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The Race for The Deep

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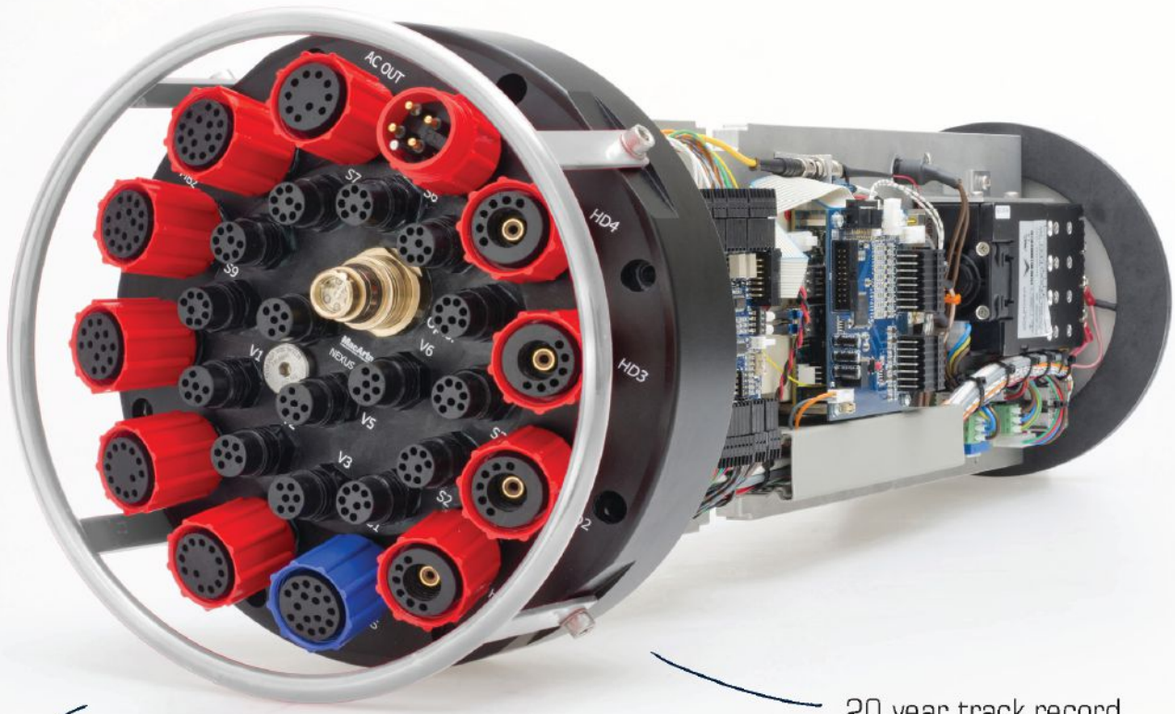

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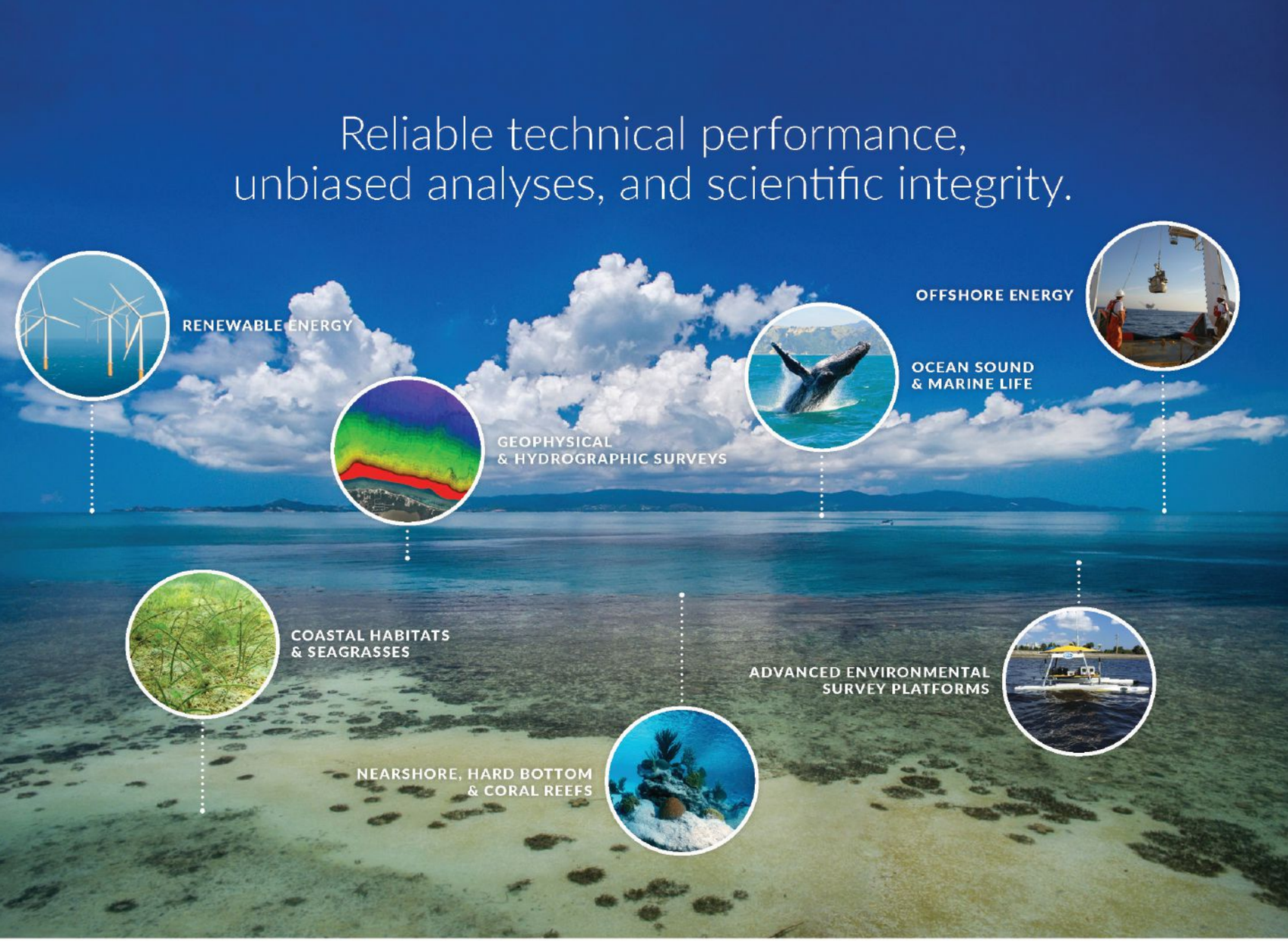

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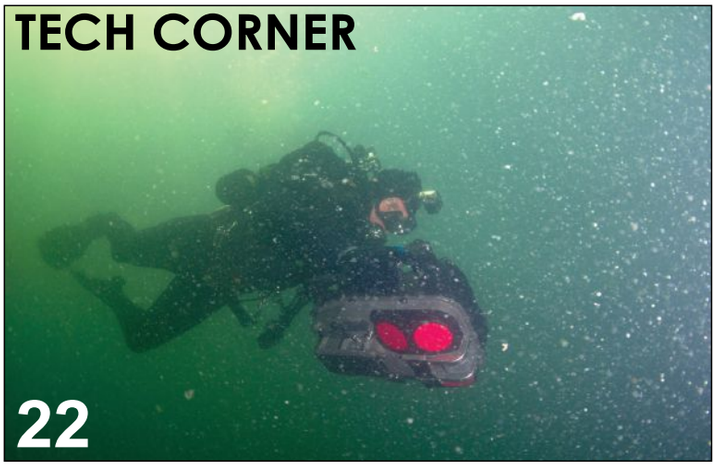

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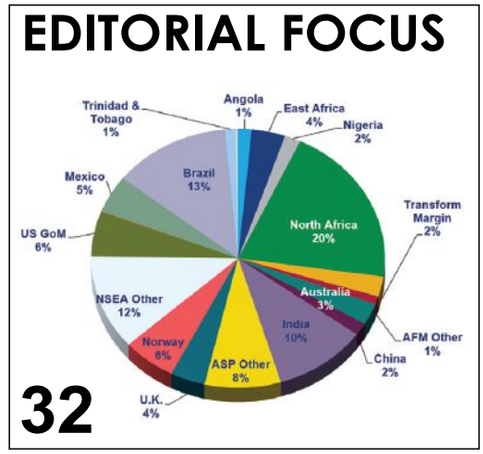

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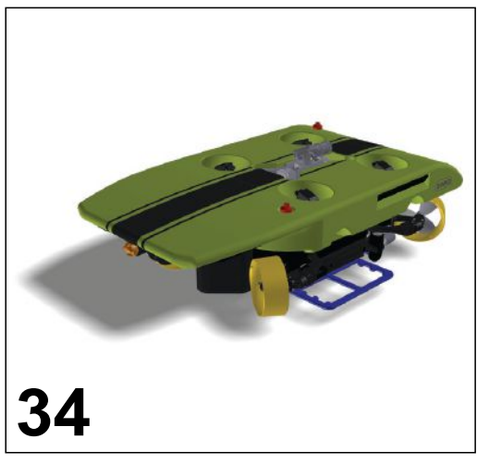

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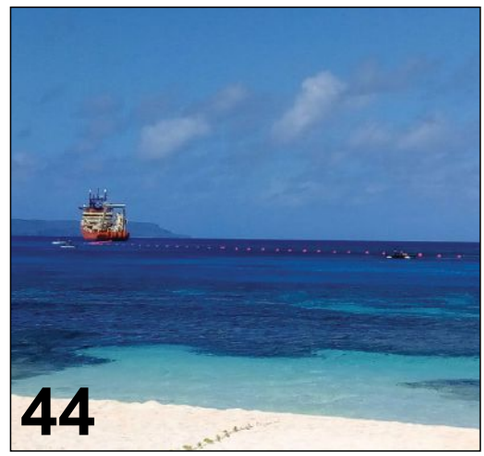

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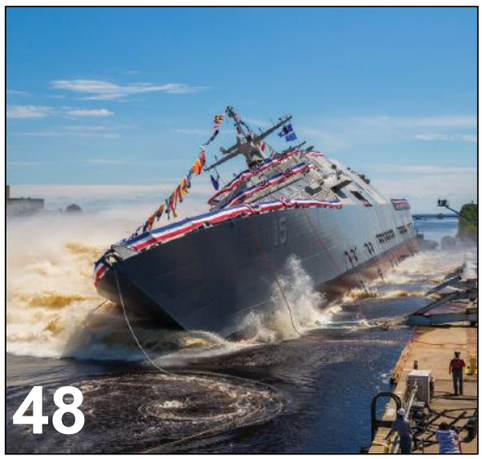

Lockheed Martin-Led Team Launches Future USS Billings

About the Cover

Submarine Rescue Service's remotely operated vehicle (ROV) being launched. This will be used to clear debris from around a stricken submarine and to deliver survival stores to buy time until a rescue can be mounted. Training exercises are held about four times a year.

Durval Tavares,
CEO of Aquabotix Technology Corporation

Connectivity is the New Driver of Offshore ROVs

Remotely operated vehicles (ROVs) continue to have major impacts on the offshore industry. In fact, it's no exaggeration to say ROVs are making strong contributions to the energy economy's attempt to get us over the carbon-footprint hill and into the low-carbon, high-energy promised land.

A big reason for the success of offshore ROVs today is the advancement of technological innovations like the Internet of Things (IoT) and cloud computing. Both foster greater interactivity and connectivity among specialists utilizing technology both below and above the sea. Whether one manufactures or operates work-class or inspection-class ROVs, a transformation is taking place—a previously singular, disconnected entity is now one, where multiple underwater technologies can work in tandem on a single, connected platform.

Consider, for example, the conduct of an inspection to spot cracks in an underwater pipeline. By using ROVs, one can leverage remote diagnostics to connect all compiled information into one cohesive network on the cloud. As a result, users no longer need to have a team of experts on site. Rather, they can live-stream data to land-based team members allowing them to monitor multiple inspections, operations, and explorations from this single platform in real time. This is crucial for the offshore industry, considering everything is centered around having the right expertise at the right time, all while lowering associated exploration costs.

Another major influence for change in the offshore ROV market is underwater camera technology. By their very nature, ROVs are designed to travel to demanding and high-risk locations, such as in between tight gaps stemming from dams and offshore oil and gas equipment. Underwater cameras are crucial to achieving a live view from beneath the surface so the vehicle can safely navigate in a variety of conditions and successfully complete missions.

In most use cases, ROVs will land at the bottom of a body of water, hover around a specific point of interest, or drive straight into a strong water current. External cameras with pan and tilt on ROVs can be effective in situations like these, but not always. The real game-changer for the underwater industry is a 360-degree external rotating camera because it gives users the freedom to look anywhere they want, while maintaining the ROV's current course and speed. This camera technology offers comprehensive flexibility for underwater viewing during missions, enabling a complete 360-degree view, high-quality imagery, better positioning for the vehicle, and increased stability in rough currents. These capabilities are critical to both optimizing offshore exploration and inspection and easing dangerous and time-consuming factors.

The future of ROV exploration for the offshore industry is already bright. Yet, through the combination of data, connectivity, and technological innovations, ROVs will further open our eyes and our world to greater possibilities under the water.

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Riptide set out to change the undersea vehicle market by combining best in class hydrodynamics, ultra low power processing, and game changing new energy technology, while significantly reducing vehicle costs. To accomplish this, we introduced the small, yet highly-capable micro-UUV.

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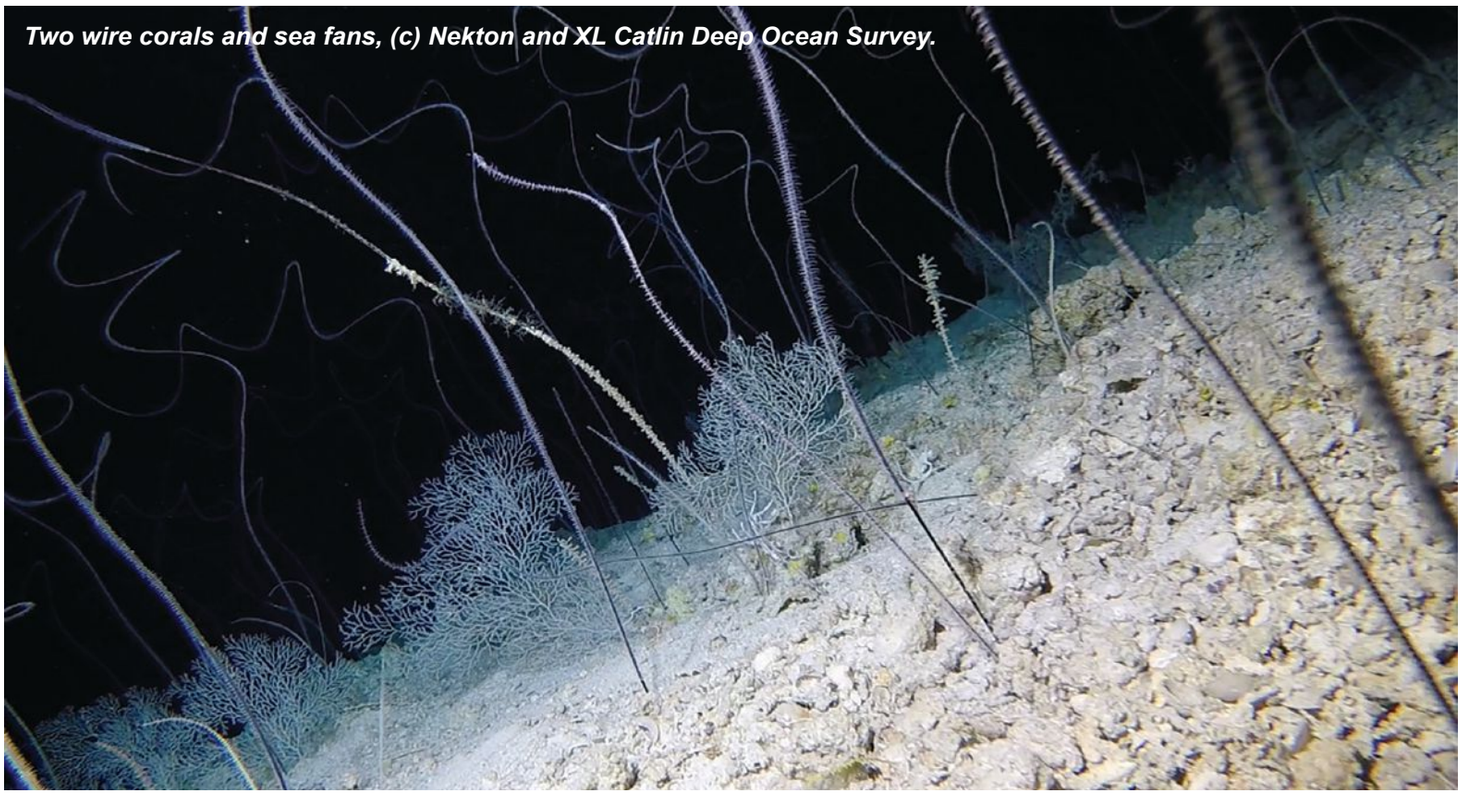
THE RACE FOR THE DEEP

Under glistening blue waves lies a dark, inhospitable world unlike anywhere else on our planet. Although the harsh conditions make it impossible for humans to survive there, the deep ocean is far from devoid of life. The largest ecosystem on Earth is home to many bizarre species and unique habitats. It is also rife with valuable metals, rare elements, and hydrocarbons yet to be harvested by humankind. Past efforts at exploiting deep-sea resources have caused significant damage to biodiversity hotspots such as seamounts and cold-water coral reefs. Now, the new "gold rush" is enticing maritime industries into deeper waters on the hunt for Earth's hidden treasures. Professor Alex Rogers, science director of Nekton and one of the world's pre-eminent oceanographers, explains that in the race for the deep, global science communities must unite to advance knowledge, legislation, and technology to ensure a sustainable Blue Economy.

Fish over tiger bank at 250 m (c) Nekton and XL Catlin Deep Ocean Survey.


Two wire corals and sea fans, (c) Nekton and XL Catlin Deep Ocean Survey.

In Europe alone, the Blue Economy is worth around €500 billion every year—equivalent to 4% to 5% of the total economy. It is a significant area of economic activity globally, and one that is not restricted to coastal states.

Rogers explains: "Since the 2008 crash, many countries now look towards the Blue Economies as a means of increasing employment and revenue. This is not just the West, it also includes developing economies and small island states throughout the world. A new frontier for Blue Growth is the deep ocean. The main industry players include Fishing—a legacy industry in the ocean—and Oil and Gas—around 40% of the remaining large hydrocarbon reserves are found in deep water. Newer activities such as renewables, carbon capture and storage, marine mining, and even aquaculture are not far behind."

History has already demonstrated how these activities have the potential for direct impact on deep-sea ecosystems. But the deep sea can also be affected indirectly; even activities in shallow water can have knock-on effects in the deep ocean.

The Unprotected Frontier

The fact that the ocean is divided into different legal regimes makes management complicated. While operations within coastal state zones are bound to the states maritime regulations, there is no legal framework for the protection of marine biodiversity in the high seas.

According to Rogers, "There are currently negotiations going on at the United Nations around the topic of biodiversity beyond national jurisdiction (BBMJ). They are hoping to put together a new implementing agreement under the UN Convention of Law on the Sea, specifically to protect environments outside of state control. They also want to set up rules for environmental impact assessments and look at the topic of exploitation of marine genetic resources. Biotechnology is another Blue Economy area which is potentially growing."

At present, exploration of mineral resources is taking place in areas beyond national jurisdiction. The licensing process for mining activities is currently under the control of the UN organisation called the International Seabed Authority. For the fishing industry, Regional Fisheries Management Organisations manage activities in open water, but the level of enforcement is determined by the flag states of the vessels.

Rogers explains: "At Nekton, we could see that fishing was moving into deeper and deeper water. They were using very destructive methods such as bottom trawling on very fragile and vulnerable deep-sea ecosystems, such as deepwater coral reefs and sponge garden habitats. The result of pulling a trawl through those type of systems is complete destruction. After scientists gathered evidence of this damage, eventually enough pressure was brought to bear on the UN General Assembly to act. The UN, in turn, requested the Food and Agricultural Organisation (FAO) develop new guidelines for management of those deep-water fisheries in the areas beyond national jurisdiction."

"I have even heard a lobbyist from the fishing industry state that sediments in the deep sea are devoid of life. Nothing could be further from the truth."

Understanding the Unknown

Nekton's mission is to use exploration and science to focus the world's attention on the health of the deep ocean. Their discoveries generate actionable data to catalyse policy to accelerate sustainable governance.

By forming an alliance of some of the world's leading marine science, funding, technology, conservation, education, and media organisations, Nekton wants to maximise the global impact of its research to enable the protection of the deep ocean before it's too late. This starts by addressing our lack of understanding of the distribution of species in the deep—their diversity, abundance, and biomass—and how those patterns change over large spatial areas. In 2015, Rogers published a report with the European Marine Board involving scientists and industry, concluding that this lack of knowledge of the distribution of life was the major barrier to bring about more effective management of human activities in the deep ocean.

Rogers explains: "Many people have a perception that the deep sea is sparsely populated—so why worry about environmental impact? I have even heard lobbyists from the fishing industry state that sediments in the deep sea are devoid of life. Nothing could be further from the truth. There is actually an increase in species richness and the diversity as you get down to between 1,000 and 3,000 m depth."

Nekton is developing a global programme to look at diversity in the bathyal zone—an area between 200 and 3,000 m deep—where the peak in diversity occurs. It also happens to be the location of many vulnerable marine ecosystems such as cold-water coral reefs.

Members of the scientific community estimate that there are 14 bioregions in the bathyal depths globally, all with different physical attributes such as temperature, oxygen concentration, and food availability. "Nekton is targeting those bioregions to try and really make a leap forward in terms of our understanding of how life is distributed in the deep sea. This research will give us a better baseline of the state of the deep ocean and how much humans have already impacted what is the largest ecosystem on Earth," explains Rogers.

Triton pilot Kelvin takes a photo of Nemo at work on tiger bank.

"It is no longer simply a question of developing new machines to go into the deep sea."

Deep ocean exploration requires technological innovation comparable with the exploration of space. And, in many respects, it is just as challenging.

Spatially, the size of the deepwater ecosystem is a problem for research. It is also generally inaccessible to the point that more people have gone into space than to the deepest part of our oceans.

Remotely Operated Vehicles (ROVs), Autonomous Underwater Vehicles (AUVs), and Human Operated Vehicles (HOVs) developed over the last 50 years are now the cutting-edge of deep-sea exploration and scientific research. Deep-sea ROVs can operate down to 6,500 m depth. Regardless, there is still a need to develop innovative technological approaches to deep-sea research.

"It is no longer simply a question of developing new machines to go into the deep sea. Because of the size of this ecosystem, what we need are more automated approaches to gathering and analysing data. We must also think about new ways to deal with potentially vast quantities of information and visual data that underwater technologies can bring back. For example, AUVs can produce huge datasets, which leaves us with a problem of dealing with all that information. It was the same in the revolution of DNA sequencing that has caused the adoption of new methods to analyse vast quantities of genetic data that are coming from the super high throughput sequencing technologies," said Rogers.

"We really need an effort comparable both in finance and time to huge-scale space projects."

In Nekton, they are particularly keen on the use of submersibles, which not only helps to place scientists within the deep ocean environment but also helps communicate to the broader public about this enormous, seemingly remote but important ecosystem. While increasing awareness for the fragility of the deep can help drive policy changes, there is no escaping the need to further expand our knowledge and understanding of Earth's "inner space."

"We really need an effort comparable both in finance and time to huge-scale space projects—funds in [the] order of billions and projects lasting 10, 20, or 30 years. That has been severely lacking from ocean research over the last 20 or 30 years. We need a massive up scaling of scientific effort to really address the current knowledge gaps and develop automatic methods that allow us to understand the information we already have about how the deep ocean works and where life is distributed in the deep sea."

The Race for the Deep

Many within the science community and industry are expressing concerns in the growing shadow of the Blue Economy that threatens scientific endeavours to better understand the deep ocean. History has already shown how the race between science and industry is easily lost by those lacking provisions and support from global leaders. Unfortunately, science is usually left behind and can only witness the damage caused in the wake of unregulated activities.

Rogers recalls, "We have seen this first hand when we were in the southwest Indian Ocean surveying seamounts using a deep ROV. We found one seamount covered in lost lobster pots, which was really staggering. We were literally out in the middle of nowhere—around 5 or 6 days steaming at full speed from the nearest land—and yet it has clearly been subjected to intense fishery for rock lobsters. It wasn't illegal, but it was certainly unreported and unregulated. This is the type of behaviour we want to avoid in the future at all costs."

"…with the rise of nationalism over the last 5 to 10 years, this whole process is becoming more difficult."

"These systems can become heavily damaged before anyone has had the opportunity to even understand what biodiversity may be threatened or understand the potential future consequences for us as humans. Accompanying that we really need to see a much stronger scientific effort towards gaining firm knowledge bases to intelligently manage our activities and keep them functional for future generations. Unfortunately, that requires international cooperation and, with the rise of nationalism over the last 5 to 10 years, this whole process is becoming more difficult."

The deep sea is a spectacular and hidden treasure regarding the ecology of the planet. Even "aquanauts" who venture into reasonably well-studied areas such as Bermuda are discovering new ecosystems and species as shallow as 300 m deep. In the less-explored areas, sometimes everything scientists find is yet to be described by science. We are only just beginning to understand how these ecosystems function and the services they provide for humankind.

In the race for the deep, the science community and industry must work together if there is any hope in creating a sustainable Blue Economy that can endure both time and human activity for future generations.

Acknowledgements

Alex Rogers, science director at Nekton, professor of conservation biology at the University of Oxford, and scientific director of the International Programme on the State of the Ocean.

Renishaw Releases Controller Laser-Based DP Position Reference System

Fanbeam® Controller 4.0 is the advanced new Fanbeam 5 control system developed in-house by global engineering technologies company Renishaw.

Designed to enhance product usability, functionality, and performance, this next-generation Fanbeam controller includes a fresh, new software interface, with a collection of reliable, intelligent automation and advanced user modes for optimum performance in extreme conditions.

Renishaw's Fanbeam DP position reference system (PRS) pioneered the use of laser technology for dynamic positioning over 20 years ago. Today, Fanbeam 5 continues to help offshore support vessel (OSV) operators to perform safer, faster, and more accurate DP operations.

The Fanbeam 5 PRS uses accurate time-of-flight laser technology to determine vessel position relative to custom reflectors that can be fixed to offshore rigs, installations, or other vessels. Fanbeam data are fed into the vessel's DP system, which controls thrusters that are used to maintain vessel position during operations.

Renishaw has decades of experience working closely with OSV operators to understand the requirements of these operations and the challenges of working within the demanding environments found offshore. Fanbeam® Controller 4.0 is the result of the extensive research that led Renishaw's in-house software development and usability teams to make this highly functional software and control system as easy to use as possible.

To support DP vessel operators, Fanbeam Controller® 4.0 now provides advanced software features and functionality that place control in the hands of the dynamic positioning operator (DPO).

These features include a cleaner and more intuitive user interface to support ease of tracking confidence and threats from false observations. Improvements include fewer controls on screen; bigger buttons; controls that are grouped logically; simple function keys; and large, clear input/output icons.

The new software also offers next-generation functionality, which has been thoroughly performance tested for optimum usability. This includes both reliable, intelligent automation for increased operator confidence and full DPO control over filtering.

The modes and graphical display preferences supported by the new system include a basic bird's-eye-view overview mode for when conditions are good, and a range of advanced modes, which present information in greater detail for when conditions are more challenging.

Smart display preferences reduce the need for user interaction, leaving the operator free to focus on more complex tasks. Such options include a day/night color scheme that automatically adjusts the display to allow for changing conditions.

The control system now operates on a Windows® 7 embedded control PC and vessel operators have the option of installing a panel- or bracket-mounted control panel.

"The new user interface is the result of user research and information needs analysis," said Renishaw Senior usability engineer Nicholas Colford. "It's based on a deep understanding of the decisions that DPOs make and the information they need. We analyzed at each decision and worked out the right way to show the DPO the right information at the right time."

Renishaw marine sales manager John Howells added, "Renishaw is committed to improving the usability of our products, and the new Fanbeam software release focuses on that. We're confident that the new software will present DP operators, both old and new, with a greater user experience that allows them to make key decisions quicker."

For more information, visit www.renishaw.com.

Scientists and Astronauts Create World's Deepest Coral Reef Nursery

Nestled in the Florida Keys Marine Sanctuary, 10 tree-like structures made of PVC pipes rise up from the ocean floor. They are adorned with plastic cards that hang from fiberglass branches; the cards house growing pieces of endangered coral. An odd sight to see, this group of makeshift trees could help solve one of the greatest environmental problems facing the world's oceans today—the loss of coral reefs.

The structures are divided into two groups not far from the Florida International University (FIU) Aquarius Reef Base. Scientists call them nurseries, a place where they grow new corals. One resides at 90 ft below the ocean surface, the deepest coral nursery in the world.

"People haven't tried to grow coral reef nurseries at these depths before, so there are new questions we'll be able to address with science," said Anthony Bellantuono, a post-doctoral research associate in the College of Arts, Sciences & Education.

The world's coral reefs are threatened by fishing, pollution, global warming, and even sunscreen. Because these disturbances affect shallow reefs more than deep reefs, marine scientist Mauricio Rodriguez-Lanetty is studying whether corals in deep waters can be used to repopulate imperiled reefs in shallow waters. He and the members of his lab have partnered with the Coral Restoration Foundation to create the nurseries.
Read more: http://ont.news/2vH1OIA

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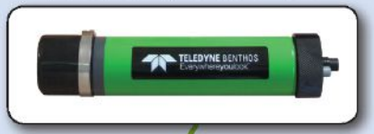
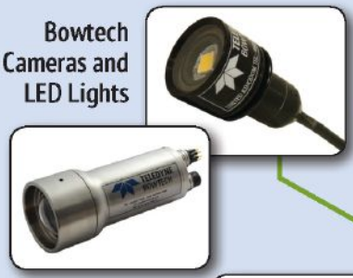
Benthos USBL/Acoustic Modem



Bowtech Cameras and LED Lights



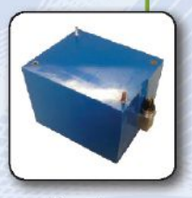
BlueView Imaging Sonar

RD Instruments CTD

TSS INS/IMU/MRU

TSS Cable / Pipe Tracker

SeaBotix Fly-Out ROV



Benthos Sub-Bottom Profiler

Impulse Connectors utilized throughout

RD Instruments Doppler Velocity Log (DVL)

Teledyne Marine Integrated Technologies powered by Greensea

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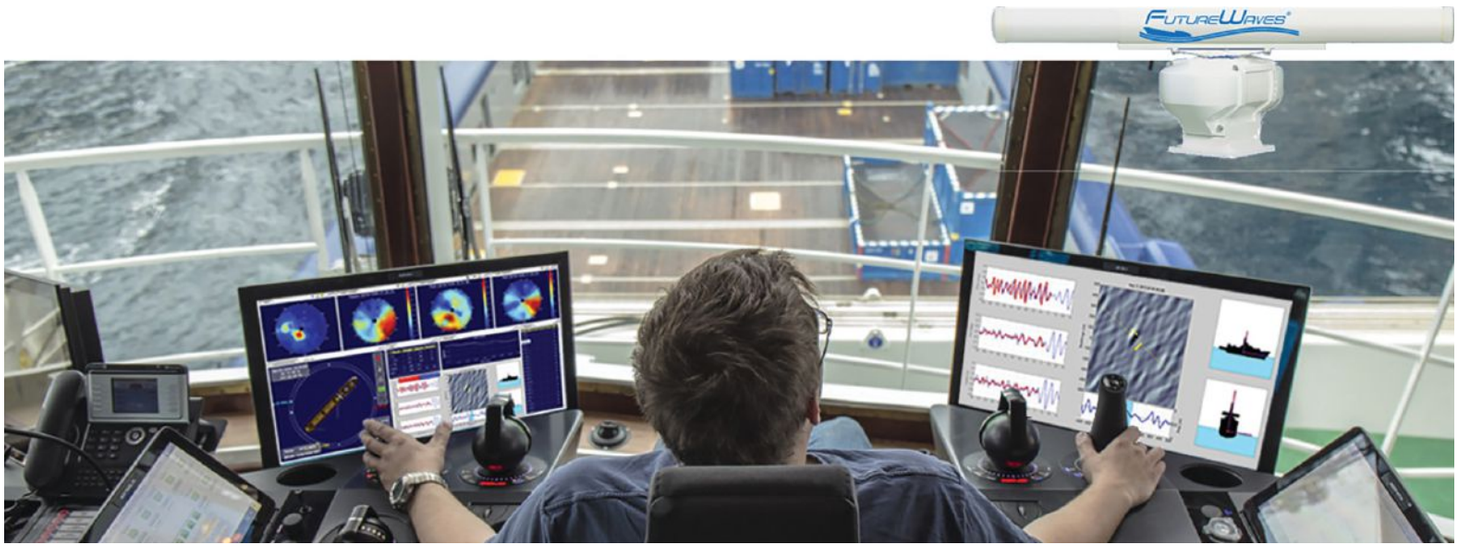
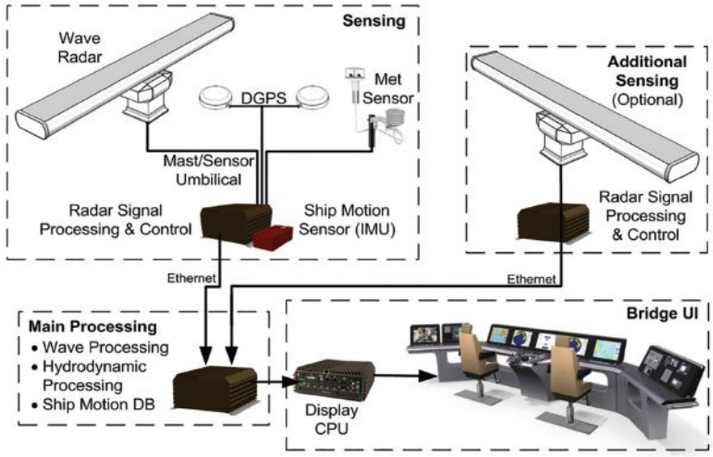
Wave and Vessel Motion Forecasting Product Introduced by APS

Applied Physical Sciences Corp. (APS), a wholly owned subsidiary of the defense giant General Dynamics known for its advanced technological contributions to national security and worldwide commercial markets, released a revolutionary wave and vessel motion forecasting product that is sure to have a progressive impact on the offshore operations industry.





FutureWaves™, originally developed by APS via funding provided by the U.S. Navy's Office of Naval Research, is a real-time shipborne system that uses a specialized X-band radar to measure and forecast ocean waves in the vicinity of the ship. It takes this information and determines the timing of waves and their impacts, which is then used to predict ship motions (such as heave, pitch, and roll) for minutes into the future. The system provides feedback for operational planning such as best course and speed for a particular operation, but also uniquely delivers critical timing information during ship and deck operations.

Though the FutureWaves™ development was initially focused on the U.S. Navy's interest in loading and offloading heavy equipment at sea (seabasing), the offshore operational applications are vast and varied. One current application of the product involves a world-leading international offshore oil and gas industry marine contractor who is planning to install the product on it largest deepwater construction vehicle. APS is also in discussions for planned installations on cruise lines, transport vessels, sea-based helicopter landing platforms, oil drilling and production vessels and platforms, and other offshore construction vessels.

Forecasting waves is not a new idea, yet past attempts and previous methods have fallen short. While buoy methods are useful for measuring of wave conditions, they are logistically challenging and cannot provide wave timing information. Other radar methods have been limited to statistical products and not proven to provide the fidelity and high level of effectiveness required to support critical operations. FutureWaves™ provides detailed wave characterization that is far superior to any existing system and is the most advanced wave and vessel motion forecasting system of its kind available today. The U.S. Navy needed a real-time solution with actionable outputs, and so does the offshore operations industry.

"There are a number of patents and trade secrets that separate our product from the rest," said John Kusters, former U.S. Navy Captain and current program manager for the FutureWaves™ product "[For example,] Our hydrodynamic modeling that allows us to better forecast the impact of the ocean energy on the ship, our real-time updating of the orbital force of the ocean energy, and a few others that you'll just have to see for yourself."

For more information, visit www.aphysci.com.

New Ocean Circulation Data Set Released

Scientists from the University of Miami's (UM) Rosenstiel School of Marine and Atmospheric Science and the NOAA Atlantic Oceanographic and Meteorological Laboratory have released an updated data set describing the statistical properties of the global near-surface ocean circulation. In addition to helping improve scientific understanding of intense boundary currents such as the Gulf Stream, the enhanced data set can help better predict the transport of fish larvae and pollutants such as oil, plastic, and marine debris.

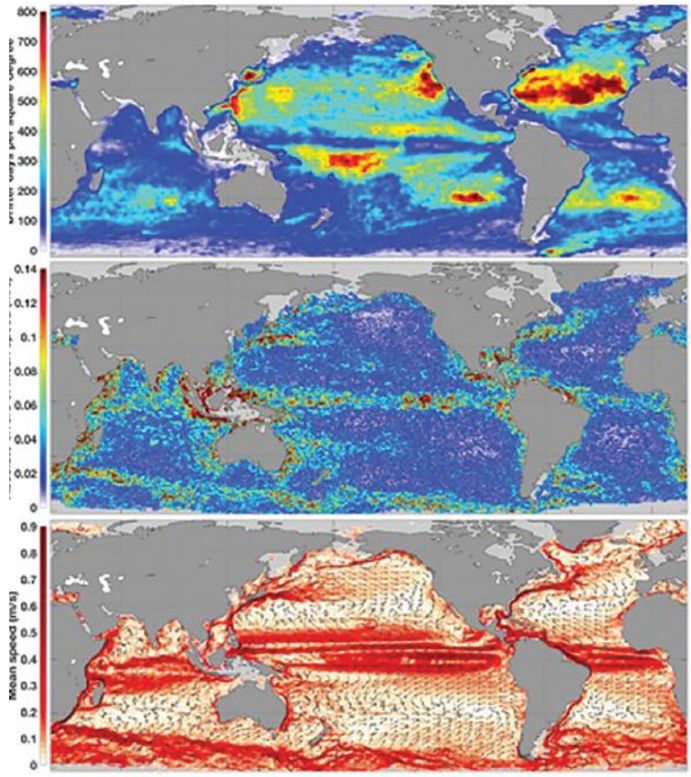


Image: New climatology of 15 meter currents for the global ocean, calculated using observations from Global Drifter Program (GDP) drifters as described in Laurindo et al. (2017). Top: drifter observation days per square degree for the period between February 1979 and June 2015. Middle: magnitude of the errors of annual mean speed estimates, simulated using current velocities estimated from sea surface elevation data measured by satellites. Bottom: annual mean speed inferred from drifter data.
http://ont.news/2vpllYy

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Inertial Navigation. Who Needs It?

By: Marybeth Gilliam, Chief Marketing Officer, VP Sales, Greensea

The Greensea INSpect GS4 inertial navigation system with DVL is fully-integrated into the STIDD RNAV2 Diver Navigation system.

Underwater navigation is difficult. Unlike land and air, there is no Global Positioning System (GPS) to identify a subsea vehicle's location and position. Instead, the industry uses a variety of sensors to approximate position. An Ultra Short Base Line (USBL) and Doppler Velocity Log (DVL) are popular navigation sensors but they are not a complete solution and work best when used as navigation-aiding sensors contributing data to an inertial navigation system (INS).

Inertial navigation relies on a combination of navigation-aiding sensor data (such as DVL, USBL, GPS, depth, etc.) and high-level math algorithms to calculate a vehicle's orientation and its location in the world. With an INS, an operator has a complete, optimized navigation solution, including heading, depth, pitch, roll, and latitude/longitude.

Doesn't a USBL provide a vehicle's position?

A USBL is frequently used to approximate a vehicle's position and can be an important contributor to a navigation system. Using a transceiver mounted on a pole and placed underwater, the USBL transmits an acoustic pulse to a transponder located on the subsea vehicle that replies with its own acoustic pulse. The direction (angle) and time passed of pulse transmission is mathematically converted into a position estimate for the vehicle.

While this information is helpful, a USBL can only transmit its data through water at a very low rate. Common position update rates provided by USBL manufacturers are between 0.5 and 10 seconds. The variability in performance is associated with water conditions such as depth, temperature, and salinity. Although the USBL does provide vehicle position, at these update rates a USBL cannot provide the accuracy required for many important or complex subsea jobs, including anything requiring closed-loop control or supervised autonomy.

Can a DVL be a single-source solution for navigation?

A DVL is another acoustic navigation device. By transmitting acoustic beams down to the seafloor and measuring frequency shift (Doppler shift), it can calculate a vehicle's velocity in three directions (x,y,z) relative to the bottom—but this information alone won't provide a vehicle's position. It is a very important navigation sensor, but it is designed to be one of multiple inputs for a navigation solution.

As an acoustic device, the DVL also struggles to provide sufficient update rates, although the maximum updates are generally better than a USBL with manufacturer published rates as high as 0.125 seconds. In addition, DVLs are challenged with maintaining bottom lock. The acoustic beams must maintain contact with the seafloor. This can be a particular challenge if the seafloor is uneven or at an angle greater than about 20 degrees. It is also challenged with maintaining bottom lock if it is too close the seafloor, too far from the seafloor, or if it becomes occluded by nearby equipment or infrastructures.

An inertial navigation system acts like an analyst, monitoring navigation data inputs and deciding which ones are reliable.

An INS is designed to capture a wide-range of navigational inputs and fuse them together into an optimized multi-state position for the vehicle. An INS considers the sensors contributing to its solution and makes real-time decisions about the accuracy of the information it is provided. For example, if the DVL loses bottom lock, it puts more emphasis on alternative data sources until it is once again receiving quality DVL data. Likewise, if USBL data become erratic, the INS can smooth the data and mitigate the noise in the system. An INS helps maintain an accurate heading and position, even in tough environments, by pulling all the information together to provide a more meaningful, accurate, and stable solution. Without an INS, navigation sensors are acting as independent, bolted-on devices providing discrete data points.

In addition, the INS provides navigation updates to the vehicle at a very high rate (upwards of 50 Hz or 0.02 seconds). The significantly higher frequency of communications to the vehicle increases the accuracy and stability of the overall navigational estimate.

The Greensea INSpect GS3 inertial navigation system is designed for small inspection-class vehicles.

An INS is essential for advanced vehicle control.

With the optimized inertial solution, a vehicle is ready for meaningful work and complex tasks. It can execute advanced vehicle control functions such as station keeping, "GO TO" position, target reacquisition, and supervised autonomy for intervention tasks. Missions can be planned and executed with high-level commands to the vehicle. Pipeline inspections, riser inspections, and explosive ordnance inspections can all be automated for reliability and repeatability.

Next month's column will focus on how inertial navigation systems are being optimized for size, weight, power, and cost (SWaP-C) to support supervised autonomy on small vehicles.

MacArtney Supplies Automatic Bolt-torquing Tool to Siemens Gamesa

A complete turnkey automatic bolt-torquing tool system designed, engineered, and manufactured by MacArtney is now available for the renewable energy sector.

The way in which waves, currents, and sediments interact in the marine environment is extremely complex. Therefore, it is vital to have the right equipment that ensures proper functionality and durability. The automatic bolt-torquing tool supplied by MacArtney represents such a type of equipment. The purpose of the tool is to tighten the pre-mounted bolts/nuts between the hub and the generator without manual involvement. The motivation is safety and zero harm, absolute traceability, and a profitable, secure process.

The supply consists of two parts: a Turner tool that creates rotation of the generator and an automatic bolt tool for torquing. The Turner tool unit is transportable by a standard 3 T rapid forklift, and the torqueing tool is portable in a customized storage carriage certified for lifting. After correct positioning of the Turner tool under the nacelle and mounting of the torquing tool in the nacelle, the fully automated process is initiated. Prior to torquing each bolt, positioning of the hub/generator is achieved through an optical sensor system. Tightening of the bolts is carried out in two torquing stages. Data are continuously accessible and presented in real time by the control system HMI. For full traceability, the torquing process is thoroughly monitored and logged in a quality report.

During stage two of the bolt torquing sequence, all bolts are stamped with a “Torque Approved” mark, ensuring a valid and visible mark for manual inspection, thus guaranteeing that the bolts are tightened to the correct torque.

The sustainable and cost-efficient equipment provided by MacArtney ensures a secure process that contributes to lowering the total cost of energy. Choosing the right supplier is crucial for the long-term success of offshore renewable energy projects. The MacArtney Underwater Technology Group has been actively working with offshore renewable energy projects for several years, supplying state-of-the-art solutions to wave, tidal, and offshore wind applications and projects around the world.

MacArtney’s portfolio of underwater technology systems and products has proven itself to be an ideal basis for advising and supplying the rapidly growing renewable energy sector. Many of our existing products are directly transferable to offshore renewable energy applications, where our termination, rotary, infrastructure, and connectivity solutions offer reliability and a proven track record. Our in-depth knowledge of the marine renewable energy industry, supported by world-wide representation, vouches for optimized and simplified MacArtney solutions in all aspects.

Being a privately owned corporation with group headquarters in Esbjerg on the west coast of Denmark, MacArtney Underwater Technology has supplied products and engineering solutions for almost four decades.

For more information, visit www.macartney.com.

Rotech Subsea

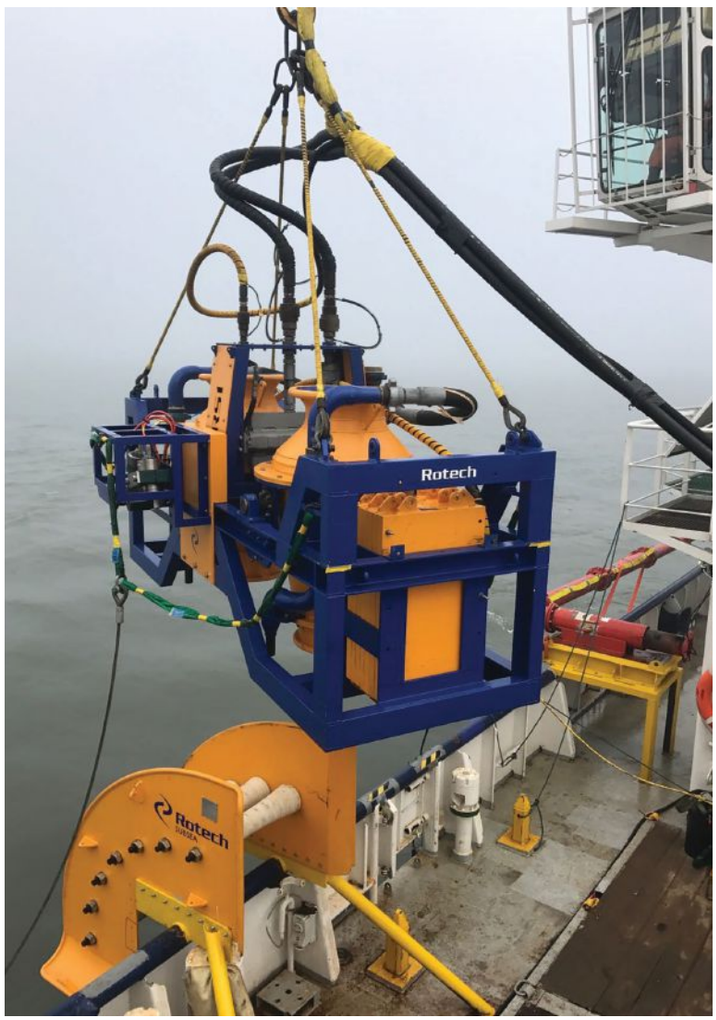
www.rotech.co.uk

Rotech Subsea Posts 400% Revenue Increase

It has been a whirlwind 24 months for Rotech Subsea since the subsea excavation pioneer—with a 32-year track record in oil, gas, and renewables—announced their return following the sale of technology that dominated the sector in the 1990s.

Rotech emerged from the subsequent non-compete period in 2015 with a bang with their new and more precise Controlled Flow Excavation (CFE) range—and, within weeks, its cutting-edge RS1, TRS1, and backfilling systems were deployed on commercial projects. In 2016, Rotech Subsea launched the next generation TRS2 systems for major sandwave clearance and pipeline trenching scopes.

The groundbreaking CFE technology that has caused such a stir provides a more targeted jet, leaving a deeper, narrower, and more uniform V-shaped trench than previously possible. It reduces the risk of damage to cables compared to tracked vehicles as well as being cheaper and safer to deploy. It is also twice as fast and up to four times more powerful than existing technology.



These capabilities have seen Rotech's TRS1 adopted as a true cable-trenching tool, suitable for commissioning works not just IRM. Projects so far have seen trenches created to 6 m deep in a single pass and progress rates up to 6 m per minute.

In the past year, Rotech has deployed its game-changing CFE technology throughout European waters. Working flat out to meet demand, their in-house fabrication division was required to deliver an additional set of TRS2 systems for immediate deployment.

"We've been on an incredible journey since re-entering the sector," said, Stephen Cochrane, director of subsea, ahead of Offshore Europe 2017. "We knew our new CFE technology could bring greater efficiencies to a rapidly changing marketplace, but we've been taken aback by the demand, which has seen us experience a 400% increase in revenue."

"Our R&D team has listened to the market and delivered," added director Dr. Donald Stewart. "Indeed, such is demand that we have two major clients bidding to keep equipment on standby rather than run the risk of not being able to redeploy it on future projects."

In May and June 2017, Rotech deployed its TRS2 on an IRM campaign in Belgium for Global Marine Systems. They also mobilised their TRS1 for Jan De Nul Group/DONG Energy to carry out deburial of array cable and post-trenching at the Burbo Bank offshore wind farm before working with the client again at Race Bank wind farm. Concurrently, Rotech was engaged by Prysmian Group on the £1 billion Western Link renewable energy project, carrying out Phase 1 cable trenching at converter stations, with Phase 2 having just commenced.

As a result, Rotech has won three additional work scopes with Prysmian and, with increasing demand for Rotech technology, Prysmian is negotiating to retain equipment on 1-year standby.

With interest from as far afield as Australia, it's set to be another hectic 12 months. The company is bidding on major decommissioning scopes in Europe and pipeline trenching scopes in the Middle East while enquiries come in daily for its soon-to-be-launched TRS1 Low Draft (LD), which has been developed for a 6-month campaign with a major European client.

From day one, Rotech Subsea has earned a reputation as an innovator, and that shows no signs of slipping. Its TRS1 LD system for specific shallow-water projects—which will be the most powerful tool on the market and the next big thing in subsea excavation—cements Rotech's position as a leader in cutting-edge innovation for the sector and promises busy times ahead.

76 Million Acres Offered in Gulf of Mexico Oil and Gas Lease Sale

U.S. Secretary of the Interior Ryan Zinke has announced that the Department will offer 75.9 million acres offshore Texas, Louisiana, Mississippi, Alabama, and Florida for oil and gas exploration and development. The region-wide lease sale scheduled for 16 August, 2017 will include all available unleased areas in federal waters of the Gulf of Mexico and provide a reduced royalty rate for shallow water leases to encourage exploration and production under current market conditions.

Lease Sale 249, scheduled to be livestreamed from New Orleans, will be the first offshore sale under the National Outer Continental Shelf (OCS) Oil and Gas Leasing Program for 2017-2022. Under this program, 10 region-wide lease sales are scheduled for the Gulf, where resource potential and industry interest are high and oil and gas infrastructure is well established. Two Gulf lease sales will be held each year and include all available blocks in the combined Western, Central, and Eastern Gulf of Mexico Planning Areas.

On 29 June, President Donald J. Trump and Secretary Zinke announced the public comment period for a new Five-Year National OCS Oil and Gas Leasing Program. The comment period is the first step in executing the new program. The 2017-2022 Program, which begins with the lease sale just announced today, will continue to be executed until the new National OCS Oil and Gas Leasing Program is complete.

"Our Outer Continental Shelf lands offer vast energy development opportunities, and we are committed to encouraging increased energy exploration and production in these offshore areas to maintain the Nation's global dominance in energy production," Secretary Zinke said. "As a global energy leader, we will foster energy security and resilience for the benefit of the American people. A strong offshore energy plan that responsibly harnesses more of our resources will spur economic opportunities for industry, states, and local communities, creating jobs and revenue. That's why we also are developing a new national Outer Continental Shelf oil and gas program that will best meet our future energy needs."

Lease Sale 249 will include about 14,220 unleased blocks, located from 3 to 231 mi offshore, in the Gulf's Western, Central, and Eastern planning areas in water depths ranging from 9 to more than 11,115 ft (3 to 3,400 m). Excluded from the lease sale are blocks subject to the Congressional moratorium established by the Gulf of Mexico Energy Security Act of 2006, blocks that are adjacent to or beyond the U.S. Exclusive Economic Zone in the area known as the northern portion of the Eastern Gap, and whole blocks and partial blocks within the current boundary of the Flower Garden Banks National Marine Sanctuary.

"To advance commonsense domestic energy production, the terms of this sale have been developed through extensive environmental analysis, public comment, and consideration of the best available information," said Counselor to the Secretary on Energy Policy Vincent DeVito. "This will ensure appropriate resource development and further our energy dominance strategy."

The Gulf of Mexico OCS, covering about 160 million acres, has technically recoverable resources of 550 million barrels of oil and 1.25 trillion cubic feet of gas, accounting for nearly three-fourths of the oil and a fourth of the natural gas produced on federal lands.

The lease sale terms include stipulations to protect biologically sensitive resources, mitigate potential adverse effects on protected species, and avoid potential conflicts associated with oil and gas development in the region. Additionally, BOEM has included appropriate fiscal terms that take into account market conditions and ensure taxpayers receive a fair return for use of the OCS. These terms include a 12.5% royalty rate for leases in less than 200 m of water depth, and a royalty rate of 18.75% for all other leases issued pursuant to the sale.

The 12.5% royalty rate for leases in less than 200 m is lower than the proposed 18.75% royalty rate for shallow water leases that BOEM published in the Proposed Notice of Sale. The purpose of this change is to adjust the royalty rate to reflect recent market conditions, thereby encouraging competition and continuing to receive a fair and equitable return on oil and gas resources.

"The rate change reflects this Administration's willingness to swiftly respond to economic indicators," said DeVito. "The 12.5% royalty rate is closer in harmony with the current market and federal onshore lease sales."

As of 3 July 2017, 15.6 m acres on the U.S. OCS are under lease for oil and gas development (2,947 active leases) and 4.1 m of those acres (842 leases) are producing oil and natural gas. More than 97% of these leases are in the Gulf of Mexico, about 3% are on the OCS off California and Alaska.

All terms and conditions for Gulf of Mexico Region-wide Sale 249 are detailed in the Final Notice of Sale (FNOS) information package. Copies of the FNOS maps can be requested from the Gulf of Mexico Region's Public Information Unit at 1201 Elmwood Park Boulevard, New Orleans, LA 70123, or at 800-200-GULF (4853).

The Notice of Availability of the FNOS is available for inspection in the Federal Register, published on 17 July 2017.

For more information, visit www.boem.gov/Sale-249.

DONG Energy Inaugurates Gode Wind 1 and 2 Offshore Wind Farms

On 26 June DONG Energy celebrated the inauguration of the Gode Wind 1 and 2 offshore wind farms at the Danish Embassy in Berlin. With 97 wind turbines and a total capacity of 582 MW, the two offshore wind farms generate enough power to supply approximately 600,000 households in Germany annually.

Samuel Leupold, member of DONG Energy's executive committee and CEO of Wind Power, says: "We're proud to officially inaugurate our latest German offshore wind farms. The wind turbines at Gode Wind 1 and 2 are already generating clean power off the coast of Norddeich, and our next German offshore wind farm, Borkum Riffgrund 2, is well underway. These large-scale projects are testament that offshore wind has become a reliable, predictable, and cost-effective technology which will contribute significantly to Germany's energy transition."

Uwe Beckmeyer, German Parliamentary State Secretary, says about the future of European energy supply: "Through technological progress, system services and efficiency, the offshore wind industry has become a driver in the energy industry and focuses on strengthening competitiveness in export, innovation and digitization. A strong home market is a crucial factor in this regard."

DONG Energy owns 50 percent of both Gode Wind 1 and 2. In addition, the infrastructure fund Global Infrastructure Partners owns a 50 percent share in Gode Wind 1. Talanx, the third-largest German insurance group, also holds an indirect interest. Four Danish pension funds, including PKA and Industriens Pension, have a total holding of 50% in Gode Wind 2.

Planning for the Gode Wind 1 and 2 offshore wind farms began with the final investment decision in 2013. In 2015, construction works for both wind farms started with the construction of the offshore substation, the cornerstone of the wind farm. The two wind farms are located 45 km off the German coast. They contribute substantially to meeting the German government's target to reach a total capacity of 6.5 GW offshore wind power by 2020. With the commissioning of the two wind farms and the ongoing construction of a fourth offshore wind farm, Borkum Riffgrund 2, DONG Energy's share of this target is expected to amount to 21%.

In spring 2017, DONG Energy took part in the first of two German auction rounds for offshore wind energy. All three awarded projects - with a total capacity of 590 MW—are located in the German North Sea. They are expected to be completed by 2024, subject to final investment decision expected to be made in 2021. Two of the awarded projects, OWP West and Borkum Riffgrund West 2, will be realized without any subsidies. The Gode Wind 3 project will receive EUR 60 per MWh in the subsidy period.

For more information, visit www.dongenergy.com.

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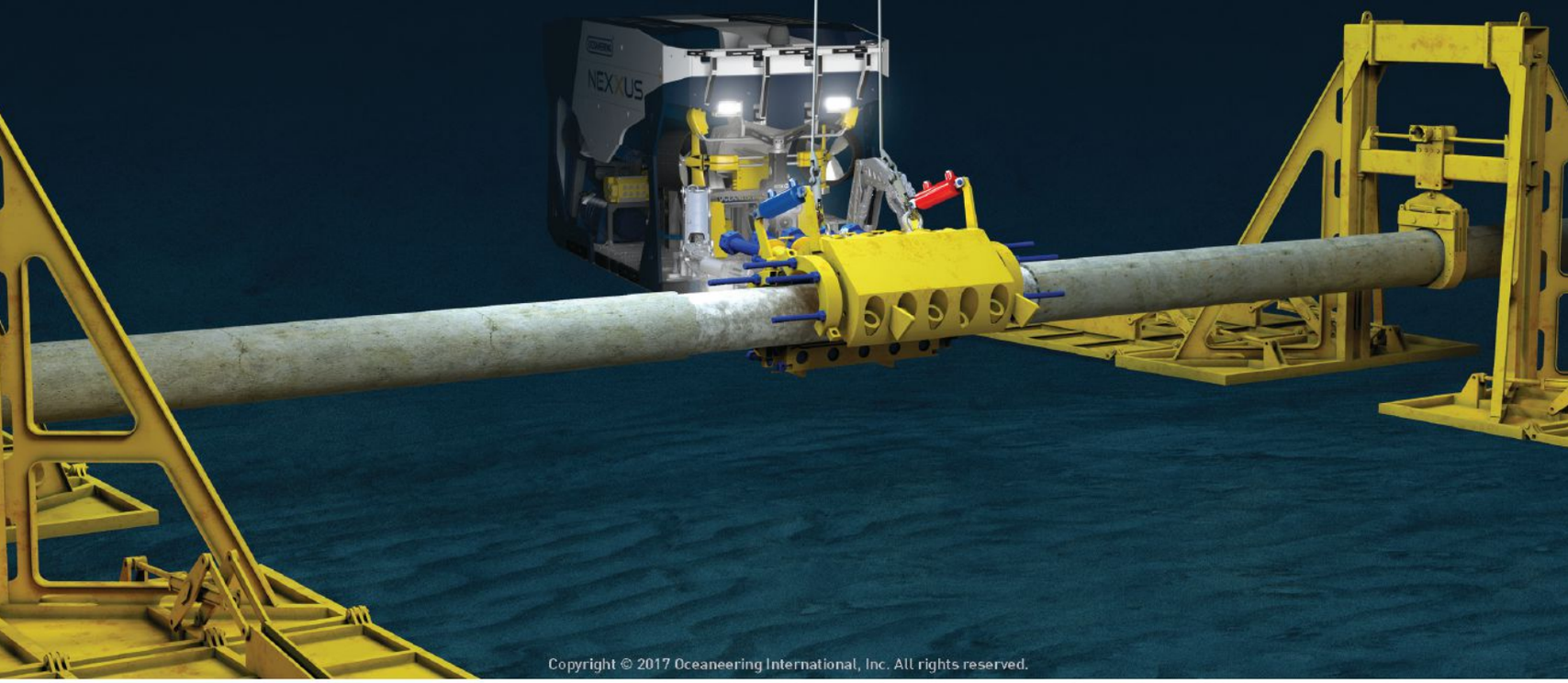

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By working together, we will safely and reliably re-shape the future of the oil and gas industry.

Connect with what's next at **Oceaneering.com/WhatsNext**

Shell's Prelude FLNG on its way to NW Australia

Royal Dutch Shell's Prelude floating liquefied natural gas (FLNG) facility left the Samsung Heavy Industries shipyard in Geoje, South Korea, marking a significant milestone for the project. The facility, constructed by Technip Samsung Consortium, is being towed to North West Australia, where the next phase of the project will begin. On arrival at the Prelude offshore gas field, 475 km (295 mi) north-northeast of Broome, Western Australia, pre-installed mooring chains will be lifted from the seabed and secured to the facility. Once secure, the hook-up and commissioning process will begin.

http://ont.news/2uQ2YiH

European Government, Industry Join to Grow Offshore Wind by 2030

The governments of leading offshore wind markets—Germany, Belgium, and Denmark—came together with industry captains in signing a Joint Statement to further the deployment of offshore wind energy in Europe. The signing ceremony took place at the opening of Offshore Wind Energy 2017, the industry event co-organized by WindEurope and RenewableUK in London. The signatory governments represented by Marie-Christine Marghem, Minister of Energy, Environment and Sustainable Development, Belgium; Rainer Baake State Secretary for Energy, Federal Ministry of Economy and Energy, Germany; and Kristoffer Böttzauw, Deputy Permanent Secretary, Ministry of Energy, Utilities and Climate, Denmark, reaffirmed their commitment of deploying a significant volume of offshore wind power in Europe between 2020 and 2030.

http://ont.news/2vIiwBp

ROS REMOTE OCEAN SYSTEMS

Remote Ocean Systems www.rosys.com

ROS Introduces Smart Technology Pan & Tilt Positioners

Remote Ocean Systems (ROS) is ISO-9001-2008 certified and has a 28,000-sq. ft research and manufacturing facility dedicated to producing products that are unparalleled in reliability in extreme environments and applications. Its product line includes underwater video cameras, lights, smart technology pan & tilt positioning systems, video inspection systems, and control systems. Whether it's the latest LED lighting design or an ultra low-light camera for deepwater inspections, ROS offers an industry-leading choice of technology and products.

ROS' New Line of Pan & Tilt Positioners

The new Positioners incorporate Smart Technology ARCHITECTURE™ and enable computer connectivity and control for more precise positioning settings and the positioner can be programmed for specific applications. ROS Smart Technology Positioners are firmware upgradable and have the capability to provide on-site diagnostics to prevent costly downtime.

The ROS P-15 Computer Controlled Positioner is available for delivery. This smaller and smarter Pan & Tilt Positioner is ideal for small ROVs as well as bridge and dam inspections. The Smart Technology ARCHITECTURE™ enables precise positioning settings and on-site firmware upgrades and diagnostics. The P-15 is designed for payloads up to 15 lbs and is available air filled for depths to 70 m and pressure balanced oil filled for depths to 6,000 m. A heavy duty connector is standard with the P-15 Positioner.

For more information on the new ROS Smart Technology ARCHITECTURE™ and technical specifications on the P-15 Pan & Tilt Positioner, visit www.rosys.com or contact sales@rosys.com.

Deepwater Pipeline Predictions:

Transmission and Export Pipeline Demand Lead Slow Recovery in Pipeline Installations

The global deepwater oil and gas market is slowly recovering from the downturn that significantly impacted operations across the deepwater supply chain and affected all those involved, including operators, contractors, and suppliers.

The supply chain has implemented fundamental and structural changes to the way deepwater reserves are developed. Industry players have worked together to reduce cycle time, increase efficiency, and innovate with a common goal of reducing the overall development cost of deepwater projects.

The Upstream Supply Chain group at Wood Mackenzie has been closely following the repercussions of the past two years of depressed deepwater activity. Subsea tree orders, which serve as a leading indicator for deepwater installation activity, have seen a small but positive step in the right direction in the first half of 2017, booking more than 80% of total 2016 demand. While we do not expect this level of award momentum to continue throughout 2017, it does indicate some positive movement within the market. As such, with pipeline installations having a lag time from the subsea market, 2017 is expected to experience the bottom of the trough in deepwater pipeline installation activity, with recovery expected to begin in 2018.

Recovery Demand Profile

The pipeline recovery is attributed to increased transmission line and export pipeline activity, which is disconnected from previous demand profiles. Previous transmission activity has been unpredictable and difficult to forecast, with geopolitical issues and economic sanctions playing a large part in the approval of these long transmission lines. Installation work on Gazprom's TurkStream pipeline finally commenced in June, after many reiterations of the pipeline route and legal issues following the termination of the installation contract with Saipem for the South Stream pipeline. Allseas won the new contract, and the Pioneering Spirit, Audacia, and Tog Mor will undertake installation of the project's two transmission lines, totaling 1,800 km of our pipeline forecast. The Sur Texas-Tuxpan transmission line and the Johan Sverdrup oil export pipeline are also expected to be large contributors to recovery, beginning in 2018.

Global Expectations

World pipeline demand decreased in 2017 and will begin to recover in 2018. Pipeline demand had declined steadily since 2015 as project start-ups were pushed back due to operators trying to conserve cash flow and lower project development costs. Next year is expected to see an increase in the +25-in. pipeline diameter category with the planned installation of the TurkStream pipeline and Johan Sverdrup oil export pipeline. Iran Oman India Gas Pipeline is the main contributor to the 20-in. to 24-in. increase in the forecast period beginning in 2019.

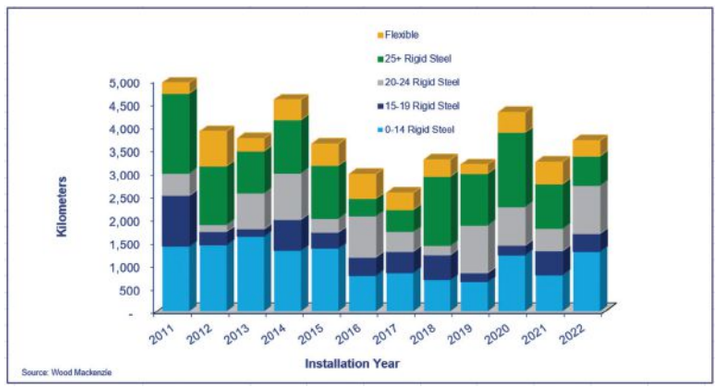


Figure 1. Worldwide Pipeline Demand, 2011-2022.

Africa/Mediterranean

North Africa is expected to be the largest demand source for the Africa/Mediterranean region, apart from the traditional hot spots of Nigeria and Angola. The trend toward geographic diversity in pipeline installation will continue throughout the forecast period. However, frontier areas in general are especially at risk due to lower oil prices, which should lead to lower than expected growth in regions such as East Africa. Despite the downturn, African installations have steadily been growing since 2013. Installations for Total's Kaombo Phase 1, BP's Shah Deniz Phase 2, ENI's Zohr project, Gazprom's TurkStream Pipeline project, and BP's Trans Adriatic Pipeline project contribute to increased installation activity in 2017.

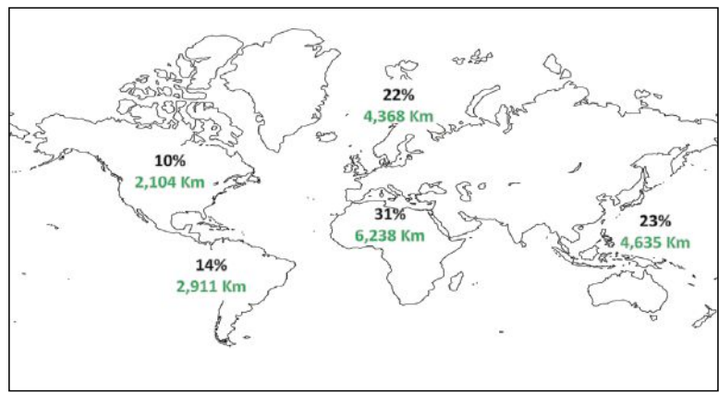


Figure 2. Deepwater Pipeline Demand – Regional Share, 2017-2022.

Gulf of Mexico

After a strong five years, led by the install of new ultra-deepwater hubs, the Gulf of Mexico is expected to see a trough in installation activity this year before picking back up in 2018. The forecast installation demand is largely composed of pipeline infrastructure for developments such as BP's Mad Dog Phase 2, Shell's Appomattox and Vito, and Pemex's Lakach. This is a function of both the depressed overall market as well as cyclicality in the region due to the installation of large exports for new hubs in undeveloped areas. Smaller subsea tieback activity is the current driver for the Gulf; however, the Sur Texas-Tuxpan transmission line installation in shallow waters south of the U.S. border will provide some offset activity on a pure-kilometer basis in 2018 and 2019, contributing to the large increase in the +25-in. diameter pipeline category.

South America

South American pipeline installation, which is overwhelmingly focused on Petrobras-operated pipelines offshore Brazil, is expected to account for 72% of global flexible flow line installations from 2017 through 2022. The majority of this South American flexible flowline demand will be attributed to infield flowlines serving deepwater, pre-salt FPSO developments. South America is expected to account for 1,581 km of flexible flowline installations out of a total global figure of 2,192 km from 2017 through 2022.

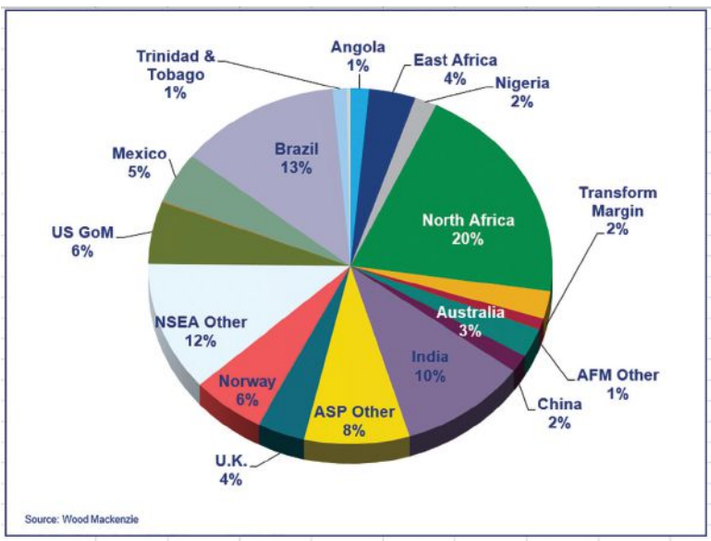


Figure 3. Deepwater Pipeline Demand by Province, 2017-2022.

Asia Pacific/Middle East

Malaysia, Indonesia, India, and other Southeast Asian countries have surpassed Australia to become the leading demand source in the Asia-Pacific region. Australia is projected to account for only 11% of the 4,635 km of pipelines projected to be installed in the region between 2017 and 2022. India will account for the majority of demand (45% of the total), and Malaysia, Indonesia, and other Southeast Asian countries accounting for 37% of the total Asia-Pacific forecast demand activity. The main contributors to the growth of India demand is South Asia Gas Enterprise's Iran-Oman-India Gas trunkline, ONGC's KG-DWN-98 Cluster, and Reliance Industries' KG-D6 Extension R series Cluster project. Negotiations have resumed for the Iran-Oman-India Gas trunkline, with the planned pipeline running from the Iranian coast via the Oman Sea and Indian Ocean to Gujarat. It is expected to be built in two years, from the date the necessary approvals and a gas sale and purchase agreement are signed.

North Sea/Arctic

The North Sea has seen low levels of installation activity in 2016 and 2017, but is expected to recover in 2018. The West of Shetlands, Baltic, and Barents Sea activity provides an upside within the forecast in addition to contributions from the more traditional UK and Norwegian North Sea areas. Statoil's Johan Sverdrup project will contribute to the recovery in 2018 and has awarded marine contractors Saipem, Technip, and Ocean Installer sections of the SURF package. The contributors of the significant increase in the +25-in. diameter category for the latter part of the forecast is the Nord Stream 2, which will be installed by Allseas' Pioneering Spirit and Solitaire.

2017 SURF Awards

While the low oil price environment is prompting operators to delay award activity and fine-tune prospective installation work scopes to reduce costs, there have been several SURF and EPIC (engineering, procurement, construction, installation and commissioning) contracts awarded in the first half of 2017. In the Gulf of Mexico, BP awarded Subsea 7 the SURF installation package for Mad Dog South Phase 2 and Shell awarded TechnipFMC and the SURF installation award for Kaikias. In the Africa/Mediterranean region, ENI awarded TechnipFMC an EPCIC for Coral South FLNG project and Allseas was awarded the installation contract for the second string of the TurkStream pipeline project. Subsea 7 was awarded an installation contract for Cooper Energy's Sole Vic project in Australia, and Saipem was awarded ExxonMobil's Liza project in Guyana.

Although installation levels have seen multi-year lows as contractors have executed previously awarded backlog and less incoming work replaces it, Wood Mackenzie projects improvement in the offshore pipeline installation market beginning in 2018. This will be driven by transmission line and export pipeline installation activity, improvements in market conditions, and increased tendering. Operators are working to increase efficiencies in their projects while suppliers and contractors work together to provide cost-saving subsea solutions. This collaborative effort across the deepwater industry will be a significant driver to how strong we move out of this downturn into the next upcycle.

The analysis and insight provided in this piece are from our recently launched global upstream supply chain research team. Through acquisitions of Infield Systems and the Quest Offshore data & subscriptions business, Wood Mackenzie has created a strong, industry-leading foundation on which to build the comprehensive suite of upstream supply chain solutions and costs.

SMD Develops High-Speed ROV Capability

As price pressures continue in the ROV industry, the need for operators to reduce operational costs through the adoption of new technologies is increasingly important.

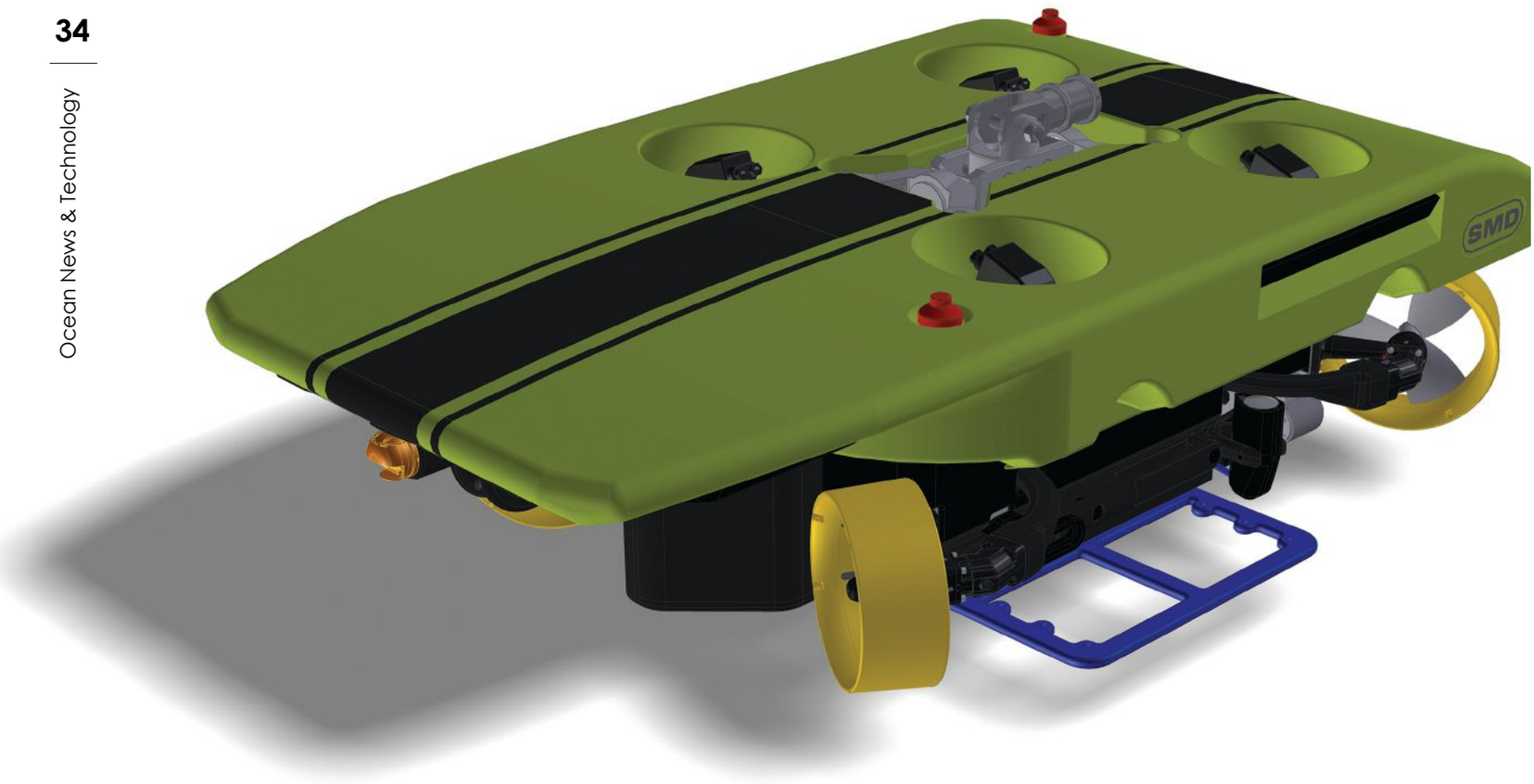
For areas such as seabed mapping and pipeline inspection where traditional work-class ROV systems remain the preferred choice, SMD has recognised the limitations of the current technology available and developed FLO, a new high-speed survey and inspection ROV system capable of delivering higher-quality survey data and significant time savings in offshore operations.

Traditionally, standard work-class ROVs have speed limitations due to their size, weight, and hydrodynamics. They can also be unsteady operating at higher speeds.

SMD engineered FLO, a high-speed variant based on proven SMD ROV fleet technology, to perform tasks faster and more efficiently. The new system has a top speed of 6 kn and the ability to hold position in currents up to 4 kn from any direction. FLO also boasts 50% faster survey times compared to conventional work-class ROVs and is capable of significantly extending the operational window in areas where high currents are prevalent, especially within the renewables sector.

From concept to manufacture, the new high-speed ROV by SMD has been designed around the latest sensor payloads it would be tasked to carry offshore while also providing the most stable and acoustically quiet platform possible to gather quality survey data.

In order to provide this level of performance, FLO uses SMD's advanced ROV drivetrain technology in a low-profile hydrodynamic package less than half the height and half the weight of a typical work class ROV. Coupled with eight open-water vectored thrusters and SMD's advanced ROV control automation, FLO is able to accurately navigate and remain stable at high speeds while close to the seabed.



FLO can also be operated in free-swimming mode for shallow water and uses a tether management system (TMS) in deeper water. Although travelling at high speed creates drag on the ROV umbilical, FLO has the power to achieve speeds greater than 4 kn in free-swimming mode in water depths of 500 m.

When using a TMS for deepwater operation, the umbilical drag is transferred to the surface vessel, allowing the high-speed ROV a high degree of manoeuvrability on a short 50-m tether. This mode allows a calculated maximum speed of 5.6 kn in depths over 2,000 m.

To ensure optimised deployment and retrieval of FLO in difficult conditions, SMD has drawn upon its 45 years of deck equipment design experience to offer a purpose-designed LARS system that incorporates innovative functions, including the auto cable render and a gimballing docking head.

EdgeTech Provides a 6205 MPES System to University of New Hampshire

EdgeTech, a leader in high-resolution sonar imaging systems and underwater technology, recently provided a 6205 MPES system to the University of New Hampshire's Center for Coastal and Ocean Mapping/ Joint Hydrographic Center (CCOM/JHC).

The EdgeTech 6205 Multi Phase Echo Sounder (MPES) produces real-time, high-resolution, three dimensional (3D) maps of the seafloor while providing co-registered simultaneous dua-frequency side-scan imagery. EdgeTech's Multi Phase technology allows a user to collect wide swathe, wide angle, high-resolution bathymetric data that are compliant to IHO Special Order S-44 in up to nine times water depth. This can be done at coverage rate that is at least twice that of a conventional multi-beam echo sounder and is an order of magnitude faster than using a single beam echo sounder. The result is an effective shallow-water hydrographic survey tool that is simple to use and cost effective.

The Center for CCOM/JHC has a close affiliation with the National Oceanic and Atmospheric Administration (NOAA) and will utilize the EdgeTech 6205 for research and education dedicated to their missions of hydrographic science and ocean mapping. The 6205 will be utilized in The Fundamentals of Ocean Mapping course this fall and deployed in other research activities at the Center throughout the year.

For more information, visit www.edgetech.com.

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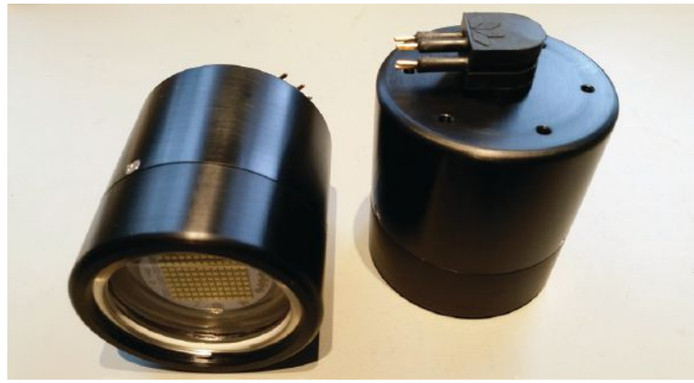
First Deep-Sea LED Strobe Using High-Potential Driver Released

Arctic Rays, LLC has released—a proven robust deep-sea LED strobe light designed for imaging applications on AUVs and other underwater vehicles or platforms. Its compact size, high brightness (30,000 lumens @ 5ms, 42,000 lumens @ 200 µs), and low current draw (550 mA @ 24 Vdc), make it ideal for AUV-based still photography, where payload size and power budget are cr itical. Drive electronics, thermal protection, and intelligent microprocessor control are integral in the Dragonfish's small 1 ATM, 6,000-m rated, anodized aluminum housing. External power and trigger are all that are needed to operate. The unit is easily synced to a standard TTL camera shutter and will self-quench automatically when the shutter line is released, allowing user-controllable strobe durations up to 5 ms. It can also be quenched by an alternate source using the independent quench line. Standard beams are a wide 62° flood or a narrow 35° spot.



Dragonfish is currently being used successfully on the Remus 100, 600, and 6000 AUVs. It was selected because it provides more illumination with less power consumption than competing products, in a smaller package and at a lower cost. In addition, unlike potted LED solutions, its 1 ATM housing design allows for easy repair and upgrade of LED elements, electronics, and control firmware.

The compact design weighs only 318 or 420 g in water (depending on options), and measures 70 mm in diameter and 70 mm long. Housed in a 6061-T6 AHC aluminum housing, it is available in depth ratings of 1,000 or 6,000 m.

For more information, visit www.arcticrays.com.

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MacArtney Renovates and Refurbishes French Bathymetric Survey Vessel

Located on the western border between Basque Country and Gascony, the harbor of Bayonne belongs to the region Nouvelle-Aquitaine which is under obligation to provide information to the various harbor operators about the depths through of the harbor. MacArtney France is the proud supplier of the multibeam solution for the bathymetric vessel Ingénieurs Lesbordes and is likewise the integrator of the diverse steps of modification that were imperative to the successful adaptation of the vessel to the prevailing IHO survey standards.
http://ont.news/2tNrETM

James Fisher Subsea Excavation Launches New Innovative MultiROV System

James Fisher Subsea Excavation (JFSE) has launched the new innovative MultiROV system to satisfy additional client requirements. The MultiROV brings new levels of controllability and productivity for excavation requirements in the offshore oil & gas and renewable energy sectors. It reduces the services required from a vessel as it needs no stabilizing tuggers or clump weights. On-board thrusters allow movement and heading control, which increase the operational window and productivity.
http://ont.news/2uPTPXd

MONTH IN REVIEW

Remote Ocean Systems Introduces Fluorescent Floodlight

The ROS LUV-LED is an oceanographic floodlight specifically designed for coral fluorescence and depth rated to 4,000 m.
http://ont.news/2uIVUmV

Ocean Installer Awarded Subsea Installation Contract from Statoil

Ocean Installer has been awarded a contract for subsea installations and tie-in operations for Statoil on Johan Sverdrup as well as Utgard and Bauge.
http://ont.news/2uQg9Ab

DTU Creating Collaborative Underwater Robots for Offshore Industry

The Technical University of Denmark has inaugurated a laboratory where researchers will complete a modular robot for use in offshore wind turbine platforms.
http://ont.news/2uQg0fZ

DOF Subsea Inks Transmediterranean Pipeline Survey Contract

DOF Subsea has recently inked a new contract in the Mediterranean with Transmediterranean Pipeline Company Limited (TMPC) to undertake the pipeline inspection.
http://ont.news/2uibluQ

Limited Turnkey HUGIN AUV Package Now Available

Kongsberg has announced the limited availability of a new turnkey HUGIN package, featuring the synonymous state-of-the-art AUV.
http://ont.news/2tx0Qfu

Teledyne RESON to Equip Japan Coast Guard Vessels

Teledyne RESON A/S has received two awards of multibeam echosounder packages to equip Japan Coast Guard new-build hydrographic survey vessels.
http://ont.news/2tJSEZq

SeaSense™ Serial Protocol: Improved Control

While developing their next generation of subsea products, DeepSea Power & Light uncovered limitations in existing EIA-232 and EIA-485 serial protocols used throughout the subsea industry. Some systems use binary protocols difficult to operate without additional software, and others are limited in functionality and extensibility. In response, DeepSea developed the SeaSense™ protocol, an innovative serial protocol offering access to advanced on-board monitoring, diagnostic, and control technologies while improving usability and flexibility over other protocols.

The SeaSense™ protocol uses human readable commands with simple formatting rules and an optional checksum field. Real-time validation and error-tolerant operation are built into the design to make testing and troubleshooting systems straightforward. SeaSense™-enabled products operate in multi-protocol installations and seamlessly respond to more than one serial protocol. For example, the HD Zoom SeaCam operates natively with both Sony VISCA™ and SeaSense™ commands.

A core command set and common formatting across all SeaSense™-enabled products keep the basic setup and operation consistent and simple. A typical command includes an address, a command ID, an access type character that designates what operation the command performs, and optional data (Figure 1). The combination of command IDs and access types both gives flexibility to the protocol and keeps unique commands to a minimum. Using the LED SeaLite® as an example, LOUT? queries the current light output, LOUT=50 sets the output to 50%, and LOUT+ or LOUT- increments or decrements from the current value.

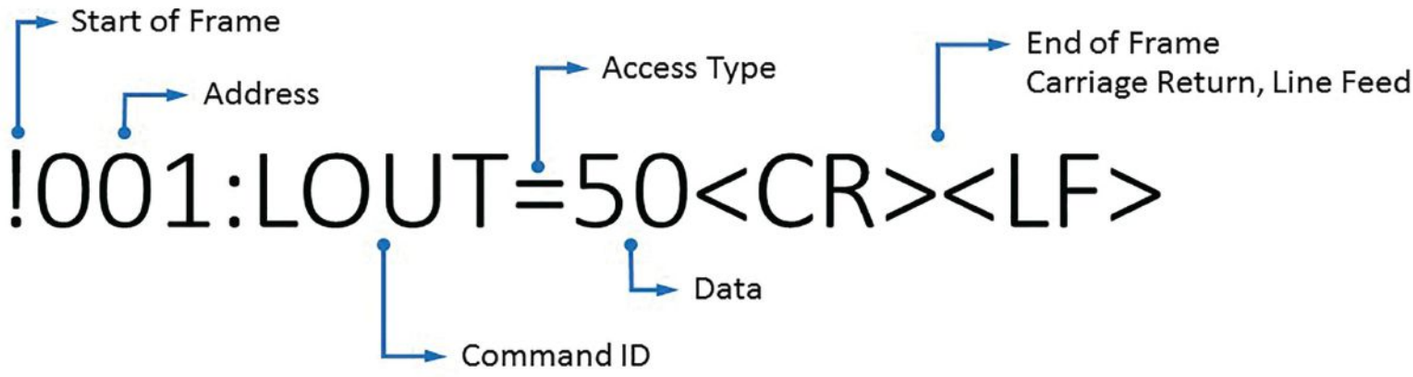


Figure 1. Example of a basic SeaSense™ command.

The SeaSense™ protocol provides unprecedented levels of control. In addition to the basic LOUT command for the output light level, there are commands to change the dimming curve, customize and recall preset levels, change the power-on level, and limit the output power to match the available power budget. The new Multiray™ LED SeaLite® extends the protocol and control with commands to select, combine, and switch the color and beam pattern of the light (Figure 2).

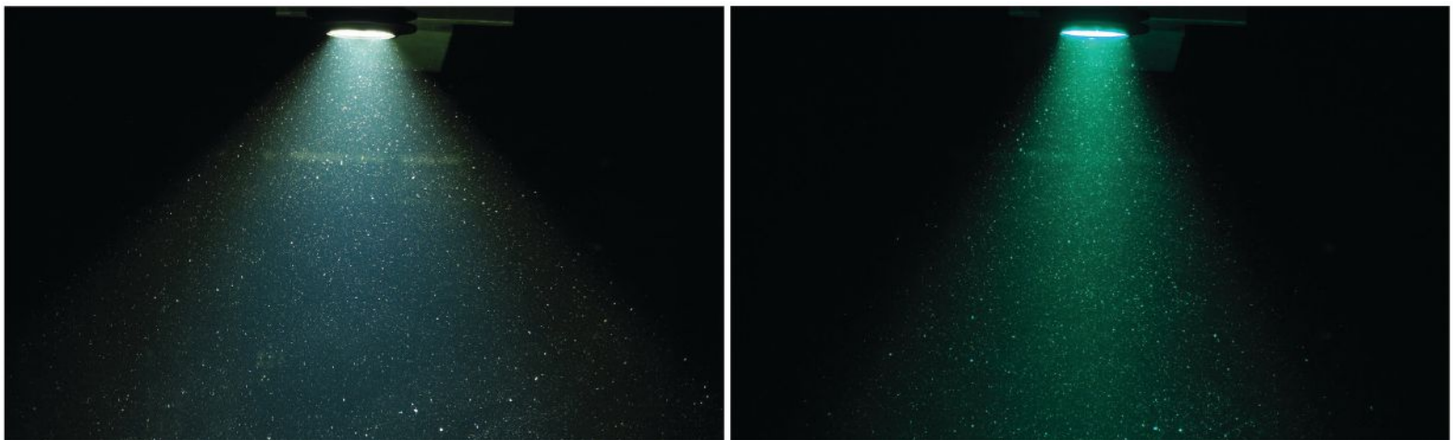


Figure 2. A Multiray LED SeaLite® uses the channel switch command CHSW+ to change the output beam pattern and color.

SeaSense™-enabled products can work together by grouping multiple devices and operating them as one. Operators can set groups in order to control lights in physical proximity (e.g., starboard or port side), synchronize the beam pattern of a Multiray LED SeaLite® with the zoom position of a camera using user presets, or put an entire bank of devices into power-saving standby mode. Layers of these behaviors can be built on top of one another, as each device can belong to more than one group (Figure 3). The SeaSense™ protocol also offers broadcast commands that address all connected devices. Group and broadcast commands require multi-drop networks or the use of port-mirroring software to combine physical ports into a single virtual serial port.

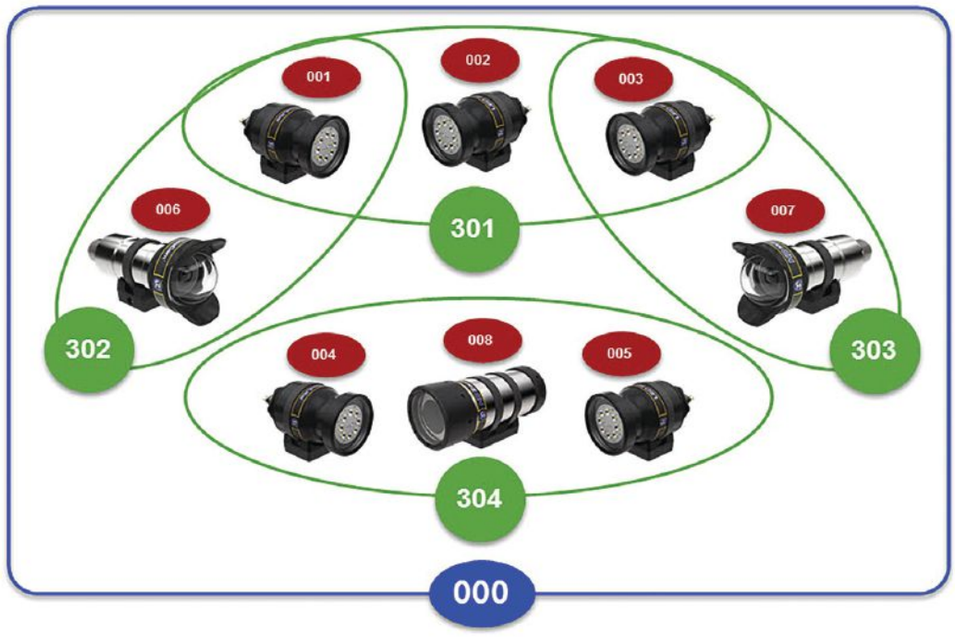


Figure 3. Group (green) and broadcast (blue) commands; individual devices (red) can be grouped together, and each device can belong to more than one group.

The SeaSense™ protocol is already a powerful means to expand the capabilities of subsea imaging systems. With scalable control over individual and groups of products, the utility of SeaSense™-enabled systems will continue to grow as DeepSea expands its next generation of products. More information is available online at www.deepsea.com/SeaSense.

OSI Delivers Construction Phase of ATISA Network

Cable ship laying ATISA cable in the Mariana Islands.

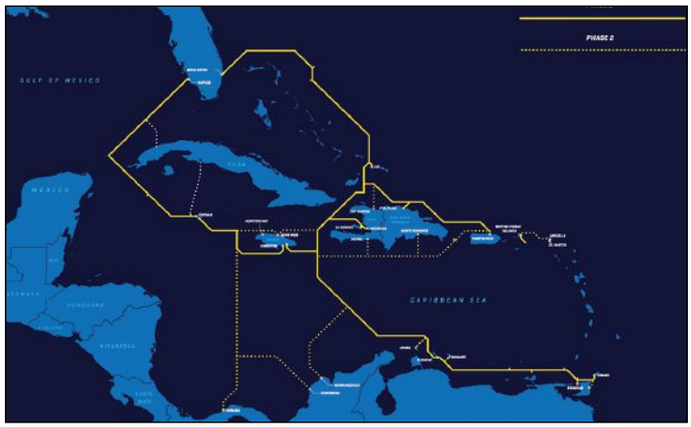
Ocean Specialists, Inc. (OSI) announces that it has completed its full scope of program work related to the ATISA submarine cable project. OSI has been engaged with DOCOMO PACIFIC since the earliest days of the project, helping shape the commercial and technical foundations of the program, with a continuing technical management role that extended through manufacturing, installation, and commissioning. The ATISA network was installed by NEC.

ATISA brings much-needed capacity and redundancy to the region, with additional fiber optic connectivity to the islands of Saipan, Rota, and Tinian with high-capacity links to Guam. “DOCOMO PACIFIC and OSI have designed and delivered the ATISA network with service restoration and robust network capabilities fully in mind. OSI has appreciated the focus and drive with which the DOCOMO PACIFIC team has led the project; we are certain the network will bring significant benefit to the Marianas,” stated Tony Mosley, OSI’s director of Asia Pacific.

“OSI’s team has worked side-by-side with us from Day One. Their suggestions and ability to balance the commercial, technical, and delivery aspects of the program were invaluable,” stated Jonathan Kriegel, President and chief executive officer of DOCOMO PACIFIC.

OSI delivers network connectivity globally for telecom, energy, and scientific industries, with current projects spanning all regions of the world. Network development portfolio services range from market studies, partner identification, technology assessment, vendor selection and full network management of installation and commissioning. “As it relates to Asia Pacific, which is always a dynamic and important region, we are particularly proud of our capabilities; we have made a strong commitment to the region in terms of resourcing and staff, and it shows in our ability to meet the needs of this market,” said Tom Soja, vice president of OSI.

For more information, visit www.oceanspecialists.com.

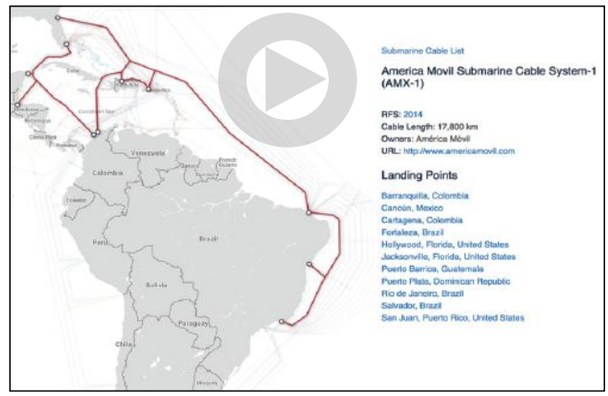


Deep Blue Cable, SubCom to Build New Caribbean-Americas Cable

Deep Blue Cable has announced that they have contracted with TE SubCom, a TE Connectivity Ltd. company, to build and deploy the Deep Blue subsea cable system. The pan-Caribbean system design spans nearly 12,000 km with initial landing points in 12 markets throughout the region, including the Cayman Islands, Curaçao, the Dominican Republic, Haiti, Jamaica, Puerto Rico, Trinidad & Tobago, and Turks & Caicos Islands, with dual diverse landings in the U.S., which will include the first landing of a cable on the Gulf Coast of Florida.
http://ont.news/2uIYBoG

What Does it Take to Get Permits for a 10,000-Mile Submarine Cable System? CSA Can Help!

The América Movil (AMX-1) Submarine Fiber Optic Cable System traverses approximately 15,900 km (9,879.8 mi) of seafloor connecting Florida to the Caribbean, Mexico, and South America. CSA provided comprehensive permit consulting services as the Permitting Agent for América Movil in support of permit acquisition for the Jacksonville and Hollywood, Florida landings as well as permit compliance assistance for landings in San Juan, Puerto Rico. CSA supported the AMX-1 Cable System from inception of the project and continued through permit acquisition and post-installation mitigation at landings in Florida and in Puerto Rico.
http://ont.news/2tDHmS3



MONTH IN REVIEW

Cobham to Supply VSAT and Radio Equipment for Brazilian Vessels

Companhia Brasileira de Offshore has chosen Cobham SATCOM VSAT and satellite TV antennas for installation on six new offshore support vessels.
http://ont.news/2vsika8

Huawei Marine Contracts to Build Cameroon-Brazil Cable System

Huawei Marine contracted with China Unicom and Camtel to construct the South Atlantic Inter Link (SAIL), which will link Cameroon to Brazil.
http://ont.news/2uQlg35

M-Tech Offshore Debuts Cable Laing Vessel for Power or Fiber Projects

M-Tech Offshore A/S announced that the CLV SIA, an efficient, handy-sized DP-2 cable laying vessel, is ready for operations.
http://ont.news/2uQhKFY

SES to Deliver Asia-Pacific Broadband

Primacom will use SES Networks' Maritime+ service to deliver the highest levels of reliable high-speed broadband connectivity to vessels in the Asia-Pacific region.
http://ont.news/2tZDSZq

Lockheed Martin-Led Team Launches the Future USS Billings

The Lockheed Martin-led industry team launched the 15th Littoral Combat Ship (LCS) into the Menominee River at the Fincantieri Marinette Marine shipyard on 1 July.

Ship sponsor Sharla D. Tester christened LCS 15, the future USS Billings, in Navy tradition by breaking a champagne bottle across the ship's bow just prior to the launch.

"As a lifelong Montanan, there is no greater honor than to serve as the sponsor of the future USS Billings and to help bring this magnificent warship one step closer to joining the fleet," Tester said. "I know the people of Billings—and all Montanans—look forward to supporting Billings and her future crews for decades to come."

Named in honor of the patriotic and hardworking citizens of Billings, LCS 15 will be the first U.S. Navy ship to bear the name of Montana's largest city. She will undergo additional outfitting and testing at Fincantieri Marinette Marine before her anticipated delivery next year.

"The Freedom-variant LCS plays a critical role in the U.S. Navy's fleet, and we are committed to getting Billings and her highly capable sister ships into combatant commanders' hands as quickly as possible," said Joe North, vice president of Littoral Ships and Systems. "These flexible ships will help the Navy achieve its goals of growing the fleet rapidly and affordably."

The Lockheed Martin-led industry team is currently in full-rate production of the Freedom-variant of the LCS and has delivered four ships to the U.S. Navy to date. The future USS Billings is one of eight ships in various stages of construction at Fincantieri Marinette Marine, with one more in long-lead production.

"We are proud to be building the USS Billings and her sister ships at the heartland's only naval shipyard," said Jan Allman, Fincantieri Marinette Marine president and CEO. "Today's launch and christening is a testament to the hard work of the more than 2,500 Michigan and Wisconsin workers who pass through the shipyard's gates, put on their hard hats, and build American warships."

The Lockheed Martin-led LCS team is composed of shipbuilder Fincantieri Marinette Marine, naval architect Gibbs & Cox, and more than 800 suppliers in 42 states. Costing less than a third of a brand new Arleigh Burke-class destroyer, the Littoral Combat Ship is the Navy's most affordable surface combatant shipbuilding program and the ideal platform to grow the U.S. Navy fleet quickly and affordably.

The Freedom-variant's steel monohull design is based on a proven, resilient design recognized for its stability and reliability.

For more information, visit www.lockheedmartin.com/lcs.

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HMS Queen Elizabeth Sails for the First Time

The Royal Navy's largest-ever warship was put to sea for the first time to commence sea trials off the coast of Scotland. In a delicate operation lasting nearly four hours, HMS Queen Elizabeth moved from the basin at Rosyth where she has been under construction since 2014, and into the Forth Estuary. There she will wait until ready to pass beneath three iconic Forth crossings—two road, one rail—and begin six weeks of sea trials in the North Sea. More than 700 sailors, led by Commanding Officer Captain Jerry Kyd, and 200 industry contractors sailed with the 65,000-tonne aircraft carrier on her maiden voyage.
http://ont.news/2uQpIyP

Klein Demonstrates S5900 Multi-Beam Side Scan for Mine Hunting

Klein Marine Systems, Inc. a wholly owned subsidiary of Mitcham Industries, Inc. successfully concluded a week of trials and demonstrations in conjunction with the Mine Hunting Challenge and Industry Days in Zeebrugge, Belgium. In the waters outside the Belgian Navy's Mine Hunting Training Center, Klein showcased the Klein 5900, its newest high-resolution, high-speed multi-beam side scan sonar towed by the Seagull, an advanced, highly configurable unmanned surface vehicle developed by Elbit Systems.
http://ont.news/2gX42e7

MONTH IN REVIEW

Huntington Ingalls Industries Awarded Contract for LHA 8

Construction of the amphibious assault ship USS Bougainville is scheduled to begin in the fourth quarter of 2018, and delivery is expected in 2024.
http://ont.news/2uj20s4

Damen Partners with Metal Shark to Build Patrol Vessels

Under the terms of the contract, Metal Shark will build up to 13 Defiant-class welded aluminum cutters for several U.S. partner nations.
http://ont.news/2tmZhfX

Austal Wins Littoral Combat Ship Contract from U.S. Navy

The 127-m long, frigate-sized LCS 28 will be the 14th Littoral Combat Ship built at Austal's U.S. shipyard in Mobile, Alabama, under a $3 billion contract.
http://ont.news/2txxEoB

Kraken, ATLAS Team on Underwater Robotics

They will combine their expertise to provide the Royal Canadian Navy with a Remote Mine Disposal System solution.
http://ont.news/2uHh59c

Belgian Navy Acquires 10 Licenses of SeeByte's SeeTrack Software

The software package, which includes additional specialist modules designed for mine countermeasure (MCM) operations, will be integrated onto their AUV fleet.
http://ont.news/2tx9cn0

Bollinger Delivers the Cutter Oliver Berry to U.S. Coast Guard

Bollinger Shipyards delivered the 24th Fast Response Cutter to the U.S. Coast Guard in June, with commissioning scheduled for October.
http://ont.news/2vsqC1o

Will Natural Gas Recapture Its Former Darling Role?

Prior to attending the recent G20 meeting in Hamburg, Germany, President Donald Trump visited Poland and delivered two speeches. The first was at the Warsaw Uprising Memorial in Krasiński Square, where he presented a vigorous defense of Western Civilization and praised the strength of the Polish people. The second talk was at the Three Seas Initiative conference focused on European energy, where he highlighted the role of U.S. natural gas in helping to break Russia's stranglehold on the continent's markets. Poland recently received its first shipment of U.S. liquefied natural gas at the country's new LNG import terminal. This LNG cargo signified a major energy market development both here and abroad. It has the potential to also change the geopolitical future.

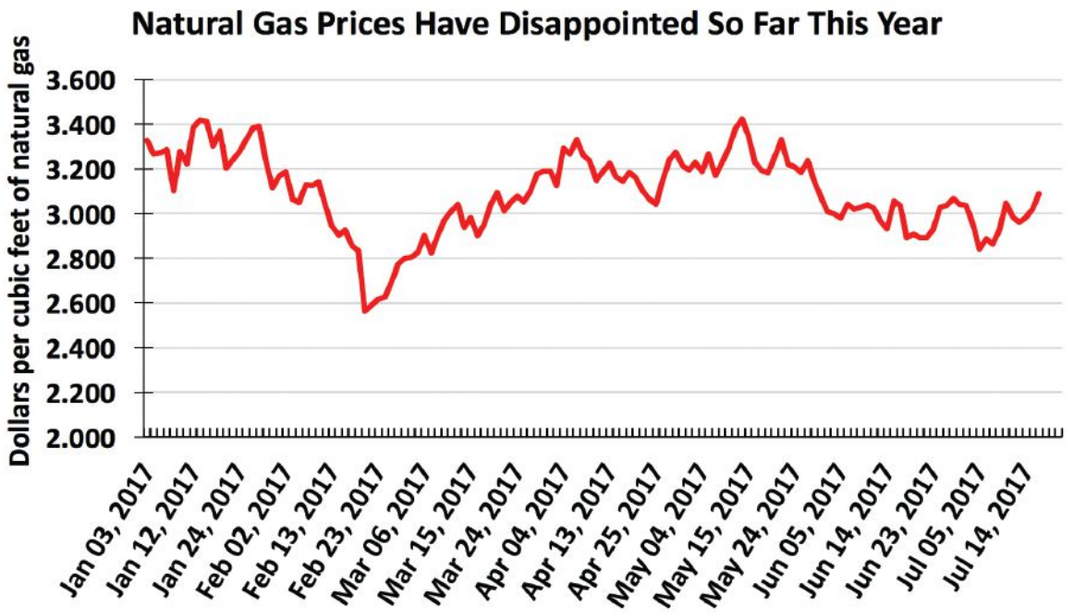
Natural gas prices, so far this year, have disappointed the optimists. Instead of soaring to the $3.50-$4.00 per thousand cubic feet of natural gas price range, they have labored to stay at $3.00. In fact, gas prices have fallen by 15% so far this year.

Natural gas futures prices are a reflection of the views of traders and producers regarding gas supply and demand growth at any point in time in the future. These views are often shaped by the inferences taken from the weekly changes in natural gas storage volumes. When current demand does not consume all the gas output, storage becomes the only alternative for producers. Shutting down well production is not an option for producers as they worry about reservoir damage or that their wells might fail to return to production at their pre-shutdown gas volumes, or even at any volume.

Gas traders and producers carefully watch the pace of weekly storage injections—are they more or less than the volume injected last year? They also compare injection volumes versus the 5-year average for the same week, again as a way to assess the health of gas markets. The latest weekly storage injection was below the prior year and 5-year average, a bullish outcome—and, as a result, the near-month gas futures contract price jumped by more than 1%. Does this mean gas storage volumes will continue underperforming last year's and/or the 5-year weekly average for the balance of 2017?

At the present time, natural gas storage volumes remain 9% above last year's volume and 5% above the 5-year average. This oversupplied storage market has depressed natural gas prices. Even following the surprisingly positive (below anticipated volume) weekly storage injection report, natural gas prices were only at $3.10 per thousand cubic feet. This is comfortably below where pundits predicted gas prices would be at this time when they prepared their 2017 forecasts.

While natural gas prices remain weak, exports of LNG were record volumes in May, albeit well below levels expected in the future. This is a result of the fact that LNG export facilities are only now coming on line. In May, according to Platts Analytics, the United States exported 17 LNG cargoes carrying the liquefied equiva-



By: G. Allen Brooks
Author of "Musings From the Oil Patch"
www.energymusings.com

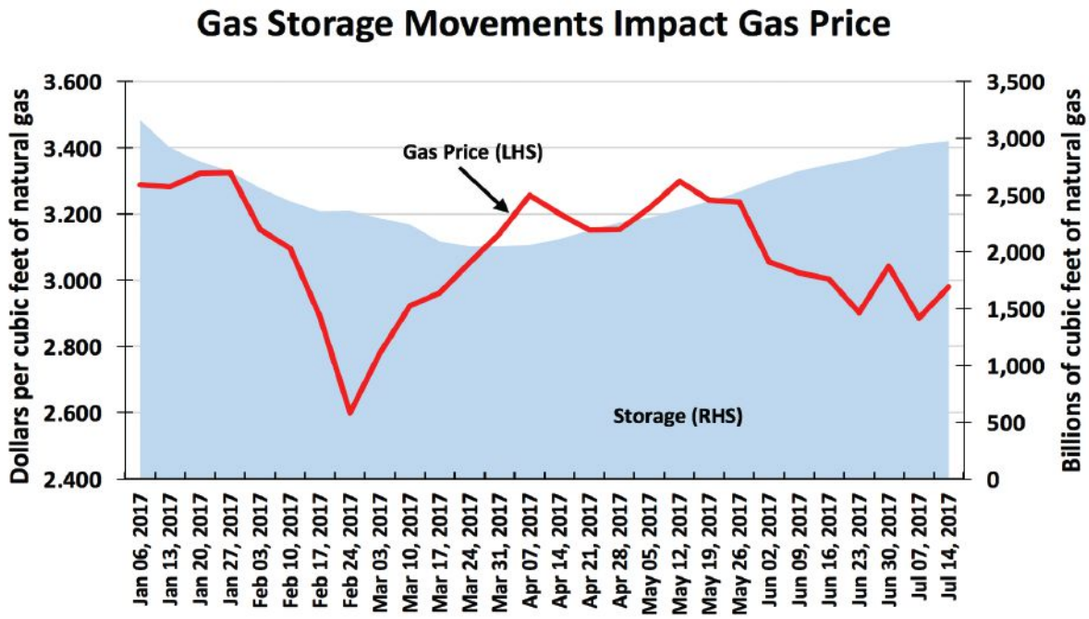
lent of 58.3 Bcf of gas. Translated to a daily rate, LNG exports were at the rate of 1.9 Bcf/d out of a total natural gas production volume of 89.3 Bcf/d as of April (latest data available), or slightly more than 2%. While LNG volumes are targeted to increase throughout the year as additional terminals start up, gas volumes shipped will still represent an extremely small market share.

Using Energy Information Administration data for April, pipeline exports represented 80% of the total natural gas export volumes. Gas exports by pipeline to Mexico represented 59% of total shipments, with the balance going to Canada. Mexico was also an LNG recipient—27% of that products' total volume. Combined, Mexico received over 52% of total U.S. natural gas exports for the month.

What was interesting about April's LNG export data was comparing regional shipping volumes. The distribution showed South America countries receiving 32%, while Mexico accounted for 27%, Asia at 21% and the Middle East at 20%. Critical to the sales opportunities is the cheap natural gas in the United States compared to gas prices in these various regional markets. As long as natural gas prices in the United States remain depressed relative to global LNG prices, profit opportunities exist for U.S. companies to buy, liquefy, ship, and re-gasify gas for foreign markets.

As attractive as the LNG market is, there are other considerations beyond profit opportunities that will determine exactly how large this market can become. On consideration about substantially higher gas exports is the role of natural gas in meeting U.S. electricity needs. Early in this century, natural gas was the darling of the environmental movement because natural gas has about half the carbon emissions of crude oil, and even less compared to coal. Environmentalists argued that natural gas could be a bridge to a cleaner U.S. climate. Of course, double digit natural gas prices helped their argument as they provided an umbrella over more expensive renewable fuels. That relationship was broken when natural gas prices fell due to the success of fracking technology in extracting greater supply than ever thought possible from shale gas wells. Exploding gas volumes collapsed prices, and transitioned natural gas into an enemy of environmentalists since low gas prices undercut the more expensive renewables, even given after impressive cost reductions of the past 5 to 10 years.

The natural gas market, while not receiving as much daily media attention as the crude oil market, remains important for the domestic energy business and now for its geopolitical influence. The evolving global natural gas market, a dream of industry insiders for decades, offers new profit opportunities for gas producers and shippers while potentially creating a challenge for U.S. energy regulators should domestic supply begin to lag behind demand growth. Current low gas prices are disguising those risks. Natural gas will probably never regain its "darling" role as environmentalists clearly see it as a threat now rather than a friend.



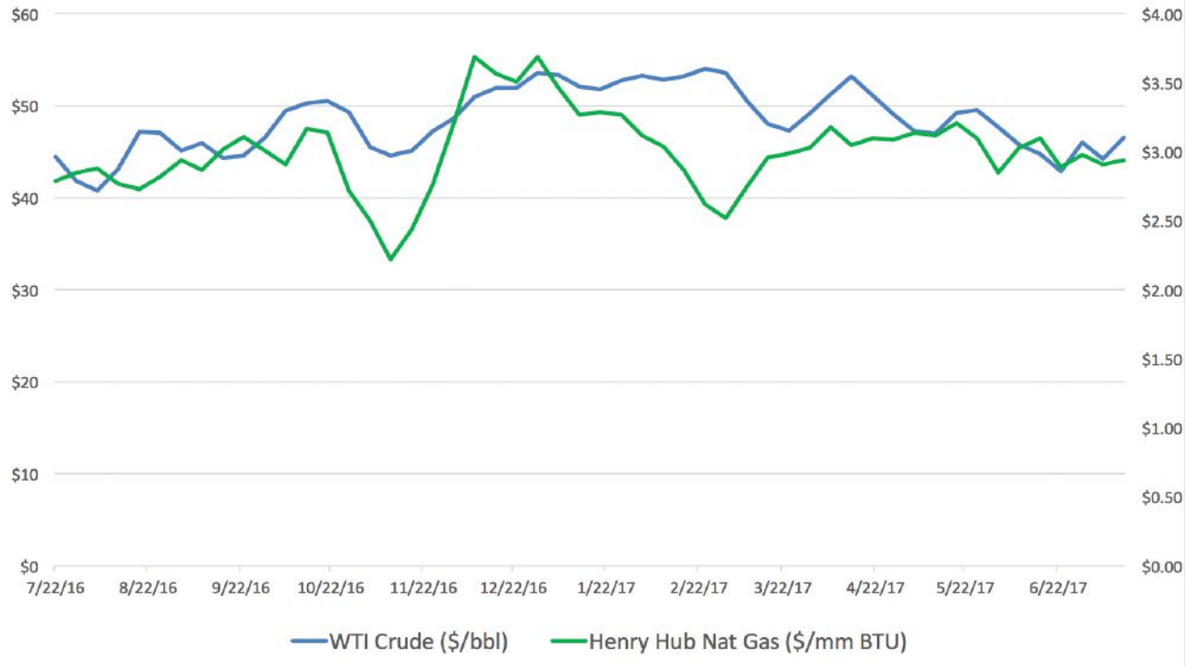
Crude & Natural Gas Spot Prices

Prices in USD as of July 17, 2017

Increased output is expected to result in lower oil prices in the summer of 2017. The July output is expected to increase by 145,000 bpd due, in part, to increased output in Libya and Nigeria in spite of an OPEC agreement to decrease production. Oil's slow recovery, however, is continuing and reporting so far this year is encouraging, even though oil prices remain low. Some degree of price relief may occur in 2018, but companies must come to terms with the reality of oil prices at or below the $50 per barrel mark for the near term.

Henry Hub natural gas spot prices closed at $2.94 as of 14 July 2017, reflecting a decline of $0.04 from our last report as global supplies remain strong. A 5 July 2017 report on energy consumption from the EIA confirmed previous data regarding the growth of natural gas at the expense of coal. Natural gas growth continues to be strong in spite of renewables, which have the fastest growth rate of any fuel and surpassed 10% of energy consumption for the first time in 2016. The trends of low natural gas prices, users switching to natural gas from other fuels, and U.S. natural gas export strength continue.

Weekly Crude Oil & Gasoline Inventory Changes and Oil Price



$46.53

$46.53 previous month

TRENDING DOWN

Cushing, OK WTI Spot Price

Henry Hub Spot Price

$2.94

$2.98 previous month

TRENDING DOWN

Key Equity Indexes

Cumulative Percentage Change as of July 17, 2017

The U.S. equity markets remained strong in spite of turbulence on many fronts. Over the last 52 weeks, the DJIA is up by 14.9% and the S&P 500 is up by 13.7%. Recently the market growth has been driven by strong jobs data and positive results from technology companies. In contrast, as shown in the chart below, the companies in Philadelphia Oilfield Services Index (OSX) continue to struggle, dropping by 18% over the last 52 weeks. The slump by oil service stocks comes amid a decrease by the price of crude oil, with crude for September delivery sliding $0.75 to $46.17 a barrel. For the companies involved in offshore oil activities, low oil prices and increasing production from cheaper onshore fields is making this a challenging time.

Selected Equity Indexes - Cumulative Percentage Change Last 52 Weeks

21,611.78

+283.31 from previous month

TRENDING UP

DJIA

2,473.45

+33.10 from previous month

TRENDING UP

S&P 500

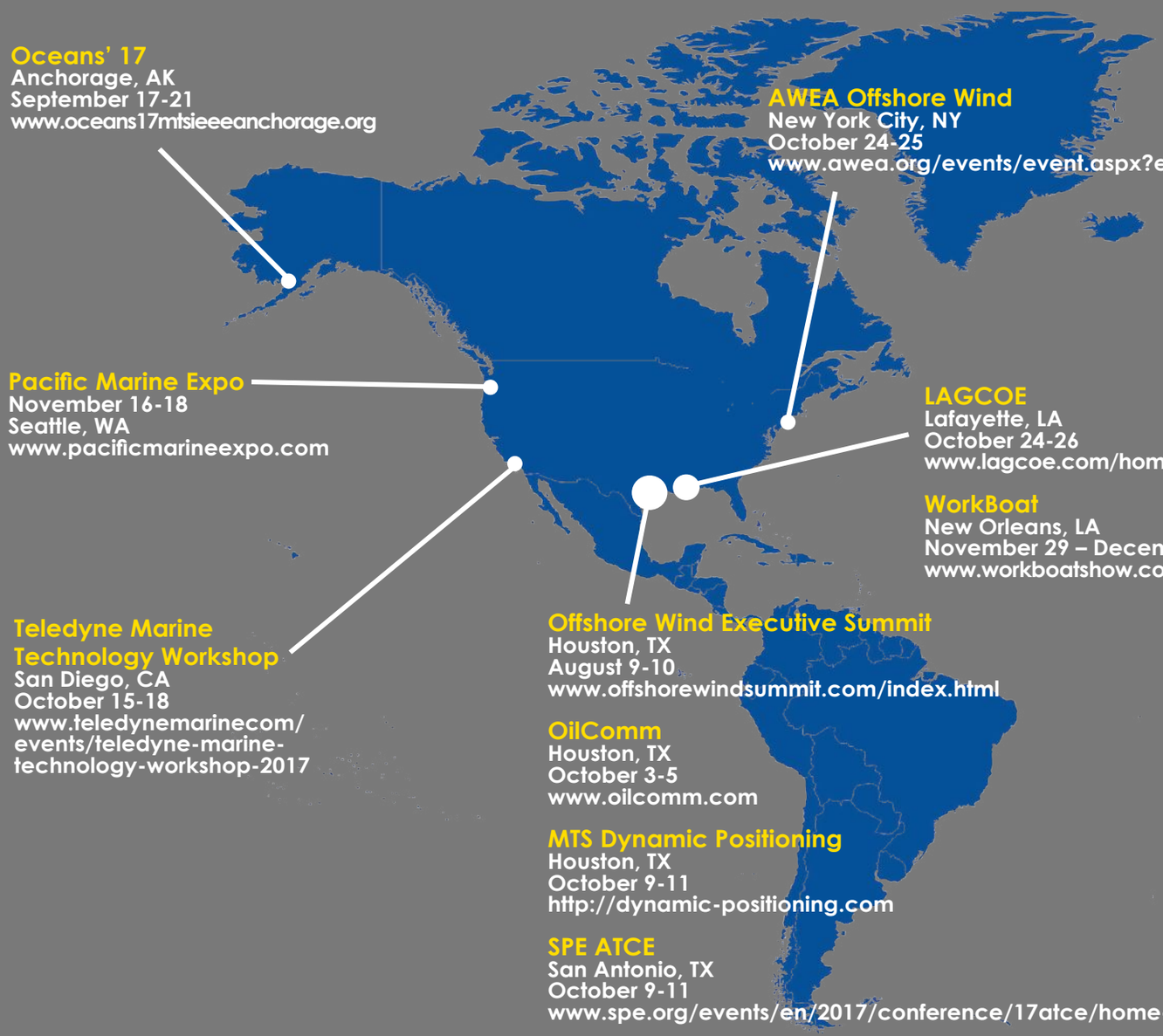
134.69

-6.84 from previous month

TRENDING DOWN

OSX

2017 EVENTS



Oceans' 17
Anchorage, AK
September 17-21
www.oceans17mtsieeeanchorage.org

AWEA Offshore Wind
New York City, NY
October 24-25
www.awea.org/events/event.aspx?eventid=50111

Pacific Marine Expo
November 16-18
Seattle, WA
www.pacificmarineexpo.com

LAGCOE
Lafayette, LA
October 24-26
www.lagcoe.com/home-expo

WorkBoat
New Orleans, LA
November 29 – December 1
www.workboatshow.com

Teledyne Marine Technology Workshop
San Diego, CA
October 15-18
www.teledynemarinecom/events/teledyne-marine-technology-workshop-2017

Offshore Wind Executive Summit
Houston, TX
August 9-10
www.offshorewindsummit.com/index.html

OilComm
Houston, TX
October 3-5
www.oilcomm.com

MTS Dynamic Positioning
Houston, TX
October 9-11
http://dynamic-positioning.com

SPE ATCE
San Antonio, TX
October 9-11
www.spe.org/events/en/2017/conference/17atce/home-1.html

Offshore Well Intervention GoM
Houston, TX
November 1-2
www.cleangulf.org

Clean Gulf
Houston, TX
December 5-7
http://interventiongom.offsnetevents.com


SPE Offshore Europe
Aberdeen, UK
September 5-8
www.offshore-europe.co.uk
Offshore Energy
Amsterdam
October 9-11
http://offshore-energy.biz
WindEurope
Amsterdam
November 28-30
https://windeurope.org/confex2017
World Congress of Ocean
Shenzhen, China
November 3-5
www.bitcongress.com/WCo2017/default.asp
ADIPEC
Abu Dhabi, UAE
November 13-16
www.adipec.com
Submarine Networks World
Singapore
September 25-27
www.terrapinn.com/conference/submarine-networks-world/index.stm
Asia Pacific Deep Sea Mining
Singapore
November 9-10
www.asia.deepsea-mining-summit.com
Maritime & Border Security
Manila, Philippines
October 3-4
www.maritimeandbordersecurityphp.com

2017 EDITORIAL CALENDAR

CALENDAR

JANUARY
Editorial: Underwater Navigation; Manned Submersibles Research & Development Services
Product & Services Focus: Multibeam & Side Scan Sonar; Research & Development Services

FEBRUARY
Editorial: Oceanology & Meteorology; Decom & Abandonment
Product & Services Focus: Buoys & Monitoring Instrumentation; Environmental Monitoring/Testing Services

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

APRIL
Editorial: Offshore Technology; Ocean Mapping & Survey
Product & Services Focus: Subsea Tools & Manipulators; Batteries; Training/Safety

MAY
Editorial: Autonomous Unmanned Vehicles; Defense & Naval Systems
Product & Services Focus: Tracking & Positioning Systems; Seismic Monitoring; Equipment Leasing/Rental Services

JUNE
Editorial: UW Imaging & Processing; Marine Salvage/UW Archaeology
Product & Services Focus: Magnetometers; Water Dredges & Airlifts; Diving Services

JULY – Digital Distribution Only
Editorial: Ocean Engineering; Marine Construction
Product & Services Focus: Navigation, Mapping & Signal Processing; Data Processing Services

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

SEPTEMBER
Editorial: Ocean Observing Systems; Subsea Telecom; Offshore Wind Installation & Maintenance
Product & Services Focus: Water Sampling Equipment; Cable Installation Services

OCTOBER
Editorial: Offshore Communications; Subsea Inspection, Monitoring, Repair & Maintenance
Product & Services Focus: Acoustic Modems, Releases & Transponders; Marine Communications; Survey & Exploration Services

NOVEMBER – Digital Distribution Only
Editorial: Offshore Support, Supply & Emergency Vessels; Deep Sea Mining
Product & Services Focus: Ship Protection Systems; Cranes, Winches & Control Systems; Vessel Charter/Leasing Services

DECEMBER
Editorial: Light Workclass ROVs; Commercial Diving; Year in Review
Product & Services Focus: Diving Equipment & Services; Buoyancy Materials; Construction & Repair Services

SHOW DISTRIBUTION

JANUARY
UDT Asia – January 17-18*
Marine Data Infrastructure GCC – January 30-31*
Euromaritime January 31– February 2
GoM Oil Spill & Ecosystems – February 1-9
Oi North America – February 14-16

FEBRUARY
Underwater Intervention – February 21-23
US Hydro – March 20-23*

MARCH
Canadian Underwater Conf & Expo – March 26-28 Ballast Water Management – March 29-30
MCE Deepwater Development – April 3-5
Ocean Business – April 4-6
Telecom Exchange – June 20-21*

APRIL
Int'l Offshore Wind Forum – April 19-21*
OTC – May 1-4
AUVSI XPonential – May 8-11
IOSC – May 15-18
Deepwater Decomm Workshop – May 23-24*

MAY
UDT – May 30 – June 1
Offshore Wind Energy Europe – June 6-8
Seawork Int'l – June 13-15

JUNE
Teledyne CARIS User Workshop – June 19-22*

JULY – Digital Distribution Only
TBD

AUGUST
SPE Offshore Europe – September 5-8

SEPTEMBER
Oceans 17 – September 17-21
AWEA Offshore Wind – October 24-25♦
WindEurope November 28-30

OCTOBER
Oilcomm – October 3-5
MTS Dynamic Positioning – October 9-11
Offshore Energy – October 9-11
Teledyne Marine Technology Workshop – October 15-18
Offshore Well Intervention GoM – November 1 –3*♦
Clean Gulf – December 5-7

NOVEMBER – Digital Distribution Only
World's Congress of Ocean – November 3 –5*
International Workboat – November 29 – December 1*

DECEMBER
TBD

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SeaCatalog is the online marketplace for industry professionals interested in procuring equipment and supplies for projects around the world.

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SeaCatalog

CSA Ocean Sciences Inc. Receives Safety Recognition Award

CSA Ocean Sciences Inc. (CSA) announces that it recently received the Sunshine State Safety Recognition Award for employee and management emphasis on safety. CSA's commitment to safety is reflected in the daily activities of its personnel as well as the personal involvement from management in support of the safety program. The Sunshine State Safety Recognition Award serves as validation of a company's achievements and track record. Initiated in 2006 by USF Safety Florida, the Sunshine State Safety Recognition Award commends Florida's employers and employees in all industries who proactively and routinely engage in job safety. The award goes to small businesses that implement sound safety initiatives to better protect employees on the job.
http://ont.news/2vYeg0u

Hydro Group Inks Strategic Agreement for International Growth

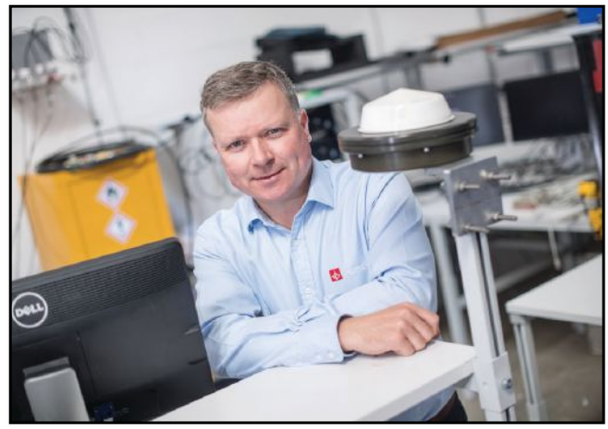
Hydro Group plc increases its global presences as it announces its partnership with Turkish firm IMCA Electronics. Complementing Hydro Group's cable and connection solutions, IMCA offers a range of sub-systems and components for highly demanding technical applications on land, sea, and air. The partnership will aid Hydro Group's customer support in Turkey and help develop key business opportunities within the region. Additionally, it will extend the services that IMCA currently offers to subsea high integrity systems developers within the high reliability and harsh environment component market.
http://ont.news/2uWQWTx

Greensea Appoints Geoffrey Abbott as New Robotics Engineer

Greensea, creator of OPENSEATM, the universal marine industry operating platform, has recently announced the appointment of Geoffrey Abbott as Robotics Engineer. Prior to joining Greensea, Abbott was a software development manager at MyWebGrocer where he led a team in the rapid application development group. His experience also includes partnership in a local software development company and a teaching position in advanced programing at Champlain College in Burlington, Vermont. heearned his B.S. degree in Mathematics and minored in Computer Science at the University of Vermont.
http://ont.news/2uuNGyn

iSURVEY Boosts Business Development Team with Two New Appointments

iSURVEY has expanded its global team with the addition of two new business development managers based in the UK and Norway. Joining iSURVEY Offshore in Aberdeen is Grant Aitchison, who has spent the last 20 years in a variety of technical and management roles at Fugro's survey and subsea services divisions. Also joining the team at iSURVEY's headquarters in Oslo is Arild Brevik, who boasts a strong track record in sales and business development, recently managing sales of subsea instrumentation at Kongsberg. He brings a range of maritime experience, including having captained several coastal passenger vessels and sea services tugs.
http://ont.news/2uWOk8K



Introducing the New 2017 Ocean Industry Directory

The Ocean Industry Directory (OID) provides a dedicated solution for finding the product and service providers you need to complete marine projects efficiently and effectively. Avoid the confusion of searching multiple directories that are incomplete or fail to consolidate ocean industry companies in one place. The Ocean Industry Directory is a unique collection of ocean-oriented businesses that takes the mystery out of corporate listings by distinguishing between manufacturers, sellers, rental agents, and service providers.

Get Listed!

Exposure across multiple media channels is important in today's competitive marketplace. The Ocean Industry Directory is featured in every issue of Ocean News & Technology's print and digital magazines. In addition, the Ocean Industry Directory is a key component of www.occeannews.com and updated monthly.

If you're interested in becoming a part of the Ocean Industry Directory, consider the benefits of adding your own corporate listing and contact your sales representative to discuss your options.

SeaCatalog Partnership

ON&T is proud to announce our partnership with SeaCatalog.com, the premier online marketplace for ocean industry professionals to obtain equipment and supplies for projects around the world. Enhance the value of your company's Ocean Industry Directory listing with a SeaCatalog.com vendor account where customers can easily go to buy, rent or request a customized quote for your products. Join now and we'll add a SeaCatalog.com member badge to your listing at no extra cost.

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E-mail: Bleblanc@okeanus.com
Website: www.okeanus.com
Contact: Benton LeBlanc

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Link to chosen categories for products and services	●	●	●
Corporate Logo		●	●
100-word company introduction		●	●
Sales contact name and email		●	●
One corporate document upload		●	●
Print listing for one category			●

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Website: www.oceansonics.com

Ocean Sonics designs and manufactures the icListen, a compact self-contained easy to deploy digital hydrophone. As the world leader in gathering ocean sound, Ocean Sonics combines very high signal performance with innovative ease of use, to give customers the best digital hydrophone technology available. It's a compact, all-in-one instrument capable of processing data while collecting in real-time

Creating Acoustic Arrays is now simple. Connect two or more icListen hydrophones together and they self-synchronize, operating as one. Ocean Sonics offers a wide range of geometries, including vertical, horizontal, autonomous, very small geometrical arrays, or spread out over many kilometres.

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E-mail: info@rtsys.eu
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We provide advanced embedded acoustic products in the environmental research, surveying and monitoring areas. With Synchronized Multichannel Acquisition and accepting a broad range of Acoustic Transducers and Hydrophones from 3Hz to more than 1MHz, our solutions allow the user a new range of applications.

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ADCP/DVL

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1351 Rud, Norway
Tel: +47 67 17 45 00
E-mail: inquiry@nortek.no
Website: www.nortekgroup.com

Nortek excels in the development and manufacture of acoustic Doppler instrumentation. Doppler Velocity Logs (DVLs) are used for subsea navigation. Acoustic Doppler Current Profilers (ADCPs) are used to understand physical processes in the ocean, rivers, lakes and laboratories. We pride ourselves on being innovative in product development and production processes. Nortek provides solutions to engineers and scientists by offering real-time data collection and support from our responsive technical team.

ROWE TECHNOLOGIES, INC.
12655 Danielson Ct., Suite 306
Poway, CA 92064
Tel: 858 842 3020
E-mail: sales@rowetechinc.com
Website: www.rowetechinc.com
Contact: Chris Arends, Global Sales Director

Rowe Technologies Inc. [RoweTech] specializes in the design and manufacture of underwater acoustic Doppler products and imaging systems for the oceanographic, hydrographic and hydrologic markets. Founded in 2009, Rowe Technologies is a technology-based private company with the main office located in Poway CA, USA. Rowe's ADCP/DVL competitive advantage is single-unit configuration which allows simultaneous current profiling and bottom tracking.

BUOYS

METOCEAN TELEMATICS
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Nova Scotia B3B 1R9 Canada
Tel: +1 902 468 2505
Fax: +1 902 468 4442
E-mail: emily@metocean.com
Website: www.metocean.com
Contact: Emily MacPherson

MetOcean Telematics designs and manufactures drifting buoys, environmental platforms, and the world renowned NOVATECH locator beacon product line. In addition to providing complete end-to-end telematics services, and one of the few manufactures in the world to achieve ISO 9001 certification. MetOcean Telematics's drifting buoy family consists of environmental and weather monitoring, oil spill response, and search and rescue drifters: NOVA profiling float, Iridium SVP (iSVP), iSPHERE, Argosphere, SLDMB, and iSLDMB.

BUOYANCY PRODUCTS

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Tel: +1 207 502 1400
Fax: +1 207 221 5718
E-mail: sales@deepwb.com
Website: www.DeepWaterBuoyancy.com
Contact: Dan Cote, Sales Manager

DeepWater Buoyancy creates subsea buoyancy products for leading companies in the oceanographic, seismic, survey, military and offshore oil & gas markets. Thousands of customers have relied on our products for over thirty-five years, from the ocean surface to depths exceeding six thousand meters.

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+49 (0) 41618 66250
info@nautilus-gmbh.com
www.vitrovex.com
Contact name: Steffen Pausch

Nautilus Marine Service provides the finest VITROVEX® glass housings that are capable of operating in the most extreme regions of the Earth. VITROVEX® glass enclosures offer the dual advantage of buoyancy and pressure proof housings - a perfect combination for small and autonomous underwater instrumentation packages.
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Contact: Richard Fryburg

Since 1977 Subsalve USA has been America's #1 manufacturer of standard and custom flotation devices and we are the innovators in buoyancy and engineered inflatables. Our products include: Professional, Commercial, Standard, Shallow Water, Enclosed Flotation Bags, Cable & Pipeline Floats, Water Load Test Bags, Rapid Recovery & Mark V/ORCA EOD Systems.

CABLES

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E-mail: ross@a2sea.co.uk
Website: www.a2sea.co.uk
Contact: Ross Taylor

In the past 20 years, A-2-Sea Solutions Ltd has had significant involvement in major submarine cable installations, on behalf of manufacturers, purchasers and installers of sub-sea cable systems – operating worldwide.

From initial beginnings in submarine cable joint design and system maintenance, A-2-Sea are now providing customers with turnkey solutions for short haul cable system installations. Other key business areas include: product design and development, coastal and offshore survey, provision of beach and subsea cable joints, cable system maintenance with a 365/24/7 emergency hotline rapid response service.

In 2016, A-2-Sea Solutions was ranked 13th on the UK Sunday Times SME Export Track 100 league table and 21st on the Fast Track 100.

CORTLAND COMPANY
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E-mail: cortland@cortlandcompany.com
Website: www.cortlandcompany.com
Contact: Marco Cano

Cortland has more than 30 years of manufacturing experience supplying custom-designed electro-optical-mechanical cables. We provide solutions that meet the challenges posed by harsh environments, hydrostatic pressures, and high mechanical stresses.

We manufacture custom EOM cables assemblies for various subsea applications which include CTDs, hydrophones, magnetometer, tow cables, ocean bottom, ROV cables, and other custom application. Our global presence and industry-leading design engineers, manufacturing facilities, and management teams, work together to implement integrated solutions with unsurpassed reliability that support the needs of customers worldwide. Visit us online at cortlandcompany.com

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Fax: +1 760 471 4970
E-mail: sales@falmat.com
Website: www.falmat.com
Contact: Shawn Amirehsani

*For over 50 years, Falmat Cable has been a key supplier and a solution provider to many global OEMs and end users supporting a wide range of marine applications. We design and manufacture high performance cables for use in harsh and demanding environments. Our rugged **Xtreme** cables are known and preferred worldwide for superior reliability and durability in commercial and military projects. We offer XtremeMarine cables with precision coaxial components for use with SD/HD video requirements, wet rated submersible pump cables, miniature fiber optic cables, a comprehensive range of highly engineered ROV Tethers plus our well recognized Xtreme Ethernet cables. Falmat is a Certified ISO9001/AS9100 organization. Visit our web site: www.falmat.com.*

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Fax: (951) 659-3958
E-mail: Sales@southbaycable.com
Website: www.southbaycable.com
Contact: Gary Brown, Sales Manager

Since 1957, South Bay Cable Corp has designed and manufactured specialized electrical, electro-mechanical and electro-optical-mechanical cables for use in demanding marine environments. Cables are designed to meet customer requirements and include tether and umbilical cables for ROVs, tow cables, video inspection, faired cables and a host of other customer specific applications.

CONNECTORS

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E-mail: service@birns.com
Website: www.birns.com
Contact: Eric Birns

BIRNS, Inc. has been serving the subsea industry since 1954, and is an ISO 9001:2008 certified global leader in the design and manufacturing of high performance connectors, custom cable assemblies and lighting systems. With a NAVSEA PRO-020 certified molding facility, the company leads the industry with sophisticated connector lines, including exceptional electrical, electromechanical, coaxial, electro-coax, optical, electro-optical and electro-opto-mechanical hybrid options. BIRNS provides the industry's highest volume of cost-effective hydrostatic and helium pressure testing, and has a wide range of ABS Product Design Assessment (PDA) certified fiber optic and electrical penetrators. BIRNS also delivers brilliant LED and tungsten-halogen marine, chamber, security and commercial diving lights trusted in the world's most extreme environments.

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E-mail: sales@birnsaquamate.com
Website: www.birnsaquamate.com
Contact: Eli Bar-Hai

Birns Aquamate design and manufacture underwater electrical connectors, cable assemblies, and cable terminations. The company produces a wide range of standard industry connectors such as the 5500 Series, SC, MC, LP, FAWL/FAWM, Rubber Molded, etc. BIRNS Aquamate is the only underwater connector producer that guarantees compatibility with other manufacturers. Birns also specializes in fast turn-around for custom design of special connector solutions. Stocking dealers in the UK, South Africa and Holland as well as dealers in Canada, Germany, Belgium, Norway, China, and Brazil.

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E-mail: seacon@seaconworldwide.com
Website: www.seaconworldwide.com

The SEACON Group are world leaders in underwater connector technology and provide an extensive and diverse range of electrical, optical and hybrid connector assemblies, submersible switches and cable system solutions for many applications within the Oceanographic, Defense, Oil and Gas and Environmental markets. With locations in California and Texas, USA, Mexico, Brazil, the United Kingdom and Norway and a worldwide network of agencies and representatives, SEACON is able to supply very quick solutions to any requirements across the globe.

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Teledyne Marine Interconnect Solutions integrates the resources of ODI, DGO, Impulse, and Cable Solutions into a single organization that supplies innovative, high-performance solutions for harsh environment interconnect. Solutions for these harsh environments include wet-mate, splash-mate and dry-mate connectors, pressure boundary penetrators, cable assemblies, cable terminations, and custom-engineered encapsulation and molding. TMIS contains a broad portfolio of field-proven, time-tested electrical, optical, and hybrid interconnect capabilities optimized for applications where performance and reliability are imperative. Products are available as stand-alone items, or as complex solutions that integrate technologies into advanced, value-added systems.

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Houston, TX 77084
Tel: 281-679-9654
E-mail bogden@hydroleduc.com
Website: www.hydroleduc.com

Hydro Leduc is a specialist in the design and manufacture of hydraulic piston pumps, hydraulic motors, hydro pneumatic accumulators, and customized hydraulic components satisfying customer needs with reliable products from a reliable source. As the leader in micro hydraulics, it is feasible to obtain several tons of force from a minimal power source within a restricted space envelope. The techniques of micro hydraulics allow simple solutions to problems that are often beyond the limits of traditional mechanical options. Hydro Leduc's expertise is at your service in varied applications such as oil service tools, oceanographic instrumentation, aeronautics, and any extreme working condition of temperature, pressure, medium, and environment.

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Website: www.okeanus.com
Contact: Benton LeBlanc

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Fax: +1 772 219 3010
Email: jbyous@oceanspecialists.com
Website: www.oceanspecialists.com
Contact: Jim Byous

Ocean Specialists, Inc. (OSI) is a submarine fiber optic network development company with global project capabilities. OSI works with clients during all project phases of subsea network development, from planning and design to procurement and implementation. Our customers, primarily representing Oil and Gas, Telecommunications and Ocean Observing, recognize the value of fiber optic networks to their field and services solutions, and look to OSI to deliver the skills and experience that developing these networks require.

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E-mail: km.seatex@kongsberg.com
Website: www.km.kongsberg.com/seatex
Contact: Finn Otto Sanne at finn.otto.sanne@kongsberg.com

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

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Contact: David Dack

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Website: www.csaocean.com
Contact: Gordon Stevens

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Contact: Darrin Verge, President & CEO

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

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

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Fax: +1 281 858 6363
E-mail: sales@rovsco.com
Website: www.rovsco.com
Contact: Jessica McKenney

***ROVSCO** is an ROV supply company, focused toward supporting worldwide the needs of work-class ROV operators for any small component or any large equipment. We have extensive experience in this and have been doing it for 31 years. Contact us for (all original brand) consumables, ROV electrical connectors, cable assemblies, hydraulic filters, parts & components. We will respond with a quick response, excellent service and great low prices.*

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Contact: Amy LaRose

EdgeTech designs, manufactures and sells industry-leading side scan sonars, sub-bottom profilers, bathymetry systems and combined sonar systems. Additionally, the company produces world class underwater actuated and transponding solutions including deep sea acoustic releases, shallow water and long life acoustic releases, transponders, reliable USBL acoustic tracking and positioning systems, and custom-engineered acoustic products.

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Website: www.saivas.no
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Contact: Bill New

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

OCEAN INDUSTRY DIRECTORY

SUBSEA TECHNOLOGY

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NO-3183 Horten
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Kongsberg Maritime is a marine technology company providing innovative solutions for all marine industry sectors including merchant, offshore, subsea, naval and fisheries. The company delivers systems that cover diverse maritime applications. Within subsea, Kongsberg Maritime's sonars, Sub-bottom profilers, multibeam and single beam echo sounders, cameras, positioning and underwater communication & monitoring systems, instruments, software and Marine Robotics are used in survey and inspection operations worldwide. Working closely with customers to develop technology that pushes the limits in subsea applications, Kongsberg Maritime is also dedicated to developing innovative environmental monitoring solutions such as the K-Lander system in addition to cutting-edge Marine Robotic platforms such as the futuristic Eelume vehicle.

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Fax: +1 508 563 3445
E-mail: glester@hydroid.com
Website: www.hydroid.com
Contact: Graham Lester

Located in the U.S. and a subsidiary of Kongsberg Maritime, Hydroid is the world's most trusted manufacturer of advanced Autonomous Underwater Vehicles (AUVs). Our Marine Robotics systems provide innovative and reliable full-picture solutions for the marine research, defense, hydrographic and offshore/energy markets. Our products represent the most advanced, diversified and field-proven family of AUVs and AUV support systems in the world.

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Contact: Jim Kirk

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UNDERWATER VEHICLES/ROVS

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E-mail: sales@deepocean.com
Website: www.deepocean.com
Contact: Mike Takeda

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Contact: Alasdair Murrie

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