi-1 will be drilled with two deviated well paths, both testing separate compartments of the Ngisi prospect and the deeper Chewa discovery. Ophir hopes a success will increase mean recoverable resources of the Chewa-Pweza-Ngisi hub to 4.1 tcf, providing sufficient reserves for a gas development on Block 4.

The partners drilled their first deviated well off Tanzania last December on Jodari. These type of wells should reduce field development costs, Ophir said.

BP awards North Star Shipping \$98.2 M support vessel contract

North Star Shipping, a division of the family-owned global shipping and energy services firm The Craig Group, has been awarded a major contract with BP with a value of \$98.2 million.

The multi-service contract is for 5 years with a possible extension of 5 years and includes tanker assist, platform supply, and emergency and response rescue vessels, all supporting BP's operations in the North Sea. Four vessels, with a possible fifth to be added, are being contracted—the Grampian Talisker, Grampian Frontier, Grampian Conquest and Grampian Dee.

"The award of this contract strengthens our relationship with BP who we have worked with for over 25 years," said Callum Bruce, managing director of North Star. "We continue to invest heavily in our fleet, which has cemented our position as the largest British wholly owned fleet engaged in the UK offshore industry." The vessels meet BP's expectations in terms of safety, operability, and efficiency.

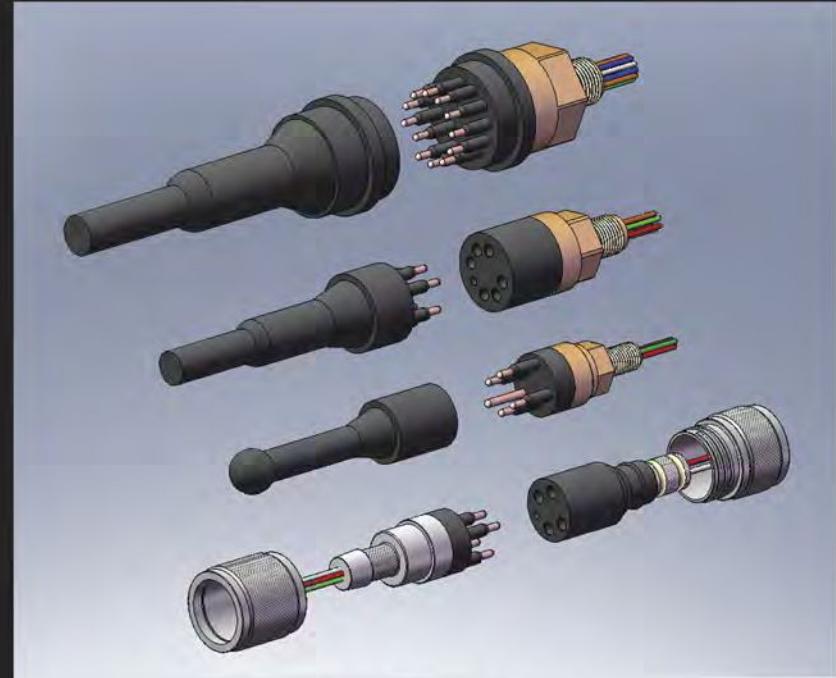


The support vessel Grampian Talisker



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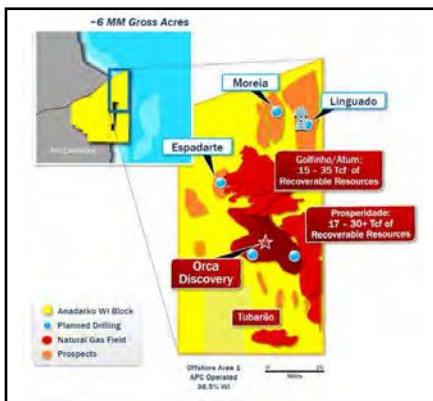
Anadarko discovers natural gas field offshore Mozambique

Anadarko Petroleum Corp. discovered a new natural gas accumulation fully contained within the Offshore Area 1 of the Rovuma Basin of Mozambique, the company said, noting that the Orca-1 discovery well encountered approximately 190 net ft of natural gas pay in a Paleocene fan system.

The Orca-1 exploration well was drilled to a total depth of about 16,391 ft in water depths of approximately 3,481 ft.

"We are designing an initial two-well appraisal program to define the areal extent of the Orca field, which will commence immediately after drilling our Linguado and Espadarte exploration wells," said Bob Daniels, senior vice president, worldwide exploration.

Anadarko is the operator in the Offshore Area 1 with a 36.5% working interest. Co-owners include Mitsui E&P Mozambique Area 1, Ltd. (20%), BPRL Ventures Mozambique B.V. (10%), Videocon Mozambique Rovuma 1 Ltd. (10%), and PTT Exploration & Production Plc (8.5%). The 15% interest of Empresa Nacional de Hidrocarbonetos, ep's is carried through the exploration phase.



Anadarko also completed drilling its Kubwa well in the L-07 Block offshore Kenya, which encountered non-commercial oil shows in reservoir-quality sands.

"We are very encouraged with our first test of Kenya's previously unexplored deepwater basin, in which mudlog and well-site evaluation of core data indicates the presence of a working petroleum system with reservoir-quality sands," Daniels said. "The Kubwa well tested multiple play concepts and provided useful data regarding the prospectivity of our 2-million-acre position offshore Kenya."

The rig will now mobilize south to drill the Kiboko well."

Anadarko operates the L-07 Block with a 50% working interest. Co-venturers in the L-07 Block include Total E&P Kenya B.V. (40%) and PTT Exploration & Production Plc. (10%).

Petrobras finds oil in subsalt area of Santos Basin offshore Brazil

Brazil's Petrobras discovered oil in a subsalt area of the Santos Basin, offshore of Brazil, it was revealed in a securities filing by the company. The new oil discovery is expected to contain about 4 Bbbl of crude and natural gas equivalent, reported Reuters.

The oil was found at a depth of 7,434 ft, located about 146 mi off the coast of the state of Rio de Janeiro, and measured at 26° on the American Petroleum Institute (API) scale.

The company found the oil in the area that was secured as part of a September 2010 oil-for-stock swap with the Brazilian government in a \$70 billion sale of stock to the government and private investors. Petrobras, which operates the well, drilled it using the Cerrado drillship owned by Brazil's Schahin Group.

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Exploration

New Zealand lease sale includes 189,000 sq. km of offshore acreage

New Zealand was to offer large sections of oil and gas exploration acreage beginning in May. It is the second time the government has asked for competing bids for permits. The sale includes 189,000 sq. km of offshore acreage and more than 1,500 sq. km onshore.

The first round was held in 2012 and resulted in 10, 5-year permits being issued for the Taranaki Basin, 2 in the Pegasus Basin and 1 in the Great South Basin. At the time, the government said the 10 permits represented \$82 million in exploration spending.

There are three onshore blocks in Taranaki, two on the East coast of the North Island, and three offshore areas in the Reinga-Northland Basins (the Taranaki Basin, and Great South Canterbury Basins).

Noble Energy finds oil at Carla South offshore Equatorial Guinea

Noble Energy Inc. has encountered oil in the Carla South exploration well in Block I in Equatorial Guinea. The well found oil in good quality Tertiary-aged sandstones, partner PA Resources AB said in a press release.

The Carla South (I-7) exploration well reached a total measured depth of 12,008 ft in a water depth of 1,903 ft. Drill cuttings, wireline log data, and downhole measurements indicate that the deviated well encountered about 39 ft of measured thickness or 33 ft of net oil pay in good quality sandstones at the targeted level, PA said.

Carla South lies on-trend with Carla North, which was recently discovered in Block O. Carla South will be sidetracked to an adjacent target, which should take 25 days to complete, the company said.

HRT spuds first of three wells in deepwater offshore Namibia

The semi-submersible Transocean Marianas has spudded the Wingat-1 well offshore Namibia for HRT Walvis Petroleum (Proprietary). The well targets the Wingat prospect on petroleum exploration license 23 in the Walvis basin, 124 mi northwest of Walvis Bay. Water depth is 3,392 ft.

HRT is targeting an elongated combination trap with a potential P10 area of 147 sq. mi, including a four-way structural closure of 16 sq. mi. The main objective is to test the resource potential of the Albian carbonate platform, which has a well-defined seismic amplitude anomaly in the PSDM 3D data set.

Reservoirs will likely be encountered at 12,959 ft below sea level. Wingat-1 will be drilled to a projected TD of 13,451 ft, with total drilling time estimated at 60 days.

This is the first of three back-to-back wells for HRT in partnership with Portugal's GALP Energia.

It will be on charter for 280 days, which HRT said is "enough to drill at least four exploration wells."



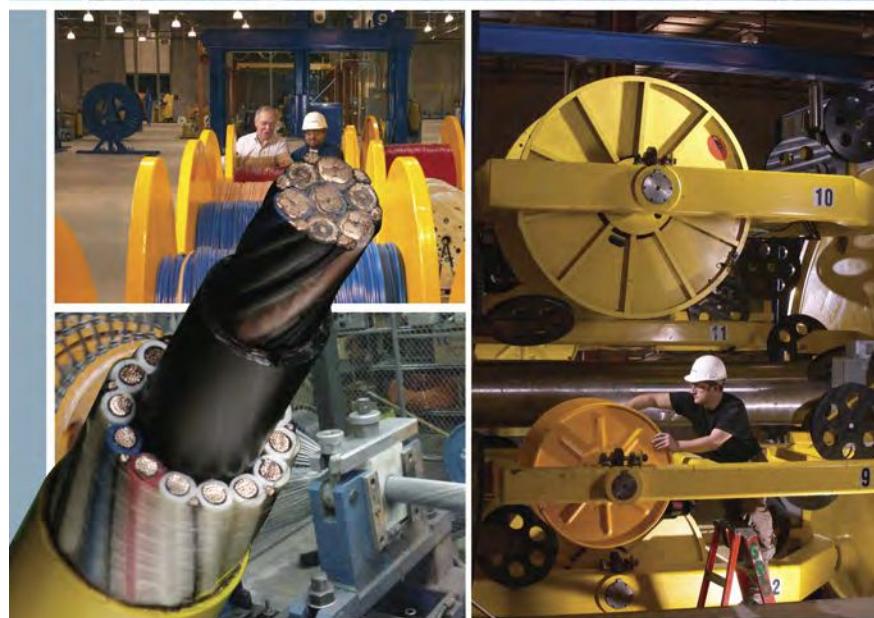
HRT takes "Marianas" offshore Africa



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Santos predicts mid-2013 start for Fletcher Finucane development

The Fletcher Finucane development offshore Western Australia is 93% complete and on track for first oil in mid-year, Santos said. The project, in permit WA-191-P in the Carnarvon basin, was sanctioned in January 2012 and involves a three-well subsea tieback to the existing Santos-operated FPSO at Mutineer-Exeter.

All have been drilled and completed, Santos said, while offshore installation of the subsea facilities is more than 60% complete. The Nan Hai 6 rig has demobilized, giving the installation vessel access to lay flowlines and umbilicals into the Finucane well center.

Installation and commissioning of the Fletcher Finucane reception equipment on the Mutineer-Exeter FPSO was completed in Singapore, and the vessel is now back on the field. Once onstream, the project is estimated to deliver 15,000 bbl/d over the initial 12 months of production.

CX-15 platform readied for start of development drilling offshore Peru

BPZ Energy said platform monitoring and control system modifications are under way offshore Peru to prepare the new CX-15 platform for the start of development drilling.

Temporary equipment is tracking platform response to weather and ocean conditions and draft during the engineering/installation work. As a precaution, an anchoring system under construction in Peru will be fitted to provide redundancy to the spud can that anchors the platform.

A joint technical team is close to finishing its review of the new Corvina field 3D seismic data to update geological interpretation.

Iran to start developing new oil and gas fields in Persian Gulf

Iran will drill 12 wells in oil and gas fields, which are located in the Persian Gulf, to start developing the fields, the Fars News Agency quoted Iranian Offshore Oil Company managing director Mahmoud Zirakchianzadeh as saying. Eight of 12 wells will be drilled in joint fields, he noted.

In November 2012, Zirakchianzadeh stated that Iran's National Development Fund (NDF) had allocated \$1.5 billion for developing the country's oilfields in the Persian Gulf. The money will be spent on developing a number of fields, such as the Esfandyar field.

According to an Iranian law, 37.5% of oil revenue is deposited into the NDF and then channeled into the development of

TAQA secures UK approval for Cladhan field development

Abu Dhabi National Energy (TAQA) said that its development plan for blocks 210/29a and 210/30a in the Cladhan field in the northern North Sea have been approved by the UK government. TAQA said the initial phase of development will involve two producer wells and one injection well.

Cladhan field, which is expected to begin oil production in the first quarter of 2015, is expected to produce more than 17,000 boe/d initially. The company will tie back the production to its Tern Alpha platform, which is located 17.5 km northeast of the Cladhan field.

Oil production from the two producers will be combined with the production from other fields, routed over the Tern platform, and exported to Sullom Voe through the Brent Oil Line.

Tern Alpha is a fixed installation that serves as a manned drilling and production installation for the Tern field in block 210/25 in the East Shetland Basin of the northern North Sea. The plat-

form also serves as a production facility for the Hudson and Kestrel fields.

TAQA UK business managing director Leo Koot said the Cladhan development is the third field that the company has developed and the largest project to date.

"Developing Cladhan as a tie-back to Tern supports TAQA's strategy to invest in our infrastructure as we recognize the crucial part it plays in allowing us to maximize recovery from the northern North Sea," Koot added.

In October 2010, EnCore Oil announced that it had found oil at a second Cladhan sidetrack well located in the UK North Sea. The well 210/29a-4Y was drilled to a total measured depth of 11,530 ft about 1 km southeast of the original 2008 discovery well.

oil and gas fields, and 62.5% of oil revenue is allocated for national budget expenditures. Oil Minister Rostam Qasemi said that the country's oil output is projected to increase by 1.5 mmbbl/d by 2016. Iran has the world's fourth-largest reserves of recoverable oil, after Venezuela, Saudi Arabia, and Canada.

Mojix secures RFID contract for Clair Ridge platform in North Sea

Mojix has secured a contract from BP to provide track-and-trace technology for the Clair Ridge oil platform development in the North Sea off the coast of Scotland. Under the contract Mojix will provide its STAR 3000 System—which includes wide-area passive radio frequency identification (RFID) technology—that will be deployed at warehouses and yards to create supply chain visibility, save costs, and mitigate risks for BP.

The system will provide real-time visibility of oil platform components mov-

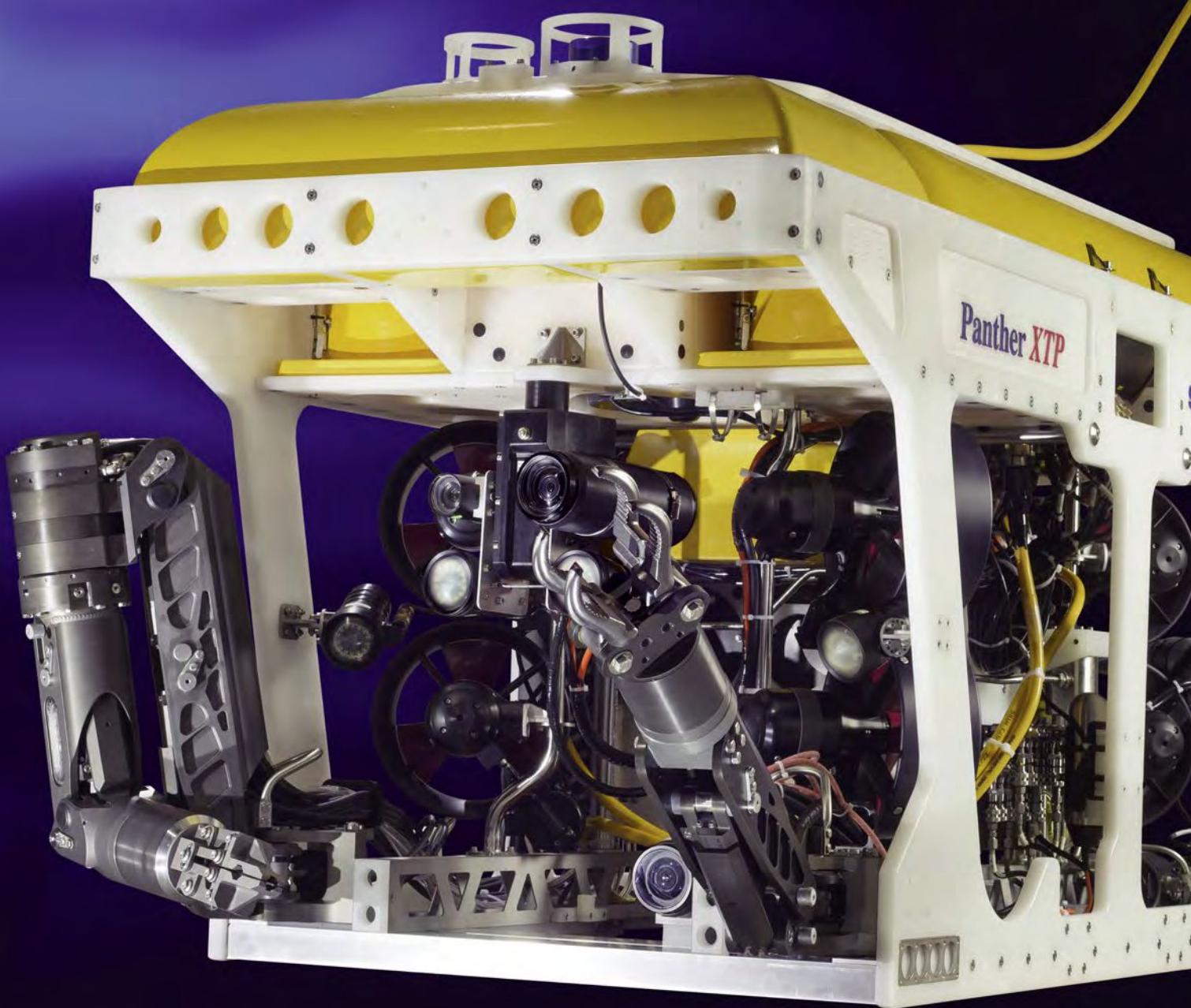
ing from suppliers located around the globe to the platform's construction site. BP will deploy the technology to monitor and manage the supply chain, which includes tracking crates, heavy lift and out of gauge equipment, containers, and vessels to improve the efficiency and safety during construction.

The energy company will use two different types of tag technology, including passive EPC Gen 2 RFID tags on all materials and components and global positioning (GPS) sensor telemetry tags on containers and heavy equipment. The passive tag and GPS location information is consolidated from around the globe into Mojix's centralized web-based, visibility platform. The track-and-trace solution, along with the STAR 3000, will provide BP with 24/7 continuous visibility of all materials needed to construct the new Clair Ridge platform. Clair oil field extends across an area of 85 sq. mi, in water depths of around 459 ft.



Worker climbs Tern platform in North Sea

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Production

Huntington field goes onstream, production to hit 25-30,000 boe/d

First oil has flowed from the Huntington field development in the UK central North Sea that is operated by E.ON Exploration and Production. Following an initial ramp up, production is estimated to reach 25 to 30,000 boe/d, said partner Premier Oil.

Huntington produces through the modified FPSO Voyageur Spirit. Other main facilities are a six-well subsea drilling template and a 7.5-mi gas export pipeline connected to the CATS transportation system.

The field is 143 mi offshore in a water depth of 295 ft. Other partners in the project are Noreco and Iona Energy.

Vietnam FPSO to 'comfortably' deliver oil of around 70,000 bbl/d

Hoang Long Joint Operating Co. has completed the first phase of a multi-stage test of the Te Giac Trang (TGT) field FPSO oil production handling capacity. This follows approvals from the Vietnamese authorities and the vessel owner.

TGT is in the Nam Con Son basin offshore southern Vietnam. Its minimum contracted oil production is 55,000 bbl/d,

but the test successfully processed sustained output of more than 60,000 bbl/d.

"The results of the first phase of the FPSO capacity test fully support our belief that, with only minor modifications, the FPSO should comfortably be able to handle volumes of around 70,000 bbl/d," said Ed Story, president and chief executive officer of project partner SOCO.

Apache starts production from third North Sea field at 10,346 bbl/d

A third Apache Corp. oil field brought on line in the British waters of the North Sea produced more than 10,000 bbl/d of oil per day in early stages, Houston, Texas-based Apache said.

"Tonto-1, the first producing well, came on stream at an initial rate of 10,346 bbl/d," the company said, noting that the field is its third in the region to come online in the last three years. Apache said all 3 were developed under the terms of a measure from the British government that gives operatives economic incentives for their work.

BP in March announced that it joined Chevron, ConocoPhillips, and Shell in a decision to move forward with plans for a third phase of operations at the Clair oil

field in the North Sea. The British government said reserves in the region may be as much as 17% of the country's total oil and natural gas potential.

Production starts from shallow water Manifa field off Saudi Arabia

Saudi Aramco has started first phase production from its Manifa field offshore Saudi Arabia, 3 months ahead of schedule. Output should build to 500,000 bbl/d of Arabian heavy crude by July, reaching the full design capacity of 900,000 bbl/d by year-end 2014.

Because of the ultra-shallow water depths, Aramco could not install conventional platform-based facilities. Instead, development involved a series of dry-land rigs and 27 man-made islands linked by a network of 25 mi of causeways with 1.8 mi of elevated bridges designed to maintain natural water flow in Manifa Bay and preserve local marine life by not interfering with the migration paths of various marine species.

The algae and seagrass beds in Manifa Bay provide nutrition for species including oysters, hamour fish, crabs, dolphins, and shrimp; the area is also home to sea turtles.

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PRODUCT SPOTLIGHT

Articulating Diamond Wire Saw Cuts Pipe and Cuts Costs

Mactech Offshore, a leading provider of subsea and offshore machining solutions, has received patent-pending status on its Articulating Diamond Wire Saw. The saw is designed for subsea and topside cutting of a variety of materials and projects and utilizes an articulating cutting arm for minimal clearance during cuts.

Articulating Cutting Arm Provides Minimal Clearance

"The Articulating Diamond Wire Saw has recently emerged as the game changer in the subsea cutting world," states Joel Wittenbraker, President and CEO of Mactech. "It is a tool specifically designed to increase the efficiency and effectiveness of low clearance cuts. These specific saws are ideal for cutting multi-string applications or heavy wall legs and cross members in the decommissioning industry, utilizing the existing diamond wire technology in a new way to perform cuts from a vertical orientation."

This vertical stance means the saw can easily fit into cofferdams or excavations with minimal dredging, where other saws can't fit or operate. The articulating design requires only 2 ft of clearance around casings, and the cut is made at the bottom of the saw so there is no need for extra dredging. The articulating diamond wire saws can easily fit into tight situations and can be seen in action on Mactech's youtube channel (www.youtube.com/user/MactechOnSite).

Designed With Efficiency, Cost Savings, and Safety in Mind

The compact and robust design creates an ideal cutting environment, reducing setup, installation, and removal time—saving operators and contractors time and money. Wittenbraker explains, "These unique articulating diamond wire saws are designed for below-the-mudline (or low clearance cuts), allowing for deepwater cutting and maintenance."

Many times an ROV is not even necessary with the Articulating Diamond Wire Saw, as the guiding arms can be

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closed around a pipe further up the line and used as a guide to lower it down to the precise location of the cut. This can provide more scenarios that keep divers out of the water as much as possible and, in turn, out of harm's way.

"These efficiencies in time reduction and cut performance allow for the increased use of concurrent decommissioning practices, reducing the total time and capital associated with decommissioning projects," explains Derek Marcks, Mactech Offshore Operations Manager. "By performing crucial steps, such as multi-string cuts, in concurrence, operators and contractors are finding ways to save costs while improving performance."

Mactech Offshore Diamond Wire Saws

All of Mactech Offshore's Diamond Wire Saws are designed for maximum cutting range flexibility, a small footprint, and reliable operation. Mactech is the original equipment manufacturer of their entire line of Diamond Wire Saws, and this gives them the capability to provide customization and adaptability to project needs when necessary. They have 28 years of field service and custom tool design, bringing innovative and productive solutions to the offshore market.

They understand that the best decommissioning strategy is the one that is safe, effective, and efficient. Their agility in the field has proven to be a catalyst for effectiveness and efficiencies offshore, and this agility has recently flourished with the breadth and depth of available services through Mactech Offshore's subsea cutting equipment.

"A new combination of dredge and cutting efficiency has entered the decommissioning market with TUSK Subsea's 600hp dredge system. The combination of an innovative dredge system that can dredge caissons in a matter of hours plus Mactech's proven cutting capability has greatly reduced the time to safely remove caissons and piles efficiently" advises David Boulet, Director of Business Development of TUSK Subsea Services.

Mactech Offshore's versatility in the subsea machining world is what makes their capabilities truly unique. No job is too big or small, with cutting capabilities of machines ranging from 4 to 102 in. and an expanding fleet of 36 diamond wire machines that have successfully performed over 500 diamond wire cuts.

For more information, contact Derek Marcks, Offshore Operations Manager of Mactech Offshore 337.839.2793 info@mactechnoffshore.com | www.mactechnoffshore.com.



Halliburton applies completion technology in GoM

U.S.-based Halliburton said it used an Enhanced Single-Trip Multizone (ESTMZ) FracPac System to complete three wells in deepwater of the Gulf of Mexico. Developed in collaboration with Chevron, Halliburton's ESTMZ downhole tool system allows the operator to stimulate and gravel pack multiple production zones in a single trip.

The ESTMZ system, which has been designed for use in deepwater and ultra-deepwater offshore completions, allows the highest treating rate with the greatest volume of proppant in the industry, according the company.

The time savings accomplished for the three Chevron-operated wells using the ESTMZ system averaged 18 days, which is equal to about \$22 million.

The solution also provided wellbore assurance through various key operations, such as wellbore cleanout, completion services, pumping, and fluids, for the completion of the three wells.

Halliburton Southern and Gulf of Mexico regions senior vice president Ron Shuman said the system allows the operator to stimulate more reservoir in less time and increase efficiency,



The ESTMZ system can be used for deepwater offshore completions.

reliability, and production, which are critical for the success of the Lower Tertiary zone.

"In addition, this system allows us to deliver a very aggressive stimulation with rates up to 45 barrels per minute and volumes greater than 400,000 pounds of 16/30 high strength propellant," Shuman added.

"We deliver this with weighted frac fluid and 10,000 horsepower per interval for up to five intervals, providing a total cumulative proppant volume of greater than 2 million lbs per well with one service tool."

Shuman noted that multiple runs in and out of the wellbore equates to a large expense for operators. The "single trip" element of the system saves time with improved reliability and better asset optimization, the company said. Halliburton has so far deployed about 20 ESTMZ systems around the globe, including the Asia Pacific region.

Software provides one data model for offshore design

Design and analysis of offshore and maritime structures has previously involved the use of several different models where data from one model must be manually transferred to others, a costly and time-consuming process. DNV Software is now releasing Sesam Genie 6.4, where design engineers can use one single model for design, modification, and life extension. This new version significantly increases both efficiency and the quality of the design results, said Ole Jan Nekstad, DNV Software product director for Sesam. "This release will enable users to do more as well as to do it more easily," he said. "In addition, they will have better control with higher quality of calculations."

For information visit www.dnvsoftware.com/sesamgenie.

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Vikoma introduces major new offshore oil recovery solution

Oil pollution and environmental technology company, Vikoma International Ltd., has unveiled the latest addition to its range of offshore oil pollution recovery systems.

The OPRS 300 (Oil Pollution Recovery System) is based on patented oil-attracting discs that have been proven to collect up to 300 m³/hr of oil and can work across oils with viscosities ranging from 1 to 1 million cSt.

"Our design, engineering, and manufacturing teams were presented with a challenging brief based on specific market feedback," said Peter Tyler, managing director of Vikoma. "Thanks to the introduction of a number of innovative solutions, the result is a system utilizing a unique oil collection principle."

The OPRS 300 comprises of a floating skimmer head that utilizes Vikoma's tufted disc technology combined with both an on-board recovered oil discharge pump and thrusters for maneuverability. The unit is operated by a hand-held remote control console.

"This truly collaborative effort has seen us rise to the challenge of bringing



this from an initial concept stage to delivering the largest capacity recovery system Vikoma has ever produced," Tyler said. "Our market research indicated a strong demand for this system and, as such, we fully expect the OPRS 300 to become a leading product in our portfolio."

The OPRS 300 was introduced at the Spillcon 2013, the Asia-Pacific Oil Spill Prevention and Preparedness Conference and Exhibition held in April in Cairns, Australia.

For more information, e-mail Jamie MacDonald, account executive, at jamie.macdonald@bigpartnership.co.uk.

DNV Software launches innovative solution for offshore risk analysis

Harsher environments, life extension, and more demanding regulatory and business requirements are some of the challenges the offshore industry faces. However, a complete software tool to evaluate the full range of potential hazards and associated risks has, until now, not been available.

Safeti Offshore is a quantitative risk analysis software solution based on DNV's more than three decades of experience within such analysis. Safeti Offshore encapsulates DNV's vast experience and knowledge within offshore quantitative risk analysis (QRA), contained within one all-encompassing software application to evaluate the full range of potential hazards.

Typical offshore QRA risk metrics, such as potential loss of life (PLL), are summarized in a database allowing flexible reporting and charting. An interactive event tree allows navigation and drill-down on the detailed risk results. In addition, a 3D visual representation of the facility allows the key consequence and risk results to be viewed in context. Visit www.dnvsoftware.com/safetioffshore.

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650m sonar head mounted on a SeaBotix ROV.
Images courtesy SeaBotix Inc.

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THE FULL PICTURE

Bibby Offshore completes hyperbaric evacuation trials on entire Diving Support Vessel Fleet

Subsea installation contractor Bibby Offshore announced the successful completion of hyperbaric evacuation trials across its entire Diving Support Vessel (DSV) fleet.

Bibby Offshore is the only company worldwide to carry out this procedure on its entire fleet, which includes the Bibby Sapphire, Polaris, and Topaz, and the only diving contractor with audited outcomes using performance-based standards for this level of contingency planning.

The trials involved mating a self-propelled hyperbaric Lifeboat from the DSV to a portable hyperbaric reception facility onshore, deployed by Mimir Marine.

The onshore facility is specifically designed to accept divers transferred from the isolation of a lifeboat in the event of vessel abandonment. Specialist technicians from Mimir Marine were also present to support the hyperbaric evacuation training exercise.

The recent trial involved a simulated dockside rescue of divers from the Topaz hyperbaric lifeboat.

This was the first time Bibby Offshore had trialled with the Bibby Topaz lifeboat, and the simulated transfer of the divers was completed within 3 hrs of the lifeboat arriving on the quayside.

Bibby Offshore's chief executive Howard Woodcock said, "Evacuation contingency plans must

run like clockwork, and the repeatability of these exercises enhances their strength. To ensure that we are able to respond as quickly as possible, we have taken a proactive and unique approach to our evacuation planning strategy by mating different lifeboats from different vessels in a number of dockside locations. Safety of our staff is imperative to Bibby Offshore, and we are proud to be the first company internationally to have completed this essential trial on the entire fleet."

For more information, visit www.bibbyoffshore.com.



Biggest test tank opened by Saab Seaeye

The largest indoor test facility ever before dedicated to the development of unmanned underwater vehicles has been opened by Saab Seaeye.

Located in Linköping, Sweden, the test tank will

allow new underwater systems' technology to be trialled and tested in a controlled environment rather than in a lake or at sea.

The tank is 6 m deep, 10 m in diameter, and holds approximately 470 cu. m of water.

"Saab's underwater operations are currently in a very expansive phase," explains Görgen Johansson, senior vice president and head of Saab's Business Area Dynamics, "and by investing in ultra-modern facilities such as this, we increase our ability to offer underwater systems and solutions for both military and civil applications."

The company sees the new facility bringing significant savings in time and costs, while offering a unique opportunity to develop and trial underwater systems that will future strengthen its product portfolio.

Saab has a world-leading position in the field of unmanned underwater vehicles and is the world's largest manufacturer of electric ROVs. Typical applications are offshore energy, mine reconnaissance, and location of accident victims. With Saab's underwater technologies, these jobs can be performed reliably and cost effectively.

For more information, visit www.seaeye.com.



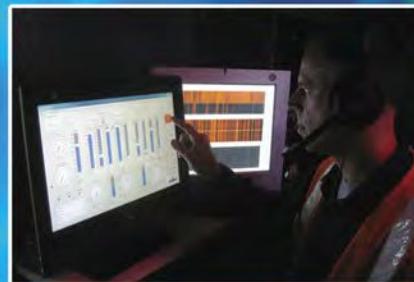


10 Years of Doing it Differently.

Since 2002, SeaView Systems has been doing the other thing. We've been designing an ROV to run 2 miles through a 28 inch bore hole into a tunnel in Finland; navigating a flooded uranium mine in Canada; performing original science exploration in the Bering Sea; offshore project managing pipeline trenching operations in Norway; mapping sewers in Manhattan; inspecting desalination plants in Australia; chasing treasure with a smart grapple Somewhere; renovating tunnels in New York; surveying wrecks off Tristan de Cuna in the South Atlantic and a shipload of other projects.

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Underwater Intervention

Bowtech Products Ltd announces contract award to equip two ROV systems with high-powered LED lights and underwater cameras

Bowtech Products Ltd, a global market leader in subsea vision systems, announced that it has been awarded a contract by ROVOP to supply cameras and lights that will equip two new ROV systems.

ROVOP has recently invested a further £4 million in two new vehicles as part of their planned expansion over the coming years; the first is a 3,000-m rated, 150-HP, work class Schilling HD ROV and the second a SAAB SeaEye Cougar XT ROV system, which has been selected by the company for its powerful, yet compact features.

The scope of supply for the new Schilling HD ROV system includes three of the latest 20,000 lumen high-powered output LED-V-SERIES flood-lights, six LED-R-7300 series lights, two L3C-650-L color tooling cameras, a SURVEYOR-SD 36:1 color zoom camera, and the newly released EXPLORER PRO low-light camera. The same suite of cameras will be integrated onto the SeaEye Cougar XT ROV system.



Bowtech Products has also supplied all of the associated cables, connectors, and brackets for the cameras and lights.

This is the third major award to Bowtech Products for the supply of cameras and lights to new ROV fleets in 2013. This latest contract with ROVOP, together with existing heads of agreements already secured with Bibby Remote Intervention Limited and Reach Subsea AS of Norway, amount to GBP1.2M of cameras and lights through to 2017.

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

SeaTrepid adds two 3,000-m Sub-Atlantic™ Comanche ROVs to its fleet

SeaTrepid International, LLC is proud to announce that it has added two 3,000-m Sub-Atlantic™ Comanche Light Work Class ROVs to its fleet of

37 Observation, Mid Class, and Light Work Class ROVs. The Comanche comes complete with A-frame Launch and Recovery Systems, 20-HP Hydraulic Power Unit, and over 9,000 ft of main lift umbilical.

With its 15-KW/20-HP HPU, the SeaTrepid Comanche ROV system provides exceptional tooling capabilities and has been designed for the following tasks, among others:

- Construction IRM—cleaning, cutting, jetting, dredging, and NDT applications.
- Drill/Rig/Completion Support.
- Well Intervention—AX/VX gasket change out, BOP shutdown, hot stab operations, Class 1-4 torque tools.
- Survey—Pipe and cable tracking, single & dual head multi-beam sonars, sub-bottom profiling, pipe profile sonars, leak sensor.

Additionally, when compared with hydraulic work-class systems, the Comanche provides important customer benefits with regard to capital and operational expenditure, simplicity of use, and requires less deck space.

For more information, visit www.seatrepid.com.

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The world's first eco-friendly solution for ROV operators

ARM 5E
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The advertisement features three images of the ECA Hytec manipulator arms. The ARM 5E MICRO is shown at the bottom left, featuring a black and red design with a gripper at the end. The ARM 5E MINI is shown at the bottom center, also with a black and red design and a gripper. The ARM 5E is shown on the right, a larger red and black arm with a gripper. The background is a blue gradient with faint technical drawings of the arms.

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eca HYTEC™

Fisher Proton 4 magnetometers for Peru

The Peruvian Navy's Department of Oceanography, Hydrography, and Navigation is using several of Fishers Proton 4 magnetometers. Conditions in the world's oceans are constantly changing, that requires continuous surveying, charting, and mapping. This department compiles a vast array of hydrographic information and combines it with other oceanographic data such as tides, currents, and thermoclines to provide the Navy with the most up-to-date information on the environment they are operating in. Magnetometers are essential pieces of equipment in survey operations to identify sunken vessels and other debris that can prevent safe passage through an area's waterways.



Other organizations using Fishers boat-towed detection systems are the U.S. Army Corps of Engineers, Royal Australian Navy, National Institute of Oceanography in India, Natural Resources Canada, LPK Geomatic Services in Vietnam, Ganem and Kelly Surveying in Texas, The Arab Potash Co. in Jordan, Mediterraneo Servicos Marinos in Spain, Middle East Surveys in Kuwait, Global Marine in South Carolina, Humbolt Sheriff in California, Wahkiakum Sheriff in Washington, Clive Cussler's NUMA, and Mel Fishers' Salvors Inc.

For more information, visit www.jwfishers.com.

MacArtney upgrades SAAB Sea Owl 500 ROV system

MacArtney Norge has a long standing relationship with ROV manufacturer SAAB Seaeye—and the two companies have worked together on numerous projects related to the production, maintenance, and sale of the versatile Sea Owl 500 observation class ROV system. Now, MacArtney and SAAB Seaeye have developed an upgraded XTi version that, while staying within the realm of the original and proven Sea Owl 500 design, features significant upgrades of

all system facets.

The Sea Owl system was developed by SAAB in the early 1990's and has since proved itself as an extremely reliable and also a very popular ROV among its users. Applications include observation and inspection of subsea installations and light work tasks in challenging environments.

The primary market for the Sea Owl is firmly rooted on the Norwegian

Continental Shelf, and the XTi has been developed to meet the requirements of operators who perform subsea work on behalf of, for instance, Statoil. Among the new features, the XTi boast a 360° control program (6 DOF), a 3,000-m depth rating, and a 400-m tether length on the top-hat TMS. In addition, the SAAB Seaeye ICON control system enables easy integration of sensors. Finally, tooling

The advertisement features the OSI logo at the top left, which consists of three stylized dolphins leaping over the letters "OSI". To the right is a small satellite icon. The main headline reads "Subsea Networks connecting your business". Below this, the words "Globally" and "in the Field" are displayed. A central image shows an offshore oil rig on the left and a supply vessel on the right, connected by a network of lines representing subsea communication. At the bottom, there is a detailed diagram of an underwater ROV system with various components like a control console, umbilicals, and subsea equipment. The OSI logo is also present here. The contact information at the bottom includes the website www.oceanspecialists.com and locations "Florida - Boston - Houston - Singapore". A QR code is located in the bottom right corner.

Underwater Intervention

package application is made even more flexible and user-friendly.

To realize this exciting system upgrade, MacArtney Norge has worked closely with the MacArtney Group HQ in Denmark to develop a complete launch and recovery system that meets customer demands for No Manual Handling and HSR requirements.

For more information, visit www.macartney.com.

BMT delivers metocean support for Total Norge AS

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

for Total Norge AS in the region.

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

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

For more information, visit www.bmtargoss.com.

OceanWorks International completes ADS 1200 upgrades for Italian Navy

OceanWorks International is pleased to announce the successful delivery of a

major system upgrade for the first of the Italian Navy's three Atmospheric Diving Systems (ADS). After its previous refurbishment in 1999, the first Italian HARDSUITTM was returned to OceanWorks International for the latest configuration upgrade.

The upgrade to the QUANTUM II configuration offers much improved operational, maintenance, and training features, including more powerful SAAB Seaeye SM7 thrusters and a completely re-designed and upgraded electronics, communication, and monitoring system to allow better control and monitoring of the system performance by pilot and supervisor.

The contract included provision of a temporary replacement ADS system to ensure that the Italian Navy did not experience any interruption of their rescue and salvage capabilities during the upgrade and refurbishment period. A 2-week pilot and technician training course is also provided to ensure that the Navy remains current on the advanced functions of the upgraded system.

For more information, visit www.oceanworks.com.

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A red and blue underwater robotic vehicle (ROV) named "PREDATOR" is shown from a side-on perspective, positioned on a sandy seabed. It has a clear dome on top and several blue thrusters at the bottom. In the background, a large metal structure, possibly an oil platform or pipeline, is visible in the water column.

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Seateronics Predator is a 300m-rated inspection-class ROV suitable for use in a broad range of industries, including oil & gas, military, search & rescue, fisheries, inshore survey, scientific research, telecommunications, and energy.



Optional attachments for the five-thruster Predator ROV – which comes standard with one camera and LED lights – include sonar, additional cameras, additional lighting, laser scaling, altimeter, and manipulators.

Visit the Predator ROV website for more information:
www.predator-rov.com



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ORBIT Unveils OceanTRx™

ORBIT Communication Systems, Ltd. has announced the launch of OceanTRx™, an innovative maritime stabilized VSAT product line sharing a common platform: OceanTRx™ 4 and OceanTRx™ 7. Complementing the maritime platform is RailTRx™ a new train stabilized VSAT product line. OrTes, a subsidiary and joint enterprise between Orbit and Italy's Tes, Teleinformatica e Sistemi s.r.l., is unveiling RailTRx™. All of these systems, aimed for the current and future needs of the maritime and train markets, will have live demos at Orbit's booth. OceanTRx™ 4 supports a variety of 1.15-m stabilized maritime antenna system configurations in multiband frequencies, such as X, Ku, and Ka bands and BUC power level. Empowering mission and business-critical applications, it features inherent field upgradability, outstanding RF performance and dynamic response under virtually any sea conditions. To enable superior system availability and connection uptime, OceanTRx 4 is designed and tested to meet the most stringent environmental standards, including shocks, bumps, and vibrations. OceanTRx™ 7 offers numerous 2.2-m stabilized maritime antenna system configurations in multiband frequencies such as C, Ku, and Ka bands and BUC power level. Built for quick and easy installation, upgrade, and maintenance, it combines exceptional RF performance and system availability with an extraordinarily small footprint. Small enough to be shipped as a fully assembled unit in a standard 20-ft container already pre-tested over satellite, OceanTRx™ 7 drastically lowers shipping costs. Its 2.2-m dish and 2.7-m radome occupy 40% less deck space and weigh 30% less than industry-standard systems. Designed for efficient on-board serviceability and maintainability, OceanTRx™ 4 and OceanTRx™ 7 feature a highly accessible pedestal design, enabling efficient service support and field upgrade process without requiring accurate or periodic balancing. The OceanTRx™ product line share common electronic field-replaceable units (FRUs), allowing lower cost of ownership, easier maintenance support, and shorter response times. For the evolving broadband communications needs of intercity, regional and high speed trains, RailTRx™ supports a variety of stabilized train antenna system configurations in Ku and Ka bands. With a track record of dozens of operational systems, RailTRx™ features outstanding RF performance, system availability, and high immunity to environmental electromagnetic interferences.

Norsat selected as preferred supplier to O3b Networks

Norsat International Inc. announced its selection as an authorized supplier of microwave components for O3b Network ground terminals. Norsat will provide O3b custom frequency 5-W and 10-W Block Upconverters (BUCs) and Low Noise Blocks Downconverters (LNBS) for the launch of O3b Networks' next-generation Ka-Band satellite constellation. The revolutionary constellation will be used for telecommunications and data backhaul from remote locations, and consumer broadband Internet services for maritime customers. Norsat's microwave components have been custom-designed for reliability and performance, and the first major application of the high-performance design will be O3b's new maritime communications network. Through this multi-year, multi-million dollar project, O3b Networks' will provide high-speed, satellite-delivered broadband service at sea through the integration of Norsat's LNBS into maritime systems. By summer 2013, thousands of guests aboard networked maritime vessels will be the first to enjoy the enhanced connectivity of the O3b network powered by Norsat technology.

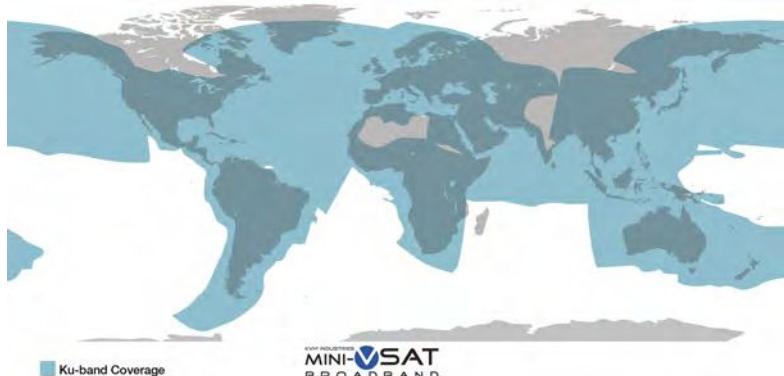
KVH introduces TracPhone® V3-IP for mini-VSAT Broadband™ Service



KVH Industries, Inc. introduced the TracPhone® V3-IP terminal for its mini-VSAT Broadband™ service. The world's smallest maritime VSAT antenna now comes with the smallest and most integrated belowdecks equipment—KVH's new Integrated CommBox Modem (ICM), a streamlined unit that includes an IP-enabled antenna control unit; built-in CommBox™ Ship/Shore Network Manager; and ArcLight® spread spectrum modem with IP voice capability, Ethernet switch, and Wi-Fi connectivity. All of the TracPhone® V3-IP's belowdecks equipment is built in to a single 2U enclosure.

KVH's new TracPhone® V3-IP costs less, is significantly easier to install, and provides greater reliability than competing solutions that combine discrete components from a number of different manufacturers. The system's completely integrated design offers a simple alternative to the complexity inherent in competing maritime VSAT systems, which typically require a local technician to configure a full rack of hardware from different third-party manufacturers of modems, antennas, controllers, switches, adapters, and servers. It also makes the advanced features of KVH's best-of-breed network management solution, the CommBox Ship/Shore Network Manager, available to every TracPhone® V3-IP customer without an additional hardware investment. With a compact antenna dish that is just 37 cm (14.5") in diameter, the TracPhone® V3-IP brings sophisticated satellite communications and network management capabilities to a wide array of vessels 9 m (30 ft) and larger.

The TracPhone® V3-IP provides extensive functionality to help manage onboard networks from the vessel's computers and



remotely from the ship owner's headquarters. The system itself is very easy for the crew to operate thanks to an outstanding web browser-based user interface that can even be accessed via an optional iPhone® app. The new ICM provides a full suite of onboard services optimized for satellite communications, including crystal clear VoIP calling, Internet café, crew calling, managed e-mail, secure file delivery, and remote network access.

KVH's exclusive mini-VSAT Broadband™ service is delivered by an interlaced network of 14 Ku-band satellite transponders providing seamless worldwide coverage north of the equator and around all major continents, including most major shipping routes south of the equator. By leveraging abundant new commercial satellite services covering the world's ocean regions, KVH offers significantly more affordable connectivity than legacy L-band services. As demand for the service grows, KVH can easily add new capacity to its network, exactly where it is needed, to assure outstanding performance for customers concentrated in specific regions.

For more information, visit www.kvh.com.

Beltship adopts FleetBroadband Unlimited for Vale

Beltship Management Limited (BML) has deployed Inmarsat's FleetBroadband Unlimited service across all 6 of the bulk carriers it manages for Brazilian-based Vale, the world's second-largest mining company. The "all-you-can-eat" service was installed by Inmarsat partner AND Group plc, a provider of global satellite and engineering services, following a review of the Inmarsat-enabled communications service by Beltship, which had previously been reviewing competing VSAT solutions.

Beltship's requirements were for a new communications solution that would provide a more robust, capable, and cost-efficient service, delivering a large data allowance that would cover both the operational needs of the vessels and for use by crew during the 3-month round-trip between Brazil and China. Beltship was also seeking a provider that could offer IT set-up and support for their terminals and Internet cafés via service departments located around the world.

Crew morale is a key consideration for Beltship; an approach that they hold in common with the vessels' owners Vale. The introduction of free crew Internet access, with unlimited access to the web, is part of a broader crew welfare initiative, which also includes a gym and entertain-

ment supplies like musical instruments, darts, and movies on each vessel.

The solution offered to Beltship was based around AND Group's IPSignature communications software, a platform that enables access to web-based applications to meet both the operational requirements of the vessel and crew communication needs. In addition, IPSignature provides full control and visibility of each vessel's communications and data usage.

IPSignature delivers the ability for shore-based ship managers to supervise settings and the access given to business and crew users on-board a vessel via the AND Web Portal. For example, ship managers can set up a whitelist and blacklist of approved websites.

The crew Internet café consists of a network of PCs, pre-configured with IPSignature for easy access to applications such as web browsing, e-mail, SMS, and instant messaging. A mobile browser for web surfing ensures that data are loaded faster and makes for a better experience for the crew.

All 6 Vale vessels managed by Beltship—Ore Para, Ore Mangaratiba, Ore Belo Horizonte, Ore Itabira, Ore Timbopeba, and Ore Pantanal—feature FleetBroadband Unlimited and Crew Internet Cafés. The vessels access the Inmarsat global mobile satellite communications services through a mix of Thrane SAILOR FB500 and Furuno FB500 terminals.

For more information, visit www.inmarsat.com.

SingTel Satellite delivers peace of mind and control

SingTel unveiled 3 innovative ICT solutions specially developed for the maritime sector to drive crew welfare, operational efficiency, and remote monitoring and control.

With the proliferation of Internet access on ships, owners and managers are increasingly feeling the need to control their crew's Internet usage to prevent fatigue and accidents. With SingTel's ConnectPortal, shoreside professionals can have total control over their crew's Internet usage by implementing a flexi-time allowance.

The solution enables shoreside managers to limit surfing time of the individual crew members by daily hours, customizable for each crew member. The service supports both free Internet access given to crew as well as self-paid prepaid card models or hybrids and is integrated to work with FleetBroadband, Iridium OpenPort, and SingTel's maritime VSAT services.

CrewXchange@SingTel is the first portal in the industry that is specially designed for seafarers. It is a one-stop, lightweight, widget-based portal for seafarers to access news (global, local, sports), social media (Facebook and Twitter), online communities, instant messaging, web mail, and e-learning that is supported by bandwidth optimization to ensure lower data usage and cost savings.

The ability to communicate with family and friends is a vital component of crew welfare. However, connecting to family and friends through voice calls is one of the highest costs borne by crew onboard. Costs can range from U.S. \$0.03/min to U.S. \$5/min, depending on the location dialed.

With VoiceLink in CrewXchange@SingTel, crew can perform text and voice chat with friends and family. Featuring the industry's lowest proprietary CODEC of 2.15 kbps bandwidth and delivered in widget format, very little bandwidth is required. Compared to other offerings, VoiceLink in CrewXchange@SingTel uses three times less bandwidth. There are three call qualities to toggle between, allowing crew members paying for own Internet access charges to control their call expenses. It is a win for crew welfare as ship owners can implement this onboard ships to offload their crew's call expenses.

CrewXchange@SingTel is a free service, and crew members can invite their friends and family to become members of this portal specially designed for seafarers. While using VoiceLink, seafarers can also surf Facebook, send e-greetings, and read news on CrewXchange@SingTel's site. CrewXchange@SingTel is an award-winning innovation with more than 66,000 visitors since it was launched in November 2011.

With the recent regulation by India's Ministry of Shipping to equip CCTV cameras as part of the anti-piracy measures for all Indian Flagged Ships, ship owners have been searching for the most bandwidth-efficient solution.

Currently, most CCTVs in the market have a data transmission rate of between 100 kbps to 2 Mbps. For terrestrial usage, there is abundant and affordable capacity available, as the average bandwidth customers have is about 3 Mbps. However, at sea, bandwidth over satellite is an expensive commodity, and the most common bandwidth subscribed to is only 64 kbps. Until now, there has been a lack of CCTV solutions designed and optimized primarily for use over satellite connectivity.

SingTel's Mobile Video Surveillance provides clear video images requiring

data transmission as low as 5 kbps, supporting unlimited multicast for concurrent viewing and live video viewing on mobile devices on IOS and Android. It also uses the highest level of AES256 encryption. Tested over FleetBroadband and Maritime VSAT to ensure seamless interoperability, the service ensures ease in monitoring cargo, preventing the pilferage of oil and goods with high-resolution enhancement for a clear view of any chosen area of footage.

For more information, visit www.singtel.com.

BYOD trend continues with Astrium Services' XChange upgrade

Astrium Services has released a new software version for its established XChange connectivity platform, which offers a range of new features to facilitate permanent remote access, allow smart-phone usage on board, and provide improved VoIP capabilities. XChange v2.3 was developed to meet specific customer demands and is available free of charge by a simple firmware update, through a local file, or via the embedded over-the-air update feature.

The inclusion of new VoIP technology in XChange enables bandwidth savings of over 50%, while at the same time offering high call quality and reliability. This makes regular use of VoIP a more attractive option to the crew, the captain, or the IT manager, who will experience clearer, more reliable calls— placing VoIP as a real alternative to more traditional voice services.

The new Astrium Services' XChange also offers possibilities for users on board to connect their own devices to a vessel's network over Wi-Fi, to access e-mail, the Internet, and social media sites. This development mirrors the increased demand of the so-called "Bring Your Own Device" (BYOD) on land, where many organizations now accept user-owned smartphones, tablets, and laptops on corporate networks.

In order to ensure security whilst allowing access to crew and passenger devices, XChange v2.3 provides enhanced network control via white/black listing of network clients for Internet access and a clear separation of crew/passenger and corporate networks.

Communication management func-

tionality has also been improved in XChange v2.3, with the inclusion of permanent remote access. IT managers benefit from improved control of the network through permanent, fully secure remote access, with no on-board action required. XChange now includes the ability to access any communication device on the network, even while offline, through another satellite terminal or from shore.

Other new features introduced by XChange v2.3 include new "maintenance" and "rescue" modes, which help to keep the system fully operational at all times, and the ability to manage personal Internet usage by setting daily access limits for any user group. XChange v2.3 also features improved satellite compatibility and now works with Furuno Felcom.

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

MTN honors pioneer of broadband communications at sea

The CEO and president of MTN Satellite Communications (MTN), Errol Olivier, granted a Lifetime Achievement Award to Richard Hadsall, chief technology officer of MTN Government Services,

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who pioneered the first C-band and Ku-band satellite broadband communications (TV, voice, and data) at sea in the 1980s. Thanks to Hadsall's innovation, today MTN delivers critical satellite and terrestrial communications to most of the world's cruise lines. In addition, hundreds of yachts, commercial oil and gas vessels; and government ships, aircraft, vehicles, and facilities around the world benefit from MTN connectivity.

In 1981, Richard Hadsall founded the company that created what is today MTN's teleport in Holmdel, New Jersey. That teleport was a communications center that made it possible for networks such as ABC, NBC, and CNN; foreign broadcasters; and heads of the U.S. Government, military, and embassies to report live events across the world for the first time. The company partnered to build the first maritime antenna operating in Ku-Band to be used on the U.S. Navy's LPH-2 USS Iwo Jima. This enabled the first tactical full-motion Ku-Band satellite video broadcast terminal at sea for surveillance and press pool support in the Persian Gulf.

Hadsall received a 2011 Emmy Award for Technology & Engineering for creating an MTN-retrofitted Ford F350 vehicle for NBC with live TV and satellite transmission to continuously broadcast reports from Iraq. He enabled the first-ever live broadcast capabilities for ABC's Good Morning America Whistle Stop Tour from a moving train. And he engineered the first live broadcast from a submarine submerged below the Atlantic Ocean.

For more information, visit www.mtnsat.com.

Orange Business Services targets new regional satellite broadband

Orange Business Services is targeting additional revenues from the Middle East and Africa (MEA) region through its Satellite VPN services, with an emphasis on the oil and gas and maritime sectors in the region where satellite solutions play a pivotal role when communicating in remote areas. Orange Business Services has already deployed more than 1,200 satellite-based solutions in the MEA region.

For enterprises located in remote parts of the globe where conventional terrestrial-based infrastructure is not viable, satellite broadband services provide a vital link to the wider world through VSAT (very small aperture terminal), a two-way satellite dish antenna fixed on the ground, or a stabilized maritime antenna at sea.

Orange Business Services' satellite solution allows access to the Orange IP

VPN network. Orange Business Services has a fully integrated terrestrial and satellite network that not only provides a secure high level of availability, but also flexibility so that changes can be made quickly and easily whenever needed.

Michel Verbist, director, business development, satellite solutions at Orange Business Services, said, "Network services represent a large proportion of the services we implement in the Middle East, and VSAT plays a big role within

the region relating to both primary and secondary connectivity. We are now aiming to increase our presence and activity in the Middle East region, and Orange is unique in that we have a large MPLS backbone with in-house satellite services on top. This means that we can provide the same end-to-end service level agreements on satellite services as we do for standard network services."

For more information, visit www.orange-business.com.

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MedNautilus deploys Infinera DTN-X

MedNautilus has deployed the Infinera DTN-X platform across the Mediterranean to increase capacity on its subsea network and deliver up to 100 Gbps international connectivity services. MedNautilus, the Mediterranean operations of the Telecom Italia Sparkle Group, operates the largest protected submarine cable network in the Mediterranean, connecting Italy, Greece, Turkey, Israel, and Cyprus, and serves the growing capacity needs of the region. The Infinera DTN-X solution enables MedNautilus to upgrade its network quickly in response to customers' demands as the platform simplifies the management of long-haul terrestrial and submarine networks. Infinera's DTN-X is the first to deliver up to 500-Gbps long-haul super-channels based on Photonic Integrated Circuits and the FlexCoherent™ Processor, scaling transport capacity without scaling operational complexity. With coherent long-haul reach for submarine links, the Infinera DTN-X platform seamlessly integrates terrestrial and subsea applications for network operators.

Nexans wins Malaysia subsea umbilical order

Nexans has made a breakthrough in the Malaysia offshore sector with the award of a major contract by Persada Engineering to supply an electro/hydraulic subsea umbilical for Sarawak Shell Berhad's F29 field development. The 22-km Nexans umbilical will be installed in a water depth of around 100 m to provide communication and control functions for the F29 field development. Nexans will be responsible for the supply and transportation of the umbilical, together with accessories as required, in a fast-track 72-week contract. The F29 umbilical will be manufactured at Nexans' specialized facility in Halden, Norway.

LS Cable wins South American contract

LS Cable & System is the first Korean cable maker to enter the South American submarine cable market. The company will supply 230-kV extra-high-voltage submarine cables to the state power corporation of Venezuela (CORPOELEC). These cables will connect the 40 km distance between Chacopata in the inland state of Sucre and Margarita Island and be used to supply electric power in the region. LS Cable & System won the contract on a full turn-key basis, including not only the delivery of cables, but also installation works and tests. Its capabilities as a general engineering company for submarine power cable systems as well as its production technology were recognized once again. The South American market for submarine power cables is expected to grow as demand for electricity in the region increases and the aging infrastructure needs to be replaced.

Statoil awards contracts for Aasta Hansteen field
Statoil and its partners have awarded several subsea pipeline and marine installation contracts for the Aasta Hansteen field in the Norwegian Sea. The Aasta Hansteen field development represents a number of firsts on the Norwegian continental shelf (NCS) in terms of water depth and technological solutions. Among the awards was one for the installation of a submarine fiber optic cable. Deep Ocean has been awarded contract for supply and installation of the 140-km cable, which will connect the Aasta Hansteen field to the existing infrastructure near Norne. The contract is worth an estimated NOK 165 million. Deep Ocean will also consider using local suppliers in northern Norway for their services under this contract. The contracts are call-offs on framework agreements for pipe-laying and subsea installations. The assignments will commence immediately, with installation seasons in 2014, 2015, and 2016. Completion is scheduled for the fourth quarter of 2016.

ABB to deliver link to Icelandic island



ABB has received an order worth around \$10 million, from Landsnet, the Icelandic transmission system operator, to supply a high-voltage submarine and underground power-cable system that will transport electricity from the mainland to the volcanic island of Heimaey.

Heimaey is the only inhabited island of the Vestmannaeyjar archipelago off the southern coast of Iceland. The new 72-kV cable system will replace an existing cable that is approaching the end of its operating life. It will increase the transmission capacity of the existing power link to ensure that the island's 4,100 inhabitants and thriving fishing industry continue to receive reliable electricity supplies.

ABB will deliver the entire 17.5-km high-voltage cable system, including a 13-km submarine section, a 4.5-km underground section, and an integrated fiber optic cable for telecommunications and temperature monitoring of the power cables. As part of the turn-key solution, ABB is responsible for design, engineering, submarine cable laying, joints and terminations, testing, and commissioning.

For more information, visit www.abb.com.

ACE, Alcatel-Lucent sign maintenance service agreement

Alcatel-Lucent and the Africa Coast to Europe (ACE) consortium have signed a contract for the maintenance of more than 6,300 km of the ACE system linking Africa to Portugal. In commercial service since December 2012, ACE interconnects 15 African countries, 7 of which has been connected to the global Internet backbone for the first time.

With an ultimate design capacity of 5.12 Tbps, ACE provides a high-speed data network that cost effectively supports innovative broadband services such as e-education and healthcare applications and is designed to address present and future needs for connectivity and capacity. The overall sys-

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Tome, and Principe, Cameroon, Nigeria, Benin, Ghana, Côte d'Ivoire, Liberia, Sierra Leone, Guinea, The Gambia, Senegal, Mauritania, Tenerife (Spain), and Portugal.

ACE joins other African systems into the Atlantic Private Maintenance Agreement (APMA), allowing operators to access Alcatel-Lucent's maintenance vessels as well as experienced, fully trained, and certified specialist personnel for cable repairs.

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

OSI awards SubCom POSEIDON contract

TE SubCom, a TE Connectivity Ltd. company, has been contracted by Ocean Specialists, Inc. (OSI) as the supplier of the POSEIDON project, a high-capacity undersea cable system that will enable advanced communications for the oil and gas industry in the Eastern Mediterranean region.

Designed to deliver critical communications to one of the world's most active regions for oil and gas production, POSEIDON will be owned and operated by Radius Oceanic Communications, Inc., a wholly owned subsidiary of OSI. The initial anchor tenant for POSEIDON will be the Offshore Communications Backbone (OCB), previously installed by TE SubCom under contract to OSI in 2010. The OCB is an existing Ocean Observatory System owned and operated by CSnet International, Inc. that provides broadband oceanographic, meteorological, and hydrographic data services to science, government, and industry. The initial configuration of the system will extend 555 km in length with two landing stations in Pentaskhinos and Yeroskipos, Cyprus with the OCB integrated into the POSEIDON system to provide a self-healing ring between the two legs. SubCom will be responsible for the engineering, procurement, installation, and commissioning services for the pro-

ject. Installation will take place using a SubCom Reliance-class vessel with completion slated for December 2013.

"This recent award continues SubCom's role as an industry leader in offshore oil and gas solutions," said Derek Buffitt, director, marine engineering solutions, TE SubCom. "The oil and gas industry is flourishing, and POSEIDON will enable us to bring new technology to the Eastern Mediterranean that will enhance communications and increase connectivity within this booming region. With expansion possible up to 500 km to eastern and western terminals, future installments are anticipated and we look forward to continuing our relationship with OSI, Radius, and CSnet as their needs evolve."

"We're extremely pleased to have awarded TE SubCom with the supply contract for the POSEIDON project," said Jim Byous, president, Ocean Specialists, Inc. "Together, our organizations' collective expertise and experience will deliver necessary offshore communications to oil and gas facilities throughout the Eastern Mediterranean region, while continuing support of the scientific community through the CSnet-OCB Ocean Observing System."

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

OMM completes installation of EBFL

Offshore Marine Management (OMM) has completed the installation of a 117-km optical fiber submarine cable for c Ltd (EBFL), a joint venture between Geo Networks Ltd, a leading fiber network provider and Ireland's leading wholesale telecom provider EBS Telecoms Ltd.

The 96-fiber subsea link provides a new and direct low-latency route from Portmarnock, Ireland to Porth-Y-Post, Wales.

OMM was fully responsible for the marine delivery of this challenging project and provided expert management and consultancy services during execution of the marine works. OMM provided a full range of turn-key services to ensure successful installation. Rob Grimmond, managing director, said, "This was an important major project to the diversity of OMM's capability and flexibility."

OMM's participation in this project commenced at an early stage with review of the initial route design and survey data before advising on the

development of the route. In addition to full project management of the marine installation, OMM delivered a number of key packages, including route deviation surveys, pre-lay grapple services, and the installation of a pre-laid shore end. Further services provided to EBFL by OMM included but not limited to the installation of the submarine cable itself but also supporting works covering assistance with permitting, inshore and offshore burial, cable protection using ducting and articulated piping, jointing, and system testing. Project final deliverables were completed using OMM's in-house resources to meet EBFL's needs for reporting, charting, and digital video.

As principal contractor, OMM was responsible for all health, safety, and environmental activities and is pleased to report that the project was successfully delivered with no lost time incidents recorded.

For more information, visit www.offshoreomm.com.

SEACOM upgrades with Ciena technology

SEACOM has selected Ciena Corporation's 6500 Packet-Optical Platform and OneControl Unified Management System for the upgrade of its submarine network across the Southern and Eastern African coastlines. This falls in line with SEACOM's focus on driving the development of the African Internet and opening the broadband tap for African consumers.

Ciena's technology will allow SEACOM to meet the growing capacity demands of its customers and enable affordable Internet access to East Africa with a network that offers a better cost point and a smoother evolution path for the future.

The upgrade covers key countries in SEACOM's 17,000-km submarine fiber optic cable network, including India, Egypt, Djibouti, Kenya, Tanzania,



Mozambique, and South Africa. The solution will allow SEACOM to deliver its capacity in very short timeframes and provide for future demands. The deployment will initially use Ciena's 40-G coherent transport technology, with ultra-long distance 100-G wavelengths planned for future upgrades.

For more information, visit www.seacom.mu or www.ciena.com.

ECI transports coherent 100 G on Jonah

ECI Telecom has successfully transported non-regenerated 100-G traffic via the Jonah international submarine fiber optic cable, owned by Israel's Bezeq International. The data were transmitted by the Apollo OMLT over a total distance of 4,600 km from Tel Aviv to Bari, Italy and back.

The deployment of 100 G enables more data to be transmitted faster over longer distances. With advanced coherent soft-decision forward error correction (SD-FEC) technology, such deployments open the door for the delivery of cost-effective, next-generation services to carriers worldwide.

The 100-G trial was carried out over Bezeq International's live operational submarine fiber in conjunction with the Tera Santa Consortium as part of its research on long-distance adaptive coherent channel behavior. This trial demonstrated the advanced capabilities of the ECI 100-G transmission system and technologies in compensating for non-linear channel impairments and chromatic dispersion utilizing advanced SD-FEC algorithms.

The Tera Santa Consortium was established in 2011 by leading technology companies and universities to develop the world's first 1T OFDM-based optical network, with financial backing from the research arm of the Israeli Chief Scientist Office.

The Apollo 100-G transponder card, already deployed by many customers, brings significant capacity increase to the optical cable, relieving traffic congestion and enabling new applications.

The Optimized Multi-Layer Transport (OMLT) architecture is ECI's vision for next-generation packet-optical transport network, with flexible convergence from metro access to core.

The Apollo OMLT is optimized for next-generation optics, and it brings transparent aggregation and transport of services over 10-G to 100-G WDM

links. Its 100-G optical performance, OTN fabric, variety of ROADM modules and configurations, tunable lasers, and a GMPLS-based control plane provide one of the most advanced NG transport solution available today. The Apollo family of OMLT was launched in November 2011 and is enjoying momentum with service providers around the world. In December 2012, ECI has launched the Native Packet Transport (NPT) family of OMLTs to deliver an affordable, scalable, and easy-to-manage metro packet transport networks for lowest TCO.

For more information, visit www.ecitele.com.



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JDR wins DECC funding for offshore cable innovation

Offshore wind innovation in the United Kingdom has been given a real boost with the announcement of the first three winners under the second call of the Department of Energy and Climate Change (DECC) and the Technology Strategy Board's (TSB's) Offshore Wind Component Technologies Development and Demonstration scheme and the launch of a fourth round of this competition.

Submarine power cable maker JDR Cable Systems Ltd was one of the three award winners and will receive £1,021,000 to develop innovative HVAC cables for offshore wind farm applications.

In commenting on the award, chief executive officer of JDR Andrew Norman, said, "We are delighted that the Department of Energy and Climate Change has recognized JDR's capabilities in the field of inter array cables and awarded funding to support our new research into high-voltage array cabling for offshore wind farms. The project will help drive down the cost of each

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megawatt of power produced by an offshore wind farm to make this source of renewable power more cost-effective and competitive. Our work will also benefit the environment through the introduction of alternative materials in the design of high-voltage cables. DECC's involvement is a positive affirmation of support for the UK offshore wind industry, and we look forward to starting work on this exciting project and contributing towards the future growth of this vital industry."

For more information, visit www.jdrglobal.com.

JDR wins major subsea umbilical contract for CNOOC

JDR has deployed a range of dynamic subsea production umbilicals and ESP power cables for the China National Offshore Oil Corporation (CNOOC) in their Liuhua 4-1 field subsea tieback project.

JDR designed and manufactured over 42 km of ESP power cable, each incorporating nine power cores, delivered in three 14-km lengths. The order also included a 14-km main production control umbilical and a bridging manifold

control umbilical. These umbilicals are operating in the South China Sea, at depths from 260 m to 300 m.

The main production umbilical is thermoplastic, designed for dynamic sub-sea environments. It incorporates a hydraulic control system to control sub-sea trees and deliver injection chemicals into the wellstream to reduce hydrate formation. Each ESP power cable includes three 3-phase power circuits capable of serving three identical ESPs in this eight well field.

For more information, visit www.jdrglobal.com.

Prysmian wins Mallorca-Ibiza contract

Prysmian Group has been awarded a new contract worth approximately €85 million by Red Eléctrica de España, S.A.U. (REE), the transmission system operator of the Spanish electricity system, for the second circuit of the interconnection between the Balearic Islands of Mallorca and Ibiza.

The project involves the design, supply, and installation of a turn-key High-Voltage Alternating Current (HVAC)

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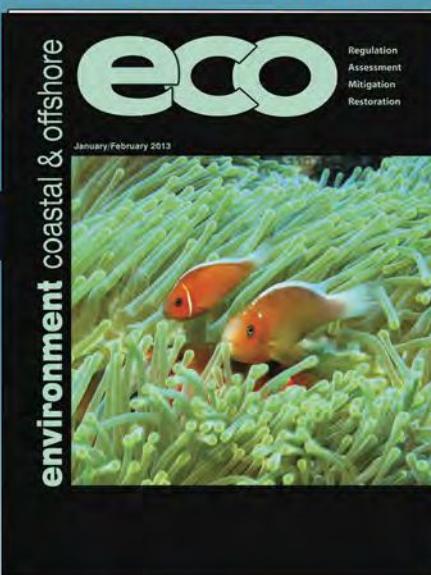
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cable system designed to transmit a power of 118 MVA and consisting of 132-kV extruded cables and associated fiber optic cable system along a total route of more than 123 km (115 km submarine and 8.6 km land) for the interconnection between the two islands that will enable integration of Ibiza in the Peninsular network system by ways of the existing "Romulo" (Iberian Peninsula-Mallorca) cable system.

The submarine cables for the Mallorca-Ibiza link will be manufactured in the Arco Felice plant (Naples), the Group's center of technological and manufacturing excellence; land cables and optical components of the submarine link will be manufactured in Vilanova i la Geltrù (Spain). Production of both submarine and land cables will be during 2014. Marine cable operations in deep waters (up to 750 m, a highly challenging activity well within Prysmian's proven expertise of record depths of more than 1,600 m) will be performed using the Group's own vessel Giulio Verne. Cable installation and protection will be completed during 2015.

Prysmian has a long-standing track

Subsea Cables

record in the development of submarine interconnection milestone projects in the entire Mediterranean region in addition to Spain, such as Italy-Greece, Sardinian-Italian Peninsula (S.A.P.E.I.), and Dardanelles. The Group is also a founding member of the industrial partnership Medgrid, launched to study the feasibility of a high-voltage direct current interconnection project to transmit electricity from solar or wind power plants to load centers on either rim of the Mediterranean.

For more information, visit www.prysmian.com.

Lithuania approves Nordbalt cable

Lithuania's government approved the Nordbalt submarine power cable plan, which will lay 450 km of cable under the Baltic Sea to allow the Baltic region's first power link with Sweden when completed at the end of 2015.

The 700-MW capacity NordBalt link will be the world's third-longest undersea power cable, with switching stations in Klaipeda, Lithuania and Nybro, Sweden, the government in Vilnius said a statement.



The European Union, which includes the NordBalt link on its list of strategic projects for connecting the 27-member bloc's energy markets, will help finance the €550 million (\$716 million) project. The EU aims to eliminate the isolation of all states' power and natural gas networks by 2015 in order to gain authority over the region's energy policy.

Horizontal drilling from the Curonian Spit at the seaport of Klaipeda into the Baltic Sea is planned to start in the autumn, and the 0cable, which is now being manufactured by ABB Ltd., will be installed starting in April 2014, according to the statement.

The project has been developed in consultation with the Curonian Spit National Park, which is a UNESCO World Heritage site, and with other social stakeholders and Litgrid AB, Lithuania's power-grid operator.

For more information, visit www.litgrid.eu.

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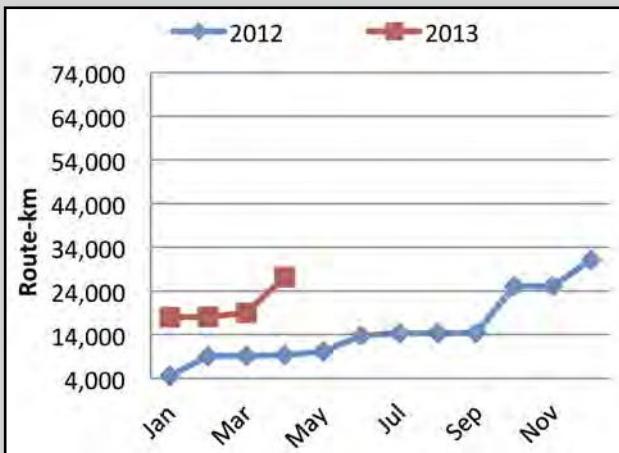
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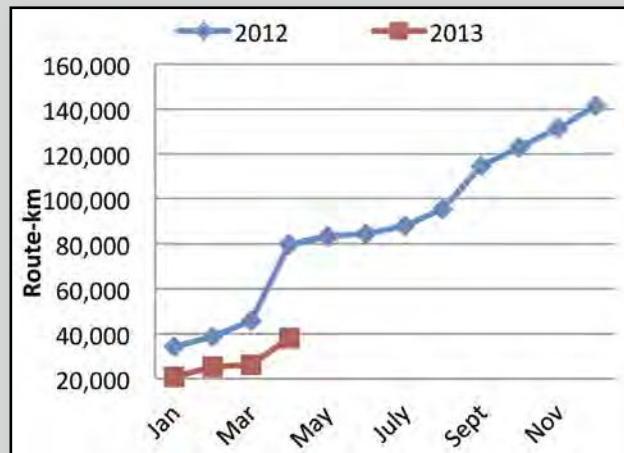
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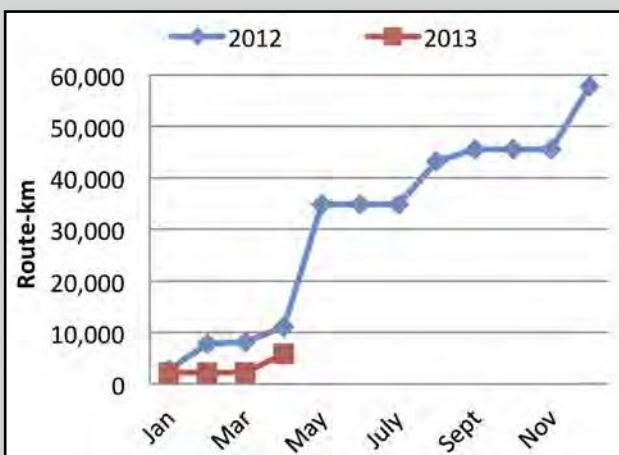
FO Cable Awards by Month



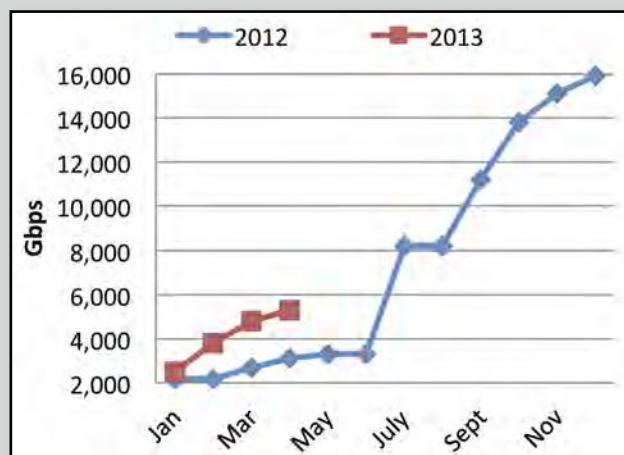
FO Cable Announcements 2013



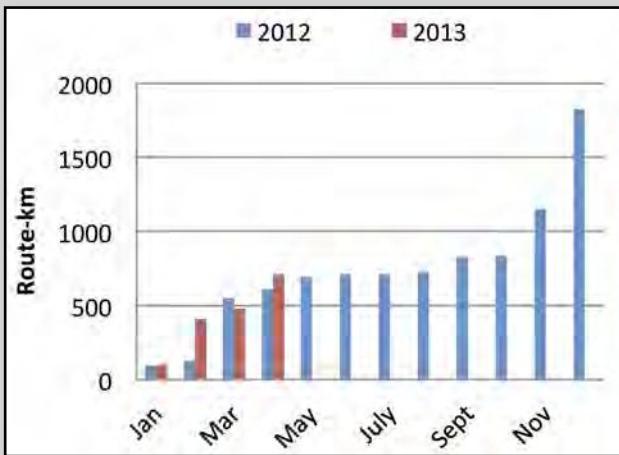
Submarine FO Cables Entering Service 2013 in Route-km



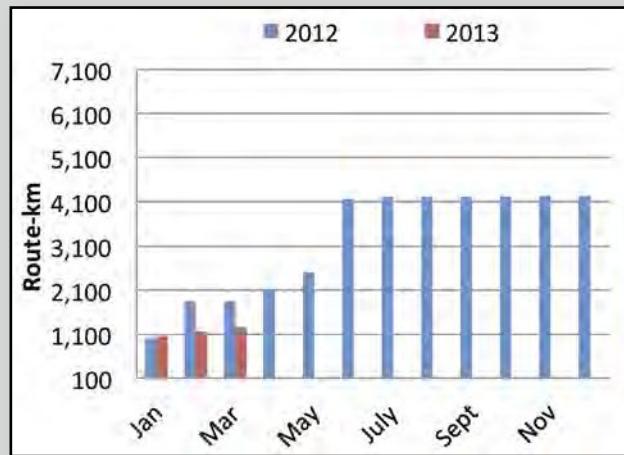
Upgrades of Existing Cable Systems in Gbps



Submarine Power Cable Awards 2013 in Route-km



Submarine Power Cable Announcements 2013 in Route-km



Gulf of Mexico Data

Current Deepwater Activity

| Operator | Area | Block | OCS Lease | Rig Name | Prospect Name | Water Depth (ft) |
|-----------------------------------|------|-------|-----------|------------------------------|---------------------|------------------|
| Petrobras America, Inc. | WR | 425 | G16987 | VANTAGE TITANIUM EXPLORER | Chinook | 8,843 |
| Anadarko Petroleum Corp. | SE | 39 | G27779 | MAERSK DEVELOPER | Phobos | 8,553 |
| Anadarko Petroleum Corp. | DC | 535 | G23520 | ENSCO 8506 | Raptor | 8,161 |
| Petrobras Amercia Inc. | WR | 206 | G16965 | ENSCO DS-5 | Cascade | 8,147 |
| Shell Offshore Inc. | AC | 857 | G17570 | NOBLE DANNY ADKINS | Great White | 8,044 |
| Shell Offshore Inc. | AC | 857 | G17561 | H&P 205 | Great White | 7,816 |
| Eni US Operating Co. Inc. | DC | 618 | G23526 | T.O. DEEPWATER PATHFINDER | San Jacinto | 7,787 |
| Shell Offshore Inc. | DC | 529 | G23517 | NOBLE JIM DAY | Rydberg | 7,639 |
| Shell Offshore Inc. | MC | 393 | G26254 | T.O. DEEPWATER NAUTILUS | White Ash | 7,375 |
| Union Oil Co. of California | WR | 677 | G18753 | T.O. DEEPWATER INSPIRATION | Saint Malo | 7,038 |
| Chevron USA Inc. | WR | 758 | G17015 | T.O. DISCOVERER CLEAR LEADER | Jack | 6,965 |
| ConocoPhillips Co. | WR | 460 | G32688 | T.O. DEEPWATER CHAMPION | | 6,915 |
| BP Exploration & Production Inc. | GC | 743 | G15607 | T.O. DEVELOPMENT DRILLER II | Atlantis | 6,834 |
| Anadarko Petroleum Corp. | KC | 875 | G21447 | ENSCO 8500 | Lucius | 6,817 |
| Chevron USA Inc. | KC | 736 | G22367 | T.O. DISCOVERER INDIA | Moccasin | 6,537 |
| Union Oil Co. of California | WR | 98 | G21841 | PACIFIC SANTA ANA | Coronado | 6,127 |
| BP Exploration & Production, Inc. | MC | 429 | G07944 | ENSCO DS-3 | Ariel | 6,106 |
| Noble Energy, Inc. | MC | 948 | G24133 | ENSCO 8501 | Gunflint | 6,083 |
| BP Exploration & Production, Inc. | KC | 292 | G25792 | SEADRILL WEST SIRIUS | Kaskida | 6,031 |
| Shell Offshore Inc. | WR | 95 | G31943 | NOBLE GLOBETROTTER | Yucatan North | 5,847 |
| LLOG Exploration Offshore LLC | MC | 300 | G24064 | ENSCO 8502 | Delta House | 5,723 |
| BP Exploration & Production Inc. | MC | 777 | G09867 | T.O. DISCOVERER ENTERPRISE | Thunder Horse South | 5,613 |
| Cobalt International Energy, LP | GC | 896 | G31765 | ENSCO 8503 | Ardennes | 5,510 |
| BP Exploration & Production Inc. | GC | 743 | G15607 | T.O. DEVELOPMENT III | Atlantis | 5,405 |
| Anadarko Petroleum Corp. | GC | 680 | G22987 | NABORS MODS RIG 150 | Ticonderoga | 4,970 |
| BP Exploration & Production Inc. | KC | 93 | G25780 | SEADRILL WEST CAPRICORN | Gila | 4,853 |
| ConocoPhillips Co. | GB | 783 | G11573 | NABORS MODS 201 | Magnolia | 4,674 |
| Hess Corp. | MC | 726 | G24101 | STENA FORTH | Tubular Bells | 4,610 |
| Anadarko Petroleum Corp. | GC | 683 | G16783 | T.O. DISCOVERER SPIRIT | Caesar | 4,485 |
| BHP Billiton Petroleum (GOM) Inc. | GC | 653 | G20084 | T.O. DEVELOPMENT DRILLER I | Shenzi development | 4,356 |
| Anadarko Petroleum Corp. | GC | 608 | G18402 | BLAKE 1007 | Genghis Khan | 4,320 |
| BHP Billiton Petroleum (GOM) Inc. | GC | 654 | G20085 | GSF C.R. LUIGS | Shenzi development | 4,300 |
| Shell Offshore Inc | MC | 809 | G05868 | CAL DIVE Q-4000 | Princess | 3,848 |
| Anadarko Petroleum Corp. | EB | 602 | G20725 | WIRELINE UNIT (L.J.#3) | Nansen | 3,678 |
| Anadarko Petroleum Corp. | EB | 602 | G20725 | NABORS POOL 140 | Nansen | 3,678 |
| Shell Offshore Inc. | MC | 809 | G12166 | NOBLE JIM THOMPSON | Princess | 3,638 |
| Eni US Operating Co. Inc. | GC | 385 | G25142 | DIAMOND OCEAN VICTORY | Pegasus | 3,585 |
| Murphy E&P Co. | GC | 338 | G21791 | NABORS MODS 200 | Front Runner | 3,330 |
| Shell Offshore, Inc. | VK | 956 | G06892 | NABORS 202 | Ram-Powell | 3,214 |
| Shell Offshore, Inc. | MC | 762 | G07995 | NOBLE BULLY I | Deimos | 3,147 |
| Shell Offshore, Inc. | GC | 158 | G07995 | H&P 202 | Brutus | 2,985 |
| W&T Energy VI, LLC | MC | 243 | G19931 | WIRELINE UNIT (N.O. #2) | Matterhorn | 2,816 |
| Apache Deepwater LLC | GC | 230 | G33241 | ENSCO 8505 | Staurolite | 2,723 |
| LLOG Exploration Offshore, LLC | MC | 503 | G27277 | NOBLE AMOS RUNNER | WhoDat | 2,646 |
| Hess Corp. | GB | 386 | G10350 | ATWOOD CONDOR | Llano | 2,627 |
| Chevron USA Inc. | GC | 205 | G05911 | NABORS 85 (MAYRONNE 162) | Genesis | 2,590 |
| Walter Oil & Gas Corp. | MC | 583 | G16624 | DIAMOND OCEAN SARATOGA | Killer Bee | 2,487 |
| Shell Offshore Inc. | GB | 341 | G15879 | NOBLE DRILLER | Habanero | 2,013 |
| Hess Corp. | GB | 260 | G07462 | NABORS S.D. XVI | Baldpate | 1,648 |
| Dynamic Offshore Resources, LLC | GC | 65 | G14668 | H&P 206 | Bullwinkle | 1,353 |
| Chevron USA Inc. | GB | 189 | G06358 | WIRELINE UNIT (L.C.#2) | Tick | 718 |

Deepwater prospects with drilling and workover activity: 51

Current Deepwater Activity as of Monday, 13 May 2013

Activity by Water Depth

| Water Depth (m) | Active Leases | Approved Applications | Active |
|-----------------|---------------|-----------------------|--------|
| 0 to 200 | 1,673 | 34,972 | 2,697 |
| 201 to 400 | 115 | 1,116 | 20 |
| 401 to 800 | 285 | 858 | 10 |
| 801 to 1,000 | 388 | 572 | 9 |
| 1,000 & above | 3,447 | 1,831 | 26 |

Rig Activity Report 17 May 2013

| Location | Week of 5/17 | Week +/- Ago | Week +/- Ago | Year Ago |
|----------------|--------------|--------------|--------------|----------|
| Land | 1693 | -3 | 1696 | -224 |
| Inland Waters | 24 | 1 | 23 | 2 |
| Offshore | 52 | 2 | 50 | 5 |
| U.S. Total | 1769 | 0 | 1769 | -217 |
| Gulf of Mexico | 49 | 2 | 47 | 3 |
| Canada | 123 | 5 | 118 | 0 |
| N. America | 1892 | 5 | 1887 | -217 |
| | | | | 2109 |

Activity by Water Depth Information current as of Monday, 13 May 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) May | Close(Mid) April | Change | Change % | High | 52 week | Low |
|--|----------|-------------------|---------------------|--------------|--------------|---------------|---------------|-----|
| Diversified, Production Support and Equipment Companies | | | | | | | | |
| Baker Hughes, Inc. | BHI | 46.14 | 45.04 | 1.10 | 2.4% | 50.97 | 37.08 | |
| Cameron Intl. Corp. | CAM | 63.60 | 59.69 | 3.91 | 6.6% | 67.42 | 38.38 | |
| Drill-Quip, Inc. | DRQ | 92.22 | 79.52 | 12.70 | 16.0% | 93.38 | 57.27 | |
| Halliburton Company | HAL | 44.06 | 39.20 | 4.86 | 12.4% | 44.57 | 26.28 | |
| Tenaris SA | TS | 43.65 | 39.13 | 4.52 | 11.6% | 44.48 | 29.79 | |
| Newpark Resources, Inc. | NR | 11.43 | 9.48 | 1.95 | 20.6% | 11.62 | 5.19 | |
| Schlumberger Ltd. | SLB | 75.78 | 72.79 | 2.99 | 4.1% | 82.00 | 59.12 | |
| Superior Energy Services, Inc. | SPN | 28.27 | 23.86 | 4.41 | 18.5% | 28.84 | 17.54 | |
| Weatherford International, Inc. | WFT | 13.54 | 12.28 | 1.26 | 10.3% | 14.04 | 8.84 | |
| Deep Down, Inc. | DPDW | 1.85 | 1.65 | 0.20 | 12.1% | 2.18 | 1.00 | |
| FMC Technologies | FTI | 56.55 | 49.47 | 7.08 | 14.3% | 56.82 | 36.89 | |
| Total Diversified, Production, Support and Equipment..... | | 477.09 | 432.11 | 44.98 | 10.4% | 496.32 | 317.38 | |
| Geophysical / Reservoir Management | | | | | | | | |
| Dawson Geophysical Company | DWSN | 36.03 | 29.55 | 6.48 | 21.9% | 36.67 | 20.20 | |
| Mitcham Industries, Inc. | MIND | 15.15 | 14.80 | 0.35 | 2.4% | 19.83 | 11.51 | |
| Compagnie Gnrale de Gophysique-Veritas | CGV | 24.49 | 21.64 | 2.85 | 4.5% | 34.84 | 20.00 | |
| Total Geophysical / Reservoir Management..... | | 75.67 | 65.99 | 9.68 | 14.7% | 91.34 | 51.71 | |
| Offshore Drilling Companies | | | | | | | | |
| Atwood Oceanics, Inc. | ATW | 52.55 | 46.69 | 5.86 | 12.6% | 55.49 | 34.93 | |
| Diamond Offshore Drilling, Inc. | DO | 70.50 | 66.68 | 3.82 | 5.7% | 76.85 | 55.83 | |
| ENSCO International, Inc. | ESV | 61.83 | 53.78 | 8.05 | 15.0% | 65.82 | 41.63 | |
| Nabors Industries, Inc. | NBR | 15.90 | 15.18 | 0.72 | 4.7% | 18.24 | 12.40 | |
| Noble Drilling Corp. | NE | 39.94 | 35.35 | 4.59 | 13.0% | 41.49 | 28.73 | |
| Parker Drilling Company | PKD | 4.45 | 3.99 | 0.46 | 11.5% | 6.18 | 3.61 | |
| Rowan Companies, Inc. | RDC | 34.78 | 31.77 | 3.01 | 9.5% | 39.40 | 28.62 | |
| Transocean Offshore, Inc. | RIG | 54.96 | 48.91 | 6.05 | 12.4% | 59.50 | 39.32 | |
| Total Offshore Drilling..... | | 334.91 | 302.35 | 32.56 | 10.8% | 362.97 | 245.07 | |
| Offshore Contractors, Services, and Support Companies | | | | | | | | |
| Helix Energy Solutions Group, Inc. | HLX | 24.91 | 21.31 | 3.60 | 16.9% | 25.49 | 14.90 | |
| Gulf Island Fabrication | GIFI | 20.41 | 20.25 | 0.16 | 0.8% | 31.69 | 18.76 | |
| McDermott International, Inc. | MDR | 8.81 | 10.55 | -1.74 | -16.5% | 13.56 | 8.78 | |
| Oceaneering International | OII | 73.93 | 60.05 | 13.88 | 23.1% | 74.41 | 43.22 | |
| Subsea 7 SA | SUBCY.PK | 21.73 | 22.00 | -0.27 | -1.2% | 26.40 | 18.16 | |
| Technip ADS | TKPPY.PK | 27.29 | 25.87 | 1.42 | 5.5% | 30.21 | 21.88 | |
| Tetra Technologies, Inc. | TTI | 9.39 | 8.83 | 0.56 | 6.3% | 10.74 | 5.35 | |
| Cal Dive International, Inc. | DVR | 1.97 | 1.69 | 0.28 | 16.6% | 1.00 | 3.08 | |
| Total Offshore Contractors, Service, and Support..... | | 188.44 | 170.55 | 17.89 | 10.5% | 213.50 | 134.13 | |
| Offshore Transportation and Boat Companies | | | | | | | | |
| Seacor Holdings, Inc. | CKH | 76.91 | 72.62 | 4.29 | 5.9% | 100.00 | 71.59 | |
| Gulfmark Offshore, Inc. | GLF | 45.70 | 37.72 | 7.98 | 21.2% | 46.09 | 27.17 | |
| Bristow Group | BRS | 66.09 | 61.91 | 4.18 | 6.8% | 67.13 | 37.92 | |
| PHI, Inc. | PHII | 33.71 | 30.00 | 3.71 | 12.4% | 34.50 | 22.43 | |
| Tidewater, Inc. | TDW | 56.58 | 49.41 | 7.17 | 14.5% | 57.10 | 42.33 | |
| Trico Marine Services, Inc. | TRMAQ.PK | 0.04 | 0.04 | 0.00 | 0.0% | 0.11 | 0.01 | |
| Hornbeck Offshore | HOS | 51.64 | 41.79 | 9.85 | 23.6% | 52.86 | 31.68 | |
| Total Offshore Transportation and Boat | | 330.67 | 293.49 | 37.18 | 12.7% | 357.79 | 233.13 | |

Monthly Stock Figures & Composite Index

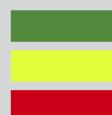
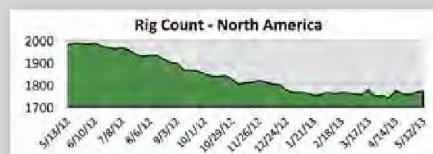
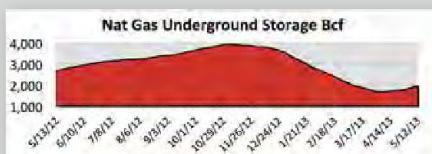
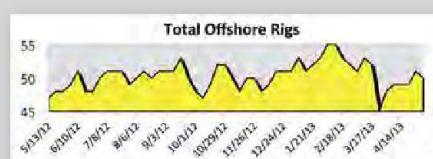
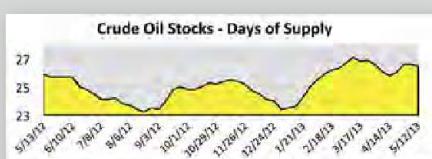
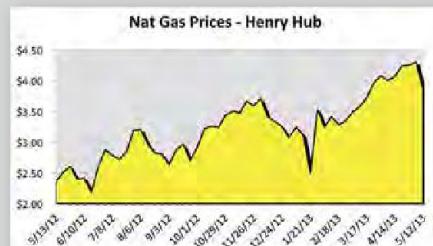
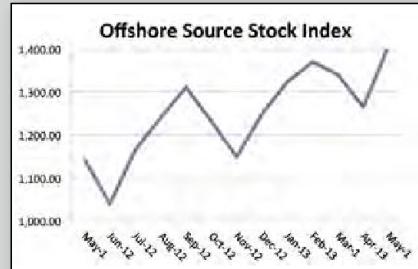
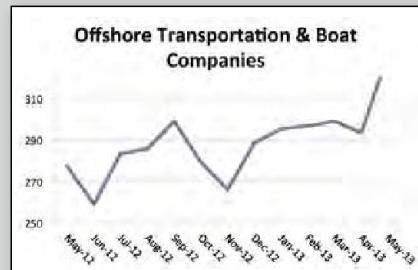
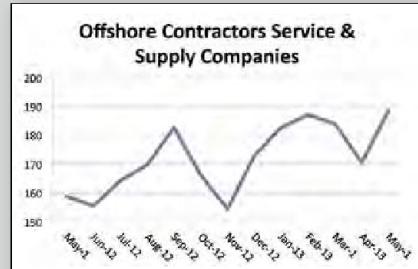
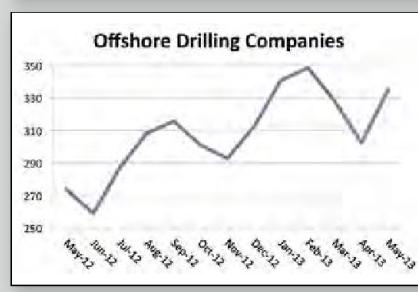
| Industry | Close(Mid) May | Close(Mid) April | Change April | Change % May | High 52 week | Low 52 week |
|---|-------------------|---------------------|-----------------|--------------------|-----------------|----------------|
| Diversified, Production Support & Equipment Companies | | | | | | |
| Total Diversified, Production, Support and Equipment | 477.09 | 432.11 | 44.98 | 10.4% | 496.32 | 317.38 |
| Total Geophysical / Reservoir Management | 75.67 | 65.99 | 9.68 | 14.7% | 91.34 | 51.71 |
| Total Offshore Drilling | 334.91 | 302.35 | 32.56 | 10.8% | 362.97 | 245.07 |
| Total Offshore Contractors, Service and Support | 188.44 | 170.55 | 17.89 | 10.5% | 213.50 | 134.13 |
| Total Offshore Transportation and Boat | 330.67 | 293.49 | 37.18 | 12.7% | 357.79 | 233.13 |
| Total Offshore Source Index | 1,406.78 | 1,264.49 | 142.29 | 11.3% | 1,521.92 | 981.42 |

DISCLAIMER

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

Oil & Gas Industry Trends

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



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

Mooring Systems Inc., introduces GP-TRBM, a general purpose, trawl-resistant bottom mount

Mooring Systems, Inc. announces the release of its newest version of trawl-resistant bottom mounts for deployment of Doppler profilers and other instrumentation payloads.

This new GP-TRBM is a culmination of improvements over a span of 15 years. "We have listened to our customers' feedback and requirements and now produce our best trawl resistant bottom mount ever."

The new GP-TRBM utilizes a molded, high-density urethane material that is virtually indestructible. The molded cover produces a consistent part and allows for easy modification to add custom brackets and instrumentation cut-outs. In addition to the new cover, the urethane rope canister was also redesigned to accommodate a larger pop-up recovery float now providing 40 lb (18 kg) of buoyancy. This added buoyancy by a factor of two will improve lift of the recovery float to the surface in high current conditions and help overcome possible bio-fouling obstructions.

Previous improvements include a center lifting post and centrally located ballast for improved stability during lifting operations on deck or when submerged and lowering to the seabed. Other improvements included

mounting brackets that attach the cover to its base and allow for easier removal for servicing.

Variations of the GP-TRBM include a diver serviceable configuration and a deepwater version with internal flotation and expendable concrete anchors.

For more information, visit www.mooringsystems.com.



DOE, Inc. announces two new autonomous/WiFi-controlled USVs

DOE, Inc. (Deep Ocean Engineering) is proud to announce it has added two new vehicles to its already impressive and diverse product line, the dual hull H-1750 and the mono hull I-1650. Both vehicles are controlled wirelessly by a dedicated WiFi link and have ranges up to 2 km. For user-controlled navigation, HD video is transmitted back to the pilot box mounted monitor and is used for obstacle avoidance. GPS-enabled autonomous movement is also an option where the flip of a switch will send the vehicle onto a predetermined path for a multitude of sampling techniques, such as SVP, ADCP, and CTD or even harbor security.

The H-1750 is a Catamaran-style vessel with two V-bow boat hulls (not pontoons) that are perfect for navigating rough or choppy seas. The thrusters are fixed in place rather than articulating, which makes for a rugged design and ease of handling comparable to ROVs. The two boat hulls have floatation fore and storage aft where powerful, long lasting Li-ion

batteries are stored. For shipment, disassembly is as easy as removing the thrusters and storing them within the boat hulls, removing four latches, and unscrewing eight-thumb screws to completely take apart this vehicle. Shipping is in three lightweight aluminum cases and can easily be checked as luggage for a plane flight. The Catamaran design makes it easy to add a multitude of third party options such as sonar or even a winch.

The I-1650 is a mono hull style vessel with a standard V-bow design boat hull. Per Sales Engineer A.J. Cecchettini, "Make no mistake, this is not a model or toy RC boat, it's an actual boat built to the same specifications as manned surface vessels, but in a scaled down version."

Each new model is also scalable; be on the lookout for larger and smaller versions soon. These models were a hit at Ocean Business 2013 in South Hampton, UK and, at their price point, they are proving to be a well sought after addition to the DOE family.

For more information, visit www.deepocean.com.



AML Oceanographic introduces new profiling instrument

AML Oceanographic of Sidney, Canada is pleased to introduce a new profiling instrument. Base•X is an entry-level-shallow-water logging instrument that offers best-of-breed performance at an attractive price. Designed for profiling in coastal waters, the instrument includes a shackle, a sensor cage, and an LED status indicator to simplify deployment preparation. High-speed 25-Hz sampling ensures data resolution.



Like all other X•Series instruments, Base•X uses Xchange™ field-swappable sensors. Base•X works with conductivity, sound velocity, temperature, pressure, and turbidity Xchange™ sensors. This means that sensor heads can be swapped and shared with other instruments, regardless of instrument size or type, providing flexibility of sensor payload and streamlined calibration.

Base•X's compact size and compatibility with AML's Xchange™ sensor-head architecture make it the logical choice for today's shallow-water hydrographic surveyor.

For more information, visit www.amloceanographic.com.

Aquatic set to launch 1500Te carousel

Aquatic Engineering & Construction Ltd, an Acteon company, will be launching this summer its greatly anticipated new carousel, the AQCS-01A-1500.

The AQCS-01A-1500 can take a product load of up to 1,500 Te; it has a built-in tensioner with a maximum line pull of 5 Te to maintain a product tension on the reel at all times. In addition, this tensioner is mounted on a level-wind tower that will ensure proper spooling on and off the carousel. With a reel diameter of 12 m and a variable hub diameter, Aquatic has built

a system that can be easily mobilized onto most installation vessels of opportunity available in the market today.

Aquatic is globally renowned for laying and retrieving flexible and semi-rigid products on the seabed, and has proven ability in shallow and deep water, and extensive experience of off- and onshore

installations, transpooling, recovery, and decommissioning. From its custom-built workshop and yard facility in Aberdeenshire, Scotland, clients are offered a complete storage, inspection, and management service for spare pipeline and umbilical products and reels while Aquatic's own extensive range of equipment includes powered-reel drive systems, tensioners, and storage reels. This kit is modular in design, making it highly flexible, able to be dismantled, and easily transported by road or sea in standard containers to anywhere in the world; for clients this means faster, more cost-effective mobilization and demobilization, an essential component of success for any commercial project.

For more information, visit www.aquaticsubsea.com.



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AN OCEAN IN COMMON

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- Technical/Scientific sessions, tutorials & workshops
- Ultra-Deep Ocean Track with renowned presenters
- A celebration of the MTS 50th Anniversary
- Student Opportunities: Discounted Rates, Session Chairs, Poster Competition
- Underwater Film Festival on two nights
- Gala on the Carrier U.S.S. Midway



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Caldwell

Marine International, LLC

Caldwell Marine International is a heavy marine construction firm specializing in the installation of submarine power and fiber cables.

Caldwell Marine International, LLC is seeking applicants for the following positions:

SUBSEA ENGINEERING MANAGER (FULL TIME)

The Subsea Engineering Manager will be responsible for maintaining, repairing, and operating subsea and cable installation equipment including:

- Subsea Jet Sleds and Plows
- Hydraulic Machinery - Hydraulic, Electrical, and Mechanical Control Systems
- Linear Cable Engines
- Dynamic Positioning System Controls
- Various Tension Measurement Systems
- Cable Coiling Arms

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

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

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

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

FIELD ENGINEER / PROJECT COORDINATOR FOR THE MARINE CONSTRUCTION INDUSTRY

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

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

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

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

CALDWELL MARINE INTERNATIONAL, LLC
1433 Highway 34, South
Farmingdale, New Jersey 07727
marc.dodeman@caldwellmarine.com

Product News

Prevco Subsea takes ceramic enclosures to new depths



Prevco Subsea is now designing and producing ceramic enclosures for 6,000-m deployment. Ceramic, although brittle on impact, is a remarkably strong substance under pressure, where its strength increases with depth, making it a strong but lightweight alternative to other materials. Ceramic enclosure assemblies can be lighter in water and less expensive than an equivalent Titanium enclosure. Ceramic also has the benefit of being non-magnetic, having low electrical and high thermal conductivity and corrosion resistance, making it the perfect alternative to heavier, more costly materials.

For more information, visit www.prevco.com.

Fugro Geos introduces new airborne ocean current measurement system

Combining recent advances in remote sensing and aerial survey, a new system for airborne current measurement has been developed to bridge the gap between satellite- and vessel-based ocean current measurements. ROCIS, the Remote Ocean Current Imaging System, combines Fugro expertise in airborne survey and operational oceanography with state-of-the-art technology and oceanographic research from Areté and Associates.

ROCIS uses an innovative surface current measurement technique to significantly enhance understanding of current phenomena in coastal and offshore areas. Using high-resolution airborne photography, the system images surface waves and retrieves surface current data from the Doppler shift of successive surface wave images. Current data can be collected at altitudes between 3,000 and 10,000 ft (900 and 3,000 m).

Over a wide operational area, near real-time synoptic surface current data are provided, while fine resolution is available for assessing smaller-scale current features. The data can be used in combination with satellite, numerical model, and *in situ* measurements, offering a better understanding of offshore current features and enhancing operational planning. Information can also support the calibration and validation of predictive models.

The collection system—comprising two 11-MP panchromatic digital cameras and an inertial navigation system—can be quickly installed on any survey aircraft with a 19-in. photogrammetric hole. Trials were successfully conducted in October 2012 using a twin-engine aircraft. Preferred operating altitudes and weather impacts, including cloud levels, were assessed and the trials successfully demonstrated system capability with stationary measurement infrastructure in the Gulf of Mexico.

In addition to significant cost savings, the key advantages of

ROCIS over existing measurement techniques include wider daily coverage, reduced data collection periods, rapid mobilization, and better measurement resolution. Unlike vessel-based techniques, as the data are collected in the top 5 m of the water column, the system measures the strongest currents.

Offshore oil and gas operators are set to benefit from ROCIS, utilizing the system's accurate information to mitigate against the impact of ocean currents on exploration, development, and production activities. Other applications of the airborne system include oil spill events, where the detailed, wide-area information can be used for response operations and for validation of oil spill models. Search and rescue operations could use current mapping and information of surface drift patterns to aid emergency responders.

For more information, visit www.geos.com/rocis.

Teledyne Oil & Gas announces the release of the Teledyne Cormon PT Sensor

The PT Sensor is an innovative, subsea pressure and temperature sensor that provides up to 0.025% full-scale pressure accuracy across a temperature range of -40°C to 180°C. The PT Sensor has been designed to provide full life of field reliable operation in process pressures up to 15 kPSI and in water depths of up to 3,000 m. Having completed a detailed product development and qualification program, including successful pre-launch subsea field trials, TOG are pleased to announce that the PT Sensor range will be commercially available from 1 June 2013.

Teledyne Cormon have been designing and manufacturing high-accuracy corrosion, erosion, pressure, and temperature monitoring devices for more than 10 years from its state-of-the-art manufacturing facility in Worthing on the south coast of England. The PT Sensor is a natural next step in developing TOG's subsea sensing portfolio and utilizes the design philosophies and technologies that have enabled TOG to deliver "best in class" solutions to the oil and gas industry for more than a decade.

The PT Sensor can be supplied in a range of standard configurations (other options may be available upon request) to meet a variety of process challenges. The range includes material options: duplex, super duplex, and Inconel 625 (wetted parts are Inconel 625); Accuracy options: 0.1%FS, 0.05%FS, and 0.025%FS; communication options: CANBus (SIIS L2), Modbus (RS485), 4-20mA; and flange sizes: 1-11/16", 2-1/16". A single or dual redundancy option is also available.

For more information, visit www.teledyneoilandgas.com.



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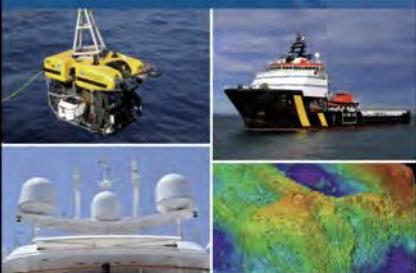
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Product News

MacArtney workshop on wheels

Marking the latest addition to its portfolio of service and support initiatives, MacArtney Inc. has recently acquired and outfitted a state-of-the-art Mobile Workshop.

Operating out of Houston, this flexible and versatile service platform enables MacArtney Inc. to bring underwater technology service, support, and technical capabilities to customer locations and facilities in any corner of the Gulf of Mexico area. Here, the Mobile Workshop enables MacArtney's certified technicians to perform a vast array of installation, repair, and maintenance tasks, including cable termination work, slip ring repair, electrical and fiber optical tests—all conveniently managed within a fully controlled environment.



This actual mobilization of service capabilities is part of MacArtney's efforts to put action behind its commitment to providing local access to global support. According to MacArtney Inc. president Lars F. Hansen, "MacArtney is experiencing an ever-increasing need to be close to customers. And with the new mobile workshop, we are able to minimize downtime of equipment and offer fast and flexible support and a mobile controlled workshop environment with specialist tools to underwater technology operators—when and where they need it."

For more information, visit www.macartney.com.

Kongsberg Mesotech Ltd. releases ultra high-resolution sonar head

Kongsberg Mesotech Ltd., the Canadian subsidiary of Kongsberg Maritime, is pleased to announce the release of the new 1171 Series Multi-Frequency High-Resolution Fan/Cone Sonar Head, specifically designed to produce the highest resolution sonar images possible. Ideal for imaging and profiling, the scanning sonar head is intended for applications where data and

image clarity supersede any other requirement, including underwater construction support, site clearance, and bridge and pier inspection.

The sonar head supports multi-frequency operation on both the fan and cone transducers. The operating frequency of the cone transducer can be selected by choosing one of four different pre-set frequencies (675/900/1200/1300 kHz). The operating frequency of the fan transducer can be selected by choosing one of three different pre-set frequencies (900/1000/1100 kHz) or by choosing "tunable" mode where the frequency can be changed in 5-kHz increments. Increasing the frequency will result in narrower beams and sharper data.

"This new sonar head operates at high frequency to provide ultra-fine resolution data, delivering a superb image quality typical of Mesotech scanning sonars," said Bogdan Constantinescu, Product Group Manager, Kongsberg Mesotech Ltd. "Not only is there increased resolution, but the multi-frequency capability opens up new opportunities for exploring the texture and other frequency-dependent characteristics of smaller acoustic targets in the underwater environment."

Kongsberg Mesotech Ltd. has also released a new version of the MS 1000 processing software (Version 5.23) that supports all multi-frequency sonar heads with selectable and tuneable frequencies and is required to access the features of the new multi-frequency high-resolution sonar head.

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

McLane Research Laboratories announces Imaging FlowCytobot Sampler

McLane Research Laboratories, Inc. announces the availability of a new *in situ* sampler. The Imaging FlowCytobot (IFCB) is an automated submersible imaging flow cytometer that generates images of particles in-flow taken from the aquatic environment. Depending on the target population, the IFCB can generate around 10,000 high-resolution images per hour.

The IFCB uses a combination of flow cytometric and video technology to capture high-resolution (1 µm) images of suspended particles in the size range <10 to 100 µm (such as diatoms and dinoflagellates). The instrument continuously samples at a rate of 15-ml of seawater per hour.



Laser-induced light scattering from individual particles are measured and used to trigger targeted image acquisition; the optical and image data are then transmitted to shore in real time.

Images collected during continuous monitoring can be processed externally with automated image classification software. Images can be classified to the genus or even species level with demonstrated accuracy comparable to that of human experts.

The IFCB can be used for bench top analysis as well as for pier and other wired deployments. The housing and fluidic components are rated to 40 m. Extended unattended deployments (6 to 9 months) are possible as IFCB's automated operation includes antifouling procedures and periodic standard analysis to monitor instrument performance.

For more information, visit www.mclanelabs.com.

New advanced DP visualization software from Veripos

Veripos, world leaders in provision of high-precision GNSS positioning solutions for the offshore oil and gas industries, has extended its range of services for Dynamic Positioning (DP) applications with introduction of a new advanced visualization software package, Orion.

Designed to provide simplified, clear imagery while ensuring rapid and straightforward configuration via either a touch-screen interface or keyboard and mouse, the package displays essential information and statistics in such a way as to enable operators to make speedy, informed decisions aboard any type of DP vessel or rig. Integrating key views such as GNSS plots for both GPS and Glonass networks and correction delivery satellites, day and night display modes also include time series plots of position calculations as well as traffic light indicators showing overall system health.

Development of Orion has been carried out by Veripos in association with informed feedback from DP users of its worldwide positioning services ranging from operators of field-support vessels to those for deep-water drilling and construction support incorporating diving and ROV operations. As a result, a number of

leading operators have already adopted the package as an integral part of their activities using Veripos LD6 receivers or standalone PCs interfaced to LD5 units.

For more information, visit www.veripos.com.

Ocean Sonic's launches icTalk Smart Projector

This calibrated instrument outputs sounds over the 10 to 200-kHz range, giving more than three octaves of flat response and low distortion. Peak output is 140 dB re.1uPa @1m.

The small, hand-held device runs for days on its internal battery or can be powered through its data cable. Users can create custom sounds with the combination of tones, sweeps, and pauses available.

The instrument has been under beta test for the past 3 months, and feedback has all been positive. One of our users has specified its use in all future deployments.

Ocean Sonics sees the icTalk as a powerful tool for:

- Underwater acoustic system QC;
- A sound check for acoustic recorders; and
- Sea mammal sound simulator.

For more information, visit www.oceansonics.com.

Scantek, Inc. Launches ScanMonitor™

ScanMonitor™ is a complete construction or community noise monitoring system composed of a sound level meter, real-time datalogger, communications, enclosure, and software to process the results. Data are stored on high-capacity local memory and also can be transmitted in real time by GSM, WiFi, or Ethernet connections. ScanMonitor™ can execute auto-diagnosis procedures and provide alerts when service is needed and can be used for permanent, semi-permanent, or mobile stations. Power can be provided by mains, battery, or solar panels.

ScanMonitor™ uses Rion NL-42EX Type 2 or Rion Type 1 NL-52EX Sound Level Meters, allows for remote data collection from the real-time datalogger and is accessible via wireless or wired LANor GPRS. It contains an on-board web server so sound level meter, parameters, sampling time, IP, VPN, DNS, and user logo are all configurable. Using Rion, 10 samples per second can be continuously recorded. Measurement metrics can include L_p, L_{eq}, LE, L_{max}, L_{min}, and five selectable L_n. Web-based software processes and displays results, so setup is easy.

For more information, visit www.scantekinc.com.

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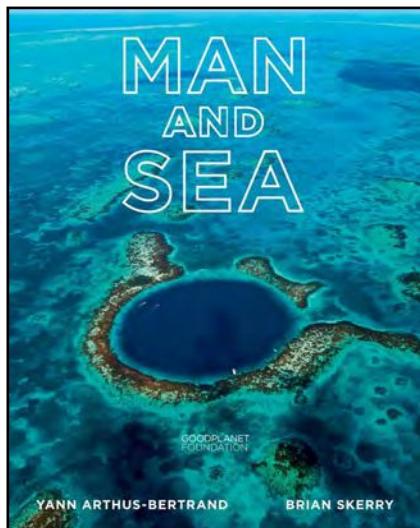
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Man and Sea

By Yann Arthus-Bertrand and Brian Skerry



Spanning from the Arctic to the tropics, from large-scale views of Australia's barrier reef to close-up images of sea turtles, *Man and Sea* is a compelling, entirely unique journey through a fascinating world. Spectacular aerial images by Yann Arthus-Bertrand and striking underwater photographs by Brian Skerry offer a top-to-bottom tour of the world's oceans, while the enlightening text covers the sea's critical mechanisms, from currents to food chains. Inspiring interviews of some of the world's most respected researchers and activists also offer cutting-edge insight into the many challenges facing the oceans today, such as overfishing and pollution. Exploring the critical and ever-evolving relationship between mankind and the ocean, *Man and Sea* is an unforgettable portrait of the global issue of sustainable development.

Yann Arthus-Bertrand is the award-winning photographer and author of more than 40 books, including the international bestseller *Earth From Above*, which has sold more than 3 million copies. Brian Skerry is a photographer renowned for creating thrilling underwater images for magazines such as *Sports Illustrated*, *BBC Wildlife*, *GEO*, *Smithsonian*, and *Esquire*, among many others. He is the author of the book *Ocean Soul*.

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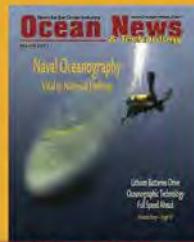
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June 18-20, 2013
UDT - Undersea Defense Technology
Hamburg, Germany
www.udt-global.com/

June 19-20, 2013
Ship Noise and Vibration Conference
London, UK
www.imarest.org/ShipNoise

June 25-27, 2013
Seawork International 2013
South Hampton, UK
www.seawork.com

July 23-26, 2013
Hydrovision International 2013
Denver, Co
www.hydroevent.com

August 12-15, 2013
AUVSI's Unmanned Systems N.A.
Washington, D.C.
www.auvishow.org

September 3-6, 2013
Offshore Europe Oil & Gas
Aberdeen, UK
www.offshore-europe.co.uk

September 22-27, 2013
SEG Annual Meeting
Houston, TX
www.seg.org

September 23-27, 2013
Oceans '13 MTS IEEE
San Diego, CA
www.oceans13mtsieesandiego.org

September 30-October 2, 2013
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New Orleans, LA
www.spe.org

October 8-9, 2013
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www.dynamic-positioning.com

October 9-13, 2013
International Workboat
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www.workboat.com

October 22-24, 2013
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www.deepoffshoretchnology.com

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Ocean Business breaks records for fourth consecutive show

Business was booming at Ocean Business 2013 from 9 to 11 April 2013. The show was extremely successful, with an unbelievable 29% increase in visitor numbers from the last show in 2011. Approximately 4,111 visitors attended over the 3 days, 38% from outside of the UK, boasting a truly international show representing a total of 65 countries.

The show's director, Versha Carter, explains, "We are delighted with the feedback from this year's Ocean Business. Not only has it been the biggest and most successful Ocean Business yet, but many exhibitors have said it is the best show they've ever been to!"

Held at the National Oceanography Centre (NOC) in Southampton, halls were bursting with visitors, and stands were crowded to such a degree that exhibitors had a non-stop stream of interest for the 3 days of the show. Ocean Business already has an outstanding reputation for its training and demonstration program where visitors can actually test drive equipment, but this year's show exceeded expectations; with 2,256 bookings for the 173 workshops—the test tank, dockside, and vessel demonstrations were overflowing with visitors, and many classroom sessions were full to capacity.

This year, for the first time, Ocean Business incorporated a number of important associated industry events. Versha Carter explains, "This was an exciting move for Ocean Business and came from the industry itself. It is fantastic that Ocean Business is seen as a focal point for the industry; organisations came to us asking if they could use the show as a platform for some really high-profile events."

The associated industry events included the International Federation of Surveyors (FIG) and International Hydrographic Organization (IHO), which jointly ran a high-profile workshop aimed at setting a forward-looking strategy for the "Blue Economy."

Ship noise and vibration conference

It is well understood that excessive vibration—whether engine, propeller, or other machinery—reduces the life expectancy of machinery and equipment as well as inducing structural fatigue.

The Institute of Marine Engineering, Science and Technology's (IMarEST) second Ship Noise and

Vibration Conference (London, 19 to 20 June 2013) will fully explore all the machinery, HVAC, and hydrodynamic influences on the problems and offer solutions, not least the impact of the problem on humans and marine life, which is expected to be the next big regulatory challenge for shipping.

"This second conference builds on the success of the inaugural event in the series held 3 years ago," explains IMarEST's chief executive, David Loosley. "Science and technology have moved on in that time; so too has the need for action. We look forward to welcoming shipowners, operators, and managers; flag and port states; ship-builders and shiprepairs; class societies; specialist manufacturers; and testing providers to 2 stimulating days of discussion."

Chaired by Professor John Carlton, FREng, City University London, the 2nd IMarEST Ship Noise and Vibration Conference comprises four sessions over 2 days looking at measurement; propulsor cavitation, vibration, and noise; shipboard vibration and noise; and radiated noise and the marine environment.

For more information, visit www.imarest.org/ShipNoise.

Hydroid opens registration for REMUS 100 AUV training

Hydroid, Inc., a subsidiary of Kongsberg Maritime, the leading manufacturer of Autonomous Underwater Vehicles (AUVs), will hold an Open Enrollment Training session during the week of 5 to 9 August 2013 in Pocasset, Massachusetts. Training will focus on basic operations and maintenance as Hydroid's highly-experienced technicians walk participants through all aspects of the REMUS 100 system.

The training course is an intensive 5-day program designed to provide a maximum of 10 participants with hands-on experience in the basic system specifications, components, capabilities, and limitations of the REMUS system. The training is designed for a variety of skill levels, from beginners to experienced operators looking for a refresher. All participants will come away from the program with the skills necessary to properly operate the REMUS system. Hydroid also offers customized 2- to 10-day training sessions based on customers' unique training needs.

For more information on Open Enrollment Training, please contact Kathy Forrester at 508-296-6162.

2013 EDITORIAL CALENDAR

January/February 2013

Editorial: Decommissioning & Abandonment, Subsea Fiber Optic Networks
Distribution: Decommissioning & Abandonment Summit, NACE, Offshore Mediterranean, U.S. Hydro
Product Focus: Navigation, Mapping & Signal Processing

March

Editorial: Oceanology & Meteorology, Maritime Security
Distribution: Ocean Business, SubOptic 2013
Product Focus: Ocean Instrumentation, Diver Detection Systems

April

Editorial: Offshore Technology, Ocean Mapping & Survey
Distribution: GMREC, IDGA Maritime Homeland Security, OTC
Product Focus: Connectors, Cables & Umbilicals

May

Editorial: UW Imaging & Processing, Marine Salvage
Distribution: EnergyOcean, Oceans '13 Bergen, Sea Work Intl, UDT
Product Focus: Cameras, Lights & Imaging Sonars

June

Editorial: Workclass ROVs, Deepwater Pipeline & Repair & Maintenance
Distribution: TBA
Product Focus: Subsea Tools & Manipulators

July

Editorial: AUVs & Gliders, Marine Construction
Distribution: AUVSI
Product Focus: Tracking & Positioning Systems, Seismic Monitoring

August

Editorial: Defense & Naval Systems, Corporate Showcase
Distribution: TBA
Product Focus: Multibeam & Side Scan Sonars

September

Editorial: Ocean Observing Systems, Ocean Renewables
Distribution: Oceans MTS IEEE, SPE ATCE, MREC, MTS Dynamic Positioning,
Product Focus: Buoys & Monitoring Instrumentation

October

Editorial: Offshore Vessels, Offshore Communications
Distribution: International Workboat, LAGCOE, Oil Comm, OTC Brazil, North Sea Decommissioning, AWEA/Offshore Windpower
Product Focus: Acoustic Modems, Releases & Transponders, Marine Communications

November

Editorial: Subsea Inspection, Monitoring, Maintenance, Repair; Subsea Telecom
Distribution: SUBSEA Survey IMMR, Clean Gulf
Product Focus: Handling Equipment, Winches & Control Systems, Battery Technology

December

Editorial: Light Workclass ROVs, Commercial Diving
Distribution: Subsea UK, Underwater Intervention
Product Focus: Diving Equipment & Buoyancy Materials

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People & Company News

Terry Loftis, a veteran of the industry and the director of engineering of Transocean, was appointed chairman of DNV's prestigious Rig Owners' Committee. The members of the committee represent owners and managers of mobile offshore units (MOUs) and floating production units. The objective of the committee is to provide an active forum for the industry to share and discuss current and future developments in technology, practices, and support initiatives that will benefit the industry. Loftis oversees Transocean's engineering services and supports upgrade and major repair projects and new construction of ultra-modern, high-specification drilling units. Loftis has been actively engaged with Transocean's engineering development efforts and newbuild design program for the past decade. His technical involvement with MOUs began as an independent consultant for Transocean in the design and construction of semi-submersible drilling rigs in the mid-80s and he joined Transocean in 1997.

ValvTechnologies, Inc. named **Julie Bodine** as director of global marketing. Bodine will be based in Houston, Texas. Bodine's principle responsibilities include

marketing, communications, branding, and public relations. Underneath this umbrella, her duties will focus on creating, implementing, and measuring the success of comprehensive marketing, communications, and public relations programs designed to enhance the organization's image and position within the industry. In addition, she will ensure the articulation of the image and position of ValvTechnologies while assuring consistent, effective communication internally and externally to all constituencies.

The American Petroleum Institute (API) appointed **Christopher Rager** as the oil and natural gas trade association's director of state relations. Prior to joining API, Rager represented the National Rifle Association as a senior state liaison. Rager has also served by presidential appointment as director of legislative affairs with the U.S. and Foreign Commercial Service and as deputy associate director for the White House Office of National Drug Control Policy, under President George W. Bush.



Bodine

National Oilwell Varco, Inc. said that **Mark A. Reese** resigned as president of rig technology to pursue other business opportunities. "In his 33 years with NOV, Mark has literally worked his way up from the field to become the president of our largest business segment. Along the way, Mark has performed every task we have asked of him in a selfless and exemplary manner," said Pete Miller, chairman and chief executive officer of National Oilwell Varco.

Greene's Energy Group, a leading provider of integrated testing, rentals, and specialty services, said that **Elroy Schaub** will assume a new role as technical sales representative for GEG's testing and services business unit. Based in Lafayette, Louisiana, Schaub will collaborate with engineers, technical scientists, and manufacturers to gain optimal knowledge of products in order to introduce new products to clientele. Prior to his new position, Schaub was part owner and general manager of the Cherokee Services division of GEG. With more than 40 years in the oilfield and an extensive background in drilling, well control, snubbing, and well testing, Schaub's expertise will aid in his sales capabilities.

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- Key Oil & Gas Applications



Steel Market Intelligence

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CDL is pleased to announce its recent hire of **Paul Watson**, who joins the CDL team as vice president of North Americas. Mr. Watson will be a key member of CDL's regional senior management team and will be responsible for managing CDL's North American presence. Mr. Watson comes to CDL with over 25 years of experience in the oil and gas industry and a long record of service to the Royal Navy. Most recently, he was global business development manager for Intermoor, a business that provides foundations and subsea services for rig moves, mooring, and offshore installation services. Prior to Intermoor, Mr. Watson held various senior positions within FORUM Energy Technologies, Subsea Division.



Watson

Saab Seaeye has expanded its international presence by opening an office in Houston, Texas. The company is already the world's largest manufacturer of electric remotely operated underwater vehicles with distributors in 26 countries and over 700 systems sold worldwide. Spare parts for Seaeye's range of commercial ROV and Hybrid AUV systems are currently being located in Houston to strengthen the service provided to existing and future customers in the region. The office is headed by **Chris Roper**, previously Saab Seaeye's North American distributor, who recently relocated to Houston to set up the new operation.

Sonardyne International Ltd. has announced the appointment of **Dr. Ralph Rayner** as its new non-executive chairman. Ralph is currently a non-executive director of the company and will succeed outgoing chairman Barry Clutton on 1 May 2013. Previously finance director and then managing director prior to his appointment as chairman in 2009, Clutton is retiring after 16 years with the company. Rayner is an internationally recognised figure within the offshore and oceanographic industries. He has extensive senior and board level international experience with a diverse portfolio of organizations, including the BMT Group, the U.S. National Oceanic and Atmospheric Administration (NOAA), and Fugro, and is actively engaged with professional and learned



Rayner

societies such as the Institute of Marine Engineering, Science and Technology (IMarEST), the Society for Underwater Technology (SUT), and the Marine Technology Society (MTS).

To facilitate further growth and to support the managing director, BMT ARGOSS (BMT), a subsidiary of BMT Group Ltd, announced the appointment of two new directors. Both directors will help to drive business improvements and further enhance the effective management of the company. **Shane Amaratunga**, whose career with BMT dates back to 2000, will assume the role of director of internal affairs, while **Wilfred Aaldriks** will take the position of director of external affairs.

BMT Scientific Marine Services (BMT), a subsidiary of BMT Group Ltd, is pleased to announce that **Andy Brown** has been appointed as vice president of business development. Brown has worked in the offshore oil and gas sector for over 25 years and has wide ranging experience in business development, marketing, commercial documentation, project management, cost control, corporate finances, and personnel management. His technical experience includes the management, design, and development of numerous multidisciplinary oceanographic projects, including oceanographic data acquisition systems, deepwater oceanographic moorings, and buoyed systems on behalf of governments, oil and gas operators, engineering firms and construction companies worldwide. In his new BMT role based in Houston, he will oversee the development and implementation of sales plans for all geographic regions and participate in identification, promotion, and implementation of new products and services that will best benefit clients.

ABS, the leading provider of classification services to the global offshore and marine industries, announces a change in leadership with the election of **Christopher J. Wiernicki**, currently president and chief executive officer of ABS, to the position of chairman of ABS. This decision was made by the ABS board of directors, who voted at their April meeting to transfer the additional duties of chairman to Wiernicki. Wiernicki, a 20-year veteran of ABS, joined the company in 1993 as vice president of Engineering within the ABS Americas Division. Other senior posi-

tions include president and COO of ABS Europe Ltd., chief technology officer and president and COO of ABS Group of Companies, Inc.

Global offshore survey company UTEC has further strengthened its Asian position with the appointment of a new general manager. **Bob Coutts** has joined the growing team at UTEC Survey Asia Pte Ltd in Malaysia and brings to the role more than 20 years of experience in the Asia Pacific region, most recently as VP of Sonardyne Asia Pte Ltd, Kongsberg Maritime Pte Ltd, and Fugro Geodetic.



Coutts

Gardline Marine Sciences, the world's largest independently owned survey group, and OceanPact, the leading oil spill response company in Brazil, announced the establishment of a joint venture. The new company is to be called Gardline Marine Sciences do Brasil S.A and is a 50/50 joint venture between Gardline Marine Sciences (South America) Ltd and OceanPact Serviços Marítimos Ltda. This strategic alliance will see the two companies sharing their marine expertise and resources in order to pursue marine survey projects in Brazilian waters.

Okeanus Science and Technology, LLC (Okeanus) is pleased to announce the appointment of **Mr. Jacob Marcell** as president as of 1 May 2013. Based out of Houma, Louisiana, Okeanus is an international provider of oceanographic and marine scientific research equipment. Mr. Marcell was appointed president due to his extensive experience and long track record in the U.S. subsea industry. Prior to joining Okeanus, Marcell was president of Mako Technologies, and he has extensive senior experience, including ROV services and tooling and topside and subsea rental equipment and services.

Flexlife, a specialist provider of flexible pipe integrity and engineering services, is expanding into new locations in Houston and targeting U.S. work with a value of nearly £2million in the next financial year. The company, which currently has three members of staff at its U.S. office, is looking to double its workforce when it expands to new location later this month, with options for future growth over the coming 12 to 18 months. Since its opening 18 months ago, the Houston office has seen an annual turnover of around £195,000 (\$300,000) and expects that to rise to nearly £1.9m (\$3 million) for the coming financial year.

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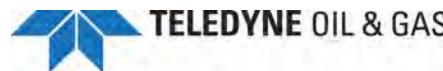
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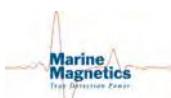
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Contact: Calvin Lwin, Applications Engineering

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.

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Tel: +354 533 6060, Fax: +354 533 6069
E-mail: baldur@star-oddi.com
Website: <http://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.

OFFSHORE EQUIPMENT

Unique System, L.L.C. (USA), Unique Maritime Group's operating entity in the United States, provides Survey and Hydrographic rentals and sales support for products such as Kongsberg C Node Maxi/Mini and Sonardyne G6 Series products. Also in inventory



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A Unique Maritime Group Company

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5355 W. Sam Houston Pkwy. N., Suite 320
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Tel: (713) 937 6193, Fax: (713) 937 8695
E-mail: infous@uniquegroup.com
Website: www.uniquegroup.com

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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.

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Houston, Texas 77084
Tel: (281) 858-6333, Fax: (281) 858-6363
E-mail: sales@rovco.com
Website: www.rovco.com
Contact: Jessica McKenney

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

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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 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 881 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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E-mail: jdemille@marinesonic.com
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E-mail: info@saivas.no
Website: www.saivas.no
Contact: Gunnar Sagstad

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

New Industries (NI) provides quality fabrication services to the offshore oil & gas and marine industries. NI focuses on large diameter, pressure vessels and deepwater subsea equipment such as jumpers, PLETS, PLEMs, suction piles and ROV components.

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Seanic Ocean Systems
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E-mail: contact@seanicusa.com
Website: www.seanicusa.com
Contact: Karen North

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

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E-mail: sales@seacon-ap.com
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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

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

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

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

ROVs



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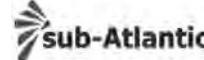
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Tel: 713-329-8230, Fax: 713-329-8299
E-mail: perry.sales@f-e-t.com
Website: www.f-e-t.com/Subsea

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



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Tel: +1 619 450-4000
Fax: +1 619 450-4001
E-mail: Info@SeaBotix.com
Website: www.SeaBotix.com

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



Sub-Atlantic

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Houston, Tx, 77041-4014, USA
Tel: +1 713 329 8730, Fax: +1 713 329 8299
E-mail: sub-atlantic.slaes@f-e-t.com
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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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Tel: (610) 458 3000, Fax: (610) 458 3010
E-mail: info@videoray.com
Website: www.videoray.com
Contact: Brian Luzzi

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

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UNDERWATER VIDEO EQUIPMENT



Kongsberg Maritime Ltd.
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Fax: +44 (0)1224 226598

KONGSBERG

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

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



SIDUS Solutions, Inc.

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

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

WINCHES, HANDLING & CONTROL SYSTEMS



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Contact: Paul Phillips

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Büøyveien 31/33, Bodø, Norway
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- 3** Which categories best describes your business?

(Indicate the primary activity of your organization by placing a 1 next to the category. Place 2, 3 and 4 next to other markets served.)

- | | |
|---|---|
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| B. <input type="checkbox"/> UW VEHICLES / COMPONENTS | P. <input type="checkbox"/> CONSULTING, DATA SERVICES |
| C. <input type="checkbox"/> NAVIGATION / POSITIONING | Q. <input type="checkbox"/> MARINE ELECTRICAL / ELECTRONICS |
| D. <input type="checkbox"/> RESEARCH & DEVELOPMENT | R. <input type="checkbox"/> COMPUTER SERVICES / SOFTWARE |
| E. <input type="checkbox"/> OCEAN INSTRUMENTATION | S. <input type="checkbox"/> OCEAN RENEWABLES |
| F. <input type="checkbox"/> OFFSHORE OIL & GAS | T. <input type="checkbox"/> SUBSEA IRM |
| G. <input type="checkbox"/> COMMUNICATIONS / UTILITIES | U. <input type="checkbox"/> OCEAN OBSERVING |
| H. <input type="checkbox"/> SCIENCE, ENVIRONMENTAL | V. <input type="checkbox"/> SHIPPING / TRANSPORTATION |
| I. <input type="checkbox"/> EDUCATIONAL INSTITUTION / LIBRARY | W. <input type="checkbox"/> SUBMARINE TELECOM |
| J. <input type="checkbox"/> GOVERNMENT MILITARY | X. <input type="checkbox"/> EQUIPMENT RENTAL |
| K. <input type="checkbox"/> GOVERNMENT CIVILIAN | Y. <input type="checkbox"/> MANUFACTURERS' REPRESENTATIVE |
| L. <input type="checkbox"/> MARINE HARDWARE / DECK EQUIP. | Z. <input type="checkbox"/> OTHER (Please specify below) |
| M. <input type="checkbox"/> FISHING INDUSTRY, AQUACULTURE | |
| N. <input type="checkbox"/> SURVEY, MAPPING, EXPLORATION | |

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

- | | |
|--|--|
| 1. <input type="checkbox"/> OWNER / EXECUTIVE | 5. <input type="checkbox"/> BUYER |
| 2. <input type="checkbox"/> MANAGEMENT / PROFESSOR | 6. <input type="checkbox"/> SALES |
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- 5** How many other people will read your issue of ON&T at this location? _____



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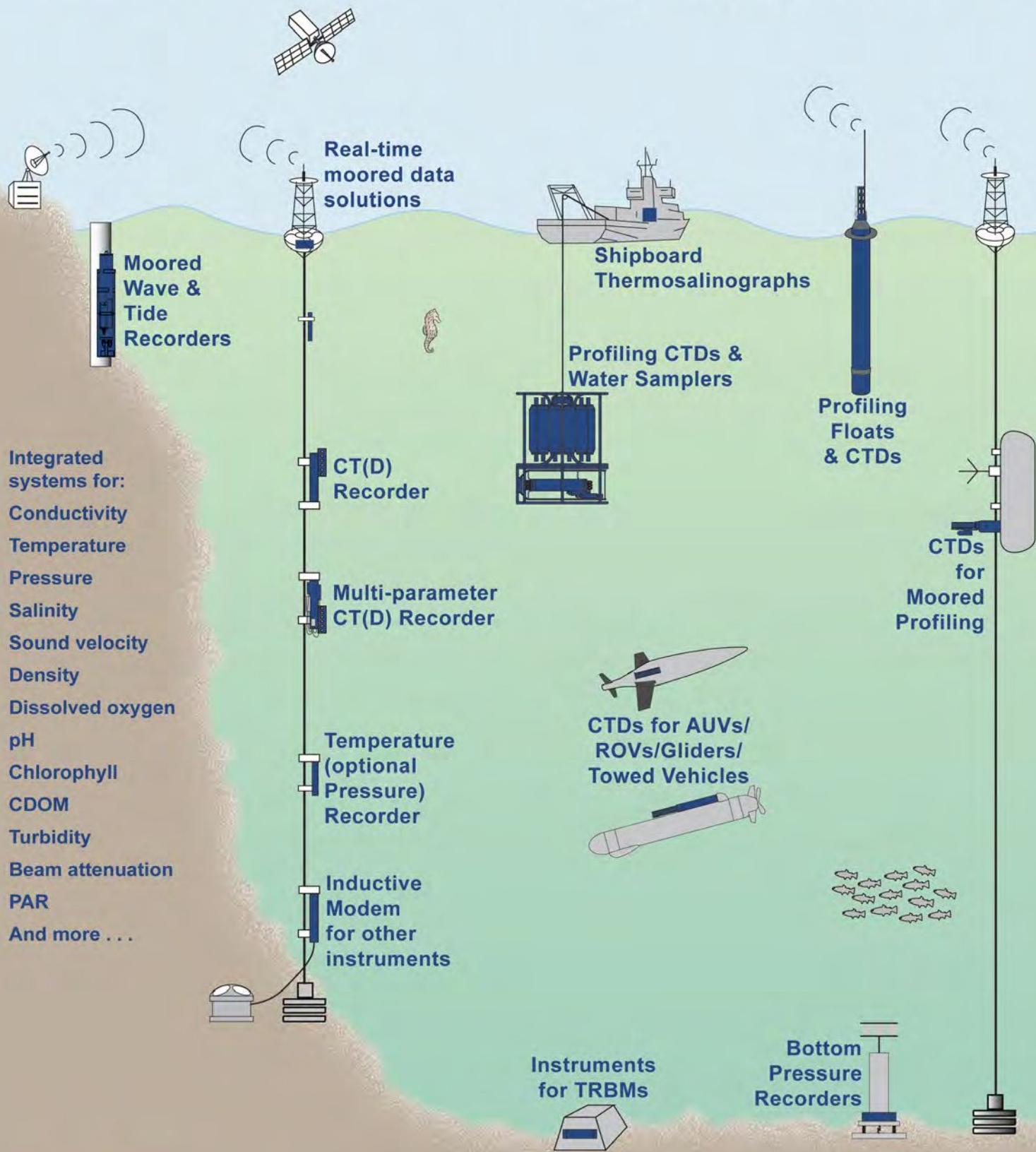
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