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Ocean News & Technology

July 2014

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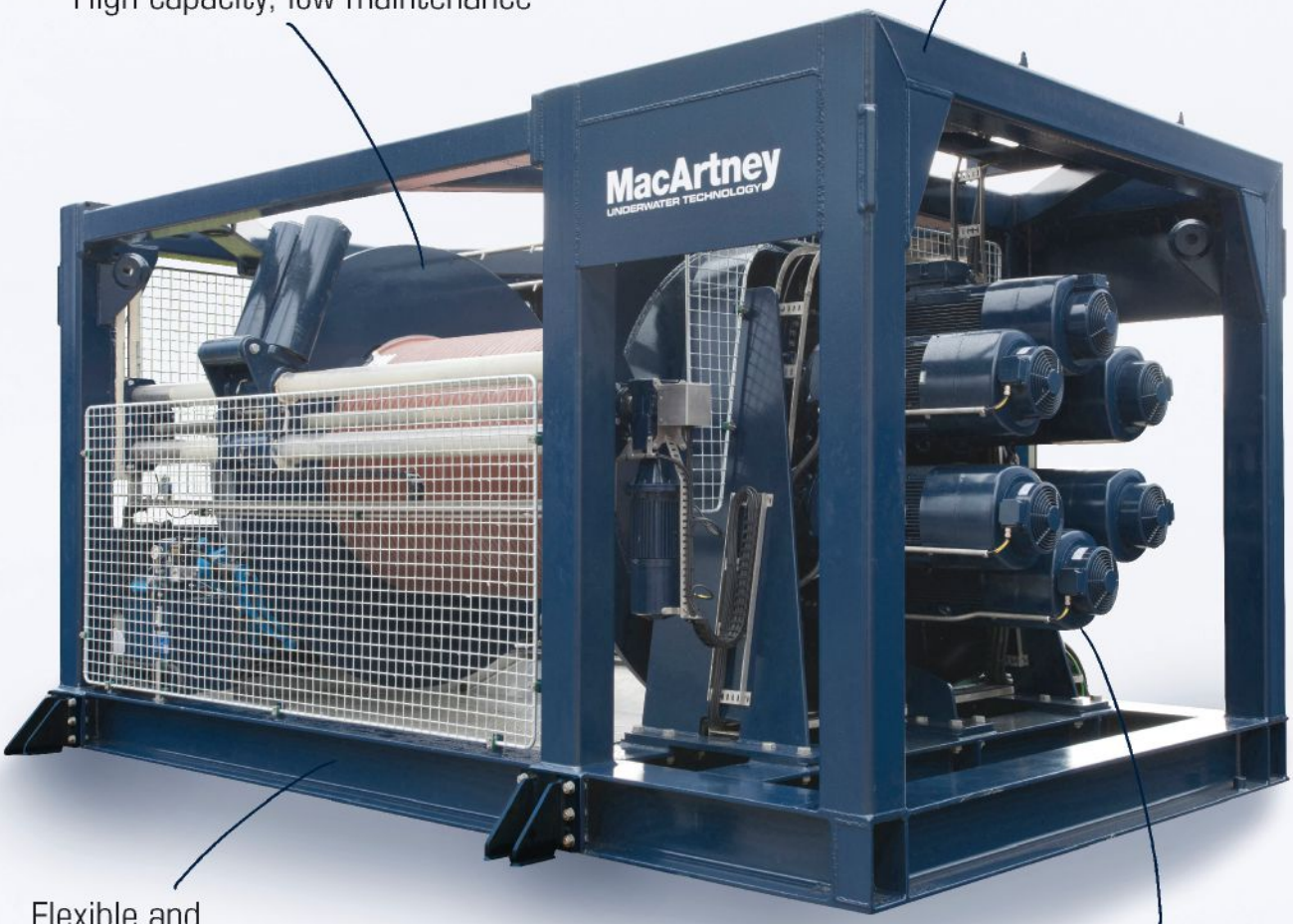

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By MacArtney

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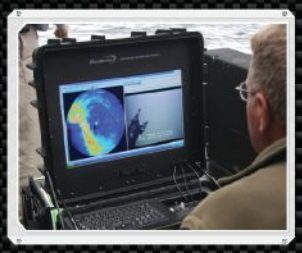

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SMD Quantum MK III heavy duty work class ROV operated by Hallin Marine

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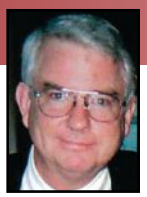

By Ray Tyson

Planning for troublesome 'pop-up' storms in the GoM

Ocean News & Technology

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Nothing strikes fear in the offshore oil and gas industry like the threat of a major hurricane. In years past these atmospheric monsters have caused untold billions of dollars in lengthy production delays and destruction to platforms, drilling rigs and subsea pipelines, as well as extensive damage to refineries and other facilities on the U.S. Gulf coast.

Fortunately, NOAA's Climate Prediction Center is forecasting a "near-normal or below-normal" season for the 2014 Atlantic hurricane season. Many other reputable long-term weather forecasters are predicting about the same.

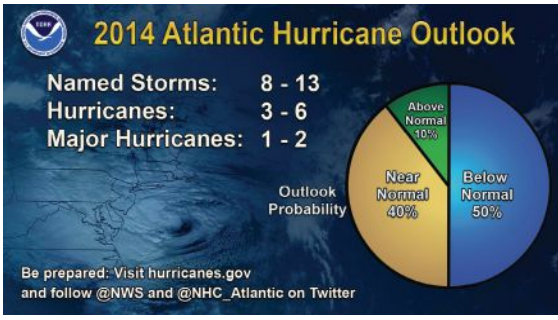
According to NOAA, the main driver of this year's outlook is the anticipated development of El Niño this summer. El Niño causes stronger wind shear, which reduces the number and intensity of tropical storms and hurricanes. El Niño can also strengthen the trade winds and increase the atmospheric stability across the tropical Atlantic, making it more difficult for cloud systems coming off of Africa to intensify into tropical storms.

The outlook calls for a 50% chance of a below-normal season, a 40% chance of a near-normal season, and only a 10% chance of an above-normal season. For the 6-month hurricane season, which began June 1, NOAA predicts a 70% likelihood of 8 to 13 named storms (winds of 39 mph or higher), of which three to six could become hurricanes (winds of 74 mph or higher), including one to two major hurricanes (Category 3, 4 or 5; winds of 111 mph or higher).

These numbers are near or below the seasonal averages of 12 named storms, six hurricanes and three major hurricanes, based on the average from 1981 to 2010. The Atlantic hurricane region includes, of course, the oil-rich U.S. Gulf of Mexico, which on average generates more than a million barrels of crude a day, or roughly a quarter of the U.S. oil supply.

Overall, cooler-than-normal waters also have eased the threat of big hurricanes, making them less likely to develop, according to BP, the largest acreage holder in the U.S. Gulf with 620 leases. Last year, only Hurricane Ingrid bothered the Gulf.

Unfortunately, a new bunch of small, unpredictable storms in the Gulf of Mexico confused forecast models last year, prompting BP to better prepare for abrupt bad weather during this summer's hurricane season.



"Traditionally, we see them coming," said Richard Morrison, regional president of BP's Gulf of Mexico business, during a press conference at the company's U.S. headquarters in Houston, Texas. "One of the things we learned last year is that some storms brew up in the Gulf pretty quickly. We've been thinking about our plans and how we plan for short, pop-up storms."

The smaller storms evidently are harder to track and predict than big hurricanes, and it's near impossible to determine whether they will dissipate quickly or survive for longer periods of time.

BP said it was forced to respond to three of the an estimated 70 sudden storms that hit the Atlantic Coast last year. Its 10 rigs in the U.S. Gulf sit about 60 mi to 130 mi off the coast and drill to depths between 4,500 ft to 7,000 ft of water.

The changing winds, caused largely by cooling waters in the Gulf, have caused the company to look at a broader variety of weather conditions and to respond earlier to key triggers, said Chris Kenny, BP's area operations manager for the Gulf. The storms can develop in less than 48 hours.

"It's very uncertain how they're going to develop, so predicting those conditions is very challenging," Kenny said. "Our forecasting capability has massively improved, but there's still a huge degree of uncertainty."

The company falls back on several phases when responding to weather events. The first begins in June, when it begins to closely track the weather. Then it secures its equipment, evacuates non-essential personnel, shuts down operations and evacuates the remaining personnel, generally by helicopter. BP is acting more quickly on tell-tale signs of incoming storms, Kenny said.

"What we've done is force ourselves to look at more uncertain weather conditions and make our decisions earlier in that process," he said.

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Advancing ROV Productivity through Integrated Design

By: Peter MacInnes, VP Sales & Marketing, FMC Technologies Schilling Robotics

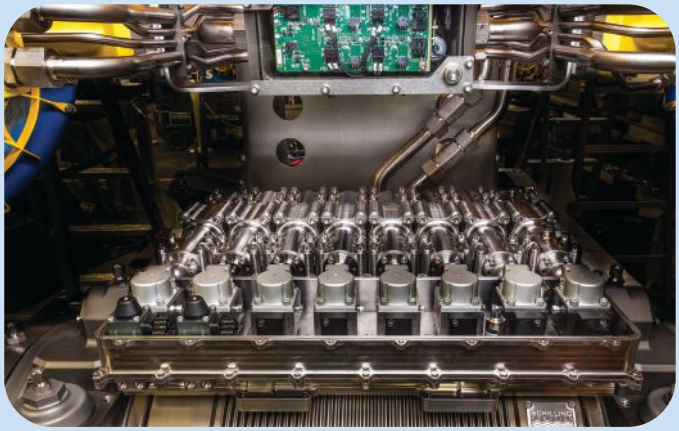
The remotely operated vehicle (ROV) industry may be one of the few industries where the primary measure of operational performance is simply up-time, meaning the percentage of time is the ROV available to work. While this is of fundamental importance, the logical progression is to optimize utilization of the ROV for specific tasks and increase the overall productivity of subsea operations. Following several decades of technology advancement, the ROV industry now experiences a high percentage of up-time, commonly approaching 100%. This reflects a tremendous level of progress for an industry where up-time was probably below 50% only 30 years ago. As a parallel comparison, similar levels of progress have been experienced in other technology sectors such as automotive and consumer electronics. Over the years, the focus on product up-time (reliability) in these industries has transitioned to focusing on advancing efficiency since high reliability has progressed to the point of becoming an industry standard. As ROVs continue to develop an increasing role of importance, the subsea industry will follow a similar path as oil and gas operators focus on increasing efficiency while maintaining extremely high levels of up-time.

Currently, the efficiency of ROV operations is dependent upon the skills of the ROV pilots, with all companies heavily relying on acquiring highly skilled personnel. These skilled personnel must not only have the unique skills to pilot the ROV but, in addition, the pilots are required to have advanced skills in maintaining mechanical, electrical, electronic, and hydraulic subsystems. Skilled pilots are also required to have comprehensive knowledge of offshore operations relating to construction, drill support, and IMR markets. The challenge of developing crews who are well trained and experienced in all of these skills is a major industry challenge, and experience in the offshore environment is the primary path to gaining the required knowledge. Obtaining this experience can take several years, which limits the number of highly qualified operators available. In order to advance the efficiency of ROV operations, the focus must transition from training pilots on how to be highly skilled technicians to becoming highly skilled operators. To enable this, the ROV itself has to become easier to maintain and operate. This is a fundamental design premise that occurs in all maturing product markets. For example, in consumer industries, the focus has evolved from which product offers high reliability to which product provides more benefits to the customer. This has been achieved through the advancement of integrated system design, while also developing more features that add value to the end user. The ROV industry has matured to a similar level where the focus on integrated design and beneficial features ultimately result in more productive operations for the oil and gas operator.

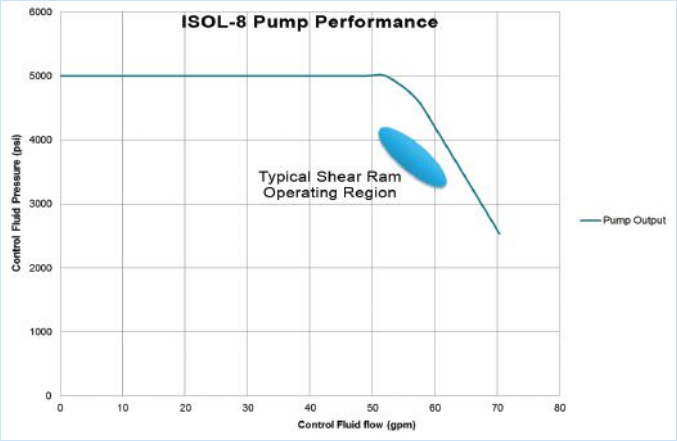
FMC Technologies Schilling Robotics has leveraged this product design methodology, applying an integrated design approach to both the 150Hp HD and 250Hp UHD-III ROV systems. These systems have been developed not only to maintain high reliability standards, but to greatly simplify the operation and maintenance of the equipment. The UHD-III ROV builds

upon the automated piloting features that originated with our StationKeep™ functionality that has been well proven over the last decade. The core stability and accuracy of this technology has enabled the development of additional Tool Dynamic Positioning (TDP) that provides simultaneous control of the ROV and manipulator to simplify the task of tooling intervention. Leveraging well-established principles of visual recognition technology, the ROV pilot can focus on inserting any tool, such as a hot stab, into the target intervention panel. The ROV and manipulator automatically maintain a relative position perpendicular to the intervention panel, which requires the operator to only manage three degrees of freedom for final tool positioning. This additional level of automated control greatly increases pilot proficiency, while also significantly reducing the time taken to complete the most common day-to-day intervention tasks. This brings a new level of consistency to the timeframe for performing frequent operations and is independent of the pilot's skill level.

Beyond enhancements to the operational aspects of ROV control, maintenance processes have been simplified across all technical elements of the system. Through the elimination of many components resulting from integrated design, the result is a dramatic reduction in the time to perform maintenance. This typically reduces maintenance times by a factor of 6 to 1, meaning that a procedure that would normally be completed within 6 hours can now we achieved in less than 60 minutes. This is achieved by making the most critical subsystems available for rapid change-out on a modular basis, rather than a component level. This minimizes turnaround time on deck, resulting in higher system availability for operations.



The ease of operation and maintenance are fundamental requirements to advancing the level of system productivity that can be achieved. Advancing the capabilities of the ROV to address industry needs is also necessary. Governing bodies are a fundamental driver of such needs and the recent requirements from API relating to Blow-Out Preventer (BOP) intervention. This new requirement has driven a core need for work-class ROVs to have sufficient power to actuate BOP shear rams to achieve closure of the well in less than 45 seconds. This industry regulation requires ROVs to provide fluid to actuate the BOP rams at a rate of 5,000 psi/50 gpm, which is significantly higher than any existing work-class ROV can achieve. FMC Schilling Robotics, therefore, developed the ISOL-8 pump in response to this need, and this custom designed pump is integrated to the UHD-III ROV. The ISOL-8 pump leverages the main 250-Hp motor to drive a series of eight bi-directional piston pumps that work in parallel to simultaneously produce the required pressure and flow. The compact design of the pump integrates directly



above the main vehicle HPU, leaving sufficient space to incorporate up to 100 gallons of intervention fluid in a reservoir that can be mounted within the framework of the ROV itself (no additional skid required). By maintaining a compact overall design, the UHD-III can provide greater accessibility to subsea infrastructure. The ability to provide such high pressure and flow rates also opens up new market opportunities for work-class ROVs. Existing solutions to deepwater intervtion tasks such as hydrate remediation, well intervention, and connector actuation, can now be accomplished with the ROV at a far lower cost.

Overall, the benefits of an integrated product design, in any market, result in greater reliability and ultimately greater productivity. The deepwater work-class ROV industry continues to mature at a rapid pace, with ever increasing expectations of performance and flexibility. In addition, the rapid expansion of the global ROV utilization has placed significant pressure on the ability to supply sufficient experienced personnel. While training continues to be a critical element of developing advanced levels of competency, the advancement of ROV technology dramatically improves the ability of all personnel.

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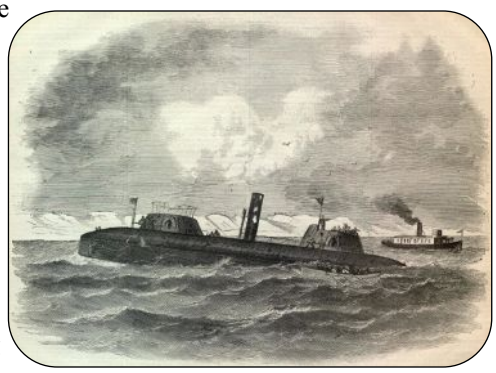
NOAA identifies probable location of iconic Civil War-era steamer

NOAA announced it has determined the probable location of the remains of the Civil War-era sidewheel steamer Planter, which gained national fame in 1862 when a group of enslaved African Americans commandeered the Confederate Navy transport ship in a daring escape to freedom.

The announcement was made in Charleston, South Carolina, where NOAA's Office of National Marine Sanctuaries released a report on its search for the Planter and plans for an interpretative sign and future exhibit dedicated to the Planter's legacy. The effort to find the Planter supports NOAA's Voyage to Discovery initiative, which seeks to highlight African-American maritime history through education, archaeology, science and underwater exploration.

Under the leadership of Robert Smalls, the ship's steersman and crew members navigated the steamer out of Charleston Harbor on May 12, 1862 and delivered the vessel to the U.S. Navy. The New York Herald called the escape "one of the most daring and heroic adventures since the war was commenced."

The notoriety generated by the escape and capture of the Planter led to Smalls eventually becoming the first African-American master in the U.S. Navy and a member of Congress representing South Carolina–the state where he was born a slave. NOAA's report helps fill gaps in the largely untold story of Robert Smalls and the Planter, which wrecked on a beach in March 1876 while trying to tow a grounded schooner.



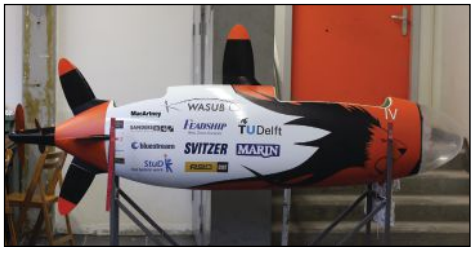
Planter at Georgetown, South Carolina. (Credit: Naval History and Heritage Command)

In an attempt to answer lingering questions about the Planter's fate, NOAA researchers reviewed historical documents and analyzed oceanographic and meteorological conditions that may have existed at the time of the Planter's loss. The likely site where the vessel came to rest, off Cape Romain between Charleston and Georgetown, South Carolina, was confirmed with magnetometer and hydro-probing surveys that detected the presence of large concentrations of iron consistent with the remains of a sunken ship. The vessel's remains are buried under 10 to 15 ft of sand and water in an environmentally sensitive area.

For more information, visit www.voyagetodiscovery.org/planter.htm.

MacArtney know-how and connectivity for WASUB human-powered sub

Spearheaded by its local operations in the Netherlands, MacArtney is thrilled to support the WASUB human-powered submarine team of the Delft University of Technology (TUDelft). Drawing on their extensive experience with underwater systems and vehicles, MacArtney engineers will put their know-how at the disposal of the WASUB team, as they prepare their WASUB 4 vessel for launching a serious title bid at the European International Submarine Races (eISR) this summer. The WASUB 4 will also be using MacArtney underwater connectors and cables for interfacing and empowering various onboard functions.



The WASUB team comprises 17 students of Delft University of Technology who are designing, building and racing a human-powered submarine. The history of the WASUB team begins back

Liquid Robotics names Gary Gysin as president and CEO

Liquid Robotics announced that Gary Gysin, a highly successful Silicon Valley executive and previously the executive vice president of global sales and marketing for Liquid Robotics, has been named as the new president and CEO of the Company and will join the Liquid Robotics' Board of Directors. Bill Vass, an industry visionary who has taken Liquid Robotics from a small start-up with innovative technology to become the thought and market leader in autonomous ocean robots, is transitioning the CEO role to his successor for the next stage of growth. Mr. Vass will continue in an advisory capacity and become a member of the company's Strategic Advisory Board (SAB). With a track record of transforming innovative start-ups into global businesses, Mr. Gysin brings more than three decades of extensive sales, marketing and CEO leadership in delivering worldwide revenue growth for IT communications, network, energy and cloud computing companies. This appointment is effective immediately.

Oceaneering announces acquisition of AIRSIS

Oceaneering International, Inc. has acquired AIRSIS Inc., a provider of remote asset management software services. This acquisition is expected to enhance Oceaneering's current asset tracking service offered on offshore drilling rigs and vessels engaged in subsea activities. Asset tracking information is utilized by customers to establish a common operating picture, which improves operational efficiency and enables incident and emergency response collaboration and reporting. This picture collects and displays real-time data associated with an offshore operation, including rig or vessel position, metocean conditions, remotely operated vehicle video, and subsea survey information. AIRSIS' signature service, PortVision®, provides web-based location reporting on commercial vessels.

Fugro to provide survey vessel to support search for MH370

The Australian Transport Safety Bureau has awarded Fugro a contract that will see the deployment of its specialist vessel, equipment and expertise in the underwater search for the missing Malaysia Airlines flight 370. Using its advanced survey vessel, the Fugro Equator, fitted with state-of-the art multibeam echosounder equipment, Fugro will conduct a bathymetric survey of the search area.

in 2004 when there was a design thesis exercise at the faculty of Aerospace Engineering about the WASUB. When the design thesis exercise was a success, the students decided that they wanted to compete in the International Submarine Races (ISR) 2005, where the WASUB 1 team won the one-person propeller category and the slalom. The WASUB 1 was succeeded by WASUB 2 and after short break, by the WASUB 3, which performed well at the 2013 version of ISR. This year, however, the young, talented and ambitions students that make up the WASUB 4 team have their sights set on the grand prize, when the eISR kicks off on 7 June.

In order to provide the submarine pilot with optimal conditions for successfully steering the submarine through the course while also effectively functioning as the vessel engine, the flaps on the WASUB 4 are fitted with servo motors. These servo motors make up the backbone of the WASUB 4 steering element; however, they depend on standard electronics to work perfectly underwater. In their role as experts on electronics underwater, MacArtney engineers provided valuable advice for the WASUB team on this matter. Moreover, MacArtney contributed with advice on water resistance and, not least, with SubConn® underwater connectors, assemblies and cables for the WASUB 4.

For more information, visit www.macartney.com.

MATE holds 13th annual international ROV competition

The Marine Advanced Technology Education (MATE) Center, the National Science Foundation, and the Marine Technology Society's (MTS) ROV Committee held its 13th Annual International Student ROV Competition.

Sixty teams representing middle schools, high schools, home schools, after-school groups, community colleges, and universities from 18 states and 13 countries competed in this year's event, which was held 26-28 June 2014 at the Thunder Bay National Marine Sanctuary (TBNMS) in Alpena, Michigan.

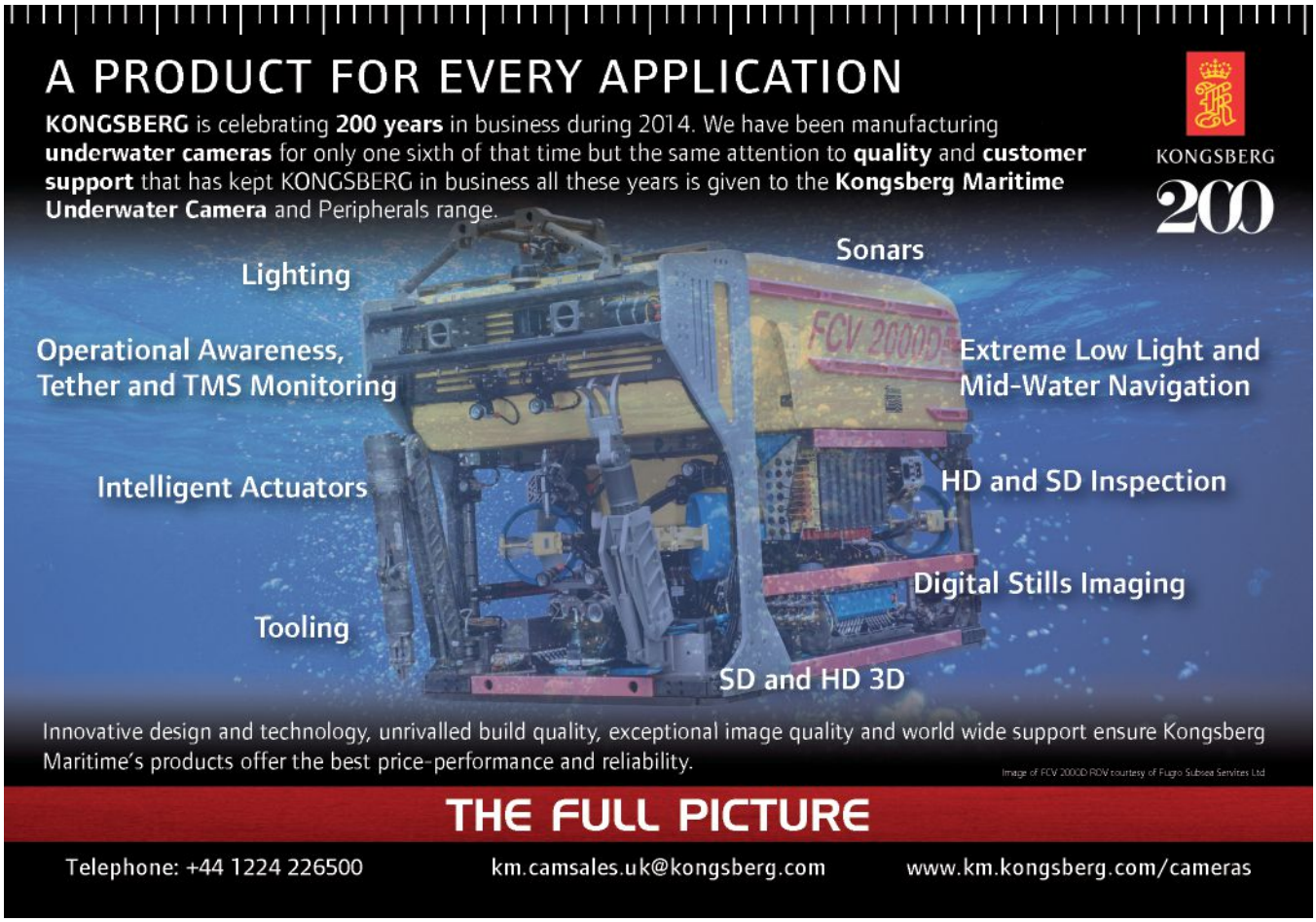
This year's contest focused on shipwrecks, science, and conservation in our National Marine Sanctuaries. Students piloted their ROVs to explore and document an unknown shipwreck, collect scientific samples, inventory invasive species, and remove trash and debris, among other tasks–all staged in the 80-ft diameter, 600,000 gallon tank at the TBNMS facility.

Each year the competition challenges students to think of themselves as "entrepreneurs." Students were asked to form companies that design, build, and market their "product" as a way to gain a better understanding the breadth of real-world business operations. Along the way, they learned how to manage a project, work as a team, think creatively, and problem-solve, which are all important 21st century workplace skills.

During the event, a panel of judges–professionals representing industry, science, government, education, and exploration–evaluated the companies on their ability to effectively communicate their vehicles' design and construction via technical reports, poster displays, and engineering evaluation interviews.

The competition also featured the Ocean Career Expo, organized by the MATE Center and its partners in the Centers for Ocean Sciences Education Excellence (COSEE).

For more information, and results, visit www.marinetech.org.



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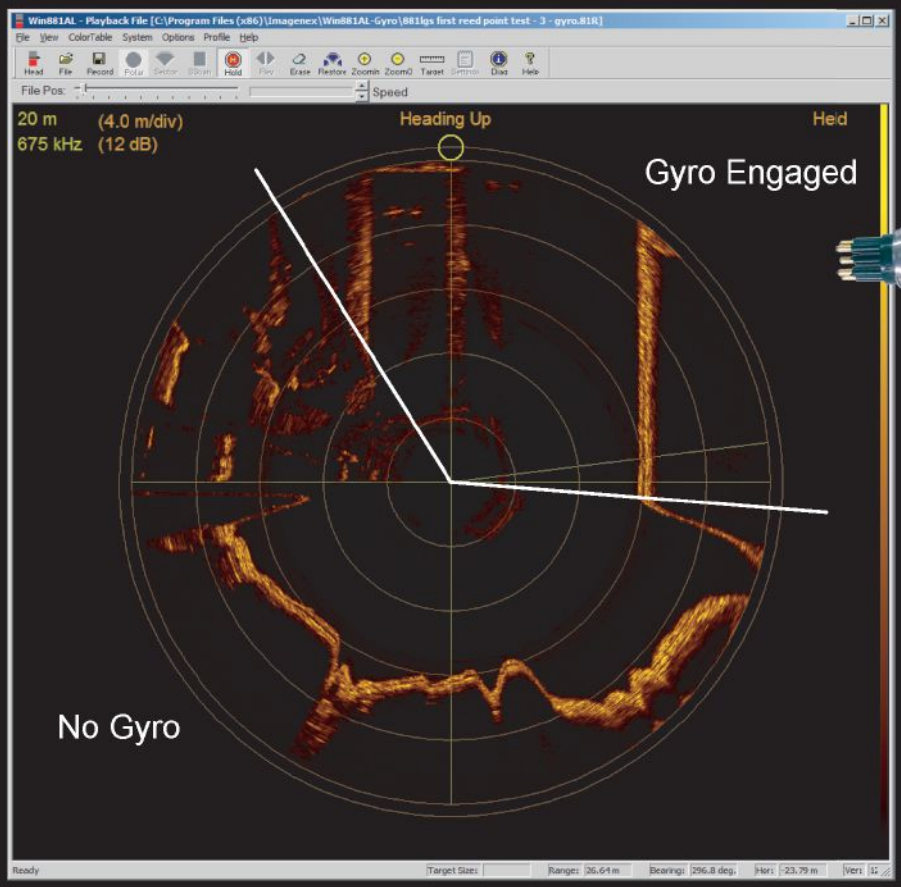

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ABS awarded class contract for two innovative Moss-type LNG carriers

ABS, a leading provider of classification and technical services to the maritime industry, has been awarded a contract for the classification of two innovative 'Moss-type' LNG carriers to be built in Korea for Malaysia's Petroliam Nasional Bhd (Petronas). The 150,200-m^3 capacity ships will the largest Moss-type units ever built at Hyundai Heavy Industry's shipyard in Ulsan, Korea, featuring the latest technology to improve energy efficiency and operational reliability. To boost their performance, reliability and ease of maintenance, the Petronas ships will adopt new ultra-steam turbine propulsion systems, which are expected to be about 15% more energy efficient than conventional steam turbines. The innovative Moss-type cargo tanks will measure about 42 m in diameter. Because Moss-type tanks have no minimum filling limits, they are well suited to serve as shuttles to and from FLNG or other offshore facilities. The ships will feature full-length tank covers integrated into the main hulls, a feature that is expected to improve longitudinal strength and minimize structural discontinuity. The unique integrated structure also will allow for piping and passageways to be arranged on the tank-cover deck, improving safety and ease of maintenance. The contract award comes just months after ABS unveiled its new Global Gas Solutions team, a multi-disciplinary group of technical experts formed to respond to the rapidly escalating number of gas-related projects, including LNG and LPG transportation, the use of LNG and LPG as fuel and the growing number of FLNG projects. ABS holds the largest share of LNG carriers on order with 34% of the orderbook set to class with the organization.

Bibby Ship Management continues to grow its offshore client base

Bibby Ship Management has secured a contract to supply crew management services for Chevron's floating storage unit, the Alba-FSU. The crew will provide operating, loading and equipment handling services on the Alba Floating Storage vessel. Mark Robertshaw, managing director, Bibby Ship Management – Isle of Man said: "This is an important contract for us as it underpins Bibby Ship Management's continued growth as a trusted business partner in the offshore sector. We invest a great deal in the selection and training of our crew to ensure we provide well-qualified and highly competent personnel for our managed vessels. We look forward to working with Chevron to ensure the safe and efficient operation of the Alba FSU." Bibby Ship Management, which is able to draw on the company's 200 years of owning and managing experience, supplies highly-trained crew for a range of international vessels, providing a bespoke service tailored to individual owners' requirements and is FPAL verified. Bibby Ship Management recently acquired GAC Travel and Murray Fenton (India) Surveyors Limited and announced that it provides statutory management services to a quarter of the Isle of Man Ship Registry's registered gross tonnage.

VSTEP secures simulator contract for FIDENA Maritime Schools

VSTEP won a prestigious contract to install FMB and Tug simulators at all three FIDENA Maritime Schools in Mexico. The contract was won by VSTEP and its Mexican partner Edutelsa through an official competitive tender procedure and enables FIDENA to replace its old simulator technology with DNV-certified NAUTIS simulators. FIDENA is the educational institution in charge of formal and comprehensive education of all seafarers in Mexico. It is the only institution in Mexico that offers higher level study programs in the maritime field and has wide international recognition. FIDENA has three nautical schools located in Mazatlan, Tampico and Veracruz and its Headquarters in Mexico City. FIDENA purchased three NAUTIS DNV Class A Full Mission Bridge Simulators and three Tug Simulators for each of its nautical schools. The NAUTIS Certified DNV Class A Full Mission Bridge simulators have a 270° horizontal field of view and are fully compliant with the Class A DNV Standards for Certification No. 2.14 for Maritime Simulator Systems and IMO model courses 1.22 and 1.32. They address all new elements from the newly revised IMO STCW Convention and allows realistic training of a wide variety of training courses. The Tug Simulators are high performance desktop trainers with a 120-degrees horizontal outside field of view. The Vera Cruz, Altamira, Lazaro Cardenas and Manzanillo environments have been added to the simulators for training.

Unique Hydra unveils the HYDRACraft series of diving daughtercraft systems

Unique (UH), a division of the Unique Maritime Group (UMG) which is one of the world's leading integrated turnkey subsea and offshore solutions provider, is proud to have received their second order this year for its diving daughtercraft system called the HYDRACraft. Unique Hydra has spent the past 12 months engaging with clients to understand their diving daughtercraft operational and equipment requirements and developing a purpose-built vessel yhatincludes a fully integrated dive system.

Diving Daughtercraft systems are used in diving operations where the conventional diving DSV is not able to position itself close enough to an FPSO or Offshore platform. The daughtercraft is fitted with surface-supplied diving systems capable of supporting Nitrox and/or air diving operations and is assisted by an additional "support craft" that transfers personnel and supplies during the diving operations. The "mother vessel," barge or platform is outfitted with davits for the daughtercraft and support craft as well as support equipment, including the decompression chamber, gas storage and compressors.

Currently two designs of the purpose-designed diving daughtercraft are available, the HYDRACraft 1400 14-m 8-man, and the HYDRACraft 1500 15-m 10-man.

The HYDRACraft design considers features and attributes required for safe and effective diving operations.

For more information, visit www.uniquegroup.com/Daughtercraft-Systems.

Kongsberg wins integrated automation and navigation systems contracts for 14 BP shipping LTD crude/product tankers

Kongsberg Maritime has secured contracts for the delivery of fully integrated navigation and automation systems for a series of 14 crude/product tankers ordered by BP shipping Ltd. The new builds will be delivered by STX Offshore and Shipbuilding Co., Ltd. by September 2016. The contracts were awarded through an international open tender.

Kongsberg Maritime will deliver "Full picture" integrated vessel control systems including navigation, communication, and automation of machinery and propulsion systems. Included in the KONGSBERG scope of supply is also a state-of-the-art tank monitoring and gauging system, based upon advanced radar technology. In addition, a sophisticated vessel performance system will monitor and provide decision support on energy efficiency, fuel usage and optimal sailing.

"Kongsberg Maritime is proud that BP Shipping Ltd. and STX Offshore and Shipbuilding Co, Ltd. selected 'Full Picture' technology solutions for this massive new building program," comments Leif Kristian Weum, sales manager merchant marine, Kongsberg Maritime.

"We have experienced significant success with our integrated approach to marine technology in the Merchant Marine market, and continue to see the 'Full Picture' chosen for control and management of the world's most advanced ships."

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

exactEarth announces new small vessel tracking service

exactEarth Ltd., the leading provider of Satellite AIS (Automatic Identification System) data services, recently announced a mutually exclusive alliance with SRT plc (SRT), the leading AIS manufacturer. This strategic alliance has produced an innovative and revolutionary new solution for tracking the millions of small vessels traversing our oceans daily around the globe. Central to this solution is a jointly developed new technology called ABSEA™ (Advanced Class B Satellite Enabled AIS) that, for the first time, enables low-power AIS transceivers to be tracked from space. Small and inexpensive ABSEA-enabled AIS devices, which can be easily installed on small commercial and leisure vessels with just a clip-on tamper-proof battery-powered unit, can now be tracked by the exactEarth existing satellite constellation. This critical information can now be securely delivered to customers through the new exactAIS Trax™ service from exactEarth that for the first time, delivers a global monitoring capability to track any maritime vessel, regardless of size and proximity to shore-based receivers.

This new solution offers customers real-time near-coastal tracking using existing coastal AIS infrastructure and rapid-update satellite tracking with exactEarth utilizing unique ABSEA technology when vessels are outside coastal range. This ensures that every vessel is tracked regardless of location.

exactEarth and SRT are confident that the combination of the ABSEA technology-enabled transceivers and the exactAIS Trax data service provides a cost-effective, secure, and simplified implementation to track any vessel, any size, anywhere in the world. This is the only product offering that does not require any additional wiring and power requirements from the ship and it is available at only a fraction of the cost of other competitive tracking systems available.

The exactAIS Trax service will deliver to customers an unrivalled picture into the world's global maritime activity. This improved insight will provide critical intelligence into a variety of marine applications such as fisheries protection, environmental preservation, as well as maritime security through improved "dark target" analysis. Additionally, each AIS message received by exactEarth will contain a vessel track history to provide even more vessel behavior information for in depth analysis.

For more information, visit www.exactearth.com.

Oman Drydock to launch new LNG repair partnership at Posidonia

Oman Drydock Company (ODC) launched a new partnership targeting the LNG carrier repair market.

The new package is being launched with DSEC, a subsidiary of Daewoo Shipbuilding and Marine Engineering Company Ltd (DSME), which is ODC's official partner.

ODC chief executive Yong Duk Park said, "We are very excited about marketing this new package and welcome visitors to our stand to hear about our plans," he said. "Working with DSME we believe we have developed one of the most advanced LNG repair packages in the world. Our new services will cover areas such as cargo containment systems and the supply chain of various materials such as INVAR, insulation boxes, membranes, prefabricated panels and cryogenic safety valves. Meanwhile, we are also investing in new facilities, including renovating our cryogenic shop so it can cater to repairing up to four LNGCs at any one time. Our expansion into LNGC will further be strengthened by our new license to support the French engineering firm Gaztransport & Technigaz (GTT), which specializes in cargo containment systems for high-end LNG carriers. "

ODC is one of the newest and biggest shipyards in the world and is based in Duqm, Oman's planned new ports and logistics mega city. Following a soft opening in 2011, the $1.5 billion shipyard, which is 1.3 million sq. m in size, has drydocked more than 230 vessels.

For more information, visit www.omandrydock.com.

World's first LNG-fuelled icebreaker to be powered by Wärtsilä dual-fuel engines

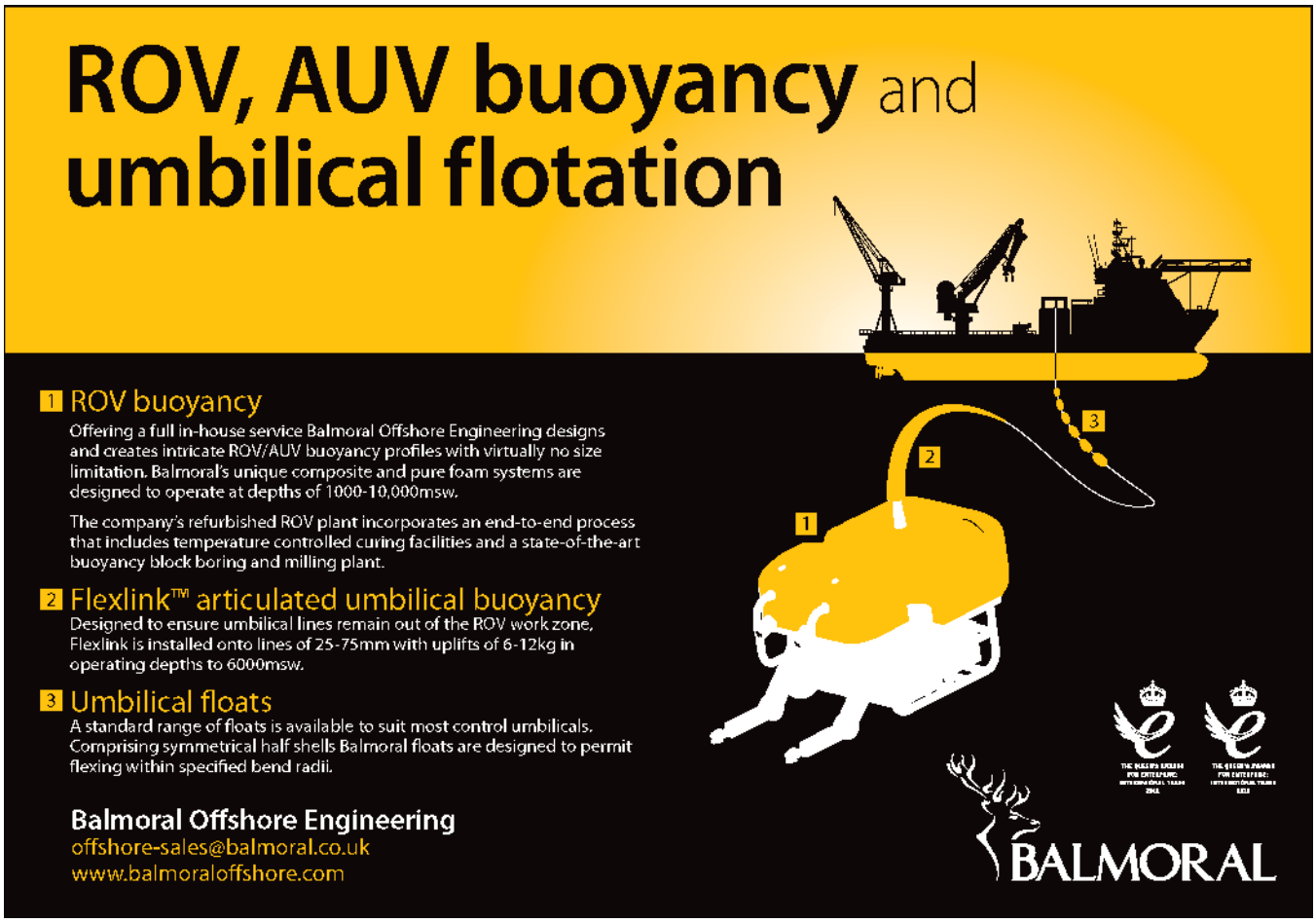
A new icebreaker being built by Arctech Helsinki Shipyard for the Finnish Transport Agency will be powered by Wärtsilä dual-fuel engines capable of operating on both liquefied natural gas (LNG) and low sulphur diesel fuel. When launched in late 2015, it will be the first LNG-powered icebreaker in the world.

Wärtsilä's industry leading track record in dual-fuel engine technology was a crucial factor in the award of the contract. By enabling LNG to be used as the engine fuel, both exhaust emissions and fuel costs are notably reduced. The impressive power output per cylinder of the Wärtsilä engines was also cited as a factor in the contract award decision. The full scope of supply calls for one 8-cylinder Wärtsilä 20DF, two 9-cylinder Wärtsilä 34DF, and two 12-cylinder Wärtsilä 34DF engines. The contract was signed in March 2014, and delivery of the equipment to the yard will be made in spring 2015.

"The new icebreaker features the highest technology and will be built especially to operate in the demanding winter conditions of the northernmost Baltic Sea. By being able to use LNG fuel, the vessel will be the most environmentally friendly icebreaker ever built," says Esko Mustamäki, managing director of Arctech Helsinki Shipyard.

The vessel will be able to move continuously through 1.6 m thick ice and be capable of breaking a 25 m wide channel in 1.2 m thick ice at a speed of 6 kts. It will also be able to reach an average assistance speed of 9 to 11 kts and in open water the service speed will be a minimum of 16 kts.

For more information, visit www.wartsila.com.



PREDATOR

Inspection-Class ROV, built for reliability and continuous performance

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

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

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

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FORUM SUBSEA PROVIDES "Everything Remotely Possible"

By: Donna J. Smith, Director – Marketing & Communications
Forum Energy Technologies

As one of the world's leading manufacturers of remotely operated vehicles (ROVs) and providers of ROV components and equipment, Forum Subsea Technologies has earned a reputation for reliability, efficiency and exceptional performance. Forum has the most extensive range of remotely operated vehicles in the industry. Its Perry™ and Sub-Atlantic™ brands of ROVs are used around the world by the defense, marine, oil and gas, and deepwater construction industries.

The Perry™ XLX Evo is the next generation of Perry™ Work Class ROVs and provides the industry with one of the most robust, reliable and dependable vehicles in the industry. The Perry™ XLX Evo offers extensively reconfigured vehicle control system components. The electrical junction boxes have been redesigned to ease maintenance and the addition of equipment. The user power supply system has also been redesigned to eliminate the need for a one atmospheric control can and to allow ease of configuration.

The Perry™ XLX EVO system also features an enhanced and fully integrated survey system, offering interfaces compatible with all modern survey equipment, including subbottom profilers, multi-beam sonars, and pipe tracking sensors. Thruster speed sensing has been introduced to give enhanced thruster response and ease of set up, yet retaining the sophisticated and powerful ICE control system at the heart of the vehicle. These new extremely powerful ROVs can operate to depths of 4,000 m supported by a payload of 300 kg and can be deployed in demanding environments, which make it ideal for deepwater operations that require significant power to lift, position and install subsea field equipment

The Perry™ T1500, made specifically for Canyon Offshore, is a heavy trenching system that can produce a trench to a depth of 3 m in most all seabed conditions, from sand to stiff clays. Capable of deploying non-conducting water jetting tools with backwash and educator debris clearance systems, this cable and pipe burial ROV can carry an optional backfill and pipe following tool over long stretches.

Forum's Sub-Atlantic™ observation vehicles are known for their innovative design and straightforward, intuitive diagnostics. They are simple and cost effective to operate, even in the world's most demanding environments. The electric Mojave, Navajo, Mohawk, Mohican, Super Mohawk, and Tomahawk vehicles also have an extensive range of tooling options. If Forum doesn't have the right tool for a customer's specific task, they can develop the solution utilizing their in-house engineers and designers.

But Forum isn't just about remotely operated vehicles. Driven by customer requests, the company has assembled and introduced a full range of related products and services for the subsea industry. Forum's other subsea products include:

- Dynacon launch and recovery systems
- Tethering Management Systems
- VMAX Simulator™ – ROV simulation software
- VisualSoft – Survey and inspection software
- Forum Subsea Rentals – Full range of rental products, including surface, inertial and wideband dynamic position aid systems, sensors, taut wire, ROV instrumentation, trackers, sonar systems, manipulators and sonar leak detection systems
- ROV tooling rental
- Geoscience Earth & Marine Services – Geological, geophysical, geotechnical and archaeological analyses
- UKPS – Supplies technical staff to the offshore industry
- Syntech – Syntactic foam buoyancy material
- Hyperbaric pressure test facility available for rental
- Moffat Subsea Engineering, which specializes in subsea pipeline inspection, gauge launch and recovery systems and subsea connectors.

From buoyancy foam to sophisticated intervention systems, Forum is a dependable source for everything remotely possible.

The Forum experience does not end with the delivery of a completed product. Our clients have ongoing needs, and our world-class service centers with a 24-hour hotline are there to meet those needs. From our headquarters in Houston and our regional headquarters in Aberdeen, Scotland to offices in Brazil, United Arab Emirates and Singapore, we are in prime locations to support our customers through Forum's well-appointed offices and worldwide network of distributors and services centers. Providing continued support and solutions after you take delivery is yet another quality that earns us a mark of distinction. We would love to hear from you so that we can better understand your problems and develop solutions customized for you. Visit f-e-t.com/yourforum to start a dialog with us.

Public gets first view of a live vampire squid and other deep-sea cephalopods

From the vampire squid to the flapjack octopus, deep-sea cephalopods come in an amazing variety of shapes and sizes. Yet few humans have seen these animals alive. Since April, members of the public have been able to see these animals for the first time as part of the ongoing Tentacles special exhibition at the Monterey Bay Aquarium. A collaborative effort with the aquarium's partner institution, the Monterey Bay Aquarium Research Institute (MBARI), this exhibit has thrilled both aquarium visitors and MBARI scientists and is providing new scientific insights into the lives of these mysterious animals. Almost 2 years in the making, Tentacles required close teamwork between husbandry experts at the aquarium and researchers at MBARI. The first challenge the team faced was simply finding animals to place on exhibit. "Few, if any, aquariums in the world have the kind of access to ROVs that we get from working with MBARI," said Bret Grasse, an aquarist working on the exhibit. "But even with these amazing robots, we still have to find the animals." The next challenge was keeping the deep-sea animals alive once they reached the surface. The deep sea is almost pitch black, with crushing pressure, near-freezing water, little oxygen, and sparse food. These conditions seem daunting to us, but they are ideal for deep-sea animals that have had millions of years to adapt to these harsh conditions.

CSA Ocean Sciences partners with CENTRE Group in Asia Pacific for risk management and environmental consultancy

CSA Ocean Sciences, Inc. (CSA), a leading global provider of marine environmental scientific and consulting services announced an agreement with CENTRE Group, an Australia based consulting firm specializing in environmental risk and compliance management and spill, emergency and crisis management services. The partnership will deliver to clients a broad range of risk and compliance management solutions, services, training and support as well as marine environmental assessments, planning and permitting, spill-related emergency response, crisis management, assessment, mitigation and restoration services. The new venture becomes the "Center of Excellence" for the group's risk and compliance management solutions, servicing the global market. CENTRE Group director Alex Spence stated, "We are very excited to be working with CSA. This venture provides an excellent opportunity for CENTRE Group to further expand its existing operations globally and deliver CSA's world-class ocean sciences services to our existing and future clients in the Asia Pacific region." Kevin Peterson, CEO of CSA, added, "The CENTRE Group team offers a perfect complement to CSA's existing capabilities and footprint. We can now offer their capabilities through our international network of offices and more effectively pursue opportunities for CSA's core business lines in the Asia Pacific region." The partnership will operate under the CSA Ocean Sciences brand and will be headquartered in Perth, Australia.

Sonardyne introduces Academic Discount Partnership for U.S. scientific research

Marine science and ocean research programs across the United States are set to benefit from access to more affordable underwater technology thanks to a new discount scheme introduced by Houston-based Sonardyne Inc. Under the terms of the company's Academic Discount Partnership, Sonardyne is offering eligible U.S. academic and oceanographic institutions a 20% discount on equipment across its extensive product lineup, including long-range target tracking systems, seabed sensors and through-water communication instruments. The level of discount being offered is expected to bring Sonardyne's award-winning 6G technology platform within financial reach of a wide range of U.S.-based scientists for the very first time. The list of products that qualify for the 20% academic discount is extensive and includes Sonardyne's sixth generation (6G®) product platform, recently granted a prestigious international award for technological innovation. 6G products include Ranger 2 USBL, a high-performance acoustic tracking and vessel positioning system that is widely used to monitor the position of ROVs, AUVs and towfish conducting surveys in deep and shallow water. Fetch is another 6G product eligible for the educational discount. It is a long-life seafloor sensor that can be configured to monitor and log environmental parameters for many years, only uploading stored data to the surface when commanded to do so.

NOAA announces updated process for nominating new national marine sanctuaries

Diver explores schooner F.T. Barney in Thunder Bay National Marine Sanctuary (Credit: NOAA).

For 40 years, America's national marine sanctuaries have worked to protect sites ranging from a Civil War shipwreck to coral reefs and tiny atolls. NOAA announced that the American public can now nominate nationally significant marine and Great Lakes areas as potential new national marine sanctuaries.

The announcement was made by John Podesta, counselor to President Obama, during Capitol Hill Ocean Week. The community-based nomination process responds to numerous requests for new sanctuaries from interested communities and stakeholders around the country.

"Our national marine sanctuaries not only protect special places in America's oceans and Great Lakes, but they promote responsible and sustainable ocean uses to protect the health of our oceans for future generations," said Kathryn D. Sullivan, Ph.D., NOAA administrator and under secretary of commerce for oceans and atmosphere. "This new process increases the public's involvement in the stewardship of our oceans, which is central to NOAA's overall mission. We look forward to hearing from the public about places in the marine and Great Lakes environment they feel deserve special status and protection as national marine sanctuaries."

The National Marine Sanctuaries Act directs NOAA to identify, designate, and protect marine areas of special national significance. The public's involvement in nominating new sanctuaries will help NOAA in this mission and support the administration's goals of ensuring healthy coastal communities and economies.

The announcement will not result in the automatic designation of any new national marine sanctuaries. However, the nomination process will result in an inventory of areas NOAA will consider for national marine sanctuary designation, taking into account input and support from various local, regional and national interests and organizations. Consideration also will be based on a proposed area's national significance and the feasibility of managing it.

NOAA may designate new sanctuaries and implement their associated regulations only after a nominated site has gone through a separate, highly public process that typically takes several years to complete. More specific details about the nomination process are available online.

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

New UK subsea research initiative launched

A major subsea research initiative has been launched. The National Subsea Research Initiative (NSRI) will be the focal point for the co-ordination of research and development activities for the UK's subsea oil and gas sector.

As a direct link between the subsea community and academia as well as government, NSRI will facilitate the development of subsea technologies that enable increased recovery of hydrocarbons, prolonging the life of the UKCS as well as innovation which adds value to the UK's subsea engineering base, helping to maintain the country's position as a world-leader in subsea.

NSRI will play an influential role in making sure the UK's subsea technology needs are understood and met within the increasingly complex and competitive technology strategy and associated funding landscape in the UK.

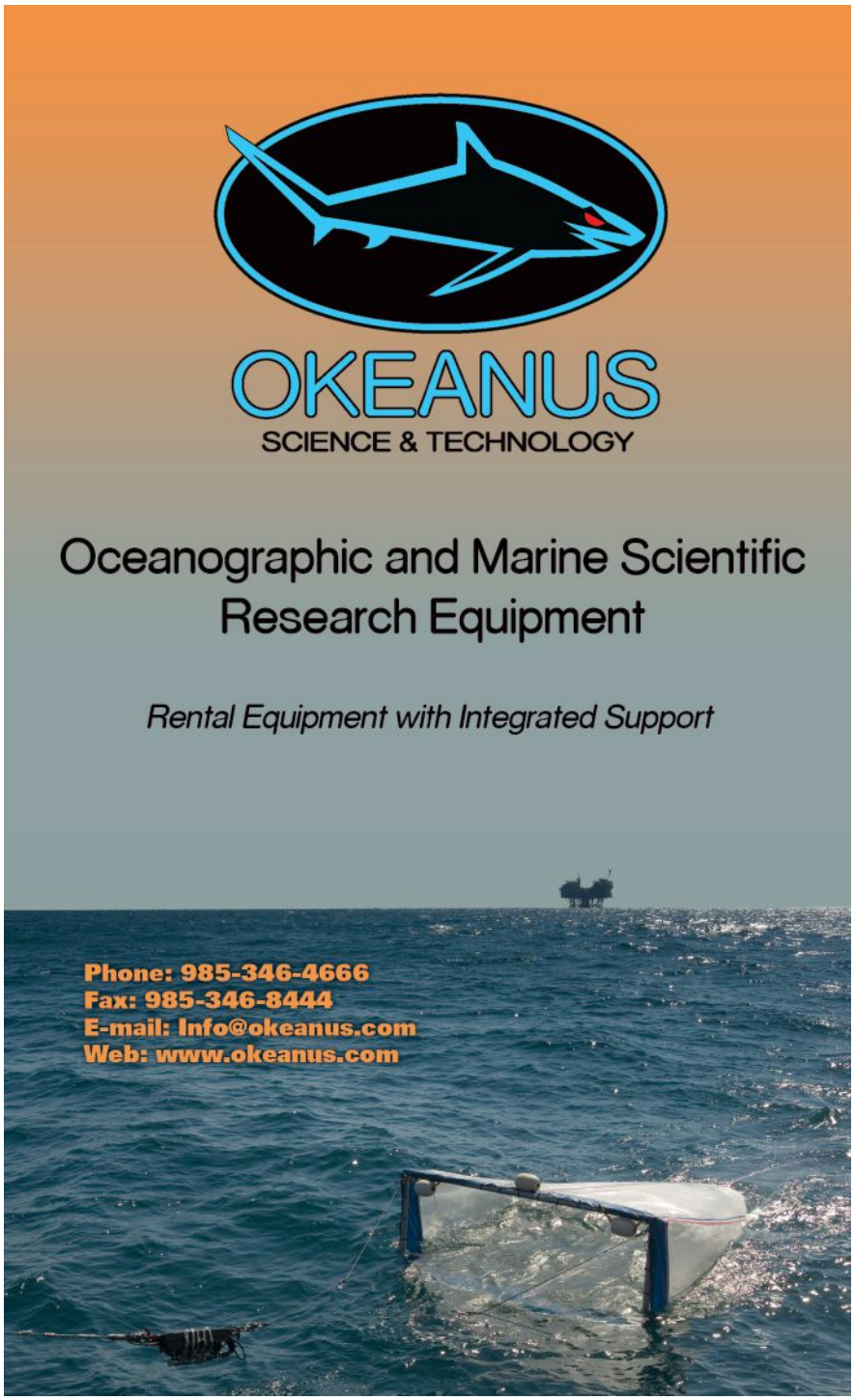
Subsea UK director and NSRI Steering Group leader John Mair believes that within the current landscape, which includes the Oil and Gas Innovation Centre and the Oil & Gas Technology Strategy Board, there is a greater need for more meaningful engagement between industry and academia.

Initial funding for the initiative over a 3-year period has been secured from Scottish Enterprise, Subsea UK and industry with further industry funding expected in the coming months. David Rennie, sector head, oil and gas/thermal generation and CCS at Scottish Enterprise, says as a not-for-profit independent organization, the NSRI will be in a strong position to work closely with Subsea UK to champion subsea development.

DNA testing to help save corals

"We are seriously tackling conservation of coral reefs in Okinawa," said Dr. Chuya Shinzato of the OIST Marine Genomics Unit. Coral reefs face various extinction risks. To avert coral demise, Shinzato is providing his expertise to the Coral Reef Preservation and Restoration Project spearheaded by the Okinawa Prefectural Government. In a paper published in Frontiers in Marine Science, Shinzato and colleagues reported the establishment of DNA markers that might be applicable to all species of the Acropora reef-building coral, giving accurate identification to individual corals. The technique, similar to DNA profiling in humans, enables scientists to study genetic diversity and connectivity among the *Acropora* coral populations, thus finding clues to help with the conservation of coral reef ecosystems in waters around Okinawa and the world.

Coral reefs occupy only 1% of the ocean floor, but they are home to as much as a quarter of all described marine species in the world. Despite their importance, corals face a range of grave risks today, from bleaching triggered by increasing seawater temperatures, to sediment loads caused by terrestrial erosion from land development, to predation by crown-of-thorns starfish. In order to improve coral conservation and restoration efforts, it is important to increase diversity so that all coral in one area is not susceptible to the same destructive force. Diversity



also helps to build reefs more robust to environmental changes than those composed of a few individual corals.

In this study, Shinzato and his team used the *Acropora* coral, the most common coral genera in the Indo-Pacific. They have 113 species that inhabit waters from the Red Sea through the Indian and Pacific Oceans to the Caribbean. There are four distinct groups of the *Acropora* coral, with a major evolutionary split occurring around 6.6 million years ago. The researchers first looked at the sequenced genome of *Acropora digitifera* and *Acropora tenius*, which belong to the two most distantly related groups. The team then located multiple repeated DNA sequences, called microsatellites in their respective genome. The number of repeats that appear differs between individual corals.

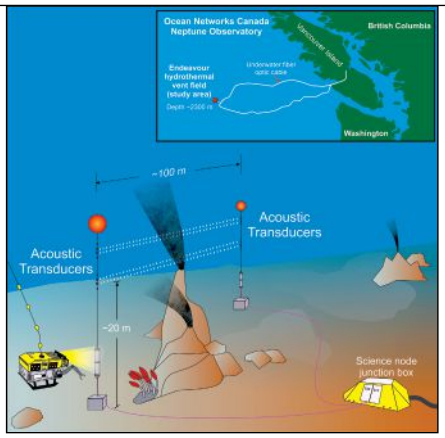
The work has direct implications for Okinawa. Since the *Acropora* coral is the most common coral in the area, the study can be applied to most of Okinawa's coral reefs. Already, the Okinawa Prefectural Government has taken steps to preserve and regenerate corals in nearby waters by employing this technology to increase genetic diversity in coral plantation.

For more information, visit www.oist.jp.

ASL builds custom acoustic instrument for deep ocean hydrothermal vent flow

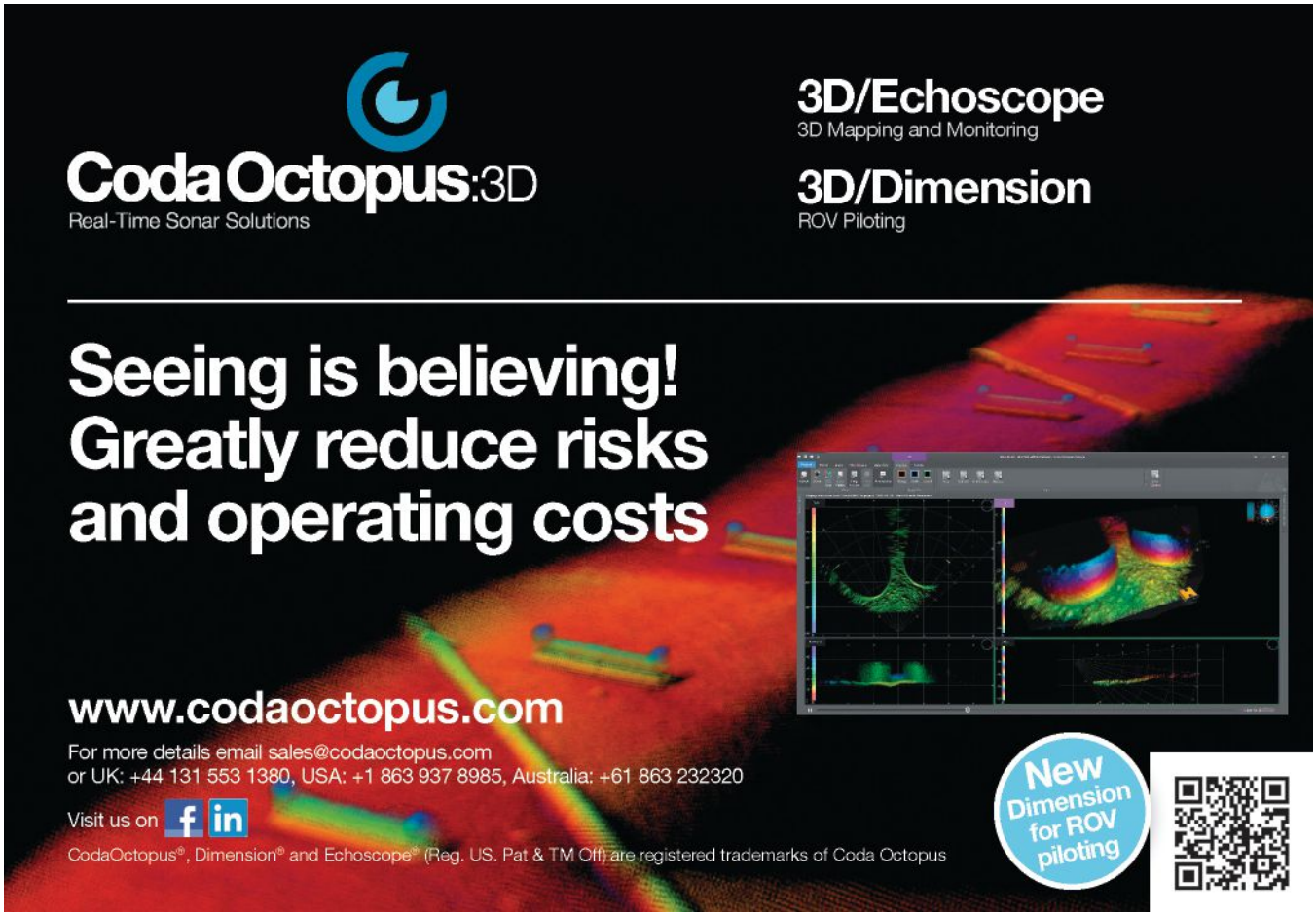
ASL Environmental Sciences Inc. has been awarded a US$0.5 million contract by the University of Georgia to build a reciprocal transmission acoustic scintillation instrument to measure the flow dynamics of a hydrothermal vent plume for a research project led by Dr. Daniela Di Iorio of the Department of Marine Sciences.

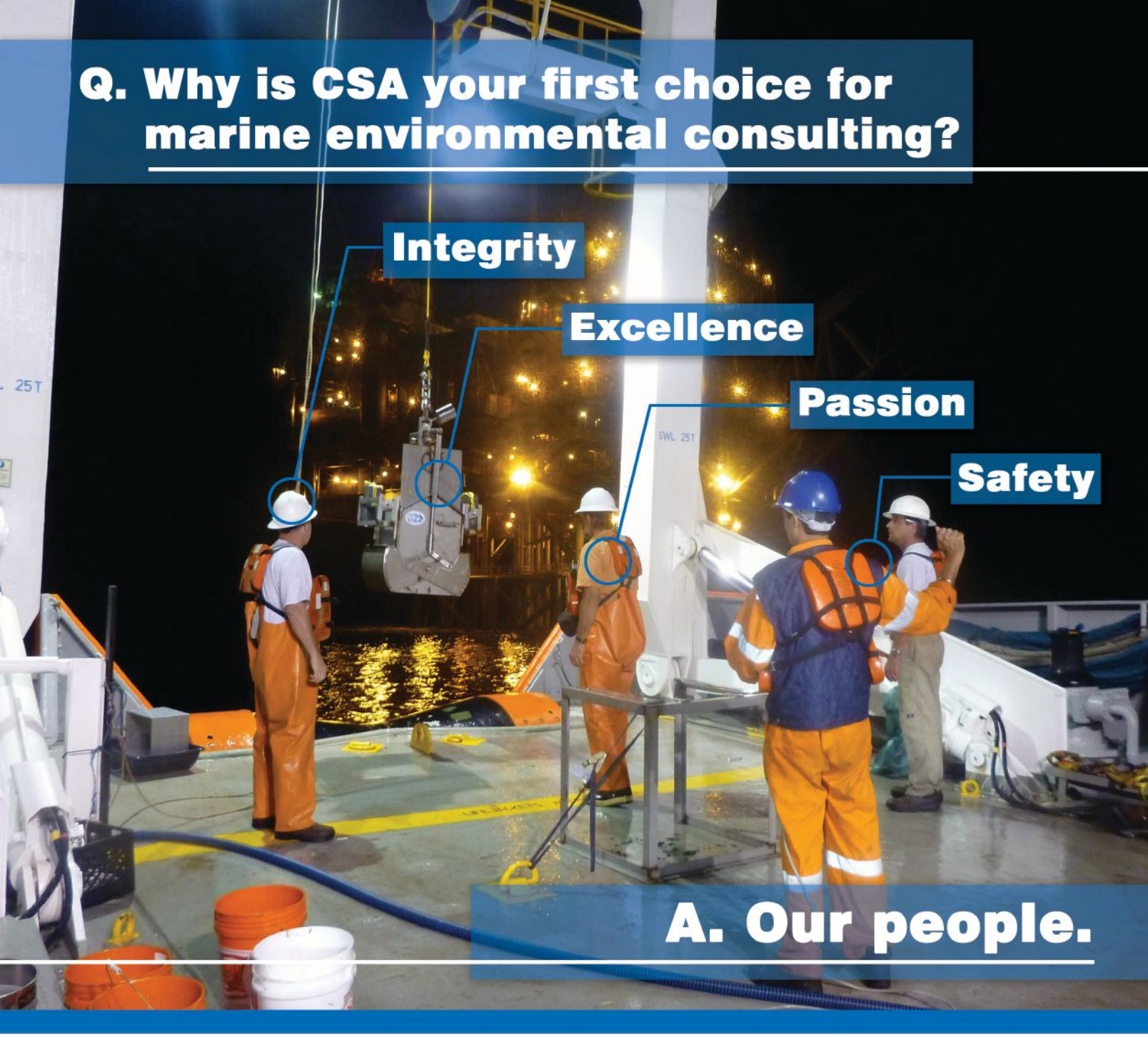
The instrument will be installed at the Ocean Networks Canada NEPTUNE cabled observatory at the Endeavour hydrothermal vent site, approximately 300 km off the west coast of Vancouver Island, in 2,200 m water depth. The deployment is scheduled for 2016, with logistical support from Ocean Networks Canada.



The instrument will employ advanced signal processing techniques and two-way acoustic transmissions to measure the rise velocity of the plume and its turbulent properties in near-real time. Long-term measurements of these properties, in conjunction with three-dimensional plume models, will advance understanding of the interaction between hydrothermal vent fluids and the surrounding ocean and how that supports the unique ecosystem found at the vents.

For more information, visit www.aslenv.com.





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VERSATILITY OF A MODERN WORK CLASS

By: Mark Collins, Deputy Managing Director – SMD ROVs

Work Class ROV models have historically been configured to satisfy requirements for distinct market sectors. Smaller units were aimed at Drill Support, medium-sized units at IRM (Inspection Repair and Maintenance) and Survey, whereas large units were intended for Heavy Construction. These distinctions were mainly driven by contractors who were purchasing equipment to fulfill their particular corner of the market.

Although some players still dominate certain market sectors and operate equipment to suit, there appears to be a growing trend for Work Class ROV systems that can undertake a wider variety of tasks. The versatility of modern vessels to do different jobs and new or remote geographical locations are driving factors that blur the lines between what used to be distinct operational areas requiring certain types of vehicle. Now, Work Class ROVs are expected to undertake a vast range of duties, whether mobilized on a rig or on a vessel. Work Class ROVs have always been versatile, but modern systems are taking flexibility to a new level.

A good example of a contractor providing a thoroughly flexible and reliable Work Class solution is Hallin Marine, who is currently operating their Quantum MkIII ROV system in the Caspian for a well-known oil major. The system is mobilized on a semi-submersible and undertaking full brownfield site development in addition to traditional drill support duties.

The Quantum MkIII was released in 2012 and is SMD's largest Work Class ROV. It uses components from the Curvetech multi-platform range, which is designed for reliability, flexibility and ease of use. The components are utilized across all SMD ROV systems, making life easy for the fleet customer who is operating different models. Curvetech components also give operators the flexibility to configure any SMD vehicle to undertake any Work ROV task, albeit with varying levels of capability constrained mainly by vehicle size.

The heavy construction tasks undertaken by Hallin's Quantum MkIII in the Caspian have been performed with ease. The vehicle produces 1,400 kg (measured) bollard pull, which has made short work of handling assets during installation of subsea jumpers, trees and manifolds. Controllability is especially important with so much power available, so the ROV is equipped with SMD's DVECS-S dynamic positioning system, which offers a suite of advanced auto functionality. During installation of the subsea assets, Quantum was deployed on metrology operations. The stability of the system and its ability to hold station were crucial to ensure accuracy of the gathered data.

The tooling system on the vehicle is capable of delivering 220 LPM (60 GPM) of oil flow. This is a considerable amount of power and useful for operation of BOP emergency intervention tooling and heavy duty dredging or suction anchor work. Torque tool operations have also been carried out using Quantum's built in torque tool control unit.

As well as the work being demanding, much of it relied on the ROV remaining submerged for many weeks at a time.

Having the versatility to undertake this range of tasks could be problematic if the system was not easy to use. SMD have addressed this by providing intuitive control screens and informative diagnostics. The result is that new local operators can get up to speed very quickly, delivering reliable performance, whatever the system may be doing!

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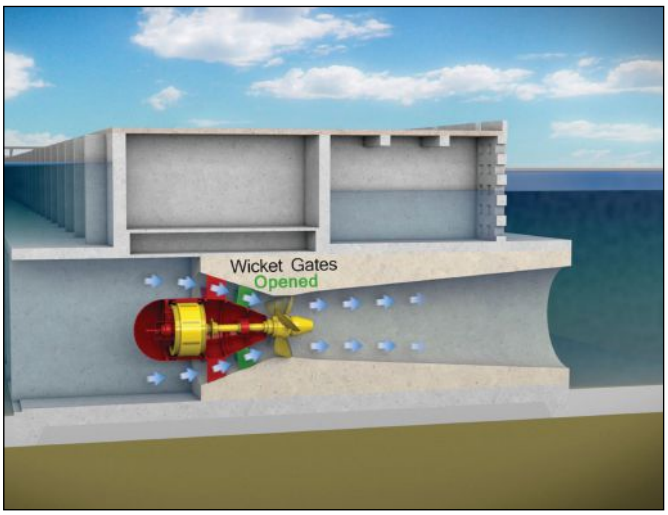
Carnegie awarded UK Wave Hub site for CETO 6
Carnegie Wave Energy Limited (ASX:CWE) announced the award of a wave energy berth by the Board of Wave Hub at its purpose-built wave energy demonstration facility in Hayle, Cornwall, southwest England. CETO Wave Energy UK (CWE UK) signed a Commitment Agreement for the final berth at Wave Hub in south west England, to support a 3-MW grid connected demonstration of its CETO 6 commercial generation technology, with an option to expand to a 10 MW+ project. Wave Hub is the world's largest purposebuilt, pre-installed, grid connected wave energy demonstration facility, with a current export capacity of 30 MW, which is upgradable to 48 MW. The berth awarded allows Carnegie to connect its CETO 6 units to the existing electrical subsea cables and grid connection already installed. The agreement was awarded following the successful completion of due diligence carried out by DNV GL on Carnegie and the CETO technology. Carnegie's executive director of European business development, Kieran O'Brien, said, "Securing a berth at Wave Hub provides Carnegie with a pre-developed site and installed grid connected infrastructure to test its CETO 6 commercial generation technology whilst leveraging off UK technical and commercial supply chain expertise in the heart of the marine renewables industry." Claire Gibson, managing director of Wave Hub, said, "We have seen an increase in demand from companies with advanced wave energy technology and have had to consider each of them carefully given we only had one berth remaining. Carnegie has an impressive track record, successfully developing their CETO technology from concept to a pre-commercial array in just 10 years. We are delighted they have decided to come to Wave Hub and benefit from the local expertise that is available in Cornwall."

FAU to install world's first ocean current energy test site
Researchers at Florida Atlantic University's Southeast National Marine Renewable Energy Center (SNMREC) will soon install the world's first offshore test berth for small-scale ocean current turbines thanks to a recently signed 5-year lease agreement between FAU and the U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM). "This project is a potentially paradigm-shifting development in the global quest for clean energy sources and puts South Florida at the forefront of research in this critical effort," FAU president John Kelly said. "It also demonstrates the multidisciplinary nature of marine renewable's research, a successful public, private partnership and FAU's international leadership in the field." The lease allows installation of multiple anchored floating test berths on the U.S. outer continental shelf 13 mi (22 km) offshore Broward County, Florida. These test berths, each consisting of a buoy anchored to the seafloor, allow ocean current turbine prototypes (up to 100 kW generation capacity) to be deployed from vessels moored in the Gulf Stream for a few weeks at a time. "This is the first time a lease has been issued to test ocean current energy equipment in Federal waters," said BOEM Acting Director Walter Cruickshank. "The Gulf Stream contains a tremendous amount of energy, and this technology offers exciting potential to expand the nation's renewable energy portfolio." Industry partners will have the opportunity to evaluate the efficacy of their turbine designs while mooring buoys collect measurements of ocean conditions nearby.

VWP wins initial grant funding from Australian Renewable Energy Agency
Ocean Power Technologies, Inc. (OPT) announced that Victorian Wave Partners Pty. Ltd. (VWP) has received approximately A$5.0 million in initial grant funding from the Australian Renewable Energy Agency (ARENA). VWP is a project-specific entity wholly-owned by Ocean Power Technologies (Australasia) Pty. Ltd. (OPTA), which is 88% owned by OPT. The funding received represents the first payment under the A$66.5 million grant that was awarded by ARENA to VWP toward the cost of building and deploying its planned wave power station project off the coast of Australia. VWP and ARENA signed a Deed of Variation in January, which amended the grant agreement to accelerate the reimbursement of eligible expenses for stages one and two of the planned three-stage project and increases the number of project milestones.

The UK's first three tidal lagoon power plants could deliver significantly cheaper power



An economic study into the cost profile of power from tidal lagoons has found that a portfolio of three UK tidal lagoons, in operation by 2021, would deliver large-scale low carbon power at a significantly cheaper price than offshore wind.

The study, conducted by energy economists at Pöyry, the management consultancy, identifies a volume-weighted levelized cost of energy for the three lagoons as around £100 MWh. The Government's central LCOE assumption for a Round 3 offshore wind farm in 2021 is £131 MWh. The cheapest of the projects assessed, Lagoon 3, has a levelized cost of around £90 MWh, broadly similar to onshore wind, large-scale solar PV, nuclear and gas-fired generation.

As with all forms of low-carbon generation, tidal lagoons will require Government support via a pre-defined "strike price." Pöyry's central assessment of the required CfD strike price for the first three lagoons studied on a volume-weighted average basis is £111 MWh. At present, other forms of marine energy are offered a strike price of £305 MWh and offshore wind projects are offered £155 MWh.

This month, plans for the Swansea Bay Tidal Lagoon, the world's first tidal lagoon power plant, were accepted for consideration by the Government's Planning Inspectorate, initiating an examination process that its developer, Tidal Lagoon Power, hopes will see construction commence in spring 2015, with first power being generated in 2018.

The study notes that the very long asset life of a tidal lagoon makes it equivalent to five generations of offshore wind investment and two generations of investment in nuclear power production and clean-up. When compared at a social discount rate of 3.5%, a rate commonly used by Government to evaluate the future costs and benefits to consumers of policy decisions, the study found that even Lagoon 1 has levelized costs that are competitive with offshore wind. While power from Lagoons 2 and 3 would be cheaper than that of a gas-fired power station.

For more information, visit www.tidallagoonswanseabay.com.

Cape Wind completing geophysical surveys

Cape Wind has announced that a team including three companies based in New Bedford, Massachusetts, is involved with completing geophysical surveys of the project site and offshore cable routes.

Survey vessels with a suite of geophysical instruments are surveying the seafloor and subsea geology on Horseshoe Shoal and along the offshore cable route.

New Bedford companies were involved with Cape Wind's prior geotechnical and geophysical work, and the harbor has been used as the assembly area for an offshore jack-up barge.

New Bedford-based Fathom Research president Ward McIntyre said, "Over the past 4 years Fathom Research LLC has provided various marine services to Cape Wind; we are pleased to be providing diver assisted sub-bottom imaging services. We look forward to continuing our work relationship with Cape Wind as we continue to position Fathom Research as a multi-tooled marine service provider for the future needs of the U.S. offshore wind industry."

New Bedford-based A.I.S., Inc. president Arvidas Poshkus said, "A.I.S., Inc. is providing the Protected Species Observers for the Cape Wind offshore wind farm project located in Nantucket Sound. AIS observers are following federal guidelines to ensure that marine mammals and sea turtles are not harmed during Cape Wind operations."

Hercules SLR, also based in New Bedford, has been providing members of the Cape Wind management team with maritime safety training.

Ocean Surveys, Inc., based in Old Saybrook, Connecticut, is the lead survey contractor and has collected over 5,000 mi of geophysical data offshore the U.S. east coast over the past 4 years.

ESS Group, based in Waltham, Massachusetts, has been Cape Wind's lead environmental and permitting consultant and is assisting Cape Wind in managing this geophysical survey project.

For more information, visit www.capewind.org.

Eight turbines installed in 1 week at Global Tech I

The construction of towers and nacelles in the North Sea wind farm Global Tech I is running in full gear. The two high performance vessels Brave Tern and Bold Tern of Fred. Olsen Windcarrier have been deployed since January and March of this year, respectively. Since then, they installed together 35 turbines. The record performance so far was eight turbines during 1 week including 10-hours transfer times to the wind farm.

The trans-shipment of the components takes place at the offshore terminal ABC Peninsular docks of the logistics provider BLG in Bremerhaven. The processes are all running so smoothly that the loading of four towers and nacelles is done within a little more than 1 day.

So far, 40 towers and nacelles and nine rotor stars have been successfully installed. According to the program, the wind farm will be fully erected and operational this summer. When Global Tech I is connected via the BorWin beta

converter station to the grid, the 80 5-MW turbines of AREVA Wind will then start to supply environmentally friendly power for the equivalent needs of 445,000 households.

For more information, visit www.globaltechone.de.

GIB announces two equity investments in UK offshore wind

The Green Investment Bank (GIB) is investing alongside Japan's Marubeni Corporation to jointly purchase a 50% stake in the Westermost Rough offshore wind farm, from DONG Energy. GIB is committing £241 million to the approximately £500 million transaction.

The Westermost Rough project, currently in the early stages of construction off the coast of Yorkshire, will utilize Siemens' next generation 6-MW direct drive turbines which are almost twice the size of the majority of wind turbines operating in UK waters. This is the first time these new turbines will be commercially deployed in the UK and the project is the first time that GIB has taken construction risk in an investment.

Once operational, Westermost Rough will generate over 800 GWh of net renewable electricity, equivalent to the electricity consumption of c. 200,000 homes, a city the size of York.

GIB has also agreed to acquire a 10% stake in the Gwynt y Môr offshore wind farm, from RWE Innogy. The purchase price is £220 million. The project, off the coast of north Wales, is in the late stages of construction.

Gwynt y Môr is the largest offshore wind farm under construction in Europe. Once operational it will generate over 1,700 GWh of net renewable electricity each year. This is equivalent to the electricity consumption of c. 400,000 households or meeting the electricity requirements of a city the size of Bristol.

The proceeds of both sales are expected to be reinvested back into renewable energy projects in the UK.

For more information, visit www.greeninvestmentbank.com.

Block Island Wind Farm receives first major project permits

In a major advancement for the Block Island Wind Farm, Deepwater Wind has received the first major environmental permit approvals needed to begin deployment of this path-breaking project.

The Rhode Island Department of Environmental Management (RIDEM) issued Deepwater Wind Water Quality Certificates, deeming the Block Island Wind Farm and Transmission System in compliance with state water quality regulations and the Clean Water Act. These regulations ensure the protection of fish and wildlife, as well as the recreational use and navigation of Rhode Island inland and coastal waters. In addition, RIDEM issued the project a Freshwater Wetland permit for certain onshore construction activities.

Deepwater Wind must next secure an assent from the Rhode Island Coastal Resources Management Council, as well as approvals from the U.S. Department of the Interior's BOEM and the U.S. Army Corps of Engineers. Each permit application has undergone extensive review and public comment. Deepwater Wind expects to secure all remaining permits this spring.

The RIDEM issued Water Quality Certificates for the Block Island Wind Farm and the Block Island Transmission System. The approval comes as part of the requirements of Section 401 of the Federal Clean Water Act, which requires the State of Rhode Island to certify projects such as dredging, filling, water withdrawals, and site disturbances. While reviewing projects, the RIDEM often coordinates with federal and state agencies and other RIDEM programs.

For more information, visit www.dwwind.com.

U.S. Department of Energy orders two WindSentinel systems

AXYS Technologies Inc. (AXYS) is pleased to announce that after a formal RFP process attracting responses from industry leaders, the U.S. Department of Energy's (DoE's) Pacific Northwest National Laboratory (PNNL) has awarded AXYS the contract to supply two WindSentinel floating LiDAR systems. The systems will be managed by PNNL to support research and development to help advance the U.S. offshore wind industry.

"This award reflects the DoE's commitment to the use of new technology to

assist in reducing the cost of offshore wind energy in the United States," says Graham Howe, director of sales at AXYS. "We are pleased to be able to assist the DoE in their work."

The WindSentinel™ is a wind resource assessment buoy that uses LiDAR to accurately measure wind speed, wind direction, and turbulence offshore up to blade-tip heights of 200 m. The WindSentinel has recorded a number of world firsts, including the first commercial deployment and the most remote LiDAR offshore wind resource assessment ever conducted, 36 mi offshore.

For more information, visit www.axystechnologies.com.

DP Energy largest international tidal energy developer in Europe

DP Energy is set to become Europe's largest independent developer of tidal stream projects following SSE Renewables' transfer of an Agreement for Lease (AfL) with The Crown Estate.

The transfer will see DP Energy take on the development of the Westray South project in Orkney, Scotland, with the potential to install up to 200 MW of tidal turbines over two phases. The continued development of the project and engagement with key stakeholders has been a key objective of the transfer, and a consent application for the first 60-MW phase is due to be submitted later this year. The investment required to construct phase one of the project is expected to be in the region of £200 million and will generate enough electricity to power 40,000 homes, saving an estimated 56,000 tons of CO_2 per year.

The acquisition increases DP Energy's overall portfolio of tidal energy projects to 330 MW making the company the largest such independent developer in Europe, with a number of other projects in the pipeline.

For more information, visit www.dpenergy.com.

HAWBOLDT INDUSTRIES

Hawboldt Industries was founded in 1906 and, while the company has maintained its roots in the commercial fishing industry, it has developed into a worldwide exporter and leading supplier of quality engineered marine product solutions.

The company employs an engineering staff capable of designing a variety of custom deck equipment using modern design techniques. Hawboldt's engineering team is familiar with designing in accordance with third-party classification societies such as ABS, Lloyds, and DNV and has received several "type approval certificates" for their designs.

Hawboldt applies these proven design and manufacturing techniques to their product lines serving the maritime defense, oceanographic marine research, offshore oil and gas, and commercial ship building. Hawboldt designs and manufactures a robust, extremely reliable product renowned for its world-class quality.

Hawboldt supplies and supports its products globally, including Marine Cranes (available from 2 to 150 ton capacity) and Launch and Recovery Systems for ROVs, AUVs, and Subsea Drills. Understanding that LARS customers need product with quick delivery, Hawboldt currently has 15mT ROV LARS available in stock for immediate sale.

Hawboldt's modern 40,000 sq. ft facility is ISO 9001 registered and has the capacity to handle both large and small projects as well as repairs and maintenance. The plant includes a comprehensive machine shop featuring CNC cutting, milling and lathe equipment, a CWB certified welding facility with certifications for both steel and aluminum, a fully equipped hydraulic shop with test stand, and contemporary blast and painting facilities.

The company has embraced project management methodologies and has full-time project managers on staff to oversee project planning, development, and execution. One key function of the Project Manager is to interface with a client's project team to ensure successful program completion.

A member of the Timberland Group of companies since 2005, Hawboldt Industries strives to meet or exceed its customers' expectations for quality and performance and endeavours to deliver on-time, every time.

Contact:
Paul Phillips
General Sales Manager
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www.hawboldt.ca

Lockheed Martin awarded $31M+ for towed array units
Lockheed Martin Mission Systems and Training, Liverpool, New York, is being awarded a $31,777,262 modification to previously awarded contract (N00024-13-C-6292) to exercise options for the production of nine TB-37/U Multi-Function Towed Array (MFTA) production units, tow cables, electro-optical slip rings, drogues, and shipping products and the performance of engineering services. The TB-37/U MFTA is the next generation passive and active sonar receiver. It affords several enhancements to the AN/SQR-19 Tactical Towed Array System allowing greater coverage, increased capability/reliability, and reduced obsolescence. The TB-37/U MFTA significantly contributes to the capability of surface ships to detect, localize and prosecute undersea threats and is a critical sensor to a combat systems suite. Work will be performed in Liverpool, New York (66%), Millersville, Maryland (33%), and Marion, Massachusetts (1%), and is expected to be completed by July 2016. Fiscal 2014 other procurement, Navy; fiscal 2014 research, development, test & evaluation; and fiscal 2014 shipbuilding and conversion, Navy funding in the amount of $30,059,740 will be obligated at time of award. Contract funds will not expire at the end of the current fiscal year. The Naval Sea Systems Command, Washington, District of Columbia, is the contracting activity.

Lockheed Martin awarded C4ISR contract to support USCG
Lockheed Martin received a $69 million contract to support the U.S. Coast Guard's efforts to enforce maritime sovereignty and address at-sea threats. Through this contract received from Huntington Ingalls Industries (HII), Lockheed Martin will provide the Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) system for the U.S. Coast Guard's seventh National Security Cutter (NSC), the future USCGC Kimball. Lockheed Martin's C4ISR system offers comprehensive, real-time situational awareness, commonality and interoperability, which enables a greater collection and sharing of maritime data. It allows the crew to see vessels in distress or targets of interest; collaborate with other Coast Guard air, sea and land assets; and act on the most current information available. "The NSC's C4ISR system is critical to ensuring the USCG can support the nation's maritime strategy," said Joe Buss, program director of Lockheed Martin's Coast Guard and Mission Control Systems. "Our brave men and women of the Coast Guard rely on the accuracy and timeliness of the data our system provides to achieve their many missions and maritime operations." Lockheed Martin has a rich legacy in supporting the Coast Guard, and has provided the C4ISR systems to all six of the NSCs. The NSC is the largest and most technologically advanced multi-mission cutter in the Coast Guard fleet, with capabilities to support the service's homeland security, law enforcement, marine safety, environmental protection and national defense missions.

Saab receives Swedish submarine orders
Saab has received orders from the Swedish Defence Materiel Administration (FMV) regarding construction and production plans for the next generation submarines and to conduct a mid-life update of two Gotland-class submarines. The orders refer to the period 2014-2015 and the order value amounts to MSEK 467. In addition, the parties have signed a Letter of Intent regarding the Swedish armed forces' underwater capability. The Letter of Intent refers to the period 2015-2024 and includes potential orders of approximately SEK 11.2 billion. Saab has received orders from FMV regarding construction and production plans for the next generation submarines and to conduct mid-life update of two Gotland-class submarines. This includes the completion of systems design and to perform detail construction. The total order value amounts to MSEK 467. Delivery shall be made in 2014-2015. The work will be carried out in Sweden within Saab's business area Security and Defence Solutions. Saab and FMV have also signed a Letter of Intent regarding the Swedish armed forces' underwater capability for the period 2015-2024. It comprises support, development, design and production of submarines and other underwater systems. The Letter of Intent includes potential orders of approximately SEK 11.2 billion, provided that necessary decisions are made.

New underwater target to test submarine crews

The Royal Navy has ordered a new underwater target being used to test the Royal Navy's latest generation of submariners as part of a £5.3-million, 5-year deal.

The targets will be used to train the sonar and control room teams aboard the RN's Astute, Vanguard and Trafalgar-class submarines to first find these devices in Scottish waters–then potentially destroy them by launching torpedoes at them.

The devices–underwater mobile acoustic targets–simulate the noise and target echo produced by a submarine and will be used at the British Underwater Test and Evaluation Centre (BUTEC) in Scotland.

The ranges run by BUTEC near the Kyle of Lochalsh are the ultimate testing ground for the Silent Service in UK waters, where boats' sonars, noise emissions and torpedoes are tested.

With the new underwater targets, submarine crews will be expected to detect and/or classify targets as well as fire training torpedoes.

For more information, visit www.royalnavy.mod.uk.

13 nations participate in BALTOPS 2014

Thirteen nations participated in the 42nd annual joint exercise Baltic Operations (BALTOPS) 6-21 June 2014 in the Baltic Sea.

BALTOPS aims to enhance multinational maritime capabilities and interoperability, while improving involvement in the larger Baltic region theater security cooperation strategy.

The objective of BALTOPS is to promote mutual understanding, confidence and cooperation among forces and personnel of the participating nations. Emphasis will be on the importance of maritime forces in maintaining regional stability. At the same time, the exercise demonstrates the United States' commitment to the security of northern Europe and the Baltic region through coordination of operations among regional countries.

Training scenarios will include air, surface, subsurface and mine warfare, with participants conducting advance information sharing, crucial to maintaining regional stability and maritime security in the region. BALTOPS will also enhance the capability of participants to conduct multinational peacekeeping missions. Specific training objectives will vary throughout multiple training scenarios scheduled to take place.

This year's exercise will include 1,300 U.S. service members, in addition to forces from Denmark, Estonia, Finland, France, Georgia, Germany, Latvia, Lithuania, the Netherlands, Poland, Sweden, and the United Kingdom.

For more information, visit www.navy.mil.

Adm. Paul F. Zukunft assumes command of U.S. Coast Guard

Adm. Paul F. Zukunft assumed command of the U.S. Coast Guard in a change of command ceremony at the Douglas A. Munro U.S. Coast Guard Headquarters in Washington, D.C. Zukunft assumed command as the 25th Commandant of the U.S. Coast Guard.

As the 25th Commandant of the Coast Guard, Zukunft will lead the largest component of the Department of Homeland Security, comprising 41,700 active duty, 7,800 reserve and 8,300 civilian personnel as well as 31,000 volunteer Coast Guard auxiliarists.

A 1977 graduate of the U.S. Coast Guard Academy, Zukunft has commanded six units and served extensively in the cutter fleet where he commanded the cutters Cape Upright, Harriet Lane and Rush. In 2010, Zukunft served as the Federal On-Scene Coordinator for the Deepwater Horizon Spill of National Significance where he directed more than 47,000 responders, 6,500 vessels and 120 aircraft during the largest oil spill in U.S. history.

A flag officer since 2006, Zukunft

most recently served as commander, Pacific Area, and commander, Defense Force West following on tours as commander, Eleventh Coast Guard District, and director, Joint Interagency Task Force West.

For more information, visit www.uscg.mil.

Royal Navy's latest hunter killer submarine is launched

Waters lapped around the 97 m long hull of Britain's newest submarine as HMS Artful was lowered into a huge basin in Barrow for the first time. The third of the Royal Navy's Astute-class nuclear submarines was launched recently in a delicate 2-day operation.

The boat was formally named last September in a ceremony inside BAE's cavernous Devonshire Dock Hall, which dominates the Barrow skyline. Engineers edged the 7,400-ton attack submarine out of the hall before lowering her into the water for the next stage of her fitting out and tests.

Thanks to the experience of building Astute and Ambush, Artful entered the Cumbrian waters in a more finished state than her older sisters, allowing the crew and BAE team to concentrate on test and commissioning work before she heads out on sea trials next year.

Of the seven boats in the Astute program, the lead boat is on her maiden deployment, and HMS Ambush will soon be on patrol too. After Artful, the remaining four boats–Audacious, Anson, Agamemnon and an unnamed final submarine–are in various stages of construction at Barrow.

For more information, visit www.royalnavy.mod.uk.

Russian flotilla enters North Sea after 20-year absence

In May, a Russian navy flotilla entered the North Sea for the first time in 20 years. The flotilla comprises 6 ships escorting the RFS Kuznetsov, an aircraft carrier.

The ships moved from the Bay of Biscay into the North Sea via the English Channel, where they were escorted by British and French navy vessels. The Russian vessels sailed in the Dutch Exclusive Economic Zone (EEZ), which is outside Dutch territorial waters.

The Russian navy's flotilla was closely monitored by the Dutch Navy, even though it was believed that in all likelihood it was on its way to Murmansk. A Dutch Coastguard aircraft observed the movements of the flotilla at the request of the Royal Netherlands Navy. Although the ships are permitted to move freely through this area, it is unusual to see Russian units using this route.

For more information, visit www.defensie.nl.

CTF-150 makes several big drug seizures

Australian and UK ships operating with the Combined Task Force (CTF)-150 made several successful drug seizures in recent months. The UK-led CTF-150 conducts maritime security operations in the Indian Ocean in order to counter terrorist acts and related illegal activities, which terrorists use to fund or conceal their movements. CTF-150 is one of three task forces operated by Combined Maritime Forces (CMF), a multinational naval partnership of 30 nations based in Bahrain.

HMAS Darwin intercepted a suspected drug smuggling dhow in international waters seizing 786 kg of hashish. HMAS Darwin's embarked S-70B-2 Seahawk helicopter located the dhow, a type of vessel common to the Middle East and Indian Ocean, maneuvering suspiciously. The warship closed the distance between them and the dhow before intercepting it. The boarding party went on to discover the hidden drugs contained in 37 bags, each weighing between 21 to 22 kg.

This capture followed the seizure of 449 kg of heroin from another dhow in May. In April 2014, HMAS Darwin recorded the largest ever amount of heroin seized from a vessel on the high seas, which consisted of 1,032 kg.

The illegal narcotics interception was part of a determined multinational campaign by maritime forces to disrupt drug smuggling in the Indian Ocean, profits from which are known to provide funding for terrorist organizations including Al Qaeda and the Taliban.

For more information, visit www.combinedmaritimeforces.com.

First Lady, sailors celebrate PCU Illinois' keel laying

First Lady Michelle Obama's initials were welded onto a metal plate as Sailors from Pre-Commissioning Unit (PCU) Illinois (SSN 786) looked on during a keel-laying ceremony for the new Virginia-class submarine, June 2.

Obama joined Navy leaders, shipyard personnel and crew families in celebrating the ongoing construction of the Navy's 13th Virginia-class submarine during an event at the Quonset Point facility for General Dynamics Electric Boat.

Three-quarters of the ship's construction is complete, said Adm. John Richardson, the Naval Nuclear Propulsion Program director. Secretary of the Navy Ray Mabus also participated in the event and served as the keynote speaker.

Obama was named, by Mabus, as the ship's sponsor. The metal plate with the First Lady's initials will later be mounted on the submarine, in keeping with Navy tradition.

Illinois will become the Navy's second vessel to bear the name of the First Lady's home state once commissioned.

The pre-commissioning unit currently includes a crew of more than 100 sailors, with others scheduled to arrive through the summer. By August, leaders expect the crew to reach its full strength of about 140 officers and enlisted personnel.

As the crew trains ashore, construction personnel from both Electric Boat and Newport News Shipbuilding in Virginia will continue to assemble the $2.7 billion vessel. Once complete, the submarine will be equipped to conduct covert surveillance, support special forces, and track other ships and submarines.

Illinois will measure 377 ft in length, displace 7,835 tons while submerged, and be able to operate at speeds greater than 25 kts (28 mph).

Japanese PM, USN CNO discuss maritime cooperation

U.S. Chief of Naval Operations (CNO) Adm. Jonathan Greenert met with Japanese Prime Minister Shinzo Abe in Abe's office to discuss regional security and maritime partnership opportunities between the United States and Japan.

The meeting between Japan's political leader and the U.S. Navy service chief underscored the importance each nation places on maintaining their strong maritime relationship to achieve strength and stability in the region through cooperative efforts.

"Given the increasingly severe security environment in the Asia-Pacific region, the importance of the Japan-U.S. alliance has become even greater than ever," Abe said. "Through your visit I understand that we'll see further collaboration between the [Japan] Maritime Self-Defense Force (JMSDF) as well as the U.S. Navy and that would mean of course the alliance between Japan and the United States. I believe that would have a positive impact on the peace and stability of the entire Asia-Pacific region."

During the meeting, Abe explained that Japan's political leadership has been examining the relationship between their constitution and the right of collective self-defense and other issues that would enable Japan to more swiftly and efficiently contribute to regional and global peace and stability.

Japan's consideration and debate of exercising the right of collective self-defense has been followed with interest by Greenert. He stated from his viewpoint collective self-defense provides greater opportunity for more effective operational cooperation among critical allies, which is key to maintaining the security of Northeast Asia.

Greenert, having lived and served in Japan, said he understands the significance of the Asia-Pacific, the partnerships there and the significance of the alliance between the United States and Japan. Greenert added that as the CNO for nearly the past 3 years he has enjoyed a close relationship with his counterpart in the JMSDF, Chief of Staff Adm. Katsutoshi Kawano, and that the two will continue to bring their navies together while he is at the helm.

While in Japan, Greenert will also meet with service members during two fleet engagement activities at Yokosuka Naval Base and Naval Air Facility Atsugi where he will have a chance to talk to and hear from Sailors, civilians and family members during all-hands calls at each location.

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TECHNOLOGY OF THE *DEEPSEA CHALLENGE* EXPEDITION

(Part 2 of 3: *DEEPSEA CHALLENGER*)

By: Kevin Hardy, Global Ocean Design LLC; Bruce Sutphen, Sutphen Marine LLC; and James Cameron, Earthship Productions LLC

Figure 1. DEEPSEA CHALLENGER is prepared for launch by two divers during the DEEPSEA CHALLENGE Expedition. Photo by Charlie Arneson, used with permission, Earthship LLC.

Introduction

Driven by a deep curiosity to explore hidden places, James Cameron's *DEEPSEA CHALLENGE* (DSC) Expedition could have claimed the motto "Vade, et vide," meaning "Go and see." But to go and see the rolling fields of the lands submerged 7 miles underwater was an unimaginably complex effort led by a single, passionate visionary. The challenges were huge and the danger real.

It had been over 50 years since the last humans visited the extreme hyperbaric world of the Mariana Trench. Only a lack of access, not interest, has kept us away. That changed forever on March 26, 2012. Explorer and Filmmaker James Cameron roamed freely for hours in the Challenger Deep, in a one-man submersible he co-designed with Australian engineer Ron Allum. Cameron vowed to leave the door open behind him as he left the trench floor. Twin unmanned landers, discussed last issue (ONT, June 2014), complemented the human exploration. This second of a three-part series will begin the discussion of the technologies, both new and legacy, used in the making of the manned submersible. Part 3 in next month's issue will complete the outline of the submersible technologies.

Science

A number of significant biological and geological findings were made through the expert observations and targeted sampling performed by the DSC vehicles. A number of peer-reviewed scientific publications by respected oceanographic and planetary science institutions, co-authored with James Cameron and other DSC team members, have been published or are in process.

Design and Project Objectives

The ***DEEPSEA CHALLENGER*** manned submersible was developed for scientific research in the hadal depths. The development, construction and operation were privately funded on an aggressive timeline, requiring the major cost centers be identified upfront. Development speed and cost effectiveness were improved by capitalizing on interchangeable technologies shared across multiple undersea vehicle types (Figure 1).

The size of the submersible was quickly understood to drive both the cost of building the vehicle and its operations. The submersible size determined the size of the surface support ship needed, its availability and associated costs, including crew, fuel, food, deck gear, logistic support, and operational weather limitations. The Pilot Sphere would also require pressure testing, and that had limited choices above a certain size. With all factors weighed, Cameron made the final call that a single occupancy vehicle was the optimum solution.

The resulting as-launched vehicle air weight was ~12.0 metric tonnes (≈13.2 imperial tons), within an overall envelope measuring 8 x 6 x 27 ft.

Vehicle Operational Considerations

The vehicle design gave consideration to the full environmental characteristics of the deep dive, including the high delta ambient pressure, wide temperature range of operation, seawater/galvanic corrosion, ambient light, convection-driven ocean currents, change in density, operational launch and retrieval sea state limits, bottom conditions, communications, data transfer, navigation, acoustic field, vehicle hydrodynamics/ride quality, and any potential biological fouling.

In order to create a manned vehicle to dive the Challenger Deep, only 11° above the equator, the vehicle had to accommodate the thermal shock of moving from a hot deck under a blazing tropic sun to a cooler sea surface, then an extended cold soak at 33°F at 6.83 mi below the ocean surface.

Radio frequencies are filtered in the first inches of depth, making it easier to talk to a robot on Mars than a manned submersible in the sea. There are also significant currents in the water column that can dislocate a submersible from its glide path and scramble acoustic signals used to track the submersible's position and communicate with its pilot.

In the round-trip journey into the deepest ocean trench, the ambient pressure changes from 1 bar/14.7 psi at the surface to 1,100bar/16,300 psi at floor of the trench. The submersible crosses the almost 7-mi distance downward in about 120 minutes. It hurtles on the way back up, covering the same distance in only 70 minutes.

Vehicle Performance and Design

It was felt that there was more to be learned from exploring the nooks and crannies of the ocean floor than in the mid-water, so the vehicle was designed to transit quickly through the 7-mi water depth. This was accomplished by the radical notion of limiting the cross-sectional frontal projected area and elongating the height. The sub had the appearance of a canoe on end (Figure 2). On deck, lying horizontal in its support cradle, it looked like a more traditional submarine. But underwater, it is a creature of the sea, diving vertically like a blue whale plumbing the depths or pirouetting on the seafloor like a graceful Siphonophorae.

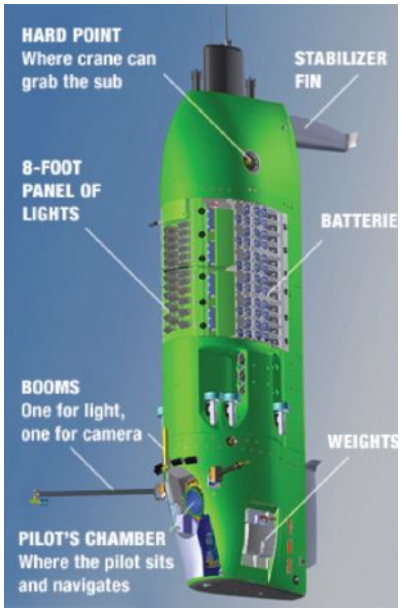

Figure 2. General outboard view of the DEEPSEA CHALLENGER, used with permission, Earthship LLC.

Buoyancy

The syntactic served the dual purpose of buoyancy and structural support (Figure 3). The personnel sphere, batteries (Figure 4), thrusters — everything — was hung directly off of the structural foam. No syntactic foam currently made for use at hadal depths met the structural and elastic requirements of the manned submersible design. A considerable effort was put into developing and producing a new composite material, later named ISOFloat, made of hollow glass micro-spheres and structural fiber secured in a toughened epoxy matrix. The foam has a specific gravity of 0.7 and experienced half the volume change as the seawater, increasing the vehicle's buoyancy with depth. The rest of the vehicle was fabricated from polyester fiber-reinforced, toughened epoxy laminates with the ISOFloat structural cores where merited.

Figure 3. The DSC main spar before painting made of ISOFloat syntactic. Photo by Tim Bulman, used with permission, Earthship LLC.

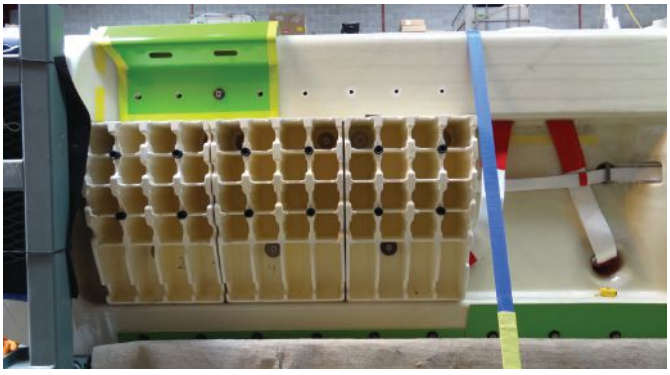

Figure 4. The PBOF LiPO slots made of ISOFloat syntactic. Photo by Ben Grant, used with permission, Earthship LLC.

Figure 5. DSC stabilizer fin and tiplet sub-assembly. Photo by Bruce Sutphen, used with permission, Earthship LLC.

Stability

The initial vehicle geometry had dynamic instability issues as it approached its terminal descent and ascent speeds; however, an integrated Computer Fluid Dynamics (CFD) study and scaled modeling program resolved the issues through tweaks in the volumetric distribution, boundary layer manipulation and passively activated stabilizer fins (Figure 5), which not only constrained the role instability but also induced a small yaw moment constraining the line of flight to a helical path (Figure 6).

The stabilizer fins (aka: Sut-Fins) were fabricated from ISOFloat structural syntactic foam with a 7000-series aluminum spar and UHMWPE (ultra-high molecular weight polyethylene) tiplets. By using these materials, the fins had a defined near-neutral buoyant moment allowing them to actuate via fluid flow as the vehicle ascended or descended.

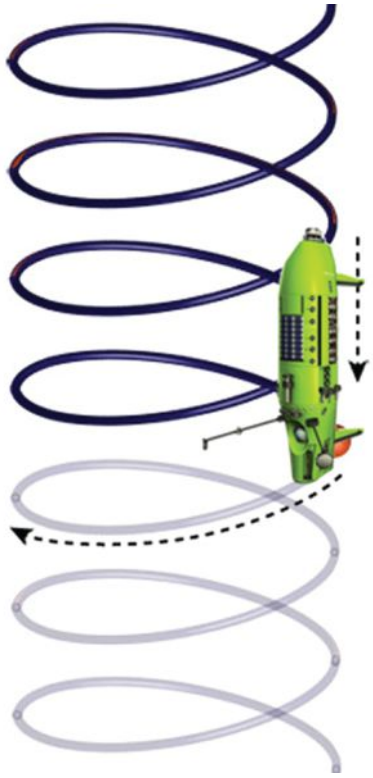

Figure 6. Passively activated stabilizer fins induce a small yaw moment constraining the line of flight to a helical path. Image by Nico Danan, Planet OS/MarinExplore, used with permission, Earthship LLC.

Fairings

Submersible fairings were fabricated from a near-neutrally buoyant fiber-reinforced laminate utilizing a toughened epoxy matrix. A vacuum-infusion process lowered the probability of implosive voids.

The polycarbonate mast housed the vehicle's surface communication equipment (e.g., VHF, Iridium Phone and LED strobe lights).

Power

The stored Lithium Ion battery power of the DSC could be configured to be as high as 96 KWh, though the storage used on the 12 manned dives was between 76 and 84 KWh. These came from a maximum of 96 PBOF LiPo battery packs, divided into three busses. The sub could operate off of a single buss in emergency mode. All power and control signals were passed through the pressure hull via four discrete penetrators in the penetrator plate at the upper pole of the pressure hull.

Controls

The main controls of the vehicle were shared between a joystick control and two graphic user interfaces (GUIs) incorporating two standard touch screen tablet displays.

Benthic Translation and Maneuverability

There were 12 PBOF thrusters on the vehicle: 6 vertical and 6 horizontal. These were used for maneuvering on the seafloor and up slopes, 3 kts horizontal and 3.5 kts vertical (Figure 7).

Figure 7. The DSC on deck with vertical thrusters and LiPO battery pods visible. Photo by Tim Bulman, used with permission, Earthship LLC.

Next month

In Part 3, we will examine the ***DEEPSEA CHALLENGER's*** ballast and trim systems, pressure hull and acrylic viewport design, life support systems, lower pod design, subsurface communications, pilot training, and emergency procedures and conclude with a look into the ***DEEPSEA CHALLENGER***'s effect on future ultra-deep exploration.

Watch for the movie ***DEEPSEA CHALLENGE*** 3D in theaters August 8, 2014.

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OFFSHORE INDUSTRY

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Report predicts surge in world subsea spending totaling $117B

Global subsea hardware capital expenditures could total $117 billion between 2014 and 2018, according to Douglas-Westwood's latest market forecast. This represents growth of more than 80% compared with the preceding 5-year period, DW said, although the global financial crisis in 2009 and the Gulf of Mexico oil spill in 2010-2011 both limited growth in subsea hardware spend during 2009-2013. Also, subsea tree installations last year were lower than expected mainly due to delays in big projects offshore Brazil and West Africa.

The strong growth to come is down to a combination of a favorable outlook in the established deepwater provinces and the start of field development in new frontier areas such as the Eastern Mediterranean and East Africa.

Subsea hardware spend is expected to be highest in Africa, Latin America and North America, with these regions providing almost half of the total expenditure. Over the next 5 years, DW also foresees around 44% of total spend committed to projects in water depths greater than 3,281 ft.

Subsea production equipment will account for almost half of all expenditure by component, according to the forecast. The SURF (subsea umbilicals, risers, and flowlines) market makes up over a third of expenditure, driven by the development of remote fields, new project phases, and the tieback of satellite fields into subsea hubs. Pipelines incur the remaining spend, driven by a few large offshore pipeline projects and smaller tieback pipelines, DW said.

Russia, China sign historic $400B gas contract covering 30 years

Russia's Gazprom and China's China National Petroleum (CNPC) have entered into a historic gas deal worth $400 billion following 10 years of negotiations. The deal will provide China, the world's fastest growing economy, with the natural gas it needs to keep in pace for the next 30 years.

According to the terms of the deal, Gazprom is expected to deliver some 38 Bcm of natural gas a year eastward to China's burgeoning economy, starting around 2018. No official price was announced by either party.

The worsening of relations with their European counterparts and the subsequent U.S. sanctions following the crisis in Ukraine have further prompted Russia in seeking alternative options for its energy exports.

Vladimir Putin

Russian President Vladimir Putin said in a statement to the Russian news channel Rossiya: "The price is satisfactory for both sides. It is tied, like it is envisaged in all our international contracts with Western partners, specifically our partners in Western Europe, to the market price on oil and oil products. It is an absolutely calibrated, general formula for pricing."

The deal is also expected to help China increase the proportion of cleaner-burning gas in its energy mix and secure a reliable partner for serving its energy needs.

More than $70 billion would be spent on infrastructure investment from both sides in what is said to be the world's largest construction project, with Russia funding $55 billion up front and China contributing $22 billion for pipelines on their respective territories.

BP and Anadarko may face billions in fines on U.S. Gulf oil spill ruling

BP Plc and Anadarko Petroleum Corp. could face billions of dollars in fines after an appeals court recently ruled they were automatically liable for pollution-law violations as co-owners of the well that blew out and started the 2010 Gulf of Mexico oil spill.

The U.S. Court of Appeals in New Orleans upheld a lower-court decision that allows the U.S. government to seek a maximum fine from London-based BP of $18 billion, if it's found grossly negligent for its actions surrounding the spill. Anadarko, which owned a 25% interest in the well, is facing a maximum penalty of $4.6 billion.

The judge will determine the size of the fines, based on factors including the degree of fault and attempts to fix the damage. His decision on whether BP was grossly negligent is pending. He has already ruled that Anadarko wasn't and excluded from trial evidence against the company alleging fault for the incident.

DNV GL launches joint project to standardize subsea documentation

DNV GL has launched a joint industry project (JIP) to standardize subsea documentation.

A typical subsea project can involve more than 10,000 documents, with up to 80,000 in a complex project, over a life cycle of 30 years. To develop, maintain, and verify the quality, security, accuracy, and availability of documentation, operators, contractors, and suppliers will often spend millions of dollars on document management, technical review, and information management systems.

The lack of standardization can lead to misunderstandings; a reduction in quality; and difficulty in handling approvals, distribution, and availability–which, in turn, increases project lead times and costs. Standardization would reduce the need to define and review technical documents, said DNV GL.

"The aim of this broad industry collaboration initiated by DNV GL and the Norwegian Oil and Gas Association is to develop a standardized set of subsea-system documents for designing, approving, manufacturing, verifying, operating, and maintaining equipment," explained Jarl S. Magnusson, the JIP project manager for DNV GL Oil & Gas.

The outcome will be a DNV GL Recommended Practice (RP) aimed at establishing industry guidelines and recommendations required to document typical subsea products and systems, with an associated minimum set of documentation. Initially, the RP will provide a method for industry variations and options for add-on documentation.

It will be linked to current sources of industry standards and practices. At a later stage, the RP may be included in industry guidelines, such as NORSOK, and as an amendment to relevant ISO standards.

Chevron is first major producer seeking Pemex partnerships

Chevron Corp. has become the first major international oil producer to reveal partnership plans with state-run Petroleos Mexicanos since Mexico signed landmark legislation to reopen its doors to foreign producers.

Chevron, which operates several rigs on the U.S. side of the Gulf of Mexico, is in talks with Mexico City-based Pemex for exploration opportunities in deepwater, shallow water or shale, Ali Moshiri, Chevron's president of Latin America and Africa, said during a conference in Mexico City. Chevron produces more crude in the U.S. section of the Gulf of Mexico than anyone except Royal Dutch Shell Plc and BP Plc.

"We are not here to replace Pemex," said Moshiri, who oversees exploration and production projects from Argentina to Angola. "We are not here to change their strategy. We are here to complement what they are doing."

Chevron, based in San Ramon, California, is waiting for the passage of Mexico's secondary energy legislation before deciding the sites of the first partnerships in Mexico. The legislation, which will determine Pemex's participation in new projects and the tax structure for private companies joining the newly opened energy market, could have been approved as soon as June.

Mexico passed an energy law last year that ended Pemex's 75-year production monopoly to allow for private firms to tap the country's 13.44 Bbbl of proven oil reserves. Private investment is anticipated to generate an additional $30 billion annually and create as many as two million jobs.

Many IOCs expected to invest in UK fields: Douglas-Westwood

Many international oil companies (IOCs) plan to invest in UK offshore fields through enhanced oil recovery, deepwater plays, and downstream infrastructure upgrades, according to Douglas-Westwood's World Development Drilling & Production Forecast.

The report predicts that UK production will rally as a result to around 1.75 mmbbl per day by 2017, although this will require a continuation of the recent 6% increase in well completions.

Beyond that, DW expects a resumption of decline toward the end of the decade because of the high cost of sustaining recovery from Britain's mature offshore fields. Hope for any long-term growth therefore rests with the proposed reform of the UK's offshore regulator, and a shift toward production from small-

er fields. Offshore Norway, Statoil's various brownfield projects along with large new projects such as Johan Sverdrup and Goliat are expected to sustain well completions at around 200 a year beyond 2020, DW predicts.

Potential risks to future growth include rising costs, which accounted for the cancellation of the subsea compression project at the Ormen Lange field despite positive results during testing and the backing of Statoil and ExxonMobil.

Light, sweet crudes to continue to drive U.S. production growth: EIA

The rapid growth of U.S. crude oil production will continue to be driven largely by light, sweet crudes, which could spark costly shifts in refining, construction of new splitters and increases in crude oil exports, the U.S. Energy Information Administration said.

Domestic production should reach 9.2 mmbbl per day in 2015, up from 7.4 mmbbl per day in 2013, the EIA said in a report. The agency said 60% of this estimated growth will come from production of sweet crude with an API gravity of 40 or above.

Similar light, sweet grades were almost entirely responsible for current U.S. crude production growth. About 96% of the 1.8 mmbbl per day in production growth from 2011 and 2013, which climbed from 5.7 mmbbl per day to 7.4 mmbbl per day, was from sweet crude with API gravity of 40 or above, according to the EIA report.

Crude production growth and its makeup varies by region, according to the report, anticipated to be the first in a series of reports on the potential implications of easing U.S. restrictions on crude oil and condensate exports.

The analysis largely showed a move toward a higher percentage of sweet crude with an API gravity between 40 and 50 API, with a diminishing percentage of crudes with API gravity above 50, which is commonly produced from wells targeting natural gas.

The growth of light, sweet crude production has largely contributed to a reduction in crude oil imports, which fell by 1.5 mmbbl per day between 2011 and 2013, about 50% of which was light crude. This caused the average API gravity of crude runs at U.S. refineries to increase from 30.2 degrees in 2008 to 30.8 degrees in 2013, the EIA said.

BOEM awards leases in U.S.-Mexico transboundary area to ExxonMobil

The U.S. Bureau of Ocean Energy Management has awarded the first three oil and gas leases in the Gulf of Mexico area subject to the U.S.-Mexico Transboundary Hydrocarbons Agreement to ExxonMobil Corp., which bid for the blocks during Western Planning Area Sale 233 in August 2013.

The leases lie in the Alaminos Canyon area, about 170 mi east of Port Isabel, Texas, and will be subject to the terms of the agreement when it becomes effective on July 18. BOEM opened the three sealed bids totaling more than $21.3 million during March's eastern and central gulf lease sales.

The agreement clarifying development of transboundary resources, signed into law in December, unlocks about 1.5 million additional acres of the U.S. Outer Continental Shelf for exploration and production activities. BOEM estimates the area has as much as 172 million bbl of oil and 304 bcf of natural gas.

"With the agreement now in full force, we can make additional oil and gas along the resource-rich boundary between the United States and Mexico available and we have a clear process by which both governments can provide the necessary oversight to ensure exploration and development activities are conducted safely and responsibly," said U.S. Secretary of the Interior Sally Jewell.

Companies from the United States and Mexico's Pemex will now be able to voluntarily enter into agreements to jointly develop transboundary reservoirs. In the event that consensus cannot be reached, the agreement establishes the process through which U.S. companies and Pemex can individually develop the resources on each side of the border while protecting each nation's interests and resources.

The agreement also provides for joint inspection teams from the U.S. Bureau of Safety and Environmental Enforcement (BSEE) and the Mexican government to ensure compliance with applicable laws and regulations. Blocks within the 1.4-nmi buffer area north of the OCS boundary in the Western Gap will become available for development on July 17, and will be available for leasing during western Lease Sale 238 in August.

Cruickshank appointed acting director of the Interior's BOEM

Walter Cruickshank has been elevated from deputy director to acting director of the U.S. Interior Department's Bureau of Ocean Energy Management (BOEM), which manages the conventional and renewable ocean energy and mineral resources on 1.7 billion acres of the U.S. Outer Continental Shelf (OCS).

He replaces Tommy P. Beaudreau, who recently stepped down as BOEM director to become Interior Secretary Sally Jewell's new chief of staff, replacing Laura Daniel Davis, who stayed in the post after the departure of Ken Salazar, the former secretary.

The chief of staff plays a largely behind-the-scenes role in every major Interior Department policy and represents the secretary in meetings with lawmakers and stakeholders.

Walter Cruickshank

Prior to becoming the deputy director of BOEM upon its establishment in October 2011, Cruickshank served as deputy director of the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) and the former Minerals Management Service (MMS) since 2002.

Cruickshank has worked in the Department of the Interior for more than 25 years. He earned a bachelor of arts in geological sciences from Cornell University and a doctorate in mineral economics from the Pennsylvania State University.

As acting director of BOEM, Cruickshank manages offshore programs that include leasing, plan administration, environmental studies, National Environmental Policy Act analysis, resource evaluation, economic analysis and renewable energy.

Poll: 70% of voters say natural gas exports will create U.S. jobs

Strong, bipartisan majorities of registered voters recognize the benefits of exporting U.S. natural gas, according to a national poll released by the American Petroleum Institute (API).

"Voters understand that natural gas exports will create thousands of jobs and strengthen America's position on the international stage," API chief economist John Felmy said, noting that America is now the world's top natural gas producer, "and U.S. workers are ready to harness that energy to help our allies around the world and cut the trade deficit."

The national telephone poll, conducted May 15 to 19 for API by Harris Poll among 1,000 registered voters found that:

- 70% of registered voters agree that exporting natural gas helps create American jobs, including 79% of Republicans and 66% of Democrats.
- 60% say exporting natural gas helps reduce the trade deficit, including 68% of voters between the ages of 18 and 34.
- 67% say exporting natural gas is good for the U.S. economy, including 73% of male voters and 61% female voters.
- 64% agree that exporting natural gas helps strengthen America's energy security by making the United States a major supplier in the world's energy market.

"The economic benefits are well-established," Felmy said, adding that policymakers should act now to accelerate Department of Energy approval for dozens of pending export applications. "Voters will welcome efforts to lock-in America's trade advantage as an energy superpower."

Felmy expressed support for congressional efforts to fast-track U.S. exports of liquefied natural gas (LNG), including legislation, H.R. 6, approved by the House Energy and Commerce Committee in April. The bill is expected to reach the House floor for a vote this summer, and related proposals have received bipartisan support in the Senate.

Meanwhile, exports of U.S. crude oil could gain 18 states more than 5,000 jobs each in 2020 and yield vast economic benefits across most states, a new study submitted to the API revealed.

The new report, conducted by ICF International and EnSys Energy, provides a state-by-state analysis of economic benefits first outlined in March in a national report, which showed that lifting export restrictions could save consumers as much as $5.8 billion per year, on average, between 2015 and 2035, as higher production and efficient markets help boost supplies and lower costs.

"Restrictions on exports only limit our potential as a global energy superpower," said Kyle Isakower, API vice president for regulatory and economic policy. "Additional exports could prompt higher production, generate savings for consumers, and bring more jobs to America. The economic benefits are well-established, and policymakers are right to reexamine 1970s-era trade restrictions that no longer make sense."

Offshore UK well services in demand despite exploration dip

Spending on UK offshore well services last year reached $3.2 billion, according to the Oil & Gas UK's 2014 Well Services Contractors Report. This represents the highest level of capital investment in the sector since 2008.

The sector has increased gross revenue by 45.5% since 2010 despite a marginal decrease in 2013, and comprises an important proportion of the $54.7 billion supply chain outlined in the UK upstream oil and gas supply chain reports published by Oil & Gas UK and EY earlier this year.

"It is clear that well services contractors are committed to addressing both the challenges and opportunities of the UK continental shelf (UKCS) with total capital investment in equipment and technology to develop future capacity rising by 9.7% to $212 million in 2013," said Oonagh Werngren, Oil & Gas UK's operations director.

Respondents to the survey reported strong demand for remediation, redevelopment, and intervention support for existing wells. The sector withstood a shortage of personnel and high attrition (staff turnover), maintaining total employment above 15,300 people. The report also noted a continued increase in the recruitment of apprentices.

High operating costs and skill shortages could have a negative impact this year, the report adds, although respondents expressed confidence in the future. This partly reflects the view that Sir Ian Wood's review of the UK continental shelf's long-term needs will result in operational improvements across the basin helping to stimulate the current low level of exploration activity.

Petrofac wins $630M EnQuest contract for North Sea
Petrofac has secured a $630 million contract to provide operations and maintenance services at EnQuest's North Sea assets. Under the agreement, Petrofac will continue to provide services to EnQuest on the Thistle, Heather and Northern Producer assets. The company will also work on the floating production, storage and offloading vessel, the EnQuest Producer, ahead of its deployment to the Alma-Galia field in the North Sea. The 10-year contract supersedes an initial 5-year deal awarded to Petrofac in 2013. In March 2014, EnQuest reported that its 2013 production averaged 24,222 boe per day, up 6.2% when compared with 2012. EnQuest increased its UK production licenses to 37 by acquiring the Greater Kittiwake Area, which was completed in the first quarter of 2013, and the Don North East area licence, which was offered "out of round" to the company in the first quarter of 2014.

Aker wins BP's offshore Norway framework contract
Oil services provider Aker Solutions has secured a $302 million framework contract from BP in Norway. Under the agreement, Aker will provide engineering, modifications and maintenance services for BP's oil and gas fields offshore Norway. The contract runs for a period of 2 years, with options to extend for another 4 years. Aker will carry out work on the Ula, Tambar, Hod, Skarv and Valhall fields and undertake studies, maintenance and modification project work. The company will also carry out a number of decommissioning services for BP. The contract started on June 1, after the expiration of a similar agreement for the same services. Aker and BP have worked together for more than 20 years and signed the first long-term framework agreement of the existing nature in 1999.

DOF Subsea wins key engineering, construction contract
DOF Subsea UK Ltd. was awarded a contract by Maersk Oil UK to undertake replacement of the Dumbarton Drill Cluster Centre (DCC) flexible production riser at the Global Producer 3 FPSO located in block 15/20 of UK sector North Sea. The work will take place at a water depth of 140 m. Engineering work associated with the project has already commenced with the offshore works scheduled to begin this month. DOF's long-term chartered construction support vessel, Normand Reach, will support the replacement of the DCC production riser. The scope of work includes all activities associated with the existing riser recovery, existing buoyancy removal, new buoyancy installation, new riser re-installation and all associated surveys. The work will involve a significant, dedicated project team drawn mostly from DOF's pool of personnel. DOF will also provide all project management and engineering support from its Aberdeen base, as well as a team to support riser pull in operations on board the Global Producer 3 FPSO.

Pemex awards multi-year seismic processing contract
ION Geophysical Corp. said its GX Technology group won a multi-year contract with Mexico's Pemex. GXT is providing a range of seismic data processing for multiple offshore and onshore surveys over the next 3 years. The scope of services includes GXT's WiBand broadband processing, velocity model building and pre-stack depth migration (PreSDM) using both beam migration and high-frequency reverse time migration. The work will be executed via GXT's Villahermosa, Mexico, and Houston offices and through its Houston computing center. GXT will utilize its proprietary imaging technologies to process seismic data.

Leviathan partners to pursue development without Woodside

The Tamar natural gas rig, located about 29 mi from the Leviathan development project 81 mi offshore Haifa, Israel

Noble Energy and its partners aim to sanction a first-phase development of the deepwater Leviathan field offshore Israel by the end of this year, despite a recent decision by Woodside Petroleum to withdraw from the project.

Plans call for a 1.6-bcf/d FPSO system exporting natural gas to Israel and surrounding regional markets. Front-end engineering and design studies are also under way for a second-phase development, anticipated to be a floating liquefied natural gas (FLNG) production system.

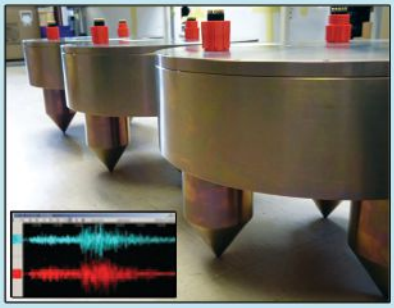
The Leviathan field, containing an estimated 19 tcf of discovered resources, is in around 5,550 ft of water.

However, Woodside Petroleum announced that it will not be involved after the partners agreed to terminate a non-binding memorandum of understanding. This concerned the sale of up to 25% to Woodside in the 349/Rachel and 350/Amit petroleum licenses containing Leviathan.

Woodside chief executive officer Peter Coleman said that this was a difficult decision and one that was not taken lightly. "All parties have worked very hard to secure an outcome which would be commercially acceptable, but after many months of negotiations it is time to acknowledge we will not get there under the current proposal," he explained.

Charles D. Davidson, Noble Energy's chairman and chief executive officer, added: "The plans for development of the Leviathan discovery have significantly changed since we began the search for a partner approximately 2 years ago. Perhaps the most dramatic changes have been associated with the growth in the regional markets. The emergence of these regional markets, which are accessible through pipeline outlet, has pushed the need for LNG into a later phase of development versus our earlier plans."

One project under consideration is an export pipeline to neighboring Cyprus.



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Seismic acquisition vessel Polarcus Naila

Polarcus' upgraded seismic vessel starts Breagh survey in North Sea

Polarcus' upgraded seismic acquisition vessel Polarcus Naila has started work on the UK Breagh RightBand multi-client project in the UK southern North Sea.

The 1-month survey is designed to enhance imaging of the Carboniferous Breagh field in block 42/13 and to improve understanding of prospectivity in adjacent open blocks opened under the UK's 28th license round.

The 55-day upgrade involved conversion of the vessel's propulsion system at Shipdock Amsterdam to accommodate twin-fin shaft and propeller technology, along with various class enhancements and a mandatory vessel classification.

As a result the vessel can now tow ultra-wide 12-streamer spreads, matching the capability of the four A-class vessels in the Polarcus fleet.

Following the Breagh campaign it will mobilize for a charter to TGS-NOPEC Geophysical.

Newbuild Hercules jack-up to work for Maersk in North Sea

Hercules North Sea has awarded Jurong Shipyard a $236 million contract to build a high-spec jack-up drilling rig, due for delivery in the second quarter of 2016. It will be based on the Friede & Goldman JU 2000E design with enhanced features for UK offshore operations, the company said.

The rig will be able to work in up to 400 ft of water and drill to depths of 30,000 ft. It will feature 2 million lb drilling capacity, 6,000-bbl mud capacity, 28,000 kips preload capacity for the legs, and accommodation for 150 personnel.

Following delivery, the rig will be chartered out to Maersk Oil and Gas for deployment in the UK North Sea.

Echo Surveyor VII and R/V Fugro Americas join Fugro's GoM fleet

Fugro is expanding its survey fleet in the Gulf of Mexico to include a new AUV, Echo Surveyor VII, and a new vessel, R/V Fugro Americas.

"Both the Fugro Americas and Echo Surveyor VII will join the current fleet later in the year," Melissa Jeansonne, vice president of Fugro GeoServices Inc., said, noting the company already operates three AUVs in the Gulf of Mexico: one Hugin (Echo Surveyor II) and two Bluefin (Echo Mapper).

"And our new multi-purpose Fugro Americas vessel enables us to have three vessels capable of operating AUVs in the Americas," she added.

AUVs are the ultimate choice of instrument platform for deepsea and remote surveys. As well as providing improved multibeam swath coverage, the Echo Surveyor VII will support the acquisition of sidescan sonar, sub-bottom profiler and CTD profiler data, and will carry various environmental sensors to meet a wide range of offshore survey demands.

With its tight turning circles that greatly reduce the time between survey lines, it will offer clients a wide range of features including an increase in depth rating to 14,764 ft. Being fully airfreight portable, Echo Surveyor VII will also allow rapid mobilization.

JVPC jack-up Naga 3 reaches offshore Vietnam field location

Fairmount Marine's tug Fairmount Expedition has towed the jack-up Naga 3 to the RD-19X oil field in block 15-2 offshore southern Vietnam.

In April the tug towed the rig from Singapore to the PV Marine Shipyard in Vung Tau, Vietnam, where the tug remained anchored.

After reaching the offshore location Fairmount Expedition assisted with installation of the rig and some cargo runs, accommodating onboard some employees of the block operator Japan Vietnam Petroleum Co.

Naga 3 jack-up gets tow to Vietnam field.

Decommissioning begins on FPSO Brasil

The Naga 3 is a 229 ft high, Gusto MSC CJ46-X100-D design jack-up, built in 2010 by Dubai Drydocks World and owned by UMW Petropipe-Singapore Drilling. It can drill wells up to 30,000 ft in depth.

SBM outlines FPSO conversion and decommissioning program

SBM Offshore has started to decommission the FPSO Brasil, which recently ceased operating after 11 years of service for Petrobras offshore Brazil. The current program is expected to be completed during the third quater of 2014. The company will consider scrapping the vessel, with opportunities for a conversion limited. Another vessel undergoing decommissioning is the FPSO Kuito, which served Chevron for 14 years offshore Angola. Again, scrapping appears the likeliest option once SBM finishes its program this summer.

As for new vessels, SBM said integration is progressing of the process modules for FPSO Cidade de Ilhabela at the Brasa yard in Brazil. The first lifting campaign has been completed using the Pelicano 1 heavy-lift floating crane. SBM expects the floater to enter service later this year.

The FPSOs Cidade de Maricá and Saquarema are undergoing refurbishment and conversion at a shipyard, with fabrication of the modules under way in Brazil. Start-up of the facilities is slated for end-2015 or early 2016.

Refurbishment and conversion of the FPSO Stones continues at the shipyard in Singapore. The FPSO N'Goma left the shipyard in Singapore in early May and set sail for Angola where conversion is to be completed at the Paenal yard, followed by start-up of the facility later in 2014. SBM is also supplying three large turrets for the Prelude FLNG, Quad 204, and Ichthys offshore projects.

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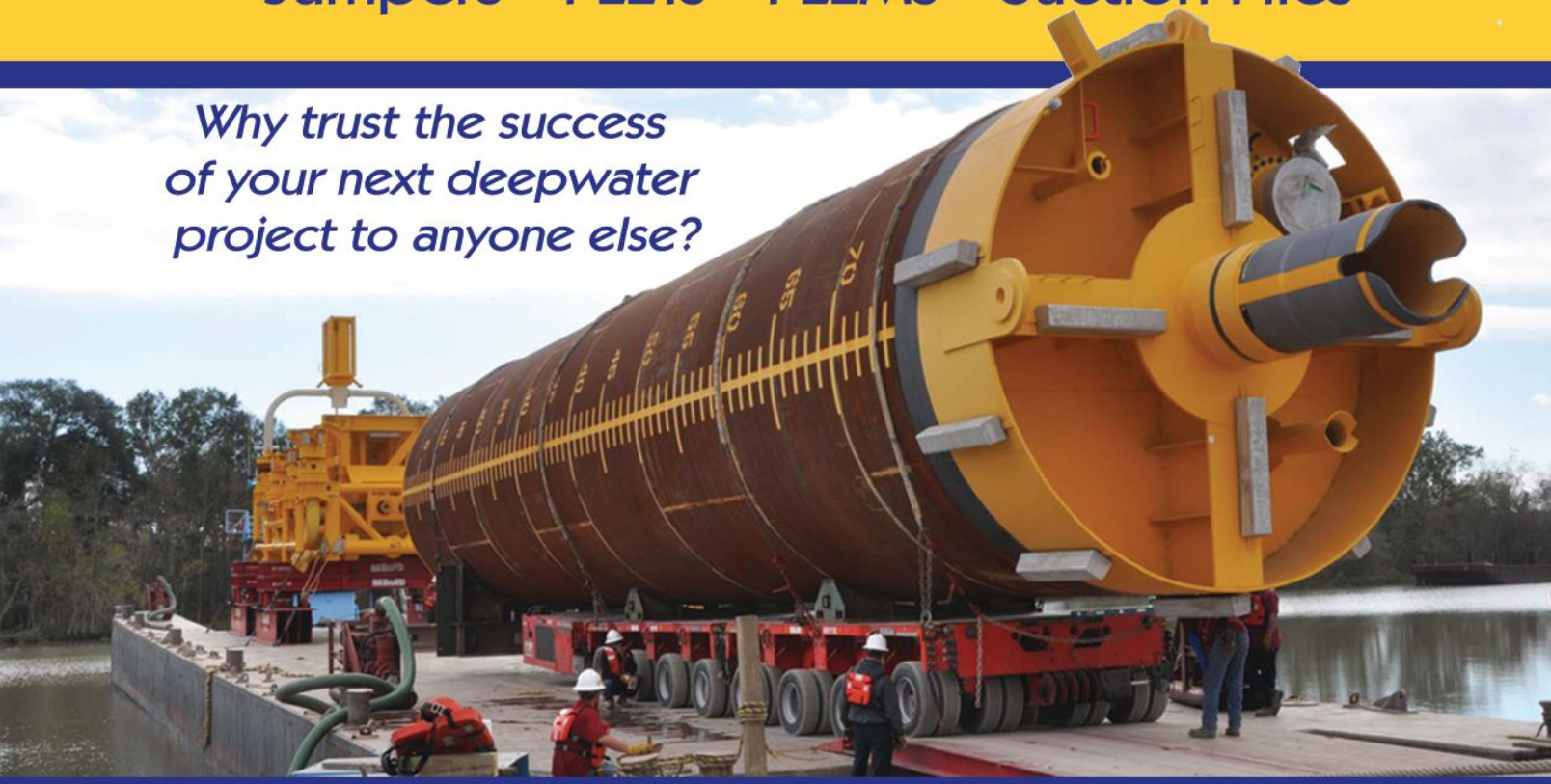

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ConocoPhillips discovers gas at Browse basin offshore Australia

ConocoPhillips has discovered oil at Poseidon North-1 well in the WA-315-P Browse basin permit, offshore Western Australia, the company said.

Karoon Gas Australia, which owns a 40% stake in Poseidon North-1, interprets that the well intersected gas bearing sands of Jurassic age across a 20-m gross, 12-m net reservoir interval.

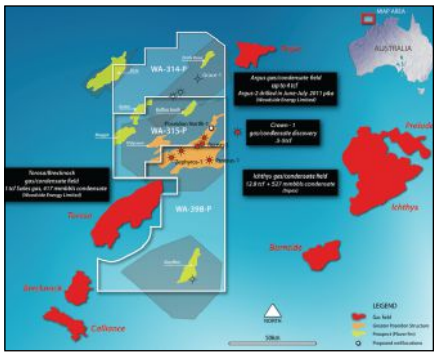
Karoon has interpreted this based on cuttings, mud gas and wireline log data, which was conducted after the well reached its final depth followed by a wireline logging programme.

Still the pressure data are inconclusive and sample analysis remains outstanding, which is required to confirm the presence of mobile gas.

Currently, the well is being plugged and abandoned with no further evaluation planned.

A ConocoPhillips and Karoon Gas joint-venture (JV) is set to drill Pharos-1 well location in permit WA-398-P as the sixth and final well following Poseidon North-1 well.

Pharos-1, which is operated by ConocoPhillips, is located around 9 km



northeast of Proteus-1 and will be a further test of the Proteus-Crown trend.

ConocoPhillips is set to use the Transocean Legend semi-submersible for drilling Pharos and the well will be targeting an extension of the discovery made at Proteus-1, which established excellent reservoir quality and condensate bearing gas in the Montara formation.

Pharos is a low-risk exploration well with the potential to add considerable resource to any future Poseidon development. The principal objective of the campaign is to better define the size and quality of the hydrocarbon resource within the exploration permits that contain the Greater Poseidon trend.

Petrobras discovers oil at Sagitario well in Santos basin offshore Brazil

Petrobras has discovered oil at 1-SPS-98 well (1-BRSA-1063-SPS) located in ultra-deep waters of the Santos basin pre-salt in Brazil. The company said it has completed the formation test at the well, informally known as Sagitario, and the results confirmed carbonate reservoirs with good permeability.

The company said that while the well reached a total depth of 23,326 ft, it encountered 521 ft of pre-salt reservoirs bearing good quality oil (32 degree API) at a depth of 20,157 ft.

Sagitario is the first well to be drilled in Block BM-S-50 and is located 120 mi off the Sao Paulo coast, at a water depth of 6,183 ft. Petrobras confirmed the discovery to the market in February 2013, when the well was still in the drilling phase. The partners in the well are Petrobras (operator) with 60% stake and BG E&P Brasil and Repsol Sinopec Brasil owning 20% each.

The operator, along with its partners, will proceed with the activities provided for in the Discovery Evaluation Plan (PAD) approved by Brazil's National Petroleum, Natural Gas and Biofuels Agency (ANP).

ConocoPhillips gets approval for Ekofisk wells offshore Norway

Petroleum Safety Authority Norway has sanctioned use of the jack-up Maersk Innovator to drill and complete two wells at Ekofisk 2/4-M in the southern Norwegian sector. Ekofisk, discovered in 1969, is around 174 mi southwest of Stavanger.

Water depth at the site is 239 ft. Operator ConocoPhillips planned to start drilling in June, with a total duration of roughly 30 days.

Another Maersk jack-up, Maersk Giant, is to plug and abandon Centrica's Butch East exploration well 8/10-5S in license PL405 in the same region. The targeted sandstones in the Upper Jurassic reservoir of the Ula formation failed to deliver hydrocarbons.

Centrica is hoping to prove more reserves in the area of its 2011 Butch discovery, in 213 ft of water and close to the Ula and Tambar complexes. Maersk Giant will next drill a separate segment at the Butch South West well.

The Maersk Innovator jack-up rig

Statoil completes Barents Sea campaign with oil discovery

Statoil has discovered oil and gas with the fifth and final well of its campaign to prove more reserves in the Johan Castberg area of the Barents Sea.

The semi-submersible West Hercules drilled well 7220/7-3-S on the Drivis structure in 1,132 ft of water in license PL532, 9.3 mi southwest of the original Skrugard discovery well. Skrugard and Havis are the two main fields lined up for the Johan Castberg development.

The well proved a 223-ft gross gas column in the Stø formation, and an 282-ft gross oil column in the Stø and Nordmela formations. Statoil estimates recoverable volumes in the 44 to 63 mmboe range, of which 42 to 54 mmbbl could be oil. After plugging and abandoning the well, West Hercules will leave the Norwegian sector.

Sterling halts drilling at Muridava well in Romania's Black Sea

Canadian oil and gas firm Sterling Resources has abandoned drilling at the Muridava well in Romania's Black Sea. The company holds a 40% stake in the well, which was drilled in April to a total measured depth of 2,747 m.

Sterling said it did not find any hydrocarbon accumulations at the well and failed to reach a secondary target in the Lower Cretaceous. The well is on the same geological trend as the current Olimpiyskaya and Eugenia gas discoveries, with targets in three formations.

Earlier in May, Sterling said the operator of Muridava Block indicated that the other two commitment wells for the block have been postponed to 2015.

"We are disappointed with the Muridava 1 well and that operating conditions prohibited the reaching of the full targeted depth," said Jake Ulrich, Sterling Resources chief executive officer.

"We have two more drilling locations on this concession, which we will be reviewing with the operator and will likely return to drilling on this Block in 2015."

Floating dock named Noble Frontier

Floating dock boosts Falklands offshore well support capability

A floating dock has arrived in the Falklands capital of Port Stanley to support the next wave of offshore exploratory drilling in the area.

Noble Energy commissioned the Noble Frontier for improved logistical support, according to partner Falklands Oil & Gas Ltd. It was due to be installed in Stanley harbor close to the existing oil industry supply base.

FOGL will participate in at least five wells in the program. Various license groups around the Falklands are looking to contract a deepwater drilling rig on a timeshare basis.

Drilling is expected to start in early 2015, FOGL said. In the South Falkland basin, Noble will drill at least two deepwater wells, while Premier Oil will drill three wells in the North Falkland basin on the Zebedee, Jayne East, and Isobel-Elaine prospects.

Stone reports deepwater Cardona South drilling success in U.S. Gulf

Stone Energy Corp. has reported success on the deepwater Cardona South well at Mississippi Canyon 29 in the Gulf of Mexico. Stone operates and owns a 65% working interest in the well.

The Cardona South well (MC 29 #5 well) encountered more than 275 ft of net oil pay in three separate sections of the well. The Cardona South success extends the productive zone of the Mississippi Canyon 29 TB-9 well to the adjacent fault block to the south and sets up a potential second and third well in the fault block.

Plans are to flow the Cardona South well (and the previously announced Cardona discovery) to the Stone owned and operated Pompano platform, with first production expected in early 2015.

Production casing has been set and cemented in the Cardona South well and the subsea tree equipment will be put in place. The rig will then move back to the original Cardona well (MC 29 #4 well) to begin completion operations before returning to complete the Cardona South well. Separately, the original Cardona well was previously estimated to have approximately 84 ft of net oil pay. After further evaluation, the estimated net oil pay for this well is now about 96 ft.

Statoil resumes drilling on Brugdan II exploration well off Faroe Islands

Drilling operations have resumed on Statoil's Brugdan II exploration well off the Faroe Islands that had been suspended since November 2012. According to partner Atlantic, the semi-submersible West Hercules is re-entering well 6104/21-2 Brugdan II in 1,509 ft of water in Faroese license 006.

Brugdan is a large four-way dip closure at Tertiary level that was drilled in 2006 by the 6104/21-1 well. This was abandoned prior to reaching the Vaila sandstone target owing to mechanical issues. The current well was expected to take more than 2 months to complete.

The well could "have a very big impact on Atlantic Petroleum and on the Faroese shelf in general," said Ben Araboa, Atlantic chief executive officer.

South Belut onstream offshore Indonesia in South Natuna Sea

ConocoPhillips has started gas production from the South Belut field in South Natuna Sea Block B offshore Indonesia, according to partner Inpex. Chevron is the other participant. The block is about 746 mi north of Jakarta, with various other fields in production.

South Belut is 9.3 mi south of the North Belut gas field in a water depth of 328 ft. It has been developed via subsea wells tied back to the North Belut central processing platform.

At peak South Belut will deliver around 120 mmcf/d to Singapore via an existing pipeline commingled with gas from the Belanak, Bawal, and Tembang fields. Resultant LPG will be sold to the Indonesian domestic market.

Statoil secures final approval to start drilling on Apollo prospect

Statoil has secured final approval from the Norway government to start exploration activities on the Apollo prospect in the Barents Sea.

The approval came a day after Norwegian police arrested Greenpeace activists who boarded Transocean Spitsbergen drilling rig. The activists boarded the rig in the early hours of May 27 when it was on its way for planned exploration drilling in the Hoop area of the Barents Sea.

The Norway Ministry of Climate and Environment said that Statoil's drilling does not violate the general guidelines for petroleum activities in the Barents Sea.

"Greenpeace has once again performed an illegal action," said Irene Rummelhoff, Statoil senior vice president for exploration on the Norwegian continental shelf. Statoil respects people's right to make a legal protest and we feel it is important to have a democratic debate around the oil industry."

Rummelhoff said Staoil's exploration drilling on Apollo is taking place in an area that has been impact assessed, opened up and awarded by Norwegian authorities.

"We have established robust plans for the operation and feel confident they can be carried out safely and without accidents," she said. "Our top priority is to have safe operations without any harm to people or the environment."

The Apollo prospect is located in the Barents Sea, where more than 100 exploration wells have been drilled in the past 34 years. The exploration will be carried out around 300 km from the mainland and 170 km from the island of Bjørnøya.

"Delayed exploration activities come at a cost," Rummelhoff added, estimating the cost at about NOK7.5 million per day. "In addition there are the costs to society."

Statoil plans to drill three wells in the Hoop area this summer: on the Apollo, Atlantis and Mercury prospects. Drilling is scheduled for the period from late May to September.

"Hoop is an area with known geology, low pressure and temperature, and where Statoil has robust plans for the operations," the company said. An oil spill is very unlikely..."

Transocean's Spitsbergen drilling rig

McDermott achieves industry first offshore Asia-Pacific

A McDermott International subsidiary has become the first to install rigid reel-lay pipe-in-pipe in Asia-Pacific for the Siakap North-Petai (SNP) development project offshore Malaysia. At more than 3,900 ft, the development is believed to be one of the industry's most challenging deepwater projects.

"Successfully installing the rigid reeled pipe-in-pipe flowlines on the Siakap project is a significant achievement for McDermott and a first for the region," said David Dickson, president and chief executive officer of McDermott. "The performance of our project team and vessels in the final months of installation was critical in helping our client achieve first oil at the end of February."

McDermott was awarded the turnkey contract in December 2011 for the project's subsea infrastructure. This included the design, procurement, fabrication, and installation of two complex rigid insulated pipe-in-pipe production flowlines, one rigid water injection, and one main umbilical system connecting eight new manifolds and subsea distribution units to existing riser slots.

McDermott's North Ocean 105

Installation of the pipe-in-pipe production flowlines and rigid water injection flowlines was undertaken by McDermott's lay vessel North Ocean 105, while flexible risers were installed by McDermott's North Ocean 102.

Installation begins on Central Fault Block extension platform off Nigeria

Afren said installation has started on the Central Fault Block extension platform on the Ebok field offshore Nigeria.

Development drilling was expected to get under way this summer targeting additional reservoirs in the block.

Batch drilling has started from the Ebok West Fault Block platform into the North Fault Block, with production to the existing MOPU. Later this year Afren plans to drill the step-out exploration well Ebok Deep.

Okoro, another offshore Nigeria field, has been averaging 15,648 b/d of oil. Afren and its partners have approval from the Nigerian authorities for the Okoro Further Field development.

The Okwok wellhead jacket has been fabricated and is on its way to the field area. Following installation of the platform development drilling is expected to start in the third quarter of 2014.

The company has completed a 1,048-sq mi 3D seismic program across its OPL 310 and OML 113 leases to determine the full extent of the syn-rift play and other dip-closed structures north and east of its Ogo discovery. Processing of the data should begin soon.

Off Côte d'Ivoire the company negotiated additional acreage last year in two new blocks, CI-523 and CI-525. It plans an extensive 3D seismic acquisition campaign later in 2014.

Diega field on Block I set to go to development off Equatorial Guinea

A long-term drillstem test has been completed on the Diega oil field in Block I off Equatorial Guinea.

Partner PA Resources (PAR) said the I-8 pilot well and subsequent horizontal side track I-8ST both yielded good-quality oil. The well was tested for 1 month at constrained rates up to about 7,300 b/d. It was suspended for re-use as a future producer. Recoverable volumes appear to be higher than PAR's previous estimate of 30 mmbbl.

PAR expects operator Noble Energy to submit a development plan during the second half of this year. In the same block, the Carla South discovery appears to be sub-commercial but will be re-evaluated following acquisition of new 3D seismic later this year.

Elsewhere off Equatorial Guinea, Noble plans to drill another production well on the Alen field to lift gas-condensate production by 20% to 30%.

Offshore Republic of Congo (Brazzaville), PAR has approval to farm out a 60% operating stake to Soco. The partners plan to drill the Baobab Marin 1 exploration well in late 2014 or the first quarter of 2015. Murphy Oil's abandonment of the Azurite field is around 80% complete. Meanwhile, the FDPSO vessel has left the Congo.

Technip to expand Alvheim field subsea facilities offshore Norway

Marathon Oil Norge has contracted Technip to extend the subsea infrastructure on the Alvheim field in the Norwegian North Sea.

Technip's scope includes installation engineering, procurement, fabrication, installation and tie-in of spools and protection covers and installation of one manifold. It will perform most of the subsea operations with divers in a water depth around 393 ft.

The company's operating center in Stavanger, Norway, will manage the project, which will involve offshore campaigns during 2014, 2015, and 2016. These will employ the dive support vessel Skandi Arctic, which can work through winter in both construction and diving mode.

Multiple platforms planned for Culzean field in UK North Sea

Maersk Oil UK and its partners have opted for a bridge-linked platform complex to develop the Culzean field in the UK central North Sea.

Culzean is an ultra high-pressure-high-temperature field discovered in 2008 in block 22/25, with the reservoir at 14,107 ft below sea level. It is one of the UK's largest discoveries of recent years. If the project goes forward, first gas could follow in 2019, with plateau production of 400-500 mmcf/d. This means the field could eventually supply around 5% of the UK's total gas needs, Maersk says.

The proposed offshore facilities, to be installed in 289 ft of water, would comprise a 12-slot wellhead platform (WHP), a central processing facility, and utilities-living quarters, with accommodation for more than 100 people. Total investment could be more than $4.7 billion.

KBR London has been appointed front-end engineering design contractor, and Hercules Offshore's new heavy duty jack-up will drill the wells starting in 2016. Due to the reservoir conditions Maersk plans to place equipment contracts for the rig now and for the WHP jacket later this year.

Subject to a final investment decision in 2015, a phased installation of the facilities would start in 2016.

Maersk Oil UK operates Culzean with a 49.99% interest, in partnership with JX Nippon (34.01%), and Britoil (BP) (16%).

Technip-Heerema group lands giant Kaombo SURF contract

Total E&P Angola has awarded the Technip-Heerema Marine Contractors (HMC) consortium a $3.5 billion contract for the deepwater Kaombo project in Block 32 offshore Angola. It's the largest SURF (subsea umbilicals, risers, and flowlines) contract ever issued, according to HMC Chairman Pieter Heerema. Technip's share is around 55% and HMC's around 45%.

The consortium will perform engineering, procurement, construction, installation (EPCI), and pre-commissioning of the subsea facilities in water depths up to 6,662 ft. The scope covers 18 rigid single top tension risers (STTRs), including buoyancy tanks around 131 ft high and 20 ft in diameter, flexible top riser jumpers, and riser base spools; roughly 186 mi of rigid pipe-in-pipe production and single pipe injection pipelines; and numerous subsea structures, piles, and steel jumpers.

Additionally, the duo will transport and install around 71.5 mi of client-supplied umbilicals, manifolds, well jumpers, and flying leads. Heerema is responsible for the riser systems as well as the deeper and heavier pipe-in-pipe (18-in. and 12-in.) production pipelines. Technip's responsibilities include flowlines, flexible pipe manufacturing and installation, umbilical installation, hookup, and pre-commissioning.

The consortium will execute engineering work in Paris, Leiden, and Luanda. Most offshore installation activity is scheduled for 2016-2017.

Qatar Petroleum to invest $10.7B in Bul Hanine offshore oil field

State-run Qatar Petroleum will redevelop the Bul Hanine offshore oil field with an investment of $10.7 billion to extend its life and increase its output.

With the investment on the field off Qatar's east coast, the company expects to produce 90,000 bbl per day of crude oil by 2020, while it currently produces around 40,000 bbl per day.

Qatar Petroleum said that the magnitude of this investment reflects the scope of the project, which includes new offshore central production facilities and a new onshore gas liquids processing facility at Mesaieed.

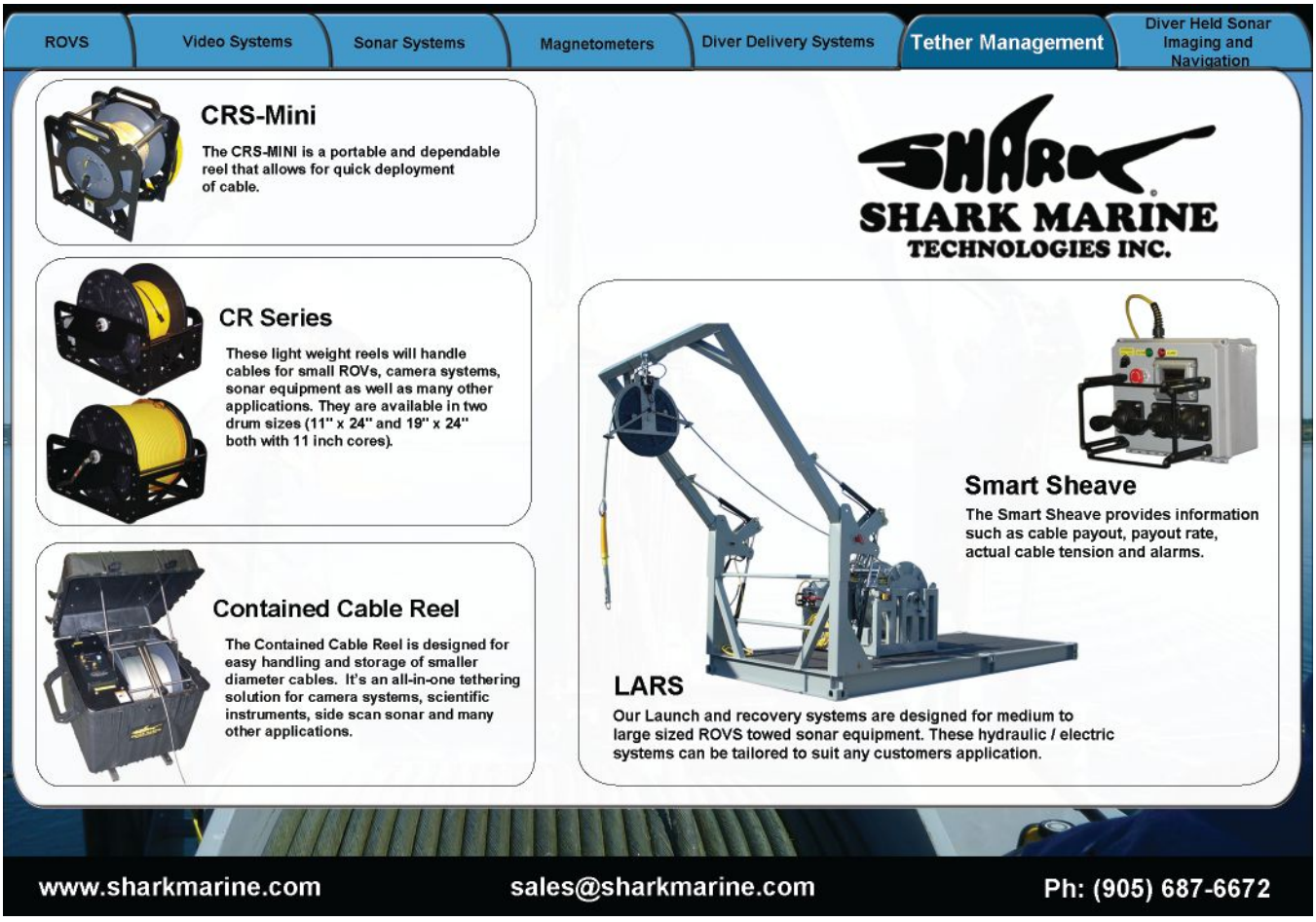
"This will be marked by a massive drilling campaign of about 150 new wells between now and the year 2028," the company said.

The key reservoir and field-wide studies have been undertaken, including seismic surveys, in order to reassess the reserves and the long-term production prospects for each field. In addition, the new wells will be drilled from the existing and modified well-head jacket, as well as from 14 new well-head jackets.

Bul Hanine field

All well-head stream fluids will be processed in the new offshore central complex, comprising production, compression, utility and living quarter platforms, with topside weights ranging from 4,000 to 14,000 tons.

"This important project is part of a development and production strategy based on maximum recovery of reserves through the longest possible plateau of sustainable production levels," said H.E. Dr. Mohammed bin Saleh Al-Sada, minister of Energy and Industry and Qatar Petroleum chairman. "It will help boost Qatar's oil production capacity and reinforce its position as a reliable energy provider."



Caterpillar generators to power five Super Class B jack-up rigs

Caterpillar Oil & Gas said the Cat C175 and Cat 3516B generator sets have been selected to power five Super Class B jack-up rigs. Each rig will be equipped with five Cat C175 generator sets, each with rated power of 1,833 ekW at 60 Hz (1,200 rpm), for prime power as well as 1x Cat 3516B generator set providing emergency power.

The newbuilds are being constructed by Keppel FELS in Singapore, and the Cat power solutions will be delivered over the next 2 years. Cat dealer Tractors Singapore Ltd. (TSL) led Caterpillar's efforts on the project.

Offering 20% more installed power than 3516C (HD) offshore generator sets, the company said the C175-16 allows for deeper drilling and higher mud pump loading. Its compact footprint offers weight savings when compared to medium-speed engines and allows for retrofit with today's Cat 3516 generator sets. In addition, its full-featured control system provides for easy interface with the local rig network, and the generator can be controlled and monitored remotely.

The C175-16 is also designed to be fuel efficient, incorporating a fuel system that uses a high-pressure fuel pump and control valve that deliver multiple precise injections within a single combustion event, resulting in lower emissions, improved performance, and reduced fuel consumption. Driven by two ADEM A4 engine control modules, the C175-16 engine features full redundancy and provides superior performance, even in the most demanding environments.

EM&I camera insertion methodology to be used on FPSOs offshore Brazil

EM&I's unique camera insertion methodology, a component of its ODIN™ Diverless UWILD (underwater inspection in lieu of drydocking), is set to be used offshore Brazil. The camera insertion methodology is used to inspect critical isolation valves and sea chests. It does not require divers, can be undertaken while the asset is in service, and gives better and more accurate data than other methods, the company said.

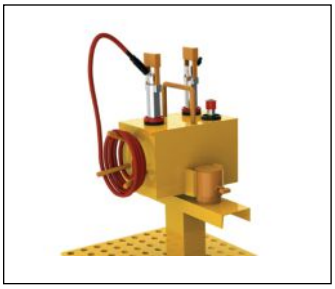
A successful demonstration of the camera insertion methodology was carried out by EM&I to classification societies, regulators and clients at its training and validation center in the UK, and has been fully accepted by the groups.

"Our diverless UWILD methodology, ODIN, has met with great interest and affirmation and the new camera insertion methodology is receiving positive interest," said Danny Constantinis, EM&I Group chief executive officer. "The visual results from the demonstration we gave provided exceptional views of in-service valves and valve gates, giving better quality and more useful information for our clients. ODIN has proved successful and has shown benefits to operators in major cost and risk reduction and the camera insertion is a beneficial addition to our diverless UWILD strategy."

ODIN is currently being implemented on two FPSOs in Brazil and is being evaluated as a fleet-wide approach for a major lease operator.

Shell joins BP, Total in developing Viper Subsea's V-SLIM unit project

Viper Subsea has attracted major operator Shell to join BP and Total in a joint industry project (JIP) to develop its Subsea Line Integrity Monitoring (V-SLIM) unit, which is used to identify and locate faults in remote subsea electrical distribution systems.



The company says that the addition of another major operator as a sponsor for the development of this technology confirms the need within the industry for such electrical integrity monitoring.

Viper Subsea will carry out all the research and development for the V-SLIM system, while the JIP partners will contribute funding and ensure that the products are optimized for field use. The establishment of the JIP has been facilitated by the Industry Technology Facilitator (ITF).

Viper Subsea expects the new V-SLIM to be field-trialed in less than 18 months.

Schlumberger launches new drilling and mapping technology

Schlumberger has launched a new technology, the GeoSphere reservoir mapping-while-drilling service, which has been tested in more than 140 wells worldwide.

The new technology gives operators an opportunity to optimize well landing operations, steering capabilities and mapping of multiple boundaries using new deep-directional resistivity measurements enabled by proprietary real-time interpretation techniques, the company claims.

The GeoSphere service enables the positioning of wells within target reservoirs, away from fluid boundaries, leading to increased reservoir exposure, as well as allowing geoscientists to refine their seismic interpretation and geological and structural models.

"With GeoSphere technology, Schlumberger is introducing the first-ever reservoir mapping-while-drilling service that enables customers to map their reservoirs using unprecedented depth of investigation measurements around the wellbore, combined with a novel mathematical inversion methodology," said Steve Kaufmann, Schlumberger drilling and measurements president.

"With the drill bit more than 300 ft away from the target reservoir, the mapping-while-drilling technology confirmed that there was considerable distance for adjusting the trajectory if needed, to optimize reservoir entry."

He said this long-awaited technology milestone commercialization now enables asset teams to seamlessly integrate the data provided by the reservoir mapping-while-drilling service with other downhole measurements to optimize production and reservoir management.

The GeoSphere service was tested in North America, South America, Europe, the Middle East, Russia and Australia, where in the North Sea the service has successfully landed a well and detected the top of the reservoir target from a distance of nearly 50 ft, allowing for optimization of the drilling plan before the formation is drilled. In northern Europe, the GeoSphere service was used to double the reservoir net-to-gross ratio from 0.45 to 0.96 on two horizontal wells with complex geologies.

Enhanced Drilling completes pilot with Statoil using EC-Drill system

Enhanced Drilling has completed a pilot project with Statoil regarding use of the EC-Drill as a managed-pressure-drilling system for floating rigs. The pilot, conducted on the Troll field on the Norwegian continental shelf, saw the EC-Drill system used in the drilling of three branches of a well.

Drilling of the 8½-in. section started from the COSLInnovator drilling rig on March 10, concluding on April 30. The EC-Drill system made it possible for Statoil to minimize losses, while the amount of drilling mud used was reduced by approximately 70% in relation to comparable wells.

The system solves the challenge of drilling within a narrow pressure window, said Enhanced Drilling. The EC-Drill system manipulates bottomhole pressure by changing the level of drilling mud in the riser, enabling the operator to "walk the line" between pore and fracture pressures.

Following the Troll pilot project, Statoil is due to introduce the EC-Drill system to the Gulf of Mexico later in the year, on the Maersk Developer rig, for a multi-well project.

AVEVA Engineering 14.1 increases control on complex global projects

The latest release of oil and gas industry software AVEVA Engineering adds what is said to be important new productivity features that increase control of engineering information throughout highly complex projects.

Engineering contractors (EPCs) can face serious challenges in controlling and communicating changes in engineering and design information as it evolves. Poor management of this highly interactive, multi-disciplinary process increases project risk and cost and can extend delivery schedules and reduce quality.

Responding to customer feedback, AVEVA has added new capabilities to AVEVA Engineering that enable many engineering disciplines in multiple locations to collaborate more effectively in parallel workflows, producing higher quality designs with less wasted effort.

With more added intelligence and automation, AVEVA Engineering allows for revision control at the level of an individual tagged object and for each discipline to release information to the rest of the project team only when it is sufficiently mature to be used by others.

"One of our customers' major pain points has been the difficulty in achieving efficient parallel working between disciplines on complex engineering projects," said Bruce Douglas, AVEVA's senior vice president, EDS product strategy and marketing.

"AVEVA Engineering supports true collaborative working by enabling each discipline to work at its own pace while being able to see relevant changes made by others and to respond to these changes in an efficient, prioritized manner. Now our customers can control their engineering projects more efficiently, driving wasted time and effort down and project quality up."

For more information on this product, visit www.aveva.com/aveva_engineering.

INDUSTRY DEALS

PDVSA signs $2.2B oil service financing to boost drilling

Petroleos de Venezuela SA, the country's state oil company, has signed financing deals worth $2.2 billion with oil service companies Weatherford International, Schlumberger Ltd. and Halliburton Co.

PDVSA renewed a $1 billion credit line with Schlumberger, while the Halliburton and Weatherford arrangements are for $600 million each, Oil Minister Rafael Ramirez told reporters at a conference in the city of Maracaibo.

"The companies will increase their activity in the country, in some cases doubling," Ramirez said.

Company officials from Repsol SA and Eni SpA were planning to visit the country to sign a deal related to the Perla 3X offshore natural gas well, he added.

The company intends to start natural gas exports to Colombia in July, Ramirez said.

PDVSA first signed the $1 billion rolling credit line with Schlumberger in May last year. It can be renewed each year, Ramirez said at the time.

McDermott International signs agreement for Gulfport spoolbase

McDermott International, Inc. said that one of its subsidiaries has signed a lease agreement with the Mississippi Development Authority and the Mississippi State Port Authority for the exclusive right to operate a spoolbase and marine operations base in the Port of Gulfport.

McDermott said it expects the facility, designed to serve projects from the Gulf of Mexico, will be available in early 2016. The new facility in Gulfport, located on the Mississippi coastline, will be used to fabricate steel pipe stalklines through advanced welding processes for use in offshore reeled pipelay operations.

The new 50 acre facility will feature a state-of-the-art fabrication building and stalk racks as well as a dedicated dock for vessel berthing to accommodate reeling pipe onto McDermott's fleet of specialized vessels for transport and installation offshore.

"Gulfport's well established port with coastline access to the Gulf of Mexico makes it a prime location for the operation of a spoolbase," said Tony Duncan, executive vice president subsea. "This facility complements our efficiency and quality standards in reel-lay and our high performance vessels, positioning McDermott to serve our clients from the Gulf of Mexico. This commitment further supports the repositioning of our company for long-term growth."

Port of Gulfport, Mississippi

ROC, Horizon agree to merge with market cap of about $741M

Roc Oil Co. (ROC) and Horizon Oil have agreed to merge, forming a single Asian-Australasian E&P company with market capitalization of around $741 million. The combined group will hold assets offshore and onshore China, Malaysia, Myanmar, Australia, New Zealand, and Papua New Guinea.

The company will have 2P reserves of 36.9 mmboe, 2C contingent resources of 120.7 mmboe, and working interest production of 5.5 mmboe.

ROC chairman Mike Harding will be chairman of the merged entity and Horizon chairman Fraser Ainsworth will be a non-executive director. ROC chief executive officer Alan Linn will remain as president of ROC Oil Malaysia until April 2015.

Marathon Oil to sell Norway oil business to Det Norske for $2.1B

Marathon Oil Corp. has struck a deal to sell its Norwegian offshore oil production business for $2.1 billion, its latest move to lighten its portfolio and concentrate on U.S. shale basins. Its Norway business includes a floating production vessel, licenses to drill in some parts of the North Sea and a daily output of about 80,000 boe.

The buyer, Norwegian offshore producer Det Norske Oljeselskap ASA, has agreed to absorb debt and other liabilities, bringing the total deal value to $2.7 billion for Marathon.

Separately, Marathon took its U.K. North Sea business off the sales block after it failed to garner a bid worthy of its assets there, the company said.

The Norwegian sale, expected to close in the fourth quarter, follows $6.2 billion in divestitures the Houston oil producer has made since 2011 to prune its portfolio "for future growth and profitability," Marathon Oil chief executive Lee Tillman said in a written statement.

"The disciplined allocation of capital to opportunities that can deliver long-term growth at higher returns and improved margins is a strategic imperative," Tillman said.

Marathon's liquids-rich inventory in the Eagle Ford Shale, Bakken Shale and Oklahoma basins has "expanding opportunities to further accelerate activity," the company's first priority in allocating more investment capital, Tillman said.

Total to sell 10% stake in offshore Shah Deniz field to TRAO for $1.5B

Total has agreed to sell its 10% interest in the Shah Deniz field and the South Caucasus Pipeline to the Turkish state-owned E&P firm TPAO for $1.5 billion. The deal increases Ankara-based TPAO's stake in the project to 19%.

Located approximately 100 km southeast of Baku in the Caspian Sea, the offshore Shah Deniz field covers around 860 km², with water depths ranging from 50 to 550 m.

The field's first phase, which started operations in 2006, is currently producing 200,000 boe/d while the second development phase was sanctioned at the end of 2013. The Shah Deniz field is being developed by consortium partners that include BP, Statoil, SOCAR, Lukoil, Nico and TPAO.

"The sale of our interest in Shah Deniz is in line with Total's active portfolio management and the focus of its investment capability on more strategic assets," said Michael Borrell, Total exploration and production vice president, Continental Europe and Central Asia. "This sale is another step forward in achieving our asset sale program."

Origin to buy Karoon's stake in two Browse basin exploration permits

Sydney-based Origin Energy has agreed to acquire Karoon Gas' 40% stake in two Browse basin exploration permits in Western Australia for $800 million. Origin Energy said the permits, WA-315-P and WA-398-P, contain large and prospective offshore gas fields, such as the Poseidon discovery. U.S.-based ConocoPhillips is the operator with 40% stake in the acreage while PetroChina holds the remaining 20% interest.

Origin has agreed to pay $600 million upfront with a $75 million payment due if a final investment decision is made and another $75 million after achieving first production. Another $50 million will be paid if reserves reach an unspecified level before an investment decision is made, according to the agreement.

Mid-term outlook strong for jack-up construction

The jack-up rig construction sector remains extremely competitive, despite a substantial increase in the number of rigs ordered last year, including those commissioned on a speculative basis, Lamprell said, adding that demand is likely to tail off this year as operators focus on putting to work units being delivered over the next 18 months.

Although the deepwater drilling segment is experiencing capital expenditure budget pressures, the fabricator said, global shallow-water fleet utilization remains close to record levels. Average jack-up day rates remain strong, with reasonable growth over the past year.

On average the age of the global jack-up fleet is more than 25 years, with the economics of aging rigs leading to a divergence of day rates between older and newer units. As a result, Lamprell foresees fleet replenishment to bolster demand and drive a return to order growth in 2015 and 2016.

Demand for rig refurbishment should also stay strong, Lamprell said, with older assets either being maintained until they are replaced or converted for alternative use. But there is growing competition at the lower end of the market in particular, with increased numbers of new entrant yards to this market.

Lamprell itself has a $2.2 billion backlog of jack-up newbuilds. The fabricator is seeing increased competition from yards in Asia that appear to be willing to offer clients back-ended payment terms.

Signet Maritime acquires Harvey Gulf OTV fleet

Signet Maritime Corp. has completed its acquisition of eight Harvey Gulf International Marine offshore towing vessels (OTVs) ranging in size from 153 to 75 mt bollard pull. The sale will encompass all Harvey OTVs, spares, business and supplies. Signet has committed to retention of all crewmembers and plans for Tier 3 generation of power onboard all eight tugs with conversions starting immediately.

The purchase expands Signet's vessel classes and allows the company to broaden its service, offering over 38 ASD tractor and conventional vessels to customers in the Gulf of Mexico and worldwide. When combined, the modern fleet under Signet ownership and operation will average 11 years of age.

Towing vessels acquired from Harvey Gulf are Signet Warhorse I, 152.63 mt; Signet Warhorse II, 153.58 mt; Signet Warhorse III, 135.44 mt; Signet Lightning, 98.76 mt; Signet Thunder, 89.74 mt; Signet Intruder, 86.98 mt; Signet Titan, 82.81 mt; and Signet Trojan, 75.70 mt.

"The combination of Harvey and Signet follows a thorough due diligence process and is fully consistent with our strategy of being a one-stop turnkey source for all our customers' needs," said J. Barry Snyder, Signet's president. "This acquisition will accelerate our growth plans..."

Shane J. Guidry, chairman and chief executive officer of Harvey Gulf, added: "Our two companies share a strong culture of entrepreneurship and a focus on quality and service to the customer. I look forward to seeing the talented people of Harvey and Signet work together as we continue to fulfill our commitment to meet all our customer needs."

Signet specializes in rig moves, towing, ship assist and escort, vessel design, new vessel construction, repair and maintenance. It was one of the first to incorporate EPA Tier 3 engines into all its vessel designs. Most recently, Signet's ASD reverse tractor tugs participated in the safe movements to Shell's Olympus, Chevron's Jack and St. Malo, Anadarko's Lucius, and Chevron's Big Foot.

The addition of the eight ocean-class offshore towing vessels enhances Signet's high-performance fleet and enables it to provide ocean towing of semi-submersible, jack-up drilling rigs, TLPs, anchor handling, and subsea pipeline installation support.

Demonstrating its strength, the Signet Warhorse II is the most powerful ABS classed ocean towing vessel in Signet Maritime's offshore towing division. At 153.58 tons bollard pull, it will lead the fleet providing towing of rigs, spars and other vessels.

The transfer of OTV ownership was completed with financing provided by Wells Fargo Equipment Finance as part of a $209 million syndicated financing facility. All vessels are scheduled for Tier 3 upgrade and refurbishment at Signet Shipbuilding & Repair in Pascagoula, Mississippi. Signet will continue to maintain its Offshore Towing Division operations from Port Fourchon, Louisiana.

Atlantic Towing wins supply vessel contract in Canada

Atlantic Towing was awarded a contract by ExxonMobil Canada Properties and Hibernia for four new platform supply vessels operating out of St John's, Newfoundland and Labrador.

The 10-year contract also includes a total of 15 years of options at the Charterers' discretion. The first ships for the contract, which are set be delivered in 2016, will join Atlantic Towing's current fleet of eight offshore support vessels in Atlantic Canada.

Damen Shipyards Group will design and build the new ships in the Netherlands. The ships will deliver a number of environmental benefits, including clean design designation with a diesel electric power plant, the latest environmental control equipment, wave piercing bow design and enhanced crew comfort.

"This exceptional contract, the largest in our company's history, will increase our fleet size, our workforce and our overall contribution to the economy in Newfoundland and Labrador," Atlantic Towing general manager Sean Leet said.

"We expect hiring of approximately 100 new positions, which will provide a great opportunity for local seafarers, to begin in December 2015."

Teekay subsidiary to supply ICSS, power package

Kongsberg Maritime Engineering has signed a contract with Gina Krog LLC, a subsidiary of Teekay Shipping AS, for supply of an integrated control and safety system (ICSS) and power package to the Gina Krog floating storage and offloading (FSO) unit, to be delivered to the Statoil-operated Gina Krog field on the Norwegian continental shelf.

Teekay recently entered an agreement with Statoil to provide the FSO for the Gina Krog field. The $220 million conversion project is expected to be completed in the first quarter of 2017, before the newly converted FSO unit will commence operations under a time-charter contract to Statoil.

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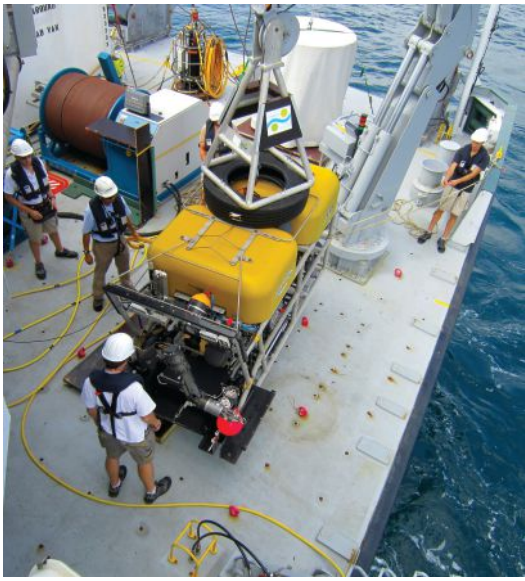
DEEP SEA SYSTEMS INTERNATIONAL

Deep Sea Systems International announces that its ROV Global Explorer has recently been refurbished with significant upgrades and is actively performing work for science survey, documentary, and asset (AUV) recovery.

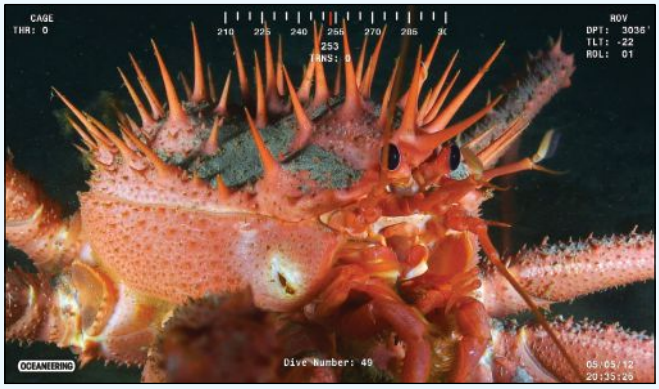
Global Explorer launched from R/V Pelican in the Gulf of Mexico. The 3,000-m system adds valuable capabilities to smaller, cost-effective vessels.



Deep Sea Systems International has an impressive history of working with universities, agencies, and institutes. Here, Global Explorer is deployed from Schmidt Ocean Institute's R/V Falkor.

The group has just wrapped up two successful Gulf of Mexico projects on LUMCON's R/V Pelican this spring, with an ECOGIG Consortium (ecogig.org) cruise followed by a shipwreck survey with field work led by George Mason University (cruise blog posted at mbac.gmu.edu). This summer, Global Explorer is on board the R/V F.G. Walton Smith (rsmas.miami.edu) with a USGS survey before returning to the R/V Pelican.

The recent work on the R/V Pelican and R/V Walton Smith highlights the Global Explorer's uniquely small footprint that allows for pairing with cost-effective vessels. The system is described as a lightweight, work class ROV, packing deepwater capabilities in a very mobile operation. The 3,000-m (10,000-ft) rated ROV is geared for science projects with a serious suite of sampling tools, sensors, and cameras. The platform is well suited for emergency stand-by or response with lost asset recovery, including AUVs fouled on the seafloor.



Global Explorer's cameras offer close-focus imagery with 18-MP stills or frame grabs from the HDTV video.

Deep Sea Systems puts special emphasis on providing stunning imagery with its stereo 3D HDTV cameras with videogrammetry, 10X zoom HDTV, and an 18-MP digital camera — all via GigE connection. Global Explorer's equipment following the upgrade includes a new 3,000-m fiber-optic armored cable, improved power, and 20-ft ISO control van. Available science instrumentation includes rotary suction and detritus samplers, 7-function manipulator, plenty of payload space, and options for customization.

Global Explorer's agility also makes it suitable for worldwide transport. Deep Sea Systems has lease availability surrounding upcoming work in Gulf of Mexico and Oceania regions and is presently booking immediate and future projects worldwide. Contact (508) 564-4200 or find more information online at deepseasystems.com.

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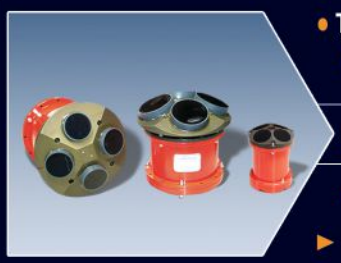

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Ocean Sonics officially opens the first digital hydrophone calibration lab
The traditional analog approach to calibrating hydrophones is a tricky and demanding task. Digital hydrophone calibration greatly simplifies the calibration process. A new state-of-the-art digital hydrophone calibration lab, the only one known of its kind, has been commissioned at the Ocean Sonics office in Great Village, NS. The separate wood framed lab sits above the ground to isolate it acoustically. A Faraday cage shields instruments from electromagnetic radiation that could interfere with low signal measurement. Power is isolated from the main building and the data are wired to the main building to allow remote operation. The lab facility features a large test tank with room to fit multiple icListen Smart Hydrophones and an icTalk Smart Projector as the sound source. Each icListen hydrophone comes with a calibration certificate indicating when it was tested and the result. Ocean Sonics recommends returning the hydrophone unit for recalibration every 2 years. The goal of the calibration lab is to raise calibration standards and continuous product improvement. As digital hydrophones become more common, Ocean Sonics will welcome new calibration standards as they are developed, and indeed the company hopes to be a part of standards development for these instruments.

EdgeTech announces 2014 sonar training seminar
EdgeTech, the leader in high-resolution sonar imaging systems and underwater technology, will be holding their annual sonar training seminar in New Bedford, Massachusetts September 23 to 25, 2014. This comprehensive course will cover sonar theory, operational training, system maintenance and post processing data for all of EdgeTech's standard side scan sonar, sub-bottom profiling and combined systems. The format for the 3-day seminar includes 2 1/2 days of classroom instruction and 1/2 day at sea. Topics and systems to be addressed include the following: 4125 Side Scan Sonar – Shallow water side scan sonar operations; 4200 Side Scan Sonar – Offshore multifaceted side scan sonar solutions; 3100 Sub-bottom Profiler – Sub-bottom profiling system for various operations; 6205 Side Scan/Bathymetry – Combined side scan sonar & bathymetry system; 2000 Series Combined Systems – Combined side scan/ sub-bottom profiler systems.

Hardide Coatings partners with Seatronics in first ROV application
Hardide Coatings, provider of advanced surface coating technology, has completed its first application for a remotely operated vehicle (ROV) for Seatronics with exceptional test results resulting in a greatly improved performance, which has led to production orders. Since using the coating on a critical part of the thruster system, the Predator ROV manufactured by Seatronics has increased in performance and power, with critical wear issues also vastly improved. David Currie, managing director at Seatronics, said: "The Observation-class ROV sector is a growing market for us and we want to make the Predator as maintenance-free as possible. The Hardide coating solved the wear issues we were facing and increased the performance of the ROV. Using the Hardide coating on the Predator was like tuning a car to get more miles per gallon and getting F1 performance." Seatronics, an Acteon company, is a global leader in the sale and rental of subsea marine electronic equipment. The company manufactures the Predator ROV mainly for the oil and gas market to support operations using a diver or larger ROV to provide backup and support. ROV operations are a growing market, with recent reports highlighting an 80% increase in ROV expenditure from 2013 to 2017 compared to the previous 5 year period (Douglas-Westwood World ROV Operations Market Forecast). Hardide plc CEO Philip Kirkham said: "This is the first time Hardide coatings have been used in the ROV industry. The results from the tests with Seatronics have shown the capability of the coating to make a significant contribution to the performance of this subsea equipment." Seatronics has advanced its services with the Predator, now offering a fast response with the Rapid Deployment Platform (RDP). The company is also exploring other markets such as hull inspection in the maritime sector, port security, fish farm inspections, with added interest in search and rescue applications further down the line.

Sonardyne and Liquid Robotics improve data recovery options

A collaboration between Sonardyne International Ltd., Shell and ocean data services provider Liquid Robotics has seen the development of a Liquid Robotics Wave Glider autonomous marine vehicle configured for unmanned data retrieval from seafloor sensors. For the last 3 years, an array of Sonardyne's autonomous sensors has been recording pressure data for monitoring seafloor subsidence in a Shell-operated deepwater field. Now, using a Wave Glider fitted with a Sonardyne high-speed acoustic modem, multiple data harvesting operations have demonstrated the capability to retrieve logged data on demand without the intervention of a conventional survey vessel.

Seabed settlement monitoring is a surveillance tool used to constrain dynamic reservoir models and is undertaken as a part of a comprehensive reservoir surveillance campaign. Changes to the seabed can often be subtle and slow to become apparent so surveillance technologies need to be both precise and repeatable in their measurements to stand any chance of detecting them.

The sensor logging nodes designed and manufactured by Sonardyne operate autonomously and are able to remain deployed for several years without intervention. Depending on the environmental parameters being investigated, a wide range of high-precision sensors can be fitted including pressure (depth), temperature, inclination, sound velocity and conductivity. At remotely configurable intervals, each node wakes up, logs and time-stamps sensor data to its onboard memory before returning to standby mode until the next measurement cycle.

The data stored within each sensor node are available for recovery on demand at the surface via the integrated high-speed acoustic modem and during the early stages of the monitoring project, data were conventionally retrieved using acoustic modem technology onboard a vessel of opportunity. However, the new innovative Wave Glider removes the need for such a vessel as it is capable of remaining at sea for many months in all weather conditions, autonomously transiting between each node's location to collect data. "Using a Wave Glider to harvest data acoustically from seabed instruments is a highly economical, and sustainable way to monitor our production," said Paul Hatchell, geophysicist in Shell's areal monitoring research team.

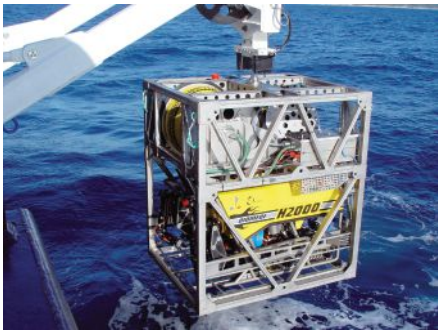
"This method not only significantly reduces the total cost of operations but it also removes the health and safety risks associated with sending a vessel and crew to sea," added Shaun Dunn, global business manager, exploration at Sonardyne.

"The collaboration to deploy an autonomous marine vehicle such as the Wave Glider means that we can offer clients such as Shell cost-effective and safe methods of collecting subsea sensor data in remote deepwater offshore fields," commented Sudhir Pai, vice president operations and technology at Liquid Robotics Oil and Gas.

For more information, visit www.sonardyne.com.

ECA Robotics delivers ROV to the French Navy

The Montpellier Department of ECA Robotics has delivered an H2000 work class ROV to the French Navy in early 2014. The H2000 is depth rated to 2,000 m (6,550 ft) and is equipped with two hydraulic manipulators, one with five functions and the other with seven functions).



The main missions will be:

• expert survey of wrecks (ships or planes), including recovery of black boxes

• recovery of torpedoes laying on the sea bottom

• assistance to rescue of manned submarines, including set up of ventilation system

The H2000 is noted as the only work class ROV of its category that is transportable by air.

For more information, visit www.ecahytec.com.

MODUS takes delivery of new-build Schilling 150hp HD ROV

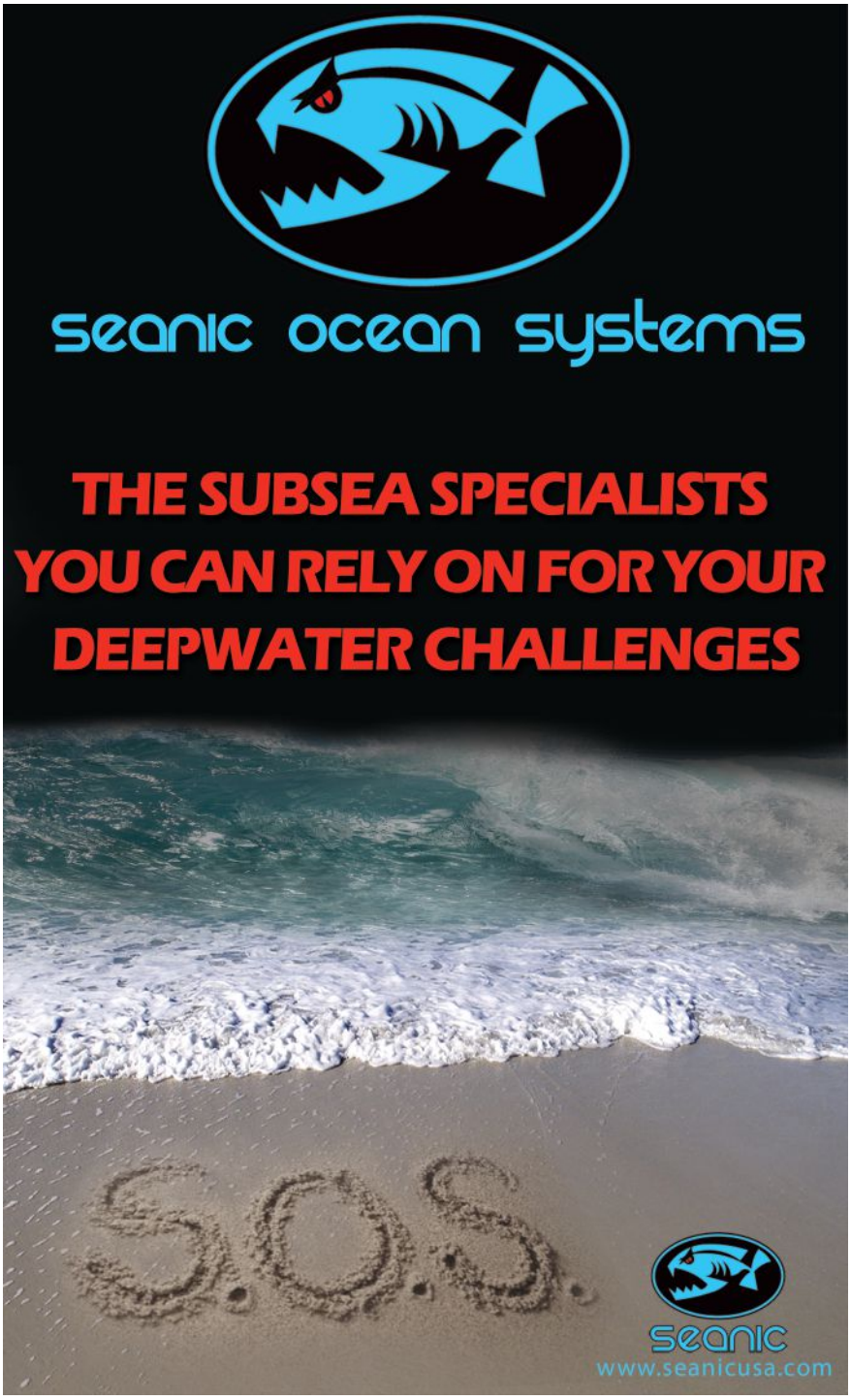
Modus Seabed Intervention Ltd is pleased to announce that the company has taken delivery of a new 150hp HD ROV complete with Launch and Recovery System (LARS) from Schilling Robotics in Davis, California.

The 3,000 m rated 150 hp work-class ROV is a high performance vehicle and will be deployed by Modus across the range of its subsea operations in IRM (Inspection, Repair and Maintenance), survey, drilling and general construction support.

Jake Tompkins, managing director, Modus Seabed Intervention, said, "We are delighted to be working with Schilling and to continue our fleet development and investment program into specialist subsea technology with this leading edge HD ROV."

Peter MacInnes, VP sales & marketing, FMC Technologies Schilling Robotics, stated, "The HD ROV has proven to be a rugged and highly capable system that is ideal for the varied operational markets supported by Modus. We are very pleased to have been awarded this contract and look forward to supporting Modus with their strategic focus and continued growth in the subsea industry."

For more information, visit www.fmctechnologies.com.

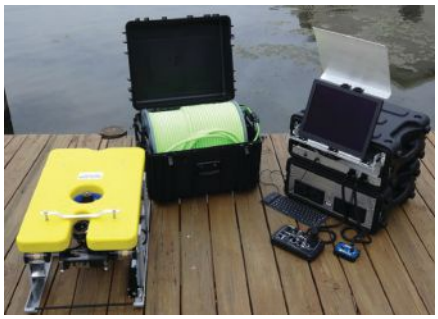


Outland introduces new ROV with twice the power

Outland Technology is proud to announce their newest ROV model, the Outland 2000. Boasting twice the power and heavier payload of the Outland 1000, this model is a standout addition to our product line. The Outland 2000 comes with a larger frame that allows for even more room to add various tools and sonars.

With the introduction of the Outland 2000, the company also revamped the console for both models and made them modular, meaning one for high voltage (power unit) and one for low voltage (control unit). The models also feature a brand new hand controller and tool controller. The new hand controller includes depth, heading (compass or gyro), cruise controls, and an option for altimeter depth control. There is also an option to show CP contact or proximity readings on the screen.

Outland is also now shipping both models with brighter LED lights, a standard second camera to be mounted rear-facing that can be moved about the ROV, and digitally-controlled cameras.



In the works are many more enhancements to both models such as digitally controlled thrusters, HD camera and a new wrist rotate grabber.

For more information, visit www.outlandtech.com.

DOF Subsea wins call-off for MBE and AUV survey services

DOF Subsea Norway AS has been awarded a call-off on an existing survey frame agreement with Statoil Petroleum AS for Multibeam Echosounder (MBE) inspection and AUV survey services in the North Sea.

The call-off has a firm period of approximately 50 days in addition to optional services and will be performed during summer season 2014. The scope of work includes vessel-based MBE pipeline inspection in shallow waters, deepwater AUV pipeline survey, as well as AUV coral mapping. Project execution will be handled by DOF Subsea's operating center in Bergen, Norway. The offshore support and ROV vessel, Libas, will be mobilized for execution of the call-off. Libas is chartered from Lgo and can potentially undertake other commitments for DOF Subsea.

Executive vice president of DOF Subsea, Jan-Kristian Haukeland, states: "We are pleased to see that DOF Subsea continues to be a preferred supplier of survey and inspection services in the North Sea. Our clients know that we can provide them know-how and the best technology available thus ensuring cost efficient and solution-oriented project execution. Our long-lasting client relationships prove that we are successful in creating value for our clients and this is what we in DOF Subsea work for every day." DOF Subsea has recently completed a successful AUV pipeline inspection outside the North Sea. The AUV will be transferred to the North Sea to perform the pipeline survey for this Statoil scope.

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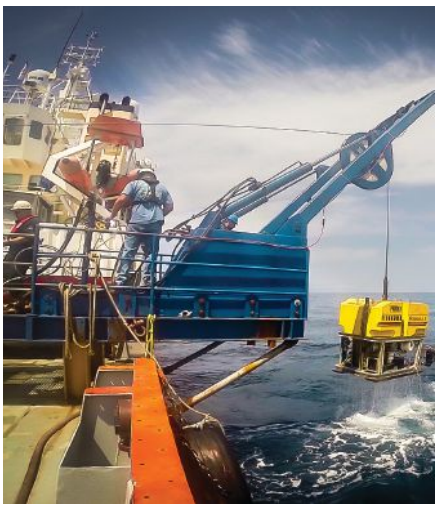
DOF Subsea has proven capabilities in specialist survey, subsea construction, and inspection, repair and maintenance services worldwide. The company also owns and operates one of the largest global fleets of high-specification vessels, ROVs and dive systems.

For more information, visit www.dofsubsea.com.

Phoenix conducts successful search and recovery of Spanish helicopter

Phoenix International Holdings, Inc. (Phoenix) recently completed an underwater search and recovery operation for the Spanish Ministry of Defence (MOD) to recover a Super Puma helicopter that crashed into the sea on 19 March 2014 off the Canary Islands in 2,365 m of seawater (msw). Phoenix deployed personnel and the company's Remora 2 Remotely Operated Vehicle (ROV) to Gran Canaria Island onboard the motor vessel EDT Ares which was hired by Phoenix to support the project. The MOD had a relatively accurate impact position for the helicopter, so search operations were conducted using Remora 2 and the vehicle's Simrad



1071 scanning sonar. Following a predetermined search grid, ROV operators maneuvered the vehicle along the search route while sonar technicians reviewed images of the seafloor. After Phoenix personnel identified a likely sonar target, Remora's onboard cameras were used to verify the target as the downed helicopter. Phoenix ROV operators then used the vehicle's manipulators to connect rigging to the wreckage. A hoist line from M/V EDT AresS lifted the wreckage to the surface and onto the back deck of the vessel. All recovered items were turned over to Spanish MOD personnel.

For more information, visit www.phnx-international.com.

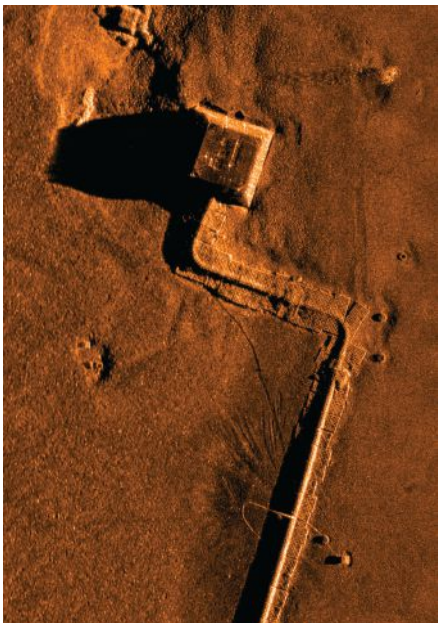
Exceptional imagery for Bluefin Robotics with Sonardyne Solstice

Following the successful integration of Sonardyne International Ltd.'s Solstice Side Scan Sonar with a Bluefin Robotics Bluefin-12 AUV, the results of recent payload testing have produced higher quality imagery than currently available from conventional sonar.

The most recent trials of the Bluefin-12 AUV with integrated Solstice were conducted from Bluefin Robotics' headquarters in Quincy, Massachusetts, where the AUV was deployed from Bluefin's vessel, the R/V Resolution, to perform short missions around the Boston Harbor area in approximately 15 m of water. Each mission consisted of legs of 500 m, during which the AUV flew in a pattern commonly known as "mowing the lawn."

"A pipeline end manifold (PLEM) surveyed during the trial provided an excellent target to show the resolution and contrast performance of Solstice. This PLEM consists of a large square template, pipe and mattress protectors; you can see where the individual elements of the mattress are clearly resolved in the imagery," commented Nick Swift, Sonardyne's business manager for maritime security. "This imagery is further proof of Solstice's exceptional image quality and is thanks to advanced processing techniques, inbuilt technologies and a unique array design for minimising multipath effects."

For more information, visit www.sonardyne.com.



ROV BOP intervention to API 53 standards:

We've got the power.

Schilling Robotics' new UHD-III ROV with integrated ISOL-8 Pump is the only ROV powerful enough to meet API 53 guidelines for BOP emergency override. All by itself. At 250-horsepower, it's the most powerful and versatile ROV ever made for subsea construction, IRM and drill support operations. It's the ROV you've been waiting for. And you don't have to wait any longer.

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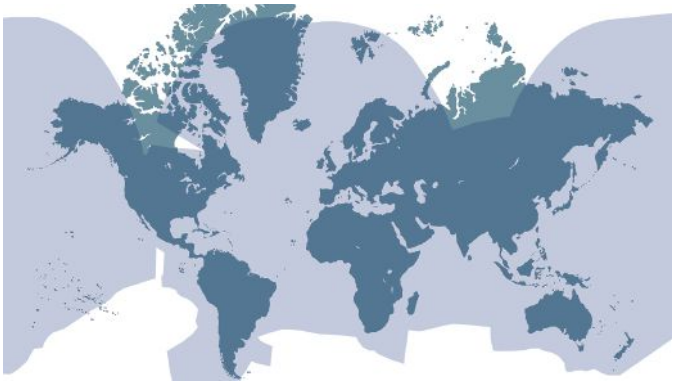
We put you first.
And keep you ahead.

Telemar SpA appointed VAR for Inmarsat Global Xpress
Inmarsat has signed an agreement with Telemar SpA, appointing the specialized managed satellite services provider as a Value Added Reseller (VAR) for Global Xpress, serving the government market in Europe. Telemar was established in Italy in 1947 and is one of world's leading international managed satellite service and navcom maintenance providers with 14 operating companies in 12 countries. Telemar serves the Maritime, Enterprise and Government markets. In this latter sector, the company addresses the requirements of civilian ministries, navies and other armed forces. Telemar provides end-to-end value propositions on a global scale, which encompass a broad range of services from system design for communication and IT solutions through to installation, maintenance and repair. The company has been a successful Inmarsat partner for over 30 years and, in 2012, was appointed as the first GX VAR for the maritime sector. Global Xpress is the world's first globally available Ka-band mobile broadband satellite network, providing very high bandwidth services to end-users on land, at sea and in the air, delivered through a resilient, secure waveform that is optimized for mobility. Integrated seamlessly with Inmarsat's current L-band network, Global Xpress will ensure reliable communications in support of mission critical operations in the most challenging environments. Inmarsat-5 F1, the first Global Xpress satellite, which was launched in December 2013, is on course to enter commercial service by mid-year 2014. The full constellation of three satellites is scheduled to achieve full global coverage by the end of the year.

Royal Navy's mine counter measure ships get new communications system
Airbus Defence and Space has successfully delivered full operational capabilities for X-band satellite communications–comprising Deployable Maritime Milsat (DMM) satellite services that use the Skynet 5 constellation–to four Royal Navy Mine Counter Measure Vessels (MCMVs) operating in the Arabian Gulf, ahead of equipping additional vessels. Commanding officers onboard these MCMVs now benefit from full military communications capability at all classification levels, enabling improved operations in bandwidth-hungry ISTAR operations. These services form part of Airbus Defence and Space's AuroraGlobal portfolio providing integrated satcom solutions, ensuring that vessels are fully connected to the wider maritime coalition network using the latest global IP baseband (GiN) infrastructure. This program is an example of how Airbus Defence and Space is working with the UK MOD (Ministry of Defence) to achieve optimal value for existing assets, by consistently updating associated technologies and infrastructure to meet the growing and evolving demands of users. Airbus Defence and Space is set to equip an additional two vessels in the UK with full capability and is in discussions with the UK MOD to extend it across the full MCMV fleet.

Fleet One brings broadband to small vessels
The launch of Fleet One from Inmarsat Maritime enables yacht and fishing boat owners to take advantage of broadband services previously only enjoyed by much larger vessels. Accessing weather information and chart updates, staying in contact with loved ones or keeping up with the news is now as simple to do at sea as on land. On sailing holidays or extended fishing trips, the new Fleet One service ensures small vessel owners have uninterrupted and cost-effective access to the internet, and can send SMS messages and talk on the phone anywhere in the world. Fleet One is delivered over the world's most advanced global broadband satellite network–relied on by the maritime industry across the seven seas. Fleet One is delivered through a compact 2.5 kg antenna, specially created for leisure and fishing vessels, which can be quickly and easily installed. It offers data connectivity at up to 100 kbps, a single voice line and SMS. Fleet One also supports Inmarsat's unique '505' safety service, which in an emergency routes callers directly to a Maritime Rescue Co-ordination Centre (MRCC).

Airbus Defence and Space expands VSAT coverage in the Indian Ocean



Airbus Defence and Space has expanded its Ku-band VSAT coverage in the Indian Ocean Region (IOR), using the Intelsat IS-702 S2 satellite.

The new coverage enables improved availability of Pharostar, Sealink and WaveCall VSAT voice and data services for vessels transiting or operating primarily in the Seychelles area, north to Ethiopia and south to Madagascar.

Several diverse maritime groups will make use of more available high-speed VSAT, including commercial fishing, government, naval, shipping and yachting vessels. An improved Ku-band footprint will also enhance security and anti-piracy efforts in the region.

"By bringing up this network, we enhance our market leading global VSAT coverage to support service providers serving customers in the IOR. The new coverage enables delivery of reliable connectivity up to 3.8 Mbps," said Ghani Behloul, head of product marketing, maritime, Airbus Defence and Space. "The IOR coverage extension is part of our commitment to maintaining the most extensive maritime VSAT coverage for global users."

For more information, visit www.airbusdefenceandspace.com.

Redline wins contract for offshore communications network

Redline Communications Group Inc. has received a $1.6 million contract to deliver a marine communications network based on the recently announced RAS Extend Marine product.

The customer, a government organization whose ships are used to patrol the waters of its country's coastline to ensure the safety of its citizens, will be using the Redline network to enhance its high-speed communications capabilities within 80 km of its shoreline where the fleet spends the majority of its time. With their Redline network, ships within 80 km of shore can be connected cost-effectively, giving them real-time coverage of maritime borders and a holistic view of all ships for wide area fleet tracking, sensor integration, support for prevention operations, and even Internet access for crews.

Designed initially for communications between offshore oil drilling platforms and the many ships that service those platforms, the RAS-Extend Marine is a wireless broadband networking system designed to connect moving assets in remote locations over sea, automatically locating and connecting to a network base station, which can be located on a ship, platform or shore. Because it can maintain reliable high-speed connectivity, RAS-Extend Marine can be used for a wide range of applications at the same time – including high-speed data,

high-resolution video, Wi-Fi, telephony, satellite communications extension, and backhaul services.

This customer had been actively involved in the initial field trials of this new product and was impressed with the performance of the product, which consistently delivered higher throughput over longer distances than originally expected. A documented account of their field trial experience can be found on the Redline blog, and other trials of this product by oil and gas operators are ongoing.

The deployment of the network is expected to start immediately with full deployment expected by the end of 2014.

For more information, visit www.rdlcom.com.

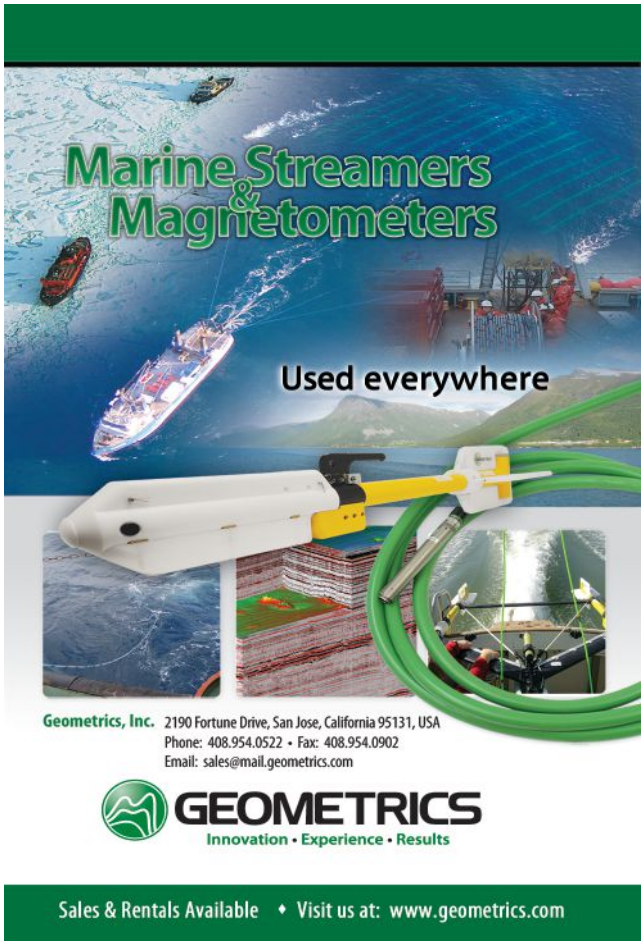
KVH IP-MobileCast content delivery service goes live

The IP-MobileCast content delivery service developed by KVH Industries, Inc., for its mini-VSAT Broadband satellite network is now live, constituting a maritime industry first that will enable seafarers in the middle of the ocean to have affordable access to daily digital newspapers, television news, sports updates, music, new-release blockbuster movies, and TV programs via a multicasting service. KVH, a leading provider of satellite Internet services to the maritime industry, recently completed successful beta testing of IP-MobileCast and is making the service available immediately to existing mini-VSAT Broadband customers who are interested in subscribing to IP-MobileCast.

The IP-MobileCast service utilizes multicasting technology to deliver large amounts of content to many ships at once, overcoming the prohibitively high satellite communications costs typically charged to deliver files for individual use. The new service (patent pending) is notable for numerous technological advancements: content is delivered over the top of the network so there is no charge for the delivery, only for the content itself; the multicasting transmission does not affect the vessel's mini-VSAT Broadband onboard data speed; the service ensures digital rights management (DRM) of copyrighted material, such as Hollywood movies and television programs; and the content is delivered using forward error correction to minimize burden on the mini-VSAT Broadband network.

Thousands of hours of beta testing were completed to ensure the IP-MobileCast service can deliver large multimedia files and regularly updated content to a vessel's onboard server, which can then make the content available to nearly all types of platforms on the ship, whether it is a flat screen TV, a computer, or a Wi-Fi enabled personal device, such as a smartphone, tablet, or laptop.

For more information, visit www.kvh.com.



Globalstar, VehSmart to outfit Ecuadorian fishing fleet

Globalstar, Inc. announced that their Value Added Reseller, VehSmart, of Victorville, California, has been awarded the first regional pilot project of its kind for Ecuador, which will outfit the Ecuadorian artisanal fishing fleet with life-saving satellite tracking and emergency notification devices.

VehSmart already provides GPS-enabled telematics devices with cellular connectivity to cars, trucks, and motorcycles around the world. Their sophisticated and advanced solutions are a perfect fit for the fishing fleet. Globalstar prides itself on offering the most modern communications network available, providing innovative products that deliver superior, reliable–and often–lifesaving performance results. With Globalstar's SmartOne hardware, and VehSmart's world class reporting and expertise in deployment, both companies are looking forward to additional orders for artisanal fishing fleets around the world.

The project will initially outfit 4,000 small fishing boats with Globalstar's leading satellite transmitter, the SmartOne. SmartOne devices will provide Ecuadorian fishermen and women with a means for help at sea when facing a life-threatening emergency including piracy. By linking to Ecuador's National Emergency Response System, the SmartOne devices will be outfitted with a proprietary panic button that any sailor can activate discreetly to summon a rescue.

The combined risks of an unpredictable marine environment and piracy attacks make fishing one of the world's riskiest occupations, with a high annual cost both in lives and lost or stolen property. During 2012, 184 acts of piracy occurred against Ecuadorian fishermen, according to the Ecuadorian government. During 2013 alone, the Ecuadorian government replaced 370 stolen boat motors. Pirates steal the boat motors and leave the fishermen stranded out at sea. These stranded fishermen often die, leaving families bereaved and without economic resources. Between January and April of 2013, seven Ecuadorian fishermen disappeared at sea. The Globalstar SmartOne provides a means for fishermen to not only send an SOS, but also allows authorities to pinpoint the location of the distressed vessel and send lifesaving rescue personnel.

The satellite devices will also provide the Ecuadorian Vice Ministry of Aquaculture and Fisheries with a wealth of information about the seasonal movements of the fishing fleet. Authorities will be able to police overfishing and better protect exclusionary zones, such as the waters surrounding the Galapagos Islands, one of the richest and most bio diverse ecosystems on earth.

Fishermen and women will also have access to a robust software platform, protected by login script and viewable on handheld devices and computers. Boat owners will be able to access information about their vessels, track the whereabouts of loved ones at sea and use historical data to identify prime fishing areas.

For more information, visit www.globalstar.com.

KVH doubles mini-VSAT broadband capacity in Africa to support offshore O&G industry

KVH Industries, Inc. has doubled the capacity of its mini-VSAT Broadband network in the oil- and gas-rich areas off the West African coast, where maritime traffic and customer demands are surging. This additional Ku-band capacity, which became available in April, addresses demand in an area where offshore supply vessels (OSVs) are the critical link between drilling rigs, cargo ships, and operations on shore.

This area includes the international offshore waters of western Africa, where oil industry activity is increasing, and reliable satellite communications is vital to improving the quality of life and safety for crews and ships. The capacity increase in Africa follows a model KVH built successfully in the Gulf of Mexico, where the mini-VSAT Broadband network provides extensive satellite coverage for offshore supply vessels.

According to reports from the U.S. Energy Information Administration, Africa's proven oil reserves have grown 120% in the past three decades, from 57 bbl to 124 bbl, with at least another 100 bbl waiting to be discovered. Proven reserves of natural gas have grown 140% in that time.

KVH's mini-VSAT Broadband network is the dominant player in the global maritime VSAT market, with twice the market share of its closest competitor, according to a 2014 industry report by Euroconsult. KVH and its technology partner, ViaSat, Inc. use ArcLight spread spectrum technology to deliver fast broadband service, with Internet download speeds up to 4 Mbps.

The mini-VSAT Broadband network covers 100% of the maritime market through a combination of 19 Ku-band transponders and three C-band beams. KVH has built this global infrastructure by leasing available commercial satellite capacity, rather than investing in its own satellites, leading to lower costs and better prices for customers. Designed exclusively for the mini-VSAT Broadband network, KVH's unique TracPhone V-IP satellite communications antenna systems are built 85% smaller than typical VSAT antennas to install more easily in all vessels. With antenna sizes ranging from 37 cm (14.5 in) to 1.1 m (42.5 in), there's a TracPhone V-IP system for vessels of every size.

The ongoing expansion of the mini-VSAT Broadband network in Africa follows network upgrades in other parts of the

globe and supports KVH's recently announced IP-MobileCast content delivery service, which will be available to subscribers this month. Using the same broadband network already streaming into more than 4,000 onboard terminals worldwide, IP-MobileCast will deliver a separate data steam of licensed news, sports, entertainment, and training content – improving quality of life for crews aboard commercial vessels – as well as operational data such as electronic chart updates and weather information.

For more information, visit www.kvh.com.

Speedcast announces buyout of SatComms Australia

SpeedCast Ltd announced the buyout of SatComms Australia. The closing of the transaction is subject to regulatory approval. The acquisition will further consolidate SpeedCast's leadership position in the Asia-Pacific region and provide SpeedCast with an expanded presence in Australia.

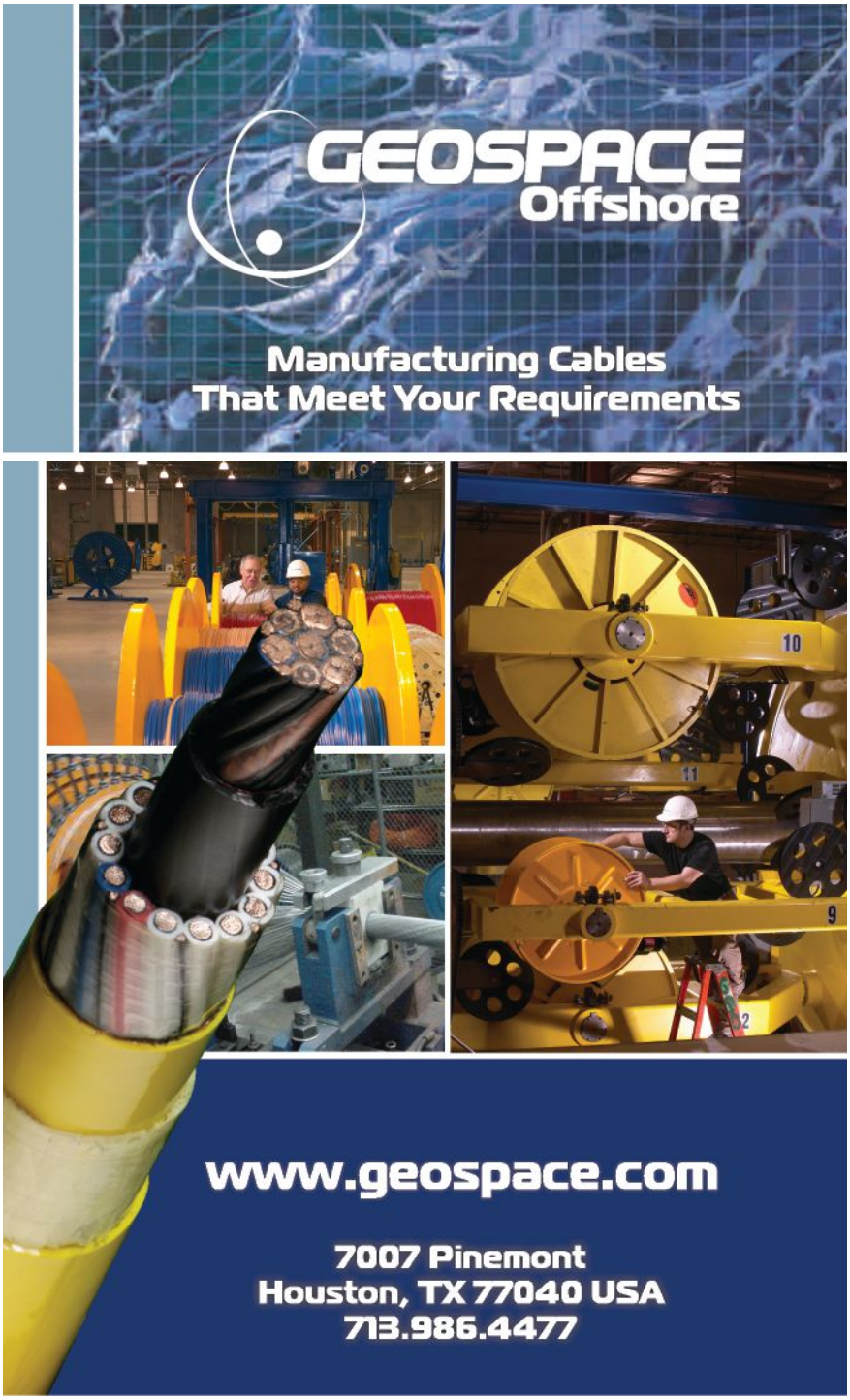
SatComms Australia is a specialized provider of mobile and fixed satellite solutions in the Australian market and the Asia-Pacific region. The company services customers in the natural resources, maritime and government sectors. SatComms is based in Queensland, Australia with a teleport and operations center in Henderson, Western Australia.

With this acquisition, SpeedCast will further extend its stronghold in the Australian market with new points of presence and infrastructure in Western Australia and Queensland and a strengthened portfolio of mobile satellite services. SpeedCast will be even better positioned to serve its growing number of natural resources customers and support their mission-critical communications in Australia and globally.

SatComms' strength in mobile satellite solutions will augment SpeedCast's current L-band offering, a key technology for offshore and exploration customers. Satcomms' significant presence in Queensland, Australia will enhance SpeedCast's ability to support customers in this important region, a hub for gas exploration and production. The SatComms teleport in Western Australia will provide flexibility and network customization capabilities to SpeedCast's natural resources customers. With two fully owned teleports in Australia, one in Adelaide and one in Perth, SpeedCast will be able to offer the highest levels of redundancy including site and satellite diversity. The acquisition follows the opening of SpeedCast's new office in Perth in February, highlighting the company's commitment to the Western Australian market.

Joining SpeedCast, SatComms will now be able to offer its customers a wider portfolio of products and services and better serve its customers' needs worldwide. SpeedCast will partner with SatComms' outstanding management team and employees to continue to provide best-in-class services to SatComms customers, while augmenting SpeedCast's own team and expertise. SatComms will complement SpeedCast's current Australian infrastructure, adding additional points of presence in this strategic market.

For more information, visit www.speedcast.com.

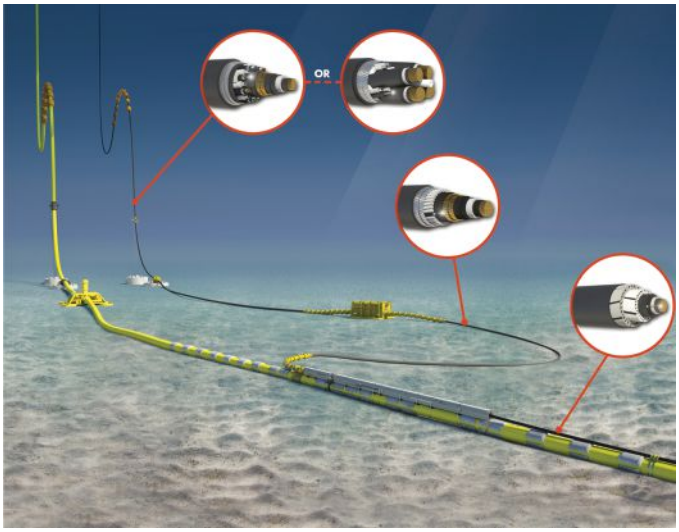


Oceanwind awarded cable storage contract
OceanWind, a joint venture between Oceanteam Shipping ASA in Norway and WIND BV, has been awarded a long-term contract to supply Prysmian Powerlink SRL with storage of submarine power cables and additional preparation services. At its cable facilities in Velsen Noord, the Netherlands, OceanWind will execute the cable handling and provide cable handling equipment. The cables will be stored at one of OceanWind's internal warehouses. OceanWind facilitates the submarine cable industry by offering its clients a full and integrated range of services comprising cable storage, cable handling, and cable transport. Its cable facility is situated immediately behind the North Sea locks of IJmuiden, in direct proximity of Amsterdam. The equipment utilized for the project is supplied by Oceanteam's 100% owned subsidiary, RentOcean.

Reef to re-organize into three independent businesses
Reef Subsea has announced a re-organization to create three independent companies: Reef Subsea, X-Subsea and Technocean Subsea, all with separate management and independent strategies. Reef Subsea was created in 2010 in a joint venture between the oil and gas private equity investor HitecVision and Rieber Shipping. Following 3 years of growth in operations in the three current business lines, a strategic review by the board of directors and the owner of HitecVision has led to the re-organization of the group. The business will now be organized in three separate entities to be known as Reef Subsea, X-Subsea and Technocean Subsea. The existing senior management will continue to lead the three new entities, delivering consistent expertise in the niche markets. Reef Subsea, to be headquartered in Thornaby, north-east England, will continue to specialize in the laying and burial services of subsea cables to all energy industries under the leadership of CEO Duncan MacPherson. X-Subsea, which will replace Reef Subsea Dredging and Excavation brand, is headquartered in Houston, Texas. With operations in UK, Norway, Singapore and the Middle East, X-Subsea will continue to focus on precision dredging and excavation led by Managing Director Jason Miller. Technocean Subsea, headquartered in Bergen, managed by Managing Director Arne Riple, will replace the Reef Subsea Integrated Projects brand to focus on subsea IMR and construction and build on its success and growth in North Sea and West Africa. Reef Subsea is majority owned by HitecVision following the buy-out of Rieber Shipping's shares in early 2014.

Columbus partners with Ocean Networks
Columbus International Inc. and Ocean Networks Inc. announced that the companies have signed a Letter of Intent (LOI) for a Landing Party Agreement for a Panama submarine cable station and related network services. Ocean Networks is the owner and developer of the South America Pacific Link (SAPL) submarine cable system. The company's planned 9,700 km trans-Pacific cable interconnects Balboa, Panama, to Oahu, Hawaii. Under terms of the partnership, Columbus Networks, working through the recently formed alliance company with Cable & Wireless, CNL-CWC Networks, Inc. will design and construct a carrier class cable station to house the SAPL system and provide network operations and management (NOC and NMA) services. In addition, Columbus and Ocean Networks have agreed to include additional commercial agreements for onward connectivity from this link to the NAP of Americas and the Caribbean region, using a variety of the diverse subsea network routes. The South America Pacific Link system will fulfill a requirement for the markets of Central and South America for connectivity to the Asia-Pacific region, Australia and New Zealand, via interconnections with existing and planned submarine cable systems. Hawaii is a mid-Pacific hub for numerous submarine cable systems. The SAPL system, which is planned for completion in mid-2016, will also provide a cost-effective, direct low latency route to Hawaii and open a previously untapped transpacific market.

Nexans' DEH system to be utilized in Shah Deniz project



Nexans' Direct Electrical Heating (DEH) cable systems will be installed to help maintain the reliable flow of products from the Shah Deniz field, located in the Azerbaijan sector of the Caspian Sea. The world's largest DEH project to date will see Nexans deliver a total of 130 km of the cable system to provide flow assurance for 10 subsea flow lines. The contract is worth approximately 100 million Euro.

The DEH systems, including riser cables, piggy back cables and accessories, will be designed, engineered and manufactured at Nexans' specialized subsea cable and umbilicals facility in Halden, Norway. They include a modern integrated protection system (IPS) to protect the sophisticated piggy back cables against damage after installation on the seafloor.

DEH is a technology for flow assurance, developed to safeguard the wellstream flow through the pipeline to the platform. Alternating current (AC) transmitted from the DEH cable runs through the steel in the pipe, which heats up due to its own electrical resistance. This allows the pipeline to be operated in a cost-efficient and environmentally safe manner.

By controlling the current, the pipeline inner wall can at all times be maintained above the critical temperature for wax and hydrate formation. As a result, problem-free and reliable transportation is achieved. Traditional methods for flow assurance, by the use of chemical treatments and pressure evacuations, have considerable operational costs with long down times and may present a risk to the environment.

For more information, visit www.nexans.com.

EMEC to study integrity of submarine cabling

The European Marine Energy Centre (EMEC) Ltd is to share learning on the performance of subsea cabling in high energy environments to support the development of commercial wave and tidal energy sites.

Funded by The Crown Estate, the project will see EMEC and Engineering Technology Applications Ltd (ETA) carry out a review of existing data to assess the reliability of subsea cables installed in the harsh wave and tidal conditions at EMEC's test sites at Billia Croo, on the west coast of Orkney, and the Fall of Warness, off the northern island of Eday.

To date there has been little information published about

how subsea cables survive and perform in high-energy marine environments, and as commercial wave and tidal sites around the UK enter the initial planning phases, information on how subsea cables may perform in areas such as the Pentland Firth and Orkney waters lease areas will be vital to project developers and investors to progress successfully.

With its first cables installed over 10 years ago, EMEC has collected considerable amounts of data. Numerous routine remotely operated vehicle surveys have been undertaken to examine structural integrity alongside comprehensive electrical cable testing.

The aim of the project is to collate and review this information and provide a report on the resulting performance of the cables.

The report will cover cable armoring, marine growth, anthropogenic interactions, and cable movements, as well as the electrical and communications performance of the cable, and will take various factors into consideration, including seabed type, current speed, wave loadings, cable usage, cable type, and installation methods.

The report will be published later in the year and made available via the Wave and Tidal Knowledge Network.

For more information, visit www.emec.org.uk.

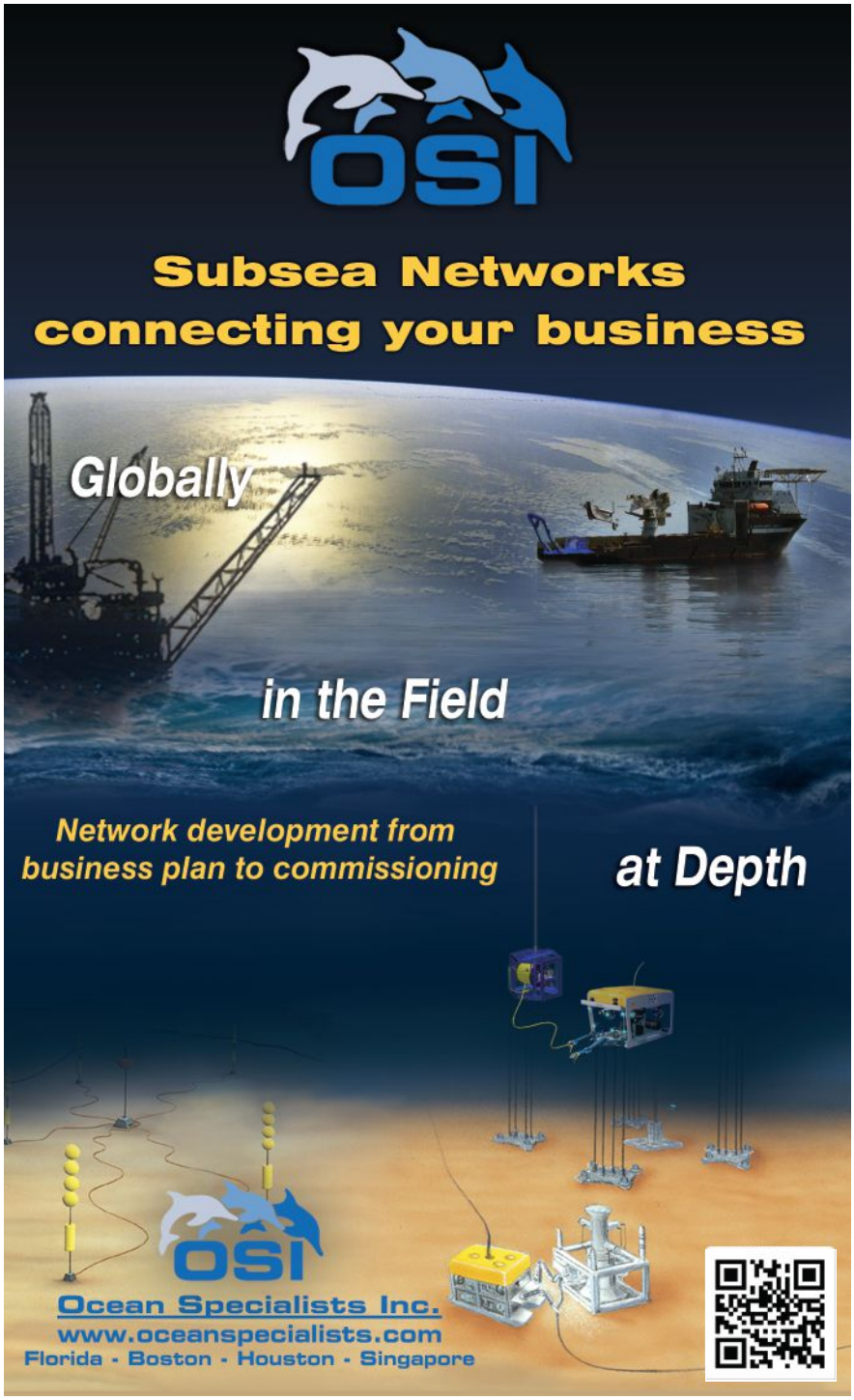
Viper Subsea signs JIP with BP and Total

Viper Subsea has signed a Joint Industry Project (JIP) agreement with energy giants BP and Total to further develop its Subsea Line Insulation Monitoring (V-SLIM) technology for identifying and locating cable and connector faults in remote subsea electrical distribution systems. Viper Subsea will carry out all the research and development for the V-SLIM system, while the JIP partners will contribute funding and field test the pioneering technology. The establishment of the JIP has been facilitated by the Industry Technology Facilitator (ITF).

When electrical faults occur in subsea production systems it is often difficult to determine the precise cause or location of the fault. However, water ingress into the aging electrical conductors and connectors over time is a common cause of subsea faults. The generally accepted perception of such failures within the industry is expressed in terms of "when," and not "if" they occur.

Viper Subsea is developing its V-SLIM technology with the backing of the JIP to provide a solution that will enable accurate electrical fault location. V-SLIM units can be strategically positioned within the subsea distribution system, and, together with a surface Line Insulation Monitoring unit (V-LIM) that incorporates a topside modem, they build a network (V-NET) of electrical condition monitoring units that intercommunicate and transmit information back to the surface. Each V-SLIM can identify whether any electrical leakage is "upstream" or "downstream" of itself, and in dialogue with one another, fault locations can be accurately located.

The JIP also utilizes the field-proven V-LIFE technology by incorporating it into the surface-located V-LIM to create an all-encompassing electrical integrity monitoring and rejuvenation solution.



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The technology developed by the JIP could be incorporated into green field developments, or retrofitted into brown fields. Once installed, continuous integrity monitoring provides the operator with the ability to both identify and predict early fault occurrence.

The benefits brought to the field operators from V-SLIM are significant. Gaining knowledge of which components are failing and the rate of degradation of all components allows interventions to be planned and optimized. Costs of the interventions are subsequently minimized, some contingency spares are not required, and some production down-time can be avoided.

Viper Subsea expects the new V-SLIM to be field-trialed in less than 18 months.

For more information, visit www.vipersubsea.com.

Hibernia Networks upgrades transatlantic link with Ciena

Hibernia Networks recently selected Ciena® to provide advanced optical solutions on the Hibernia Networks platform. The first element of Hibernia's network to utilize Ciena's technology will be Hibernia's Trans-Atlantic system. As part of the new relationship with Ciena, Hibernia has also joined Ciena's BizConnect partner program, offering a comprehensive go-to-market strategy that includes joint marketing, training and technical support to penetrate new customers and industries in North America and Europe.

Hibernia Networks is a diverse high-bandwidth connectivity provider with a rich suite of services including IP transit, CDN, carrier Ethernet, Spectrum and others. Its network provides service to global investment banks, content delivery networks (CDN), broadcasters, cloud services, enterprises, international PTTs and ISPs. Hibernia also provides low-latency routes to 31 different financial exchanges around the globe through its Global Financial Network (GFN).

Hibernia Networks owns and operates a global network connecting North America, Europe and Asia. Hibernia offers over 200 network Points of Presence (PoPs) in 89 markets and 25 countries.

Hibernia will deploy Ciena's GeoMesh submarine solution, including the 6500 Packet-Optical Platform, WaveLogic coherent optics and full

ROADM. Together, these components lay the foundation for an OPn® network architecture that will enable Hibernia to scale and react quickly to address changing trans-Atlantic traffic patterns.

Hibernia will also leverage Ciena's OneConnect Intelligent Control Plane platform, which provides seamless end-to-end service provisioning and creation. This added level of control will allow Hibernia to rapidly offer services, all with simple and efficient back-end workflows.

As a new member of Ciena's BizConnect partner program, Hibernia is working with Ciena to jointly develop new sales opportunities, particularly with government, education and other public-sector customers.

For more information, visit www.hibernianetworks.com.

Alcatel-Lucent completes 100G upgrade of Apollo

Alcatel-Lucent has completed an upgrade of the Apollo undersea cable system that links the UK and France to the U.S. This multiple 100 Gbps upgrade enhances the system's capacity in support of the continued global explosion of data traffic and increased demand for capacity-hungry applications such as cloud computing and on-demand video services.

The Apollo system consists of two of the most advanced fiber optic cables: Apollo North connects the UK to the U.S., and Apollo South connects France directly to the U.S., collectively spanning a total of 13,000 km.

The upgrade is built on Alcatel-Lucent's latest 100 G undersea technology, enabling each transatlantic system to ultimately carry capacity in excess of 25 Tbps, offering Apollo a seamless path to expand their networks in an efficient and cost-effective way. Client interfaces at 100 Gbps are implemented to simplify the backhaul network from an operational and maintenance perspective.

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

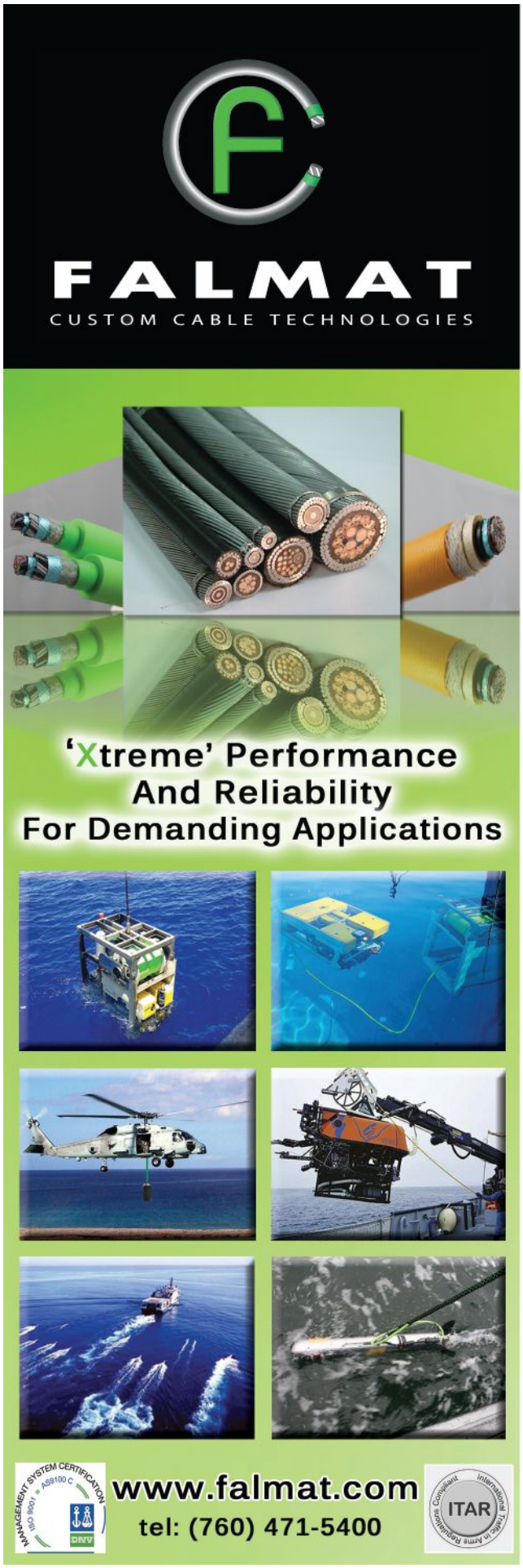
ASE to be extended to Cambodia

NTT Communications Corporation (NTT Com) announced that the Asia Submarine-cable Express (ASE) will be extended to Cambodia to provide reliable, high-capacity communication infrastructure for the increasing number of multinational companies operating in the Mekong region.

The extension is based on an agreement that NTT Com has reached with Chuan Wei (Cambodia) Co. Ltd. Under the agreement, NTT Com will lay Cambodia's first submarine optical fiber cable.

The ASE will provide highly reliable, high-capacity communications connecting Cambodia and other countries in the Greater Mekong Subregion with major locations elsewhere in Asia, including Singapore, Hong Kong and Japan. The arrival of the ASE also will enable NTT Com to provide local customers with even higher quality Internet network services.

NTT Com continues to upgrade and expand its global submarine-cable infrastructure, including through introduction of



a 100 Gbps optical transmission system incorporating digital coherent technology. In addition, the company is expanding its number of ASE connection points and Nexcenter global data centers in Southeast Asia to provide high-quality network, data center and cloud services in end-to-end one-stop solutions.

The ASE submarine cable is routed away from the Bashi Channel and the south coast of Taiwan, areas that frequently experience earthquakes and typhoons. The ASE also takes the shortest route of any submarine cable connecting Japan to Hong Kong and Singapore.

Global companies are increasingly investing in Cambodia to take advantage of government incentives for foreign investment. Located in the middle of the Southern Economic Corridor stretching from Bangkok and Ho Chi Minh City, Cambodia is experiencing rapid economic growth. In turn, the need for reliable, high-capacity networks is rising to meet the increasing communication demands of locally based multinational companies.

For more information, visit www.ntt.com.

Bharti expands i2i with Ciena

Ciena® Corporation announced that i2i, a venture of Bharti Airtel Limited, has completed a submarine fiber optic network upgrade spanning from India to Singapore using Ciena's converged packet optical and network management solutions. The upgrade leverages a flexible 100G ROADM-based infrastructure that has enabled Bharti to increase capacity over the i2i cable and respond to a surging demand for high-bandwidth data services driven by both enterprise applications and an increasing use of mobile bandwidth across the region. Ciena's network management solutions bring expanded intelligence to the i2i cable, delivering rapid service turn-up and proactive fault recovery, features that are critical to managing a high-performance submarine link.

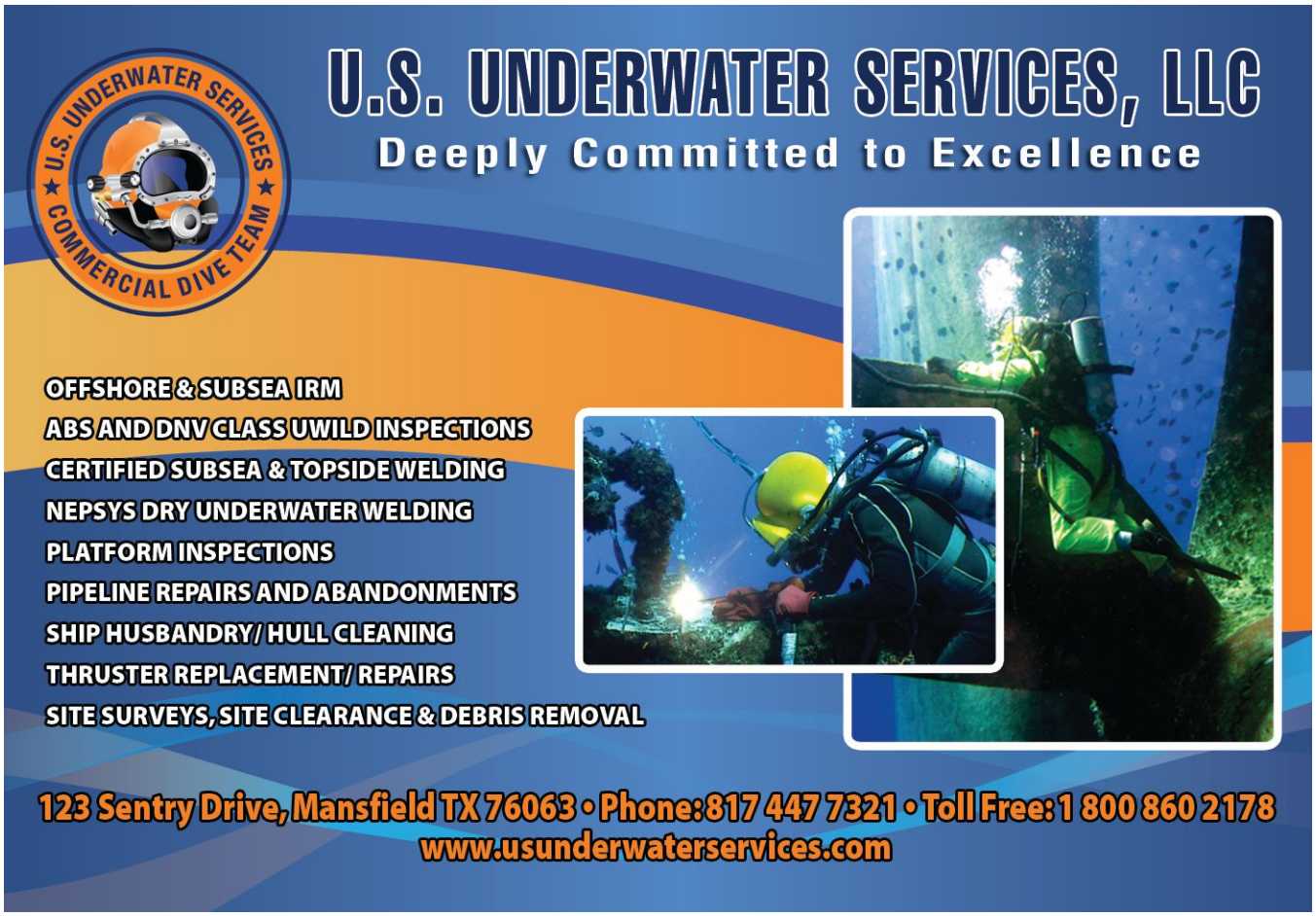
i2i is a submarine cable owned by Bharti Airtel Limited of India. The high-capacity cable spans 3,200 km and connects Singapore and Chennai, India.

Powered by Ciena's 6500 Packet-Optical Platform, equipped with WaveLogic 3 processors, this submarine upgrade leveraged a combination of coherent optical technology and wavelength selective switching to enable rapid remote configuration of traffic across the i2i cable. A commitment to intelligent and scalable network designs, both key elements of Ciena's OPn architecture, allowed i2i to implement this upgrade quickly, ensuring that new capacity was ready and available according to Bharti's customers' demand.

With Ciena's OneControl Unified Management System, i2i also benefits from simple point-and-click service provisioning to enable faster service turn-up and end-to-end visibility of network performance. OneControl also allows i2i to meet the demanding service level agreements of wholesale clients and perform rapid remote troubleshooting in the event of a network outage.

This deployment builds on a long-standing relationship between Bharti and Ciena. Ciena's suite of converged packet optical solutions plays an important role in the company's network, providing high-capacity long-haul and regional services.

For more information, visit www.airtel.in

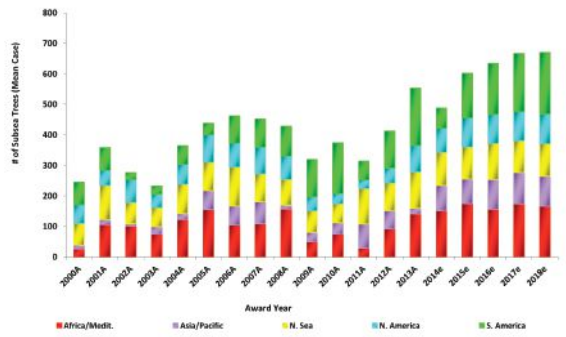


Offshore At-A-Glance

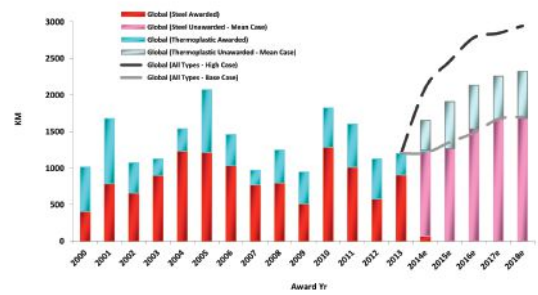
Quest Offshore Activity Report

Quest Global Subsea Tree Forecast Awards Mean Case

2000A – 2018e

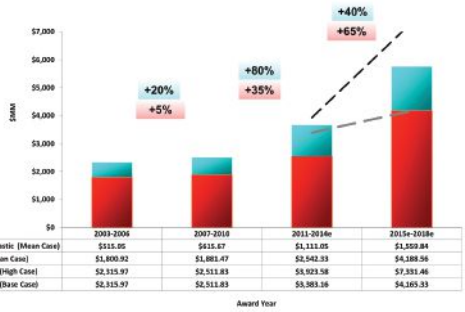


SPU KM Activity Trends Mean Case



Global SPU Activity Trends Four Year Comparison

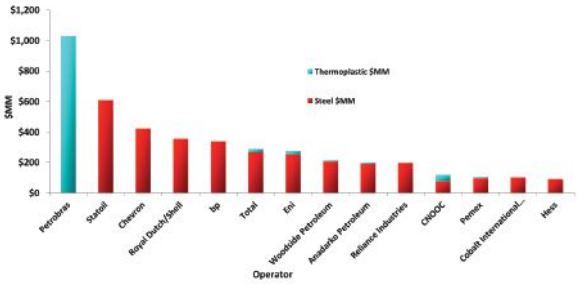
$MM Awards



	2003-2006	2007-2010	2011-2014e	2015e-2018e
Global - Thermoplastic (Mean Case)	$515.05	$615.67	$1,111.05	$1,559.84
Global - Steel (Mean Case)	$1,800.92	$1,881.47	$2,542.33	$4,188.56
•Global - All Types (High Case)	$2,315.97	$2,511.83	$3,923.58	$7,331.46
Global - All Types (Base Case)	$2,315.97	$2,511.83	$3,383.16	$4,165.33

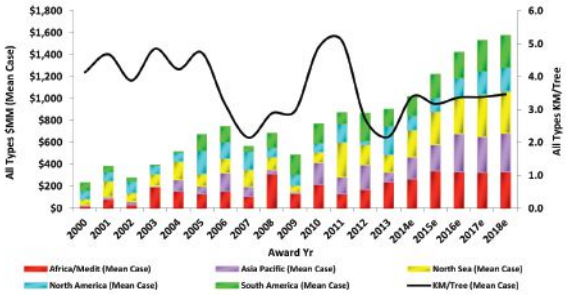
SPU Total Forecast Awards US $6,764 MM

2014e-2018e Top 14 Operators US $4,339 MM Mean Case



SPU Demand All Types* (US$) – Worldwide Mean Case

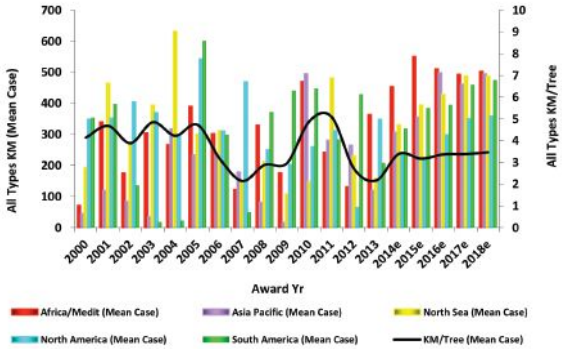
US$15.75BN, Forecast US$6.77BN



* Includes Steel and Thermoplastic SPU's

SPU Demand All Types Worldwide

Mean Case



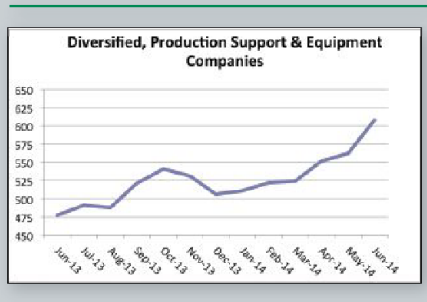
FOR MORE DETAILED INFORMATION
(281) 491-5900 - USA • 44 (0) 1737 371704 - London • e mail: corp@questoffshore.com
www.QuestOffshore.com • www.SubseaZone.com • www.FloatingProductionZone.com

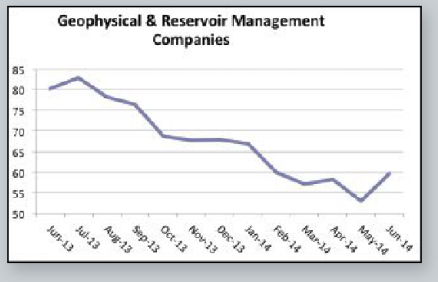
Monthly Stock Figures & Composite Index

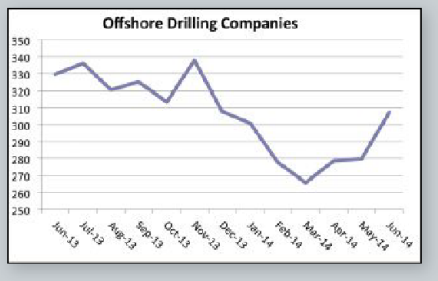
Industry Company Name	Symbol	Close(*Mid*) *June*	Close(*Mid*) *May*	Change	Change %	High 52 week	Low
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	74.40	68.92	5.48	8.0%	74.52	43.34
Cameron Intl. Corp.	CAM	67.22	64.64	2.58	4.0%	67.48	52.50
Drill-Quip, Inc.	DRQ	106.53	102.76	3.77	3.7%	121.07	86.48
Halliburton Company	HAL	69.91	62.37	7.54	12.1%	70.34	40.12
Tenaris SA	TS	46.50	42.85	3.65	8.5%	49.87	38.47
Newpark Resources, Inc.	NR	12.17	11.22	0.95	8.5%	13.64	10.30
Schlumberger Ltd.	SLB	109.28	99.50	9.78	9.8%	109.75	70.25
Superior Energy Services, Inc.	SPN	36.78	31.66	5.12	16.2%	36.96	22.85
Weatherford International, Inc.	WFT	23.06	20.49	2.57	12.5%	23.06	12.97
Deep Down, Inc.	DPDW	1.75	1.99	(0.24)	-12.1%	2.70	1.44
FMC Technologies	FTI	60.83	55.53	5.30	9.5%	60.85	47.58
Total Diversified, Production, Support and Equipment.....		**608.43**	**561.93**	**46.50**	**8.3%**	**630.24**	**426.30**
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	30.56	26.05	4.51	17.3%	40.86	25.47
Mitcham Industries, Inc.	MIND	14.36	13.54	0.82	6.1%	18.41	12.89
Compagnie Gnrale de Gophysique-Veritas	CGV	14.77	13.42	1.35	4.50%	25.85	12.68
Total Geophysical / Reservoir Management..…….....		**59.69**	**53.01**	**6.68**	**12.6%**	**85.12**	**51.04**
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	53.42	47.23	6.19	13.1%	59.49	44.88
Diamond Offshore Drilling, Inc.	DO	50.54	49.96	0.58	1.2%	73.00	43.69
ENSCO International, Inc.	ESV	55.19	50.20	4.99	9.9%	62.25	47.85
Nabors Industries, Inc.	NBR	28.47	24.81	3.66	14.8%	28.54	14.50
Noble Drilling Corp.	NE	34.52	29.87	4.65	15.6%	41.60	28.67
Parker Drilling Company	PKD	7.01	5.99	1.02	17.0%	8.67	4.77
Rowan Companies, Inc.	RDC	32.68	30.11	2.57	8.5%	38.65	29.50
Transocean Offshore, Inc.	RIG	45.61	41.75	3.86	9.2%	55.74	38.47
Total Offshore Drilling..…….....		**307.44**	**279.92**	**27.52**	**9.8%**	**367.94**	**252.33**
Offshore Contractors, Services, and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	26.37	22.44	3.93	17.5%	27.58	19.44
Gulf Island Frabrication	GIFI	21.57	18.79	2.78	14.8%	26.82	18.06
McDermott International, Inc.	MDR	8.25	7.07	1.18	16.7%	9.36	6.58
Oceaneering International	OII	76.95	70.34	6.61	9.4%	87.64	66.00
Subsea 7 SA	SUBCY.PK	20.29	19.78	0.51	2.6%	22.32	17.05
Technip ADS	TKPPY.PK	27.27	27.18	0.09	0.3%	31.32	21.08
Tetra Technologies, Inc.	TTI	11.90	11.21	0.69	6.2%	13.43	9.41
Cal Dive International, Inc.	DVR	1.47	1.42	0.05	3.5%	2.38	1.22
Total Offshore Contractors, Service, and Support..…….....		**194.07**	**178.23**	**15.84**	**8.9%**	**220.85**	**158.84**
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	83.33	78.84	4.49	5.7%	99.00	77.50
Gulfmark Offshore, Inc.	GLF	45.57	42.25	3.32	7.9%	53.89	39.31
Bristow Group	BRS	79.57	72.91	6.66	9.1%	85.70	62.34
PHI, Inc.	PHII	39.88	41.40	-1.52	-3.7%	42.70	31.92
Tidewater, Inc.	TDW	56.24	50.39	5.85	11.6%	63.22	45.51
Trico Marine Services, Inc.	TRMAQ.PK	0.04	0.04	0.00	0.0%	0.11	0.01
Hornbeck Offshore	HOS	45.42	41.80	3.62	8.7%	59.93	37.44
Total Offshore Transportation and Boat ……..…….....		**350.05**	**327.63**	**22.42**	**6.8%**	**404.55**	**294.03**

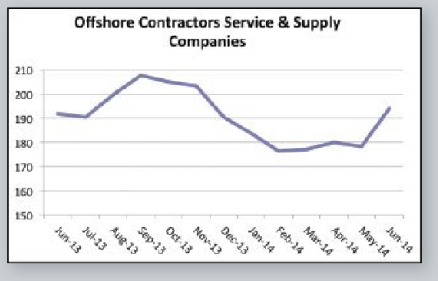
Monthly Stock Figures & Composite Index

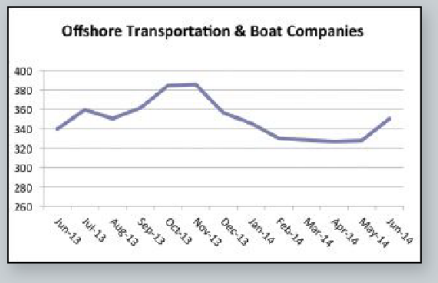
Industry	Close(*Mid*) *June*	Close(*Mid*) *May*	Change	Change %	High 52 week	Low 52 week
Total Diversified, Production, Support and Equipment	608.43	561.93	46.50	8.3%	630.24	426.30
Total Geophysical / Reservoir Management	59.69	53.01	6.68	12.6%	85.12	51.04
Total Offshore Drilling	307.44	279.92	27.52	9.8%	367.94	252.33
Total Offshore Contractors, Service and Support	194.07	178.23	15.84	8.9%	220.85	158.84
Total Offshore Transportation and Boat	350.05	327.63	22.42	6.8%	404.55	294.03
Total Offshore Source Index	1,519.68	1,400.72	118.96	8.5%	1,708.70	1,182.54

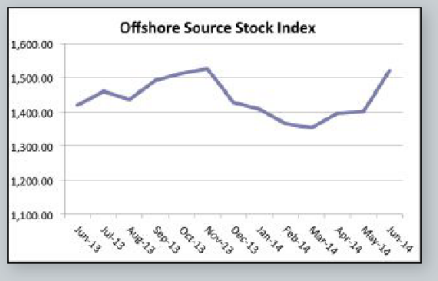










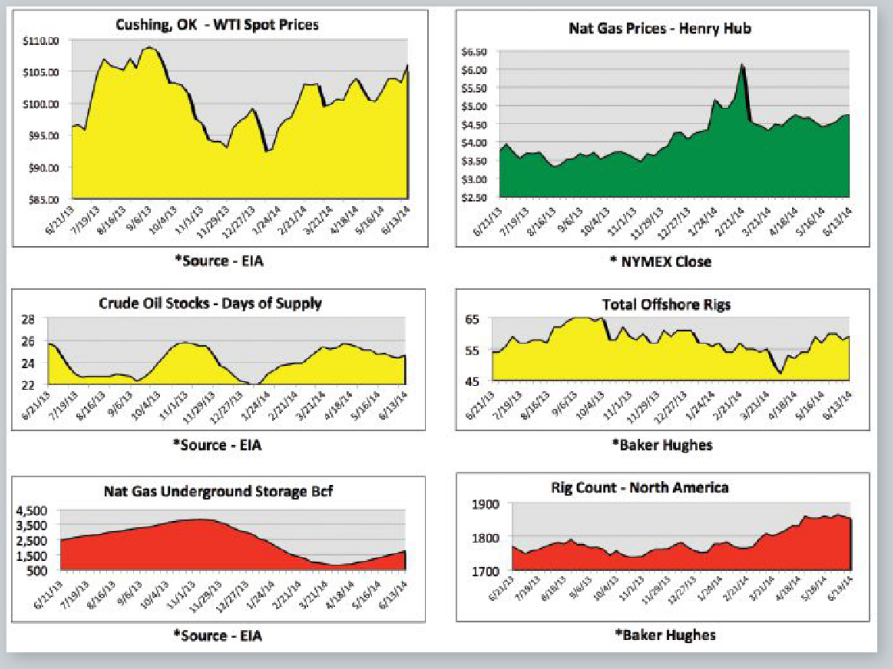


DISCLAIMER

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

Oil & Gas Industry Trends

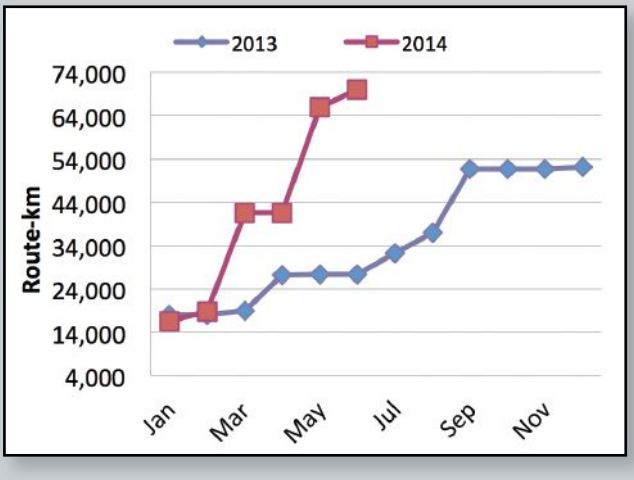
Monitoring the Pulse of the U.S. Offshore Oil & Gas Industry



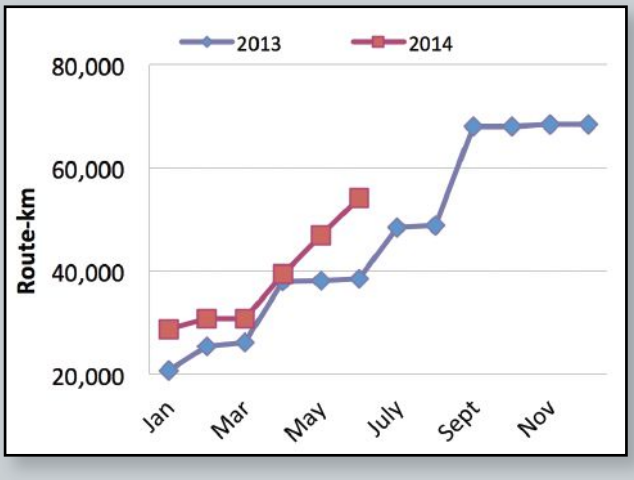
Positive trend, at least 3 weeks
Changing trend, less than 3 weeks
Negative trend, at least 3 weeks

Subsea Telecom & Power Cable Data

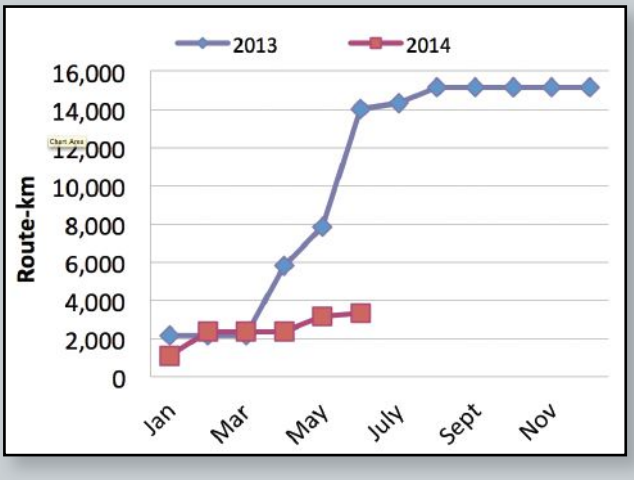
FO Cable Awards by Month



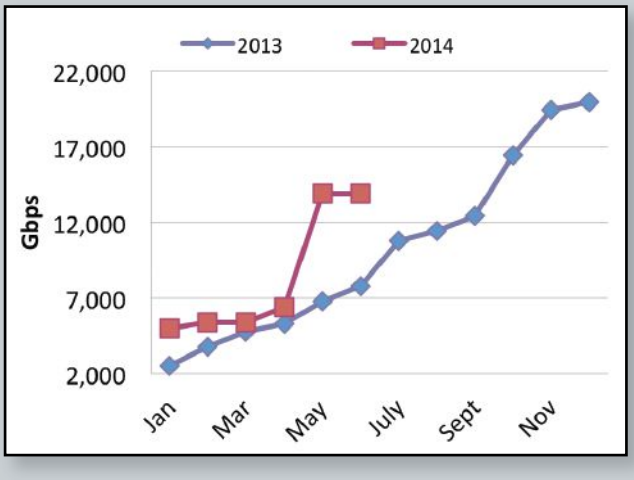
FO Cable Announcements



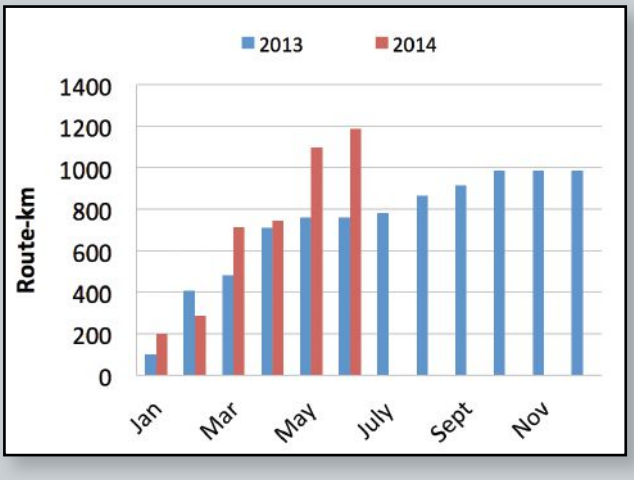
Submarine FO Cables Entering Service in Route-km



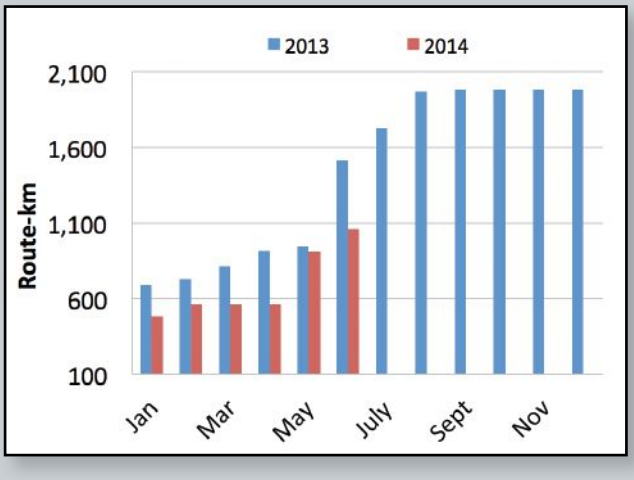
Upgrades of Existing Cable Systems in Gbps



Submarine Power Cable Awards in Route-km



Submarine Power Cable Announcements in Route-km



Gulf of Mexico Data

Current Deepwater Activity

Operator	Area	Block	OCS Lease	Rig Name	Prospect Name	Water Depth (ft)
Eni US Operating Co. Inc.	LL	411	G31847	T.O. DEEPWATER PATHFINDER		9,808
Shell Offshore Inc.	WR	508	G17001	NOBLE JIM DAY	Stones	9,556
Anadarko Petroleum Corp.	LL	399	G23480	CAL-DIVE Q-4000	Independence Hub	8,960
Freeport-McMoRan Oil & Gas LLC	KC	627	G27740	T.O. DEEPWATER CHAMPION	Bonanza	8,746
Shell Offshore Inc.	AC	857	G17565	H&P 205	Great White	7,815
Shell Offshore Inc	MC	525	G31507	NOBLE GLOBETROTTER		7,456
Anadarko Petroleum Corp.	KC	875	G26771	ENSCO 8500	Lucius	6,822
BP Exploration & Production, Inc.	MC	608	G09838	ENSCO DS-3	Anstey	6,623
Noble Energy, Inc.	MC	782	G33757	ATWOOD ADVANTAGE	Caterpillar	6,565
Murphy Exploration & Production Co.	DC	178	G25850	T.O. DISCOVERER DEEP SEAS		6,560
Chevron USA, Inc.	KC	829	G25814	T.O. DISCOVERER CLEAR LEADER	Buckskin	6,428
Anadarko Petroleum Corp.	WR	52	G25232	DIAMOND OCEAN BLACKHAWK	Shenandoah	5,874
Shell Offshore, Inc.	WR	95	G25234	STENA ICEMAX	Yucatan North	5,860
BP Exploration & Production, Inc.	MC	776	G09866	SEADRILL WEST AURIGA	Thunder Horse North	5,742
BP Exploration & Production, Inc.	MC	777	G09867	SEADRILL WEST CAPRICORN	Thunder Horse South	5,719
BP Exploration & Production, Inc.	MC	778	G09868	T.O. DISCOVERER ENTERPRISE	Thunder Horse North	5,631
Eni US Operating Co. Inc.	MC	773	G19996	NABORS POOL 140	Devil's Tower	5,610
BP Exploration & Production, Inc.	AT	362	G34584	ENSCO DS-4		5,586
BP Exploration & Production, Inc.	GC	743	G15607	T.O. DEVELOPMENT DRILLER III	Atlantis	5,414
Chevron USA, Inc.	GC	807	G31752	PACIFIC SANTA ANA	GC 807 (Anchor Well)	5,230
Anadarko Petroleum Corp.	GC	680	G22987	NOBLE BOB DOUGLAS	Constitution	5,080
Anadarko Petroleum Corp.	GC	680	G21811	BLAKE 1007	Constitution	4,968
Anadarko Petroleum Corp.	GC	683	G18421	ENSCO 8505	Caesar	4,487
Shell Offshore, Inc.	MC	812	G34461	NOBLE DANNY ADKINS		4,471
Freeport-McMoRan Oil & Gas LLC	GC	645	G11081	HOLSTEIN SPAR RIG	Holstein	4,344
Chevron USA, Inc.	GC	640	G20082	T.O. DISCOVERER INSPIRATION	Tahiti 2	4,297
Anadarko Petroleum Corp.	GC	608	G18402	WIRELINE UNIT (HOUMA #2)	Genghis Khan	4,287
BHP Billiton Petroleum (GOM) Inc.	GC	653	G20084	GSF C.R. LUIGS	Shenzi development	4,238
Anadarko Petroleum Corp.	GC	562	G11075	WIRELINE UNIT (HOUMA #3)	K-2	4,017
Anadarko Petroleum Corp.	GC	562	G11075	T.O. DISCOVERER SPIRIT	K-2	4,017
Chevron USA, Inc.	KC	10	G27698	T.O. DISCOVERER INDIA		3,965
LLOG Exploration Offshore, LLC	MC	79	G27259	SEADRILL SEVAN LOUISIANA	Humphrey	3,868
Shell Offshore, Inc.	MC	809	G09873	NOBLE DON TAYLOR	Princess	3,853
Shell Offshore, Inc.	MC	934	G07976	ATWOOD CONDOR	Europa	3,849
Shell Offshore, Inc.	MC	809	G12166	H&P 204	Princess	3,800
Anadarko Petroleum Corp.	EB	645	G32822	ENSCO 8506	Deep Nansen	3,798
Shell Offshore, Inc.	GC	248	G15565	T.O. DEEPWATER NAUTILUS	Glider	3,233
Shell Offshore, Inc.	VK	956	G06896	NABORS 202	Ram-Powell	3,214
Shell Offshore, Inc.	GC	158	G07998	H&P 202	Brutus	2,985
Shell Offshore, Inc.	MC	807	G07963	H&P 201	Mars (Ursa/Princess)	2,945
Statoil Gulf of Mexico LLC	MC	718	G34456	MAERSK DEVELOPER	Juno	2,918
Shell Offshore, Inc.	GB	427	G07493	NOBLE JIM THOMPSON	Cardamom	2,719
LLOG Exploration Offshore, LLC	MC	503	G27277	NOBLE AMOS RUNNER	WhoDat	2,647
Chevron USA, Inc.	GC	205	G05911	NABORS 85 (MAYRONNE 162)	Genesis	2,590
Anadarko Petroleum Corp.	VK	869	G13065	HELIX 534	Nile	2,423
Anadarko Petroleum Corp.	VK	869	G13065	WIRELINE UNIT (N.O. #2)	Nile	2,423
Anadarko Petroleum Corp.	VK	869	G13065	COIL TUBING UNIT (N.O. #2)	Nile	2,423
Stone Energy Corp.	MC	29	G13997	ENSCO 8502	Cardona	2,121
Murphy Exploration & Production Co.	MC	538	G16614	SNUBBING UNIT (N.O. DIST)	Medusa North	2,103
Noble Energy Inc.	GC	40	G34536	ENSCO 8501		2,079
Marubeni Oil & Gas (USA) Inc.	GC	113	G15546	NOBLE DRILLER	Angus	2,045
LLOG Exploration Offshore LLC	MC	707	G25103	DIAMOND OCEAN SARATOGA	MC 707, 751, 705	1,538
SandRidge Offshore, LLC	GC	65	G05889	H&P 206	Bullwinkle	1,353
Apache Deepwater LLC	GC	89	G15540	WIRELINE UNIT (HOUMA DIST)	Cinammon	671

Deepwater prospects with drilling and workover activity: 54

Current Deepwater Activity as of Monday, 9 June 2014

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,480	35,557	2,493
201 to 400	101	1,121	20
401 to 800	256	873	10
801 to 1,000	365	580	9
1,000 & above	3,323	1,929	26

Rig Activity Report 6 June 2014

Location	Week of 6/6	+/-	Week Ago	+/-	Year Ago
Land	1787	-5	1792	+101	1686
Inland Waters	15	+1	14	-8	23
Offshore	58	-2	60	+2	56
U.S. Total	1860	-6	1866	+95	1765
Gulf of Mexico	56	-2	58	+3	53
Canada	214	+16	198	+62	152
N. America	2074	+10	2064	+157	1917

Activity by Water Depth Information current as of Monday, 9 June 2014

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

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

J2 Subsea new 3" titanium ROV dredger

J2 Subsea, an Acteon company, is showcased the We3D, WeSubsea's new 3-in. titanium ROV dredger at Subsea Asia in Kuala Lumpur, Malaysia. Acteon companies J2 Subsea and Seatronics are now offering WeSubsea's full range of titanium dredgers from worldwide locations.

The We3D dredger is designed to operate on smaller ROVs and larger work class ROVs. Because of WeSubsea's optimised and well-proven technology, the We3D requires less power input to provide a highly efficient dredger that remains clog-free. Operating on low power provides a solution to use of inefficient dredgers available for smaller ROVs in the industry.

The dredger is constructed from titanium and is compact. Its lightweight and robust features ensure that the We3D is easier to mobilize and operate than other dredgers in the market.

John Walker, director of J2 Subsea, said, "We are excited to present the We3D dredger at Subsea Asia, as we are growing significantly in the region and value the opportunity to showcase high-end technology in an important local arena.

"The new 3-in. titanium ROV dredger is considerably more powerful than others currently on the market, easy to use and low maintenance, making it an ideal offering for our customers who expect to be supplied with top-quality technology."

For more information, visit www.j2subsea.com.

Kongsberg Maritime upgrades digital stills camera

Kongsberg Maritime has further enhanced its high-resolution digital stills camera the OE14-408, through the addition of an Ethernet control interface and a new, ergonomically designed graphical user interface.

The OE14-408 with its 1/1.7-in. CCD sensor, five time's optical zoom and achromatic doublet lens has the ability to capture stills images up to a 10-MP resolution while correcting for chromatic aberration.

With the addition of an Ethernet interface the operator has the ability to control all camera functions remotely. Captured images, in either RAW or JPEG format, can be stored to the camera's 16-GB internal memory or downloaded as soon as they are taken through the 10/100 Base-T connection. The camera supports both static and DHCP address protocols.

Images can also be transferred by USB or over an ad-hoc wireless network once the camera has been returned to deck This feature reduces the frequency the camera needs to be removed from the vehicle or lander, saving the operator time and improving cable and connector reliability.

The OE14-408 is also available with a full duplex RS232 or half duplex RS485 control interface. In this configuration the user has the flexibility of changing control methods using the hand-held I.R remote control.

The OE14-408 digital stills camera can be used in conjunction with a dedicated flash gun the OE11-442. Both are available with 1,500-m or 4,500-m depth rated housings as standard and are ideally suited to scientific applications, environmental monitoring, seabed mapping as well as both pre and post development surveys.

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

New ocean submersible solenoid valve from Hydracon

Hydracon Company's newest solenoid valve, model 1723-100, was specifically custom designed for ocean submersible applications. The solenoid valve is submersible to 4,500 psi ambient pressure. The valve design is a two-way, two-position, normally closed.

The design of this solenoid valve allows for significant reductions in both size and weight, yet it delivers superior performance. This solenoid valve offers the following features: small size, weighs less than 15 lbs, no adjustments, high flow, direct operated, long cycle life, low power consumption, bubble-tight closure, contamination tolerant zero leakage seats, corrosion resistant, and shock resistant.

The submersible solenoid is manufactured of magnetic stainless steel and is electron beam welded construction. The valve body is manufactured of 316L stainless steel. This valve assembly meets the highest industry standard for protection against continuous immersion in water, IPX8 of IEC 529.

Hydracon Company, Inc., designer and manufacturer of high-performance subsea solenoid valves, solenoid actuators, electric switches. With a working maxim of "Deepwater Means Smaller" and operating ocean depths up to 20,000 ft, it offers the latest technological advances into ever-deeper ocean ambient requirements.

Hydracon products are used in the following applications: Deepwater Offshore Oil, Naval Defense, Deepwater Pipeline, AUVs and ROVs, Subsea Electro-Hydraulic Systems, BOP Controls, Diving, and Dredging. As a leading and innovative manufacturer of high performance subsea products for over 25 years, Hydracon represents the latest subsea technological advances to provide the highest quality and trouble-free performance.

For more information, visit www.hydracon.com.

Unprecedented pre-launch success for new compressed breathing air monitor

Analox Sensor Technology's new compressed breathing air monitor has become the company's most anticipated product launch, with over £100K of pre-launch orders already secured.

The new ACG+ is the gas analysis specialist's most effective and versatile compressed breathing air monitor, designed to be used as a wall-mounted continuous monitor, or as a portable solution for checking compressed air purity.

Analox Sensor Technology (AST) launched the ACG+, its most advanced compressed breathing air monitor, on 1 May 2014. The new product provides continuous or spot monitoring of compressed breathing air for oxygen (O_2), carbon dioxide (CO_2), carbon monoxide (CO), dew point (H_2O) and Volatile Organic Compounds (VOCs). It also has a sample point to check for oil mist.

The ACG+ uses state-of-the-art, highly-accurate sensor technology, providing the alternative to the established spot testing with colorimetric tube test kits. The ACG+ sensors are easy to change, when required. The new product offers 90 days of data logging, with simple data retrieval via a USB connection. It incorporates audible and visual alarms, and via a common relay, can be programmed to shut down a compressor or activate a beacon if an alarm is triggered.

The ACG+ detects when compressed breathing air is not of the highest quality, enabling the employer to comply with breathing air standards such as EN12021. "Employers have a duty of care to their staff. Where staff rely on compressed breathing air, this is the ideal, versatile monitor to ensure the integrity of that breathing air, wherever the air is being sourced. We believe the effectiveness of this solution has led to our unprecedented pre-launch sales.", said Simon Lunt, director of sales and marketing

For more information, visit www.analox.net.

EXPOSURE Marine's switchless, hands-free dive light

The new EXPOSURE Sub M3 is an immensely powerful, 1563 lumens, switch-free, compact, primary dive light for night and daytime professional diving work.

More powerful than most primary dive lights and more compact than many secondary lights, the Sub M3 is an entirely "switchless" torch featuring EXPOSURE's pioneering Motion Control Technology (MCT).

MCT means there is no need to remove gloves or "feel" for switches in order to operate the light while underwater. A simple, small rotational movement pattern will activate on and off, change power modes and set the travel lock mode. The travel lock ensures the light cannot be accidentally switched on and drain the batteries. Give the light several firm taps and it will enter an SOS flashing safety mode.

The Sub M3 used with EXPOSURE's neoprene wrist mount enables entirely hands free operation, allowing you to concentrate on diving and keep your hands free for working.

Rated to 200 m depth, the Sub M3 boasts brilliant outputs and longer burn

times than most umbilical packages, providing between 2 to 18 hrs on high or low mode, respectively. At only 116 mm long and weighing just 311 g, it is a fraction of the weight and size too. Powered by high performance LEDs and lithium ion batteries, it has high definition clear white output and an impressive 192-m useful beam distance.

Housed in a tough, lightweight aluminium body, with marine-grade anodising, an integral digital fuel gauge displays remaining burn time in hours and minutes. This enables accurate monitoring of dive length, adaptation to the environment, and showing exactly when recharging is needed. The digital display also indicates power modes, travel mode and rotation recognition, offering valuable feedback.

For more information, visit www.exposuremarine.com.

Novacavi launches Aquancable

Italy-based special cable manufacturer Novacavi is delighted to report its growing activity in the marine industry after its launch of Aquancable, a wide range of specialist bespoke cables for maritime and underwater technologies.

As a privately owned company with almost 40 years of experience in designing and manufacturing fit for purpose cables that 15 years ago decided to focus also on subsea, marine and offshore energy applications, Novacavi has begun this year with further expansion into this market.

For more information, visit www.novacavi.it.

Teledyne BlueView expands the MSeries family with M900-2250-130

Teledyne BlueView has released the M900-2250-130 in both standard 1,000 m depth rating and 4,000 m depth rating. The M900-2250-130 includes the third generation electronics package called "S3" electronics. The "S3" electronics package gives users the most advanced controls over the sonar settings including sound source power level control, gain and threshold setting. These new capabilities give the MSeries

better imaging power at further ranges and higher resolution throughout the field of view.

"The M900-2250-130 has 150% more field of view coverage than the P900-2250-45. This new addition to the MSeries family is the most versatile sonar on the market, providing long range obstacle avoidance and close up high resolution imaging," says Ted Germann, Teledyne BlueView's chief sales and marketing executive.

For more information, visit www.blueview.com.

SeeByte launches SeeTrack Military V4

SeeByte, the global leader in creating smart software for unmanned maritime systems, is proud to announce the launch of SeeTrack Military V4.

SeeTrack Military, now in use by 19 world navies, is to benefit from improved capabilities. These capabilities include the ability to concurrently plan and monitor multiple missions for multiple assets from a single shared user interface. It also allows a user to post-process and store the data in a shared database and visualize it in both GIS and sensor-specific displays. The software is built using a Service Orientated Architecture and provides users a simple software development kit. Operators are able to operate and integrate new AUVs, diver hand-held systems, ROVs and towfish sonars using a common interface. Military users are offered simple to use and powerful contact management databases compatible with popular tactical decision level software suites. Compatibility with Version 3 of the software is preserved.

SeeTrack Military is an open-architecture platform solution for rapid on-site analysis and data fusion that can be easily adapted for specific user needs. Developed as a mission-planning, monitoring, post-processing and reporting tool, this software technology has been successfully deployed on numerous surveys, military and security operations and scientific experiments.

For more information, visit www.seebyte.com.

Tideland launches eRacon

Tideland Signal (Tideland) has unveiled its new AIS-equipped eRacon or E-Navcon at the Seawork International exhibition.

E-Navcon combines the benefits of a proven X-band radar beacon and AIS transmitter contained within a robust, weather-proof housing. Mounted on buoys, hazards or points of navigational interest, the racon component provides an all-weather position fix while the AIS system transmits information such as coordinates, type of hazard, weather and sea state. The AIS component can also be used to monitor the racon and any other navigational aids fitted nearby, and when fitted on a buoy it can provide an alarm to warn if the buoy goes off-station.

The design of E-Navcon is based on Tideland's highly successful SeaBeacon 2 System 6 dual-band racon, which is deployed in over 1,000 installations around the world. All the components of the AIS system–AIS radio, VHF antenna and GPS antenna–are fitted within the space freed up by removing the S-band antenna from a dual-band unit, which has the advantage of pro-

tecting all the internals against the elements.

The International Maritime Organisation (IMO) no longer requires S-band radars to be able to trigger racons but the requirement for X-band radar and racon compatibility remains unchanged since racons, are recognized as a means of identifying and locating navigation marks in poor visibility without reliance on Global Navigation Satellite Systems (GNSS) or other electronic position fixing systems.

An important feature of E-Navcon is that it is not dependent on GPS or GPS-like GNSS services that can currently be jammed and so become unavailable or spoofed, causing receivers to report incorrect positions. Since each E-Navcon has a unique identification and position, ambiguities inherent in other techniques can be eliminated and the ship needs no other information to determine its position.

Tideland's System 6 dual-band racon has established an international benchmark for radar beacons, proving itself extremely economical and reliable in operation, with an average trouble-free service life to date of over 14 years.

For more information, visit www.tidelandsignal.com.

Fanbeam laser radar delivers high accuracy dynamic positioning to offshore support vessels

The new Fanbeam laser radar sensor from Renishaw's Spatial Measurement division provides repetitive, high-accuracy dynamic positioning (DP) to offshore support vessels (OSV) and other marine structures. This next-generation system adds greater performance and stability through new control software that increases reliability of its single-target tracking capability and allows multiple operator stations for situations where control needs to be transferred between bridge personnel. The new software's advanced target tracking and modeling prevent spurious targets from causing a drive off, while the intelligent clutter rejection capability provides clearer signals for a better understanding of the operational environment. A training package with a fully featured, realistic simulator is also included.

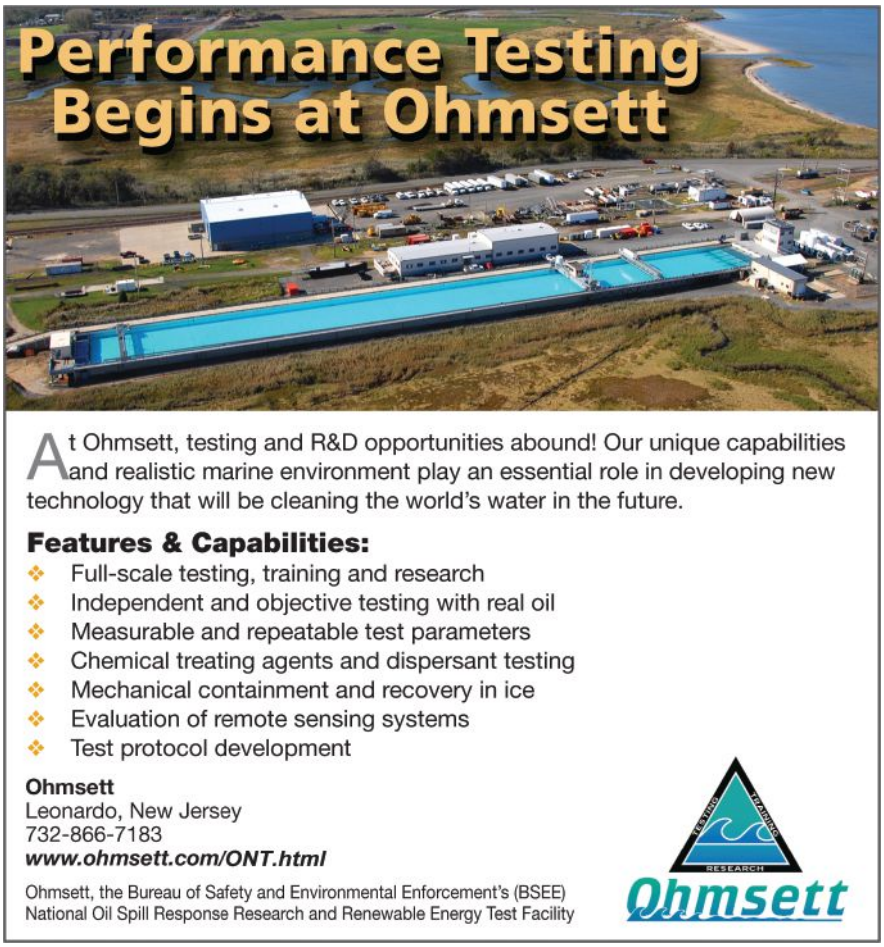
The Fanbeam system uses position data to automatically hold vessels on station and is typically the primary position reference during critical short-range operations, such as cargo container lifts from platform supply vessels. The system provides collision avoidance, gangway monitoring and docking assistance on vessels operating in crew supply, anchor handling tug supply, construction support, dive support, dredging and rock dumping capacities. Other applications include seismic source positioning for geophysical exploration vessels and positioning of mine detection equipment.

Built for harsh environments, the system's operating temperature range is -13˚F to +158˚F (-25˚C to +70˚C), with a water/dust resistance rating of IP66, and is EN 60945/EN 609950-1:2001 compliant. A marine-grade embedded PC and machined aluminum enclosure equip the system for rugged use. The compact system is approximately 8 W x 12 L x 11.5 in. H (200 x 300 x 290 mm) and weighs only 28 lbs (12.9 kgs).

For more information, visit www.renishaw.com.

HYPACK to release real time point cloud for multibeam and topo laser surveys

As one of the leading Hydrographic surveying software companies in the world, HYPACK, Inc. continues to make improvements and is proud to announce the release of its new REAL TIME POINT CLOUD. This release is an upgrade to the HYPACK®2014 release. The new program runs in conjunction with HYSWEEP® SURVEY and displays both multibeam and topographic laser data in a corrected and geo-referenced color-coded point cloud. The REAL TIME POINT CLOUD pro-



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For more information, visit www.hypack.com.

New Tritex Multigauge 5700 datalogger

Dorchester-based, Tritex NDT have launched their new Multigauge 5700 Datalogger Metal Thickness Gauge. The new gauge has all the advantages of the very popular Multigauge 5600 but with the added benefit of storing readings on the gauge. The Multigauge 5700 Datalogger includes an onboard memory for recording measurements in either a grid or string format, or combination of both. The readings are then transferred to a PC or laptop using wireless technology, which also allows remote gauging if required. The versatile intuitive software includes simple wizards that guide the user in setting up templates or files for various applications.

The gauge utilizes the Multiple Echo technique to ignore coatings up to 6 mm thick and just measures the metal substrate. No grinding or removal of the coatings is required, significantly reducing preparation time and ultimately saving both time and money when carrying out inspections. All probes have Intelligent Probe Recognition (IPR), which automatically adjusts settings in the gauge when connected, resulting in a perfectly matched probe and gauge for enhanced performance. Also, the Automatic Measurement Verification System (AMVS) ensures only true measurements are displayed, even on the most heavily corroded metals.

Single crystal probes, which have a number of advantages when measuring on curved and corroded surfaces, are protected by a membrane ensuring the probe does not easily get damaged.

The new Multigauge 5700 Datalogger is supplied as a complete kit, ready to use, with a 3-year warranty and free calibration for the life of the gauge.

For more information, visit www.tritexndt.com.

FoundOcean offers operators offshore trials of its unique Marine Growth Prevention units

Following over 26,000 installations worldwide, FoundOcean is trialling its latest range of Marine Growth Prevention (MGP) units on an unnamed offshore wind farm jacket structure in the UK.

"To demonstrate the effectiveness of controlling marine growth with this established technology, we have installed two units on a jacket structure in the Liverpool Bay area," said Andy Venn, marketing director at FoundOcean. He continued, "These latest units are the beginning of an extended trial period on the jacket, following successful results of an earlier version of an MGP unit fitted in 2013."

MGP is offered in two versions: wave driven for splash zone applications and current driven for controlling marine growth subsea. By eliminating the need for divers to periodically remove marine growth, numerous asset managers around the globe have found that the technology is one of the most cost-effective and safest life extension solutions on the market.

For more information, visit www.foundocean.com.

Introducing the LUXUS Dropplate

MacArtney is pleased to introduce the new LUXUS Dropplate–a simple and innovative underwater camera platform enabling marine operators to perform instant and effective underwater investigations by means of three LUXUS Power LED lights and any LUXUS camera.

Manufactured from high-density polyethylene with a frame shielding the onboard cameras and lights from impacts on the seafloor, the LUXUS Dropplate provides the ruggedness and stability needed for performing any basic visual inspection task in harsh underwater environments.

The LUXUS Dropplate does not require a specific handling system and can be readily deployed from a small boat or basic vessel of opportunity. Efficient operation of the onboard camera and light equipment is achieved using a LUXUS Multi Media Controller and a Kevlar TV cable, while integrated lifting handles make for easy deployment and recovery of the system. A small MacArtney hand winch can also be used.

The system provides a flexible, off-the-shelf alternative to custom-built towed systems and traditional drop

cameras. This versatility in applications, coupled with minimal deployment and handling requirements, make the LUXUS Dropplate an extremely flexible and cost-effective solution.

The LUXUS Dropplate can be supplied as a plug-and-play solution complete with cameras, lights, controller, cable and winch system.

For more information, visit www.macartney.com.

Better life safety at sea with new EPIRB

A new Emergency Position-Indicating Radio Beacon (EPIRB) makes it easier to locate people in distress at sea.

"The new distress radio beacon takes cross-bearings from multiple systems. Several vessels can participate in search and rescue, and locating survivors becomes a lot more probable," says section leader Knut Asle at Hansen Protection in Moss.

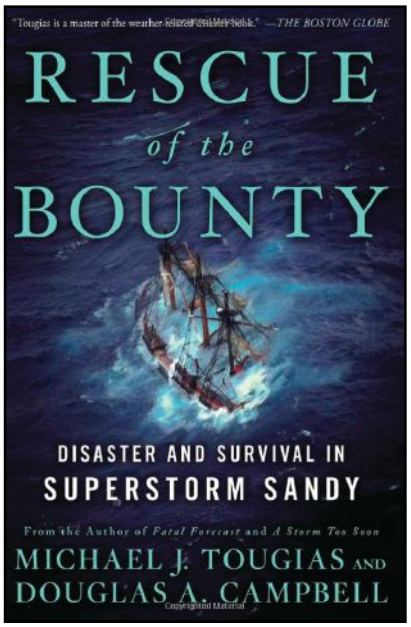
The company has developed the new emergency beacon that will initially be fitted into survival suits worn by workers on offshore oil installations. Over time, anyone who works in vulnerable conditions at sea, such as fishermen or people working on offshore wind turbines, can have the emergency locator fitted in their work wear.

Previous tracking transmitters used by offshore oil workers have only transmitted signals on the 121.5 MHz (VHF) emergency wave band that only rescue helicopters and rescue boats could pick up. But now the radio beacon combines signals on several different frequencies. In addition to sending signals over the emergency frequency, it also utilizes AIS, which is an anti-collision system for shipping. The beacon also uses the American GPS satnav system and its Russian equivalent, Glonass.

The oil company Eni Norway has already started using the equipment for their workers in the Barents Sea.

Hansen Protection has spent double digit millions (NOK) developing the new beacon and advanced new survival suits for the North. The company has worked closely with the oil industry to meet their specific safety requirements.

For more information, visit www.hansenprotection.no.



Rescue of the Bounty
Disaster and Survival in Superstorm Sandy

by Michael J. Tougias and Douglas A. Campbell

Rescue of the Bounty provides an exciting hour-by-hour narrative and vivid rendering of these dramatic events while also illuminating the history of the ship–the actual replica used in the classic 1962 movie Mutiny on the Bounty–and its crew, which includes a variety of intriguing characters as well as, amazingly enough, a descendent of Fletcher Christian, the leader of the original mutiny on the original Bounty. The authors combine suspends, high-stakes human drama, and meticulous first-hand research to tell the extraordinary story of the ship's past, its disastrous misadventure in Sandy, and the Coast Guard's resulting rescue effort, which ultimately proved one of the most massive in its entire history. In this incredible effort, the Coast Guard resolutely flew two Jayhawk helicopter crews into the heart of the hurricane and lowered rescue swimmers into the raging seas again and again despite enormous dangers such an endeavor presented. The exceptional bravery and remarkable skill of these rescue teams are on full display in this insider account, which benefits from the author's interviews with all the rescuers and their support teams.

Scribner; ISMN-13: 978-1476746630
Hardcover, 256 pages, April 2014

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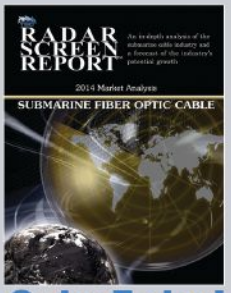

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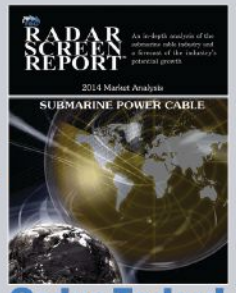

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National Oilwell Varco, Inc. said its vice president, corporate controller and chief accounting officer, **Robert Blanchard**, plans to retire July 31, 2014, and that the company has chosen **Scott Duff** as his successor. Duff holds a BBA in accounting from the University of Texas at San Antonio and is a certified public accountant. He held accounting positions at KPMG, Ernst & Young, and SBC before joining National-Oilwell in 2004. Duff has served as National Oilwell Varco's vice president of internal audit since 2005. Since joining the company in 1989, Blanchard has served in various roles of increasing responsibility, including vice president and corporate controller of Varco in 2002, and vice president, corporate controller and chief accounting officer of National Oilwell Varco since May 2005. He played a key role in integrating dozens of acquisitions undertaken by the company, and continues to play a critical role in the imminent spinout of its distribution services business unit as an independent public company.

Devon Energy Corp. said **Vince White**, senior vice president, communications and investor relations, plans to retire from the company on August 8, 2014. Since joining Devon in 1993, White has directed the company's investor relations programs as the company has grown from a small independent exploration and production company to a member of the Fortune 500. During that period, White managed the company's relationships with key stakeholder groups through numerous mergers and acquisitions, divestitures and corporate financing activities. In a related move, **Howard J. Thill** has joined the company to fill the position created by White's retirement. Thill, a 32-year veteran of the energy industry, including 15 years leading investor relations, communications and government relations efforts for major oil and gas concerns, joins Devon having most recently served as vice president of corporate, government and investor relations at Marathon Oil Corp. in Houston.

White

Manufacturer and distributor of precision tubes for critical applications Fine Tubes has appointed **Bait Al-Aseel** to act as its agent in Kuwait. The decision forms part of the company's strategic plan to secure further growth in the market for exotic alloy tubing across the Middle East region. Demand for this type of tubing continues to increase in line with greater operating demands matched by a desire for an extended service life that traditional alloys are unable to achieve, the company said. Bait Al-Aseel is a long-established and highly regarded contractor servicing the power and energy industries in Kuwait. Its prestigious client list includes Kuwait National Petroleum Co., Kuwait Oil Co. and Kuwaiti Ministry of Electricity and Water.

Diamond Petroleum Ventures LLC, a thermal unit provider based in Lafayette, Louisiana, has appointed **Em Roosevelt** as technical sales representative. Roosevelt is responsible for direct sales and account management and will work toward expanding the company's markets in the offshore oil and gas industry. He will also manage marketing and sales efforts aimed at bringing new technologies to commercialization. Roosevelt joined Diamond Petroleum Ventures in December 2013 and has more than 30 years of experience in the oil and gas industry. In his previous position, Roosevelt led the development of services utilizing membrane nitrogen for reviving and sustaining production of offshore platforms.

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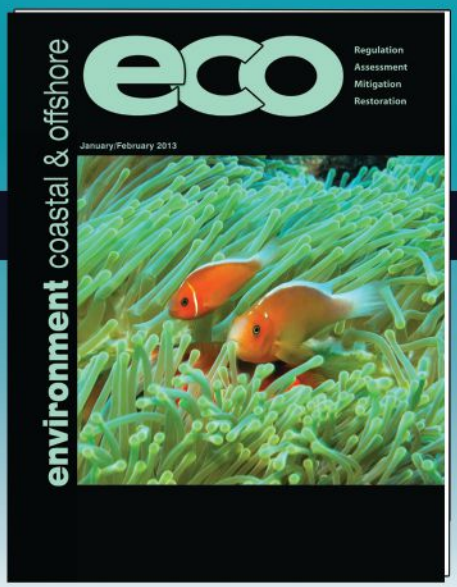

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Hawboldt Industries Ltd., an experienced manufacturer of deck equipment and a member of the Timberland Group of Companies, is pleased to announce the hiring of **Reed Okawa** as business development manager, marine crane division. Paul Phillips, General Sales Manager at Hawboldt industries says "Reed brings over 35 years of experience in crane design sales and service to Hawboldt. We are very pleased to have him onboard. Reed will be using his extensive knowledge to assist customers in choosing the right crane and accessories for their application."

Jerome Shaw has been named vice president of marine construction for Chet Morrison Contractors, LLC. Shaw's extensive background in the industry includes more than 20 years of experience, specifically in the oilfield marine service lines where he built operational expertise in pipeline and diving operations, as well as marine fabrication and construction. He previously served as HSEQ director, where he successfully integrated individual safety representatives within each of the company's business units. As vice president of marine construction, Shaw will be responsible for the strategic planning, management and operations of the division.

Shaw

Replacing Jerome Shaw as HSEQ director is **Bo Ristic**, who previously served as executive HSEQ and business development manager for Triton Diving Services. Ristic has more than 15 years of experience managing complex projects and developing HSEQ action plans. He began his career as a diver and has since gone on to manage complex special projects for major clients around the world.

Chris Remont has joined Bollinger Shipyards as director of program management. Remont will oversee all aspects of program management for Bollinger Shipyard's Lockport new construction facility, with an emphasis on the present U.S. Coast Guard Fast Response Cutter program. Prior to joining Bollinger, Mr. Remont held the position of director, engineering, central planning and production control of Avondale Engineering and Construction, a subsidiary of Huntington Ingalls Industries. He earned a Bachelor of Science in Electrical Engineering Technology from Louisiana Tech University in 1993, and a MBA from Nicholls State University in 2006.

Remont

InterMoor, an Acteon company, has appointed **Lesley Maxwell** as group human resources manager and **Nick Knight** as business development manager for InterMoor Marine Services Ltd. Maxwell has more than 20 years of international experience as a senior manager in management consulting and human resources roles across different sectors including oil and gas and will be based in Aberdeen, UK. She brings a wealth of experience in strategic human resources, operational management, project management and leadership and development to InterMoor. Knight has more than 12 years of experience in marine engineering. Previously a chief petty officer in the Royal Navy, he graduated from the University of Portsmouth, UK, with a foundation degree in mechanical engineering following an apprenticeship in marine mechanical engineering. Knight also served in various technical and operational roles in the oil and gas sector, including overseeing several complex deepwater mooring projects.

Global Diving & Salvage, Inc. announces the hiring of **Jennifer Jensen** as the vice president of the newly formed quality assurance group. Based in Global's corporate headquarters in Seattle, Washington, she will direct the efforts of our human resources, health, safety and environmental, claims and compliance, and professional development groups. Jensen has held management positions in the airlines, higher education, and retail industries. Prior to Global, Jennifer was a director in human resources overseeing talent, leadership development, organizational development, and employee relations.

Jensen

MacArtney announces the hiring of **Shannon Lewis** as system sales manager and the appointment of long-standing MacArtney ocean science expert **Andrew Ziegwied** as vice president of ocean science and system sales. Shannon Lewis is set to leverage her 16 year track record of team leadership, sales and business development to take MacArtney system sales to the next level. Ziegwied, operating out of Portland, Oregon, will direct system sales and post sale customer support for existing clients in the ocean science segment and play an active role in developing the ocean science market in North America. Ziegwied is a University of Washington School of Oceanography graduate. His background includes field work and project management with Evans-Hamilton, Inc. and application engineering with CTD manufacturer Sea-Bird Electronics, Inc.

BMT Group Ltd, a leading international design, engineering and risk management consultancy, has announced that **Charles Packshaw** has joined the Board of Directors as a non-executive director. Packshaw has 30 years of experience working with financial institutions in the City of London and is currently Head of UK Advisory at HSBC Bank, where he is responsible for advice to clients on strategy, acquisitions, capital structure, equity and debt financing and shareholder relationships. Prior to this, he was managing director of Lazard's corporate finance division in London. He began his career working in the construction industry and is a Chartered Civil Engineer.

Packshaw

Autonomous Surface Vehicles Ltd (ASV) is proud to announce the company's plans to break into the North American unmanned marine systems industry with the appointment of **Duane Ashton** to director of unmanned systems business development. Ashton will also work with ASV sister company C&C Technologies, Inc.

Leading marine survey equipment rental specialists **Subsea Technology & Rentals Ltd** (STR) has announced an exciting agreement with Western Advance, who have become the company's exclusive rental partner in Australia. **Western Advance Pty Ltd** (WA) are an established supplier and integrator of survey instrumentation, security and surveillance systems, and with over 19 years of delivering unrivalled solutions to the oil and gas industry and defense industries, are an ideal partner for STR as part of their continued growth in the rental market.

Ocean Sonics welcomes **Kristen Kanes** to the office in Great Village NS while she completes a key stage of her orca research project. Kanes, a student working at Victoria BS's Ocean Networks Canada Innovation Centre, holds an undergraduate degree in co-op Biology and is now doing her Masters' at the University of Victoria School of Earth and Ocean Sciences, specifically focusing her thesis research on the acoustics of orcas.

The MacArtney Underwater Technology Group is delighted to announce the entry of a representative agreement with the Mexican ROV and subsea service company, Meyah Ich Ha, who is set to administer the promotion and sales of MacArtney systems and products within the Mexican part of the GOM region.

August 12-14, 2014
Deepwater Intervention Forum
Galveston, TX
www.deepwaterintervention.com

August 25-28, 2014
Offshore Northern Seas
Stavanger, Norway
www.ons.no/2014

September 3-5, 2014
Oceanology International China
Shanghai, China
www.oichina.com.cn

September 14-19, 2014
Oceans '14 MTS/IEEE
St. John's, Newfoundland
www.oceans14mtsieeestjohns.org

September 15-17, 2014
Int'l Conf. on Offshore Renewable Energy
Glasgow, UK
www.marinescienceandtechnology.com

September 22-25, 2014
Maritime Security Conference
Oxford, UK
www.maritimesecurityconference.org

October 6-9, 2014
Oceanic Engineering Society IEEE AUV
Southhampton, UK
www.auv2014.org

October 7-9, 2014
AWEA Offshore Windpower
Atlantic City, NJ
www.awea.org

October 13-15, 2014
WJTA-IMCA Expo
New Orleans, LA
www.wjta.org

October 13-17, 2014
Sea Tech Week
Brest, France
www.seatechweek.com/

October 14-15, 2014
MTS Dynamic Positioning
Houston, TX
www.dynamic-positioning.com

October 14-16, 2014
Deep Offshore Technology International
Aberdeen, Scotland
www.deepoffshoretechnology.com

October 27-29, 2014
SPE ATCE
Amsterdam, The Netherlands
www.spe.org

October 27-31, 2014
Meeting of Acoustical Society of America
Indianapolis, IN
www.acousticalsociety.org

October 28-29, 2014
Offshore Energy
Amsterdam, The Netherlands
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November 1-5, 2014
Restore America's Estuaries
Washington, D.C.
www.estuaries.org

November 4-6, 2014
Deepwater Operations
Galveston, TX
www.deepwateroperations.com

November 5-7, 2014
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Ocean News & Technology 2014 EDITORIAL CALENDAR

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

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

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

APRIL
Editorial: Offshore Technology; Ocean Mapping & Survey
Distribution: OTC; AUVSI; Well Control and Containment Conference
Product & Services Focus: Subsea Tools & Manipulators; Offshore Risk Assessment; Training/Safety

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

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

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

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

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

OCTOBER
Editorial: Offshore Communications; Subsea Inspection, Monitoring, Repair and Maintenance
Distribution: OilComm; North Sea Decommissioning; Submarine Cable Forum; International Conference on Ocean Energy; Euronaval
Product & Services Focus: Acoustic Modems, Releases & Transponders; Marine Communications; Survey & Exploration Services

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

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

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- reliable data transmissions
- range: up to 8000 m
- accuracy: up to 0.04 degrees

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LBL POSITIONING SYSTEMS

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- reliable data transmissions
- range: up to 8000 m
- accuracy: better than 0.01 m

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