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INCREASING PRODUCTIVITY, DECREASING COMPLEXITY

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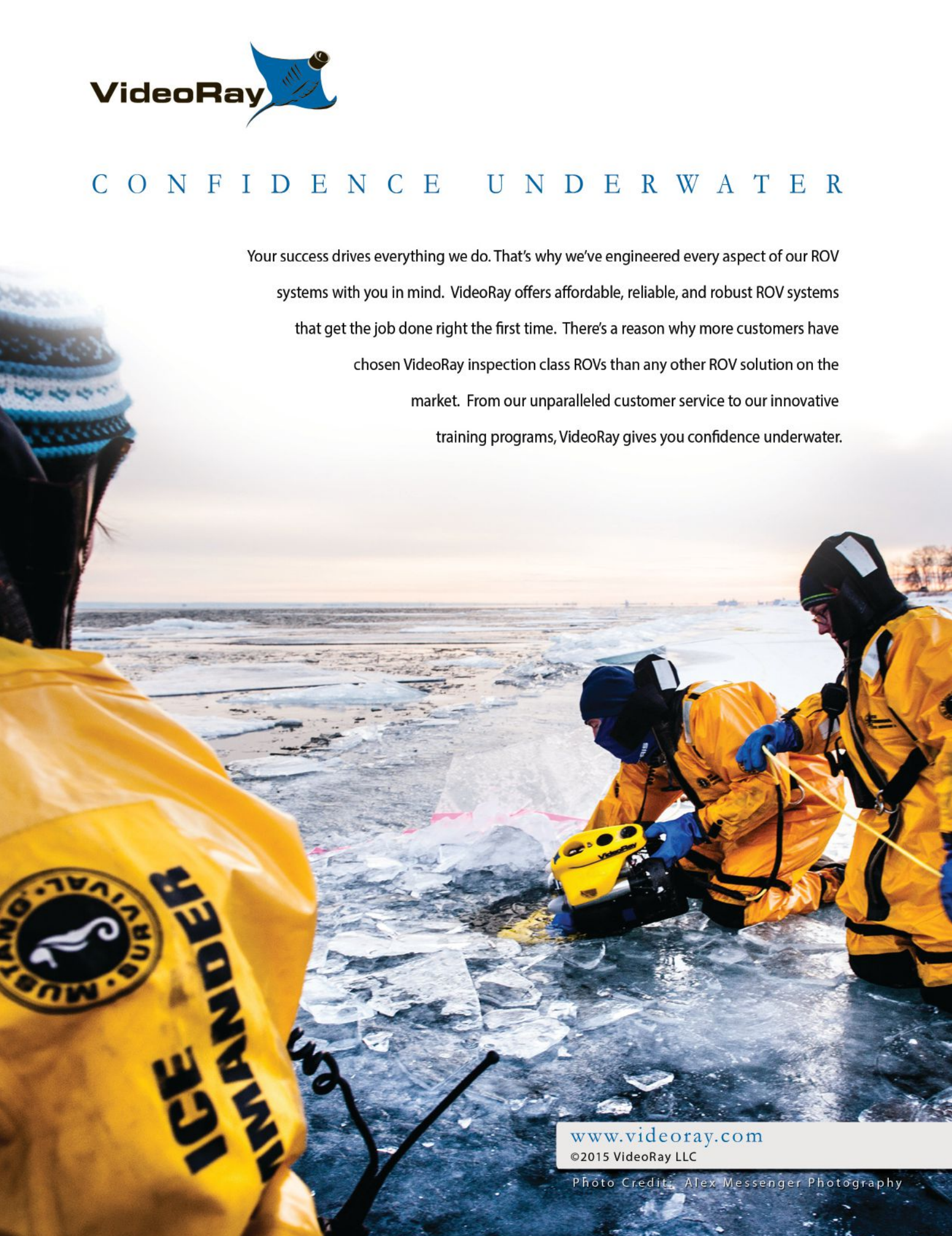

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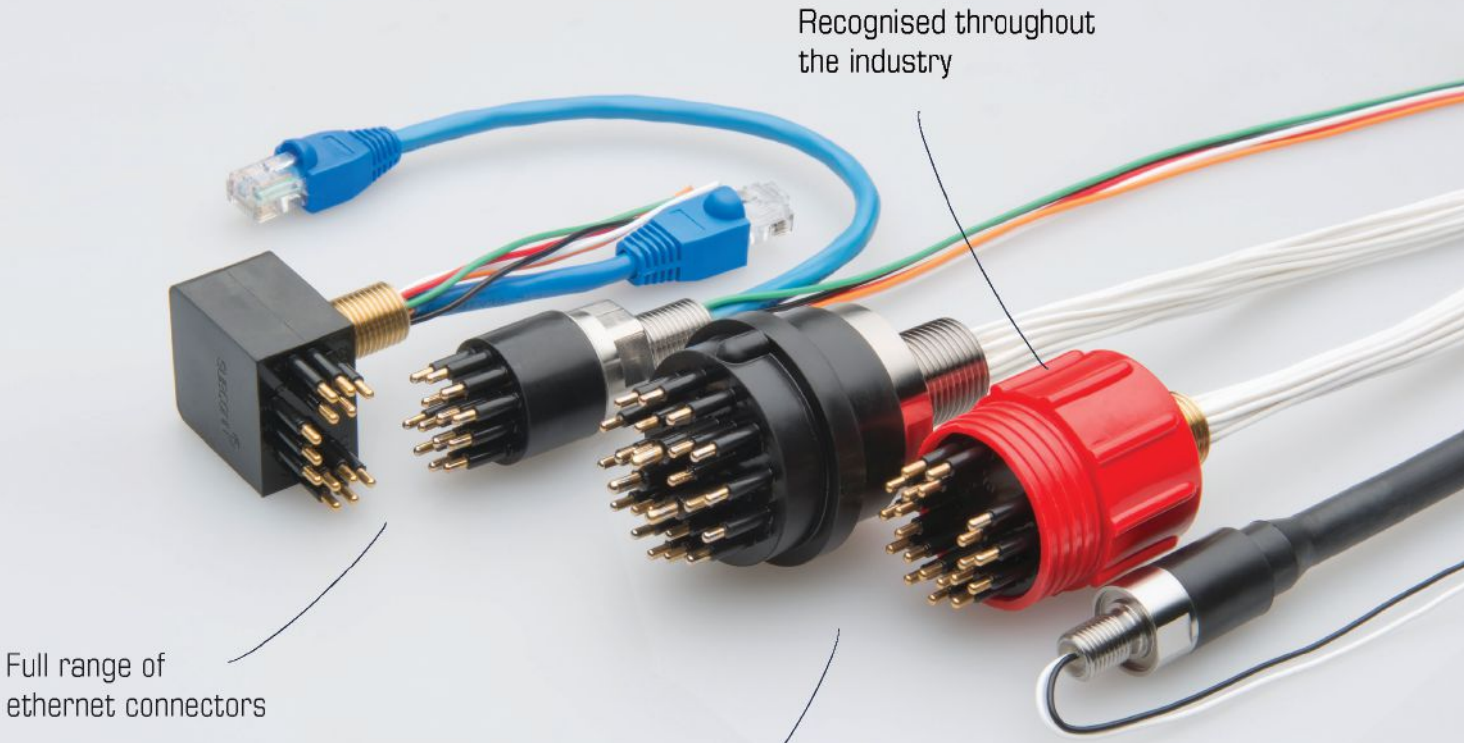

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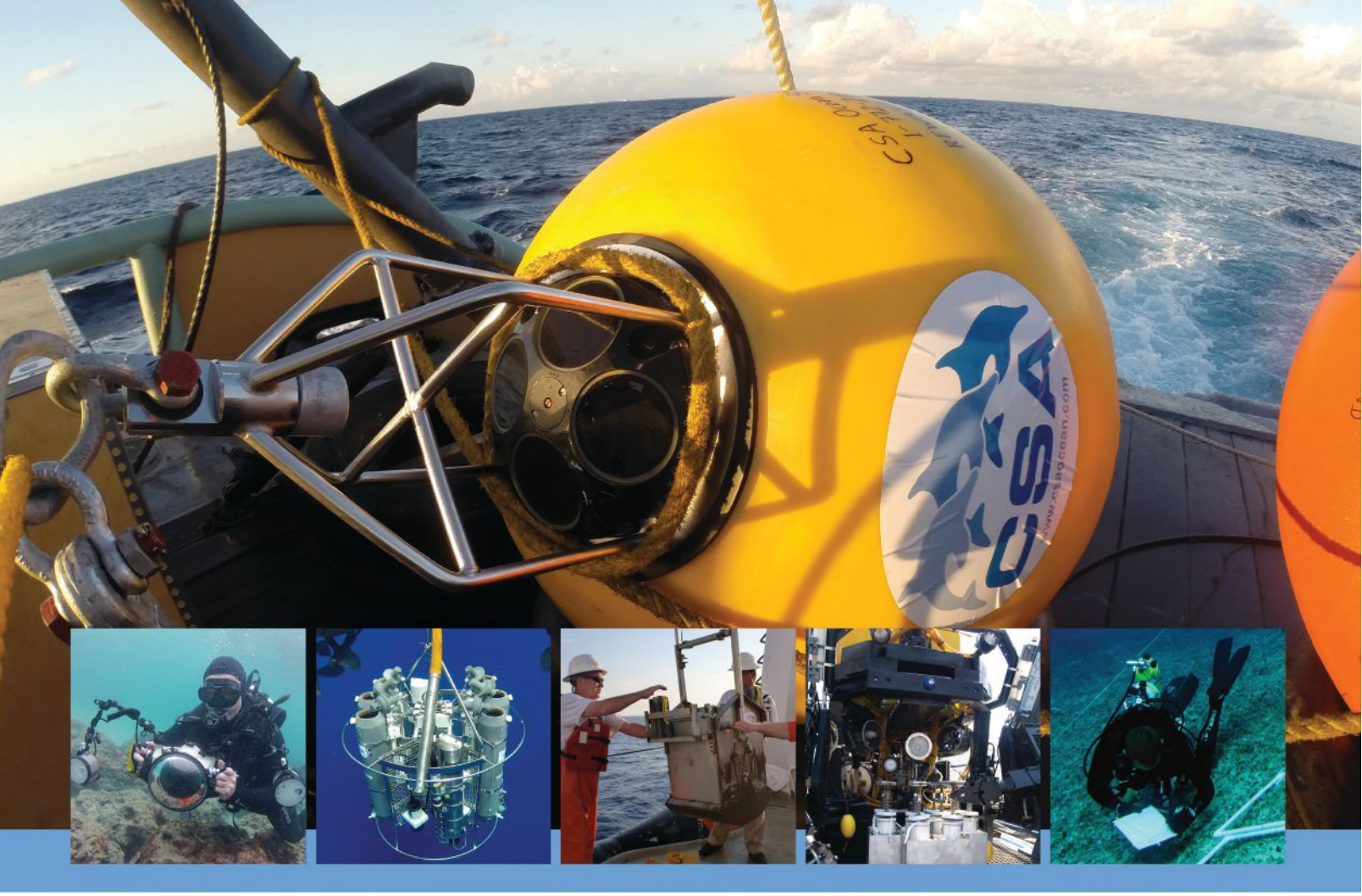

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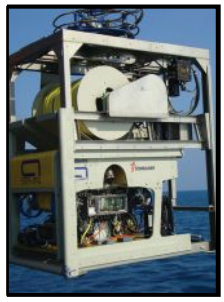

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UHD-III recovery during sea trials off California Coast. Photo courtesy FMC Technologies.

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State of the ROV Industry

By Tyler Schilling, President, FMC Technologies Schilling Robotics

One year has passed since oil prices tumbled, adding to the pressures that were already becoming apparent from the numerous deepwater development projects that were significantly over budget. The result has been an almost unprecedented belt-tightening exercise from the E&P companies throughout the entire supply chain. Such a reaction is unfortunately unavoidable, especially when costs spiral up at the same time as revenue spirals down. This perfect storm of events has certainly resulted in a challenging set of circumstances for all of us to manage; however, it has also caused us to revisit the basics of business and establish how to ensure the E&P companies can develop their deepwater assets profitably.

The focus on establishing and accepting standardized subsea production system hardware has received unprecedented focus during the last 12 months. In a global market that may see 400 to 500 subsea trees being installed in any given year as "busy times," we clearly work in an environment where the volumes of subsea products are so low that adopting standardization is paramount to reducing the crippling costs associated with customization. For many of us who have lived through three or more decades of this industry, the term "standardization" has often resulted in laughter at many business meetings but, as with every other mature industry, it has now become essential.

With a background of developing manipulator arms and remotely operated vehicles, FMC Schilling Robotics has helped tackle the many problems faced by the industry resulting from customization. ROVs have been the industry's "adjustable wrench," with a host of unique tools being developed to help install, maintain, and repair the vast assortment of resident subsea devices. The future, however, is likely to look very different. As we quickly venture into the new era of highly standardized subsea field equipment, ROVs will need to adapt and become more efficient at installing, maintaining, and repairing these devices. Unsurprisingly, this evolution has transpired in all other mature industries, and it is a very positive reflection of progress within the O&G industry that we have reached this point quite rapidly.

While it is difficult to draw direct parallels with other industries due to differences in volume, the requirements of the O&G industry for reliability, quality, and productivity are no different. In every factory these days, management has precise control of their operations through highly automated machines and data systems for gathering and processing information from every step of the process. This results in real-time information that allows plant managers to optimize production and distribution as the input parameters to the business change daily or even hourly. Data-driven businesses enable tremendous efficiencies to be achieved, and we see the benefit of this in our everyday lives.

It has always surprised me that the ROV industry has predominantly relied on one item of data: uptime. In essence, does the ROV work or not work? Arguably, it is impressive that in such a challenging environment, our industry should be very proud of achieving uptime statistics commonly reported in the 99% range. However, we are now in an era where additional data must be gathered to understand the true productivity of these machines. The time taken to perform any one of the hundreds of tasks performed by ROVs should be consistent and not subject to dramatic variation. The most common example that we all encounter is the task of inserting a hot stab in a subsea receptacle. This one task can take a few minutes or over an hour, the variation in time being a factor of the ROV performance and ROV pilot performance. Tasks such as this will be optimized through automation and will be routinely performed within a few minutes every single time. There is no reason for this not to be the case, especially as we will see a far greater level of standardization being adopted in the resident subsea hardware with which ROVs must interface.

While the present market environment presents the usual challenges faced with a downturn in this industry, the future may be brighter than ever. Market supply and demand will resolve, and the cost structure for field development will be optimized through standardization. With regard to the evolution of the ROV market, we are faced with an opportunity to enhance productivity and help dramatically increase the efficiency of ROV intervention. As with every other modern day industry, this will be driven by adopting automation as a standard and delivering performance data that enables management to make effective business decisions. Personally, I am excited about the pace at which such advancements will now be made and seeing the industry where I have invested 30 years mature rapidly from both a technological and financial standpoint.

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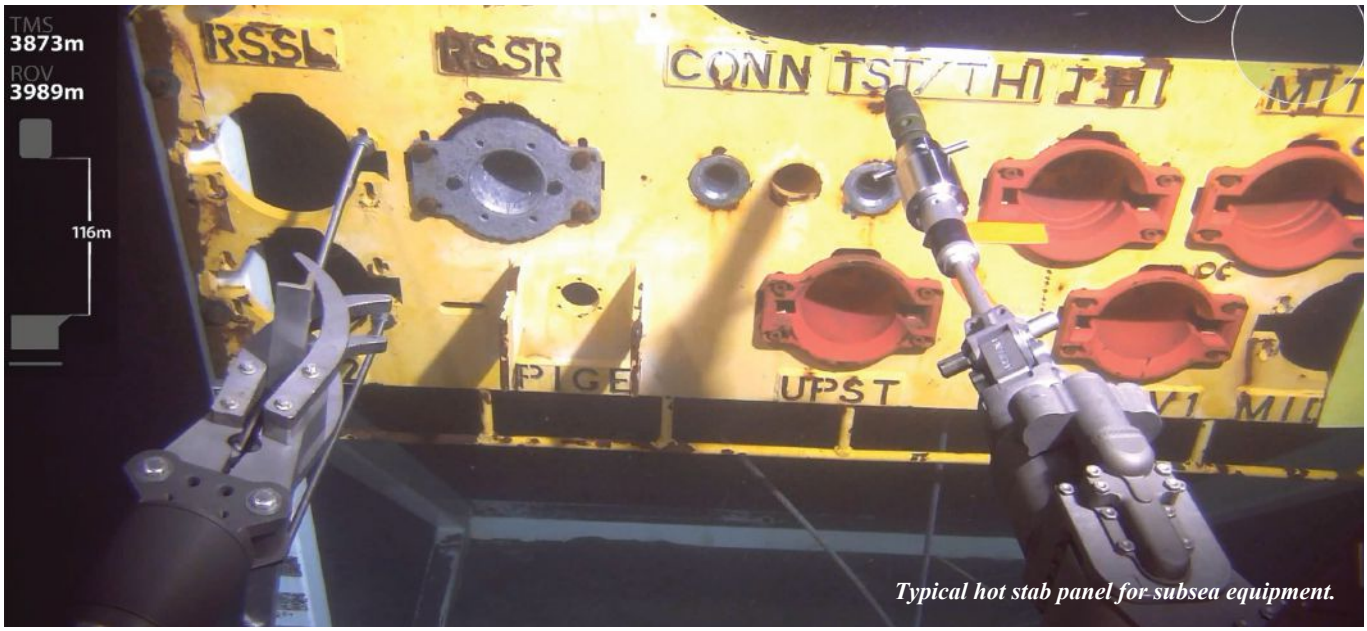
INCREASING PRODUCTIVITY, DECREASING COMPLEXITY

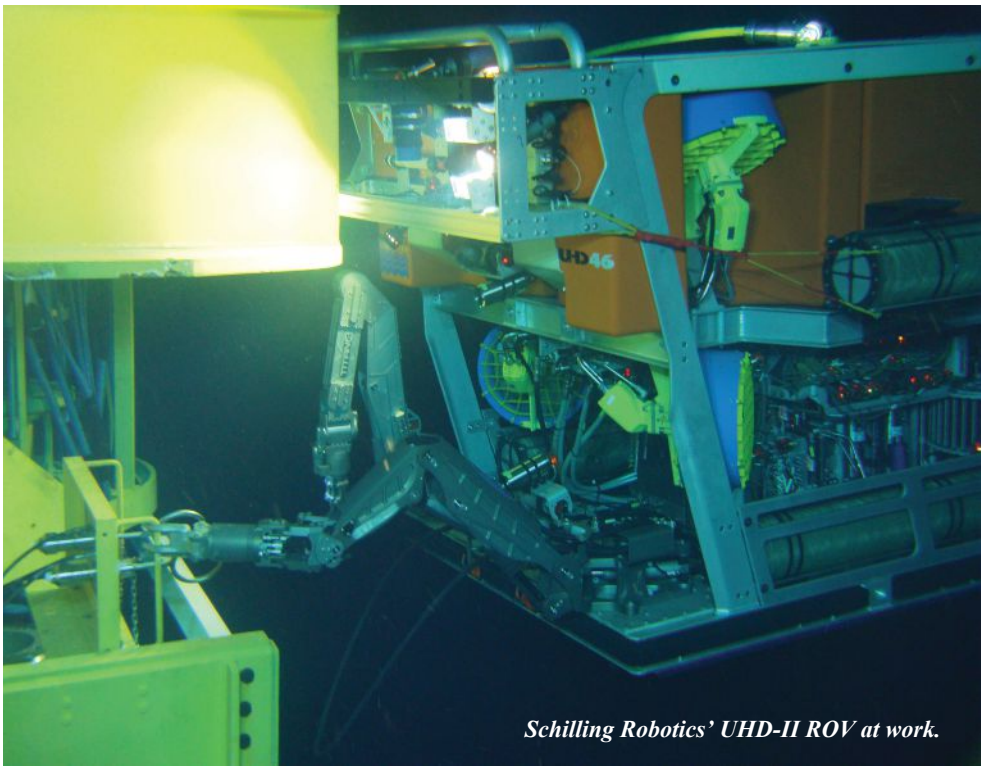
By: Peter MacInnes, Vice President of Sales and Marketing, FMC Technologies Schilling Robotics

Work-class remotely operated vehicle (ROV) systems routinely perform hundreds or even thousands of intervention operations around the world every day. The vast majority of these tasks require the use of the ROV's manipulators to interface some form of intervention tooling, such as a hot stab or torque tool, with a subsea intervention panel. The art of precisely controlling both the ROV and manipulator arm requires careful coordination between the ROV pilot and manipulator operator (co-pilot). In recent years, the task of piloting the vehicle has advanced with the development of station-keeping technology; however, the control of the manipulator has always required a very high degree of skill to articulate all six degrees of freedom to accurately position the tooling deployed by the manipulator. Schilling Robotics is developing software tools that aid the subsea manipulator operator while accomplishing specific common tasks quickly and efficiently as well as with improved safety and a lower risk of equipment damage. This article describes the development and deployment of operator-assisted capabilities for common subsea tasks that currently require a high level of operator skill and often take significant time to execute.



Typical hot stab panel for subsea equipment.

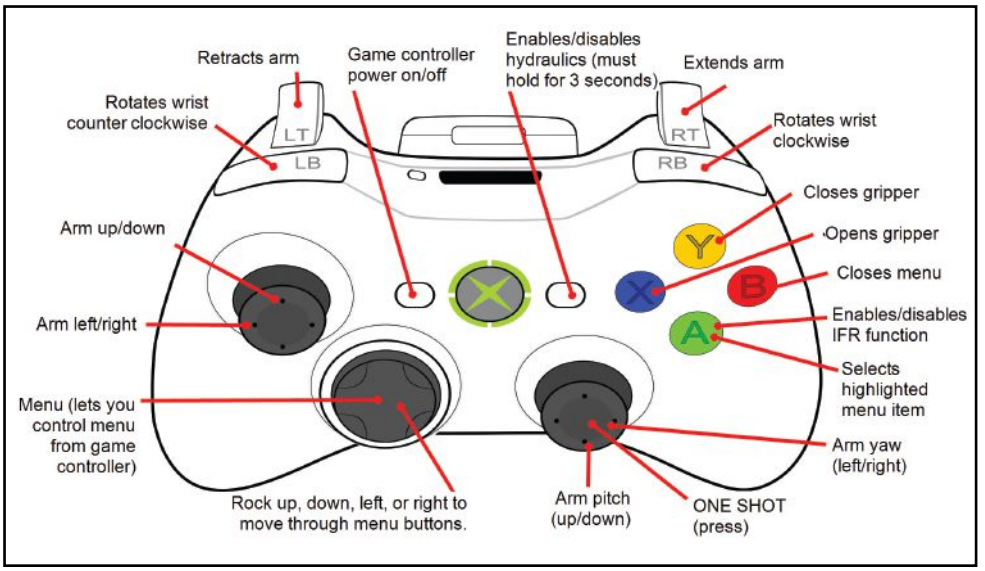
Over the last three years, FMC Technologies Schilling Robotics has endeavored to simplify the control of the manipulator so that the operator can focus on completing the tooling intervention task more efficiently. To achieve this, the method of controlling the manipulator had to become much more intuitive. As with other modern machine-based tasks, fully automated control would be the most efficient outcome possible, but the application of this is limited to highly repeatable tasks in a controlled environment. Subsea intervention presents a wide range of environmental and situational challenges that require the operator to make cognitive decisions that address the unique elements of each task. Providing the manipulator operator with a more efficient control solution that enables them to easily focus on interfacing the tool with the target is therefore key to enhancing the efficiency of such operations.



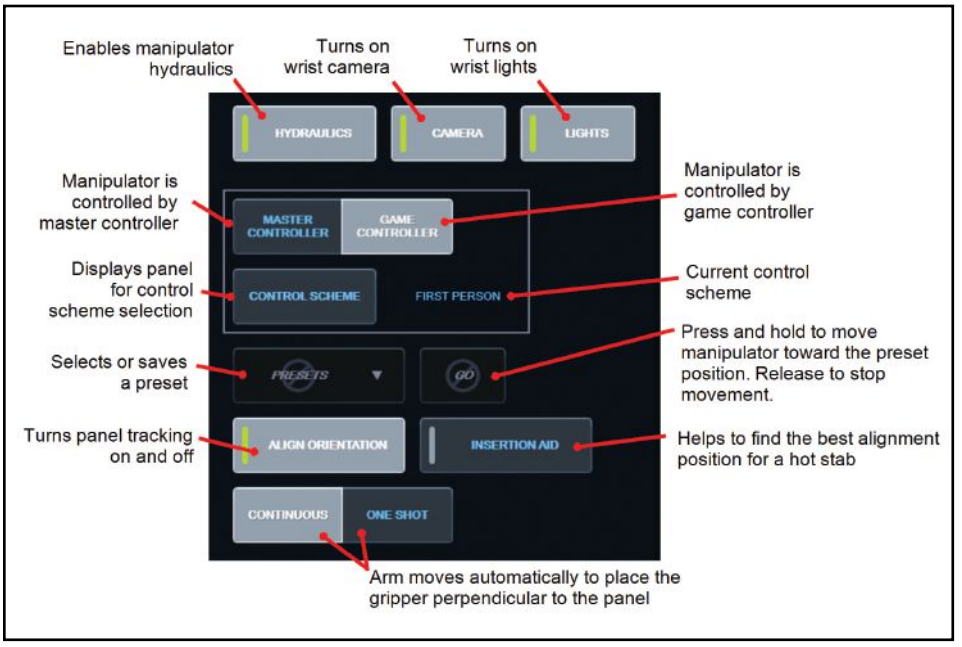
Schilling Robotics' UHD-II ROV at work.

Development efforts focused on enhancing the operation of the TITAN 4 manipulator, which has become the

industry standard for performing subsea intervention. Instead of controlling each individual joint on the arm, the concept of Cartesian control was applied, resulting in an intent-based control solution, or essentially tool dynamic positioning. Software development now enables users to move the arm in Cartesian space along the X, Y, and Z axes at the tip of the intervention tool. Using a simple game console controller, the operator is responsible for translation of the TITAN 4, while the onboard control system maintains alignment with the intervention panel. Reducing the degrees of freedom that have to be controlled by the operator and allowing the user to focus on intuitive three degrees of freedom spatial control environment results in dramatic efficiency improvements. During automatic alignment, a machine vision system uses images from on-board cameras to determine the orientation of the panel relative to the ROV. Manipulator control is then shared between the operator and the on-board computer control system; while the operator manually controls the manipulator tip position, the manipulator control system maintains a perpendicular orientation with the panel, leaving the operator free to execute the required task (such as inserting a hot stab) without having to simultaneously maintain alignment, which improves operator precision and reduces execution time. These options include:



Tool Dynamic Positioning controller functionality.



Schilling Robotics' Hammerhead Pilot Console user interface.

- First person: Manipulator movement is relative to the manipulator wrist camera (called "camera frame"). This works best if you are driving the tool by looking at wrist camera video.
- Third person: Manipulator movement is relative to the ROV frame. (For example, "forward" moves the gripper forward relative to the ROV frame.)
- Hybrid joint: Moves shoulder, elbow, and pitch together in combination for up/down and left/right movements. Best for gross manipulator motions.

Providing this level of flexibility allows users to adapt to specific situations and apply the most appropriate control solution.

The fully integrated Cartesian Control solution has been embedded into the UHD-III Hammerhead control system to provide a highly integrated user experience, similar to what would be experienced with any modern industrial machine. This results not only in the best system performance of the machine itself, but it also results in the best user experience and enhances the skills of every pilot. Although extensive testing has been conducted both onshore and offshore, the final version will be utilized offshore on customer projects during the remainder of 2015 to fully qualify the system.

Further advancements to the system will include integration with Schilling Robotics' high-definition video system and vision recognition software. These vision-based features will further enhance ROV system productivity by reducing the time needed to perform any intervention task.

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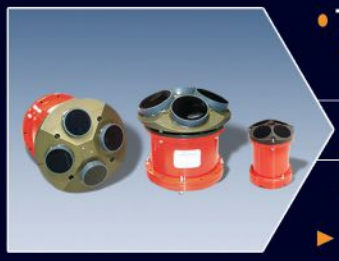

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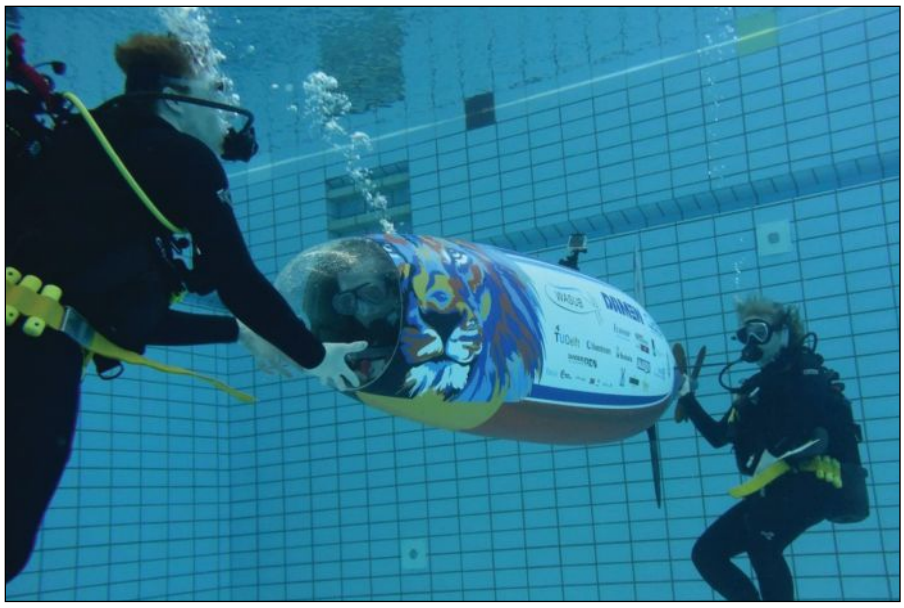
WASUB V team reaches new human-powered submarine world speed record



The WASUB team of the Delft University of Technology now holds the world speed record for human-powered, one-person, propeller-driven submarines. The final clocked speed of 7.42 kts was the highest in all categories including two-person submarines during the International Submarine Races (ISR) held 22-26 June 2015 at the Naval Surface Warfare Center near Bethesda, Maryland.

Damen is proud to be one of the main sponsors. "They have the absolute speed record. Damen congratulates the WASUB TU Delft team on being the fastest in all classes. An outstanding achievement," comments research coordinator Damen Schelde Naval Shipbuilding Joep Broekhuijsen.

A team of 20 students from Delft University of Technology designed, built and tested a man-powered submarine, the WASUB V. After a year of hard work, it was time to participate in the race. During ISR, the WASUB V shot across the 900 m long David Taylor Basin at a tremendous speed and won first place.

Team manager WASUB V Ruben de Nie, explains: "Best we could have done. We had the right ingredients and it all came together at the right moment." Over the relationship between the team and Damen, he states: "By sharing our team's innovative knowledge with Damen we can help tackle problems and co-create solutions."

The 2015 first place award for innovation was given to Team "Godiva" from Warwick University, UK, in recognition of their unique "biodegradable" hull design that incorporates a flax fiber with pine resin matrix, their rotor asymmetric chain ring, their overall "fold away" design for the hull and chassis that accommodates flexible packaging resulting in reduced shipping costs, and their extensive and effective use of 3-D printing to manufacture numerous key components.

Teams receiving honorable mention certificates are Team "Taniwha" frorn Auckland, New Zealand, for their creative water trim system; Team "Umptysquatch" from Sussex County, New Jersey, for their "squid drive" which had various degrees of success; Team "Archimede" from Montreal, Canada, for their use of virtual reality-based training methodology; and Team "Nautilus" from southern Maryland for their use of a Fibonacci screw as part of their propulsion design.

For more information, visit www.isrsubrace.org.

Woods Hole Oceanographic Institution names Mark Abbott president and director

The Board of Trustees of the Woods Hole Oceanographic Institution (WHOI) announces that Dr. Mark Abbott has accepted the position of president and director of the institution. Abbott becomes the tenth director in WHOI's 85-year history. Abbott will assume the office 1 October 2015, succeeding Susan Avery, who served from 2008 to 2015. A biological oceanographer whose research focuses on the interaction of biological and physical processes in the upper ocean, Abbott joins WHOI from Oregon State University where he served as dean and professor in the College of Earth, Ocean, and Atmospheric Sciences. Over a career spanning 35 years, Abbott has served on numerous professional committees for federal science funding agencies, scientific societies and laboratories, and has advised the Office of Naval Research and the National Science Foundation (NSF) on ocean information infrastructure. Abbott was selected after a 6-month search, which was overseen by a search committee that included five members of the WHOI Board of Trustees and five members of the WHOI scientific and engineering staff. Abbott served a 6-year term on the National Science Board, which oversees the National Science Foundation and provides scientific advice to the White House and to Congress. He is vice chair of the Oregon Global Warming Commission, which is leading the state's efforts in mitigation and adaptation strategies in response to climate change. In 2011, Abbott was the recipient of the Jim Gray eScience Award, presented by Microsoft Research and presented to a nationally recognized researcher who has made outstanding contributions to data-intensive computing.

Photo courtesy of Oregon State University.

NOAA announces more than $25M in grants to improve fishing opportunities, observations, resiliency and sustainability

NOAA is announcing more than $25 million in recommended funding for 88 projects under the 2014-2015 Saltonstall-Kennedy Grant Program. This is the most significant amount of funding ever granted by NOAA under this decades-old program.

"NOAA is committed to helping communities become more resilient environmentally as well as economically," said NOAA administrator Kathryn Sullivan, Ph.D. "These awards will create jobs, increase economic opportunities for fishing communities, improve the kinds of data and observations we collect about the health of our nation's fisheries and oceans, and make sound investments in mitigating future risk."

This year's recommended projects fall into four broad categories: Maximizing fishing opportunities and jobs; Improving key fisheries observations; Increasing the quality and quantity of domestic seafood; and Improving fishery information from U.S. territories.

"With projects in every region of the country and in U.S. territories, these grants underscore that communities have different goals and needs across the country and they all have something significant to bring to the table as far as their approach to research and project development," said Eileen Sobeck, assistant NOAA administrator for fisheries. "The grants we are recommending touch every aspect of marine research including socioeconomics, fishing gear and bycatch, aquaculture, fisheries management and the effects of climate."

Established in 1954, the Saltonstall-Kennedy grants program is designed to address the needs of fishing communities, optimize economic benefits by building and maintaining sustainable fisheries, and increase other opportunities to keep working waterfronts viable.

As in past years, the competition for funding was robust. The agency received 279 applications from state and local governments, the private sector, non-governmental organizations, and academia, totaling more than $76 million in requests. Proposals underwent extensive and rigorous technical review, both within the agency and by an external constituent panel, before final agency review, resulting in the list of recommended projects.

"These grants once again underscore NOAA Fisheries' commitment to addressing the needs of our fishing communities," said Sobeck.

At this point in the selection process, the application approval and funds obligation is not final. Divisions of NOAA and the Department of Commerce, NOAA's parent agency, must still give final approval for the projects, and successful applicants will receive funding in the near future.

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

Centuries-old shipwreck discovered off North Carolina

Scanning sonar from a scientific expedition has revealed the remains of a previously unknown shipwreck more than a mile deep off the North Carolina coast. Artifacts on the wreck indicate it might date to the American Revolution.

Marine scientists from Duke University, North Carolina State University and the University of Oregon discovered the wreck on 12 July during a research expedition aboard the Woods Hole Oceanographic Institution (WHOI) research ship Atlantis.

They spotted the wreck while using WHOI's AUV Sentry and the manned submersible Alvin. The team had been searching for a mooring that was deployed on a previous research trip in the area in 2012.

Among the artifacts discovered amid the shipwreck's broken remains are an iron chain, a pile of wooden ship timbers, red bricks (possibly from the ship cook's hearth), glass bottles, an unglazed pottery jug, a metal compass, and another navigational instrument that might be an octant or sextant.

The wreck appears to date back to the late 18th or early 19th century, a time when a young United States was expanding its trade with the rest of the world by sea.

"This is an exciting find and a vivid reminder that even with major advances in our ability to access and explore the ocean, the deep sea holds its secrets close," said expedition leader Cindy Van Dover, director of the Duke University Marine Laboratory.

"I have led four previous expeditions to this site, each aided by submersible research technology to explore the sea floor–including a 2012 expedition where we used Sentry to saturate adjacent areas with sonar and photo images," Van Dover said. "It's ironic to think we were exploring within 100 m of the wreck site without an inkling it was there."

"This discovery underscores that new technologies we're developing to explore the deep-sea floor yield not only vital information about the oceans, but also about our history," said David Eggleston, director of the Center for Marine Sciences and Technology (CMAST) at NC State and one of the principal investigators of the science project.

After discovering the shipwreck, Van Dover and Eggleston alerted NOAA's Marine Heritage Program of their find. The NOAA program will now attempt to date and identify the lost ship.

Bruce Terrell, chief archaeologist at the Marine Heritage Program, says it should be possible to determine a date and country of origin for the wrecked ship by examining the ceramics, bottles and other artifacts.

"Lying more than a mile down in near-freezing temperatures, the site is undisturbed and well preserved," Terrell said. "Careful archaeological study in the future could definitely tell us more."

James Delgado, director of the Marine Heritage Program, notes that the wreck rests along the path of the Gulf Stream, which mariners have used for centuries as a maritime highway to North American ports, the Caribbean, the Gulf of Mexico and South America

"The find is exciting, but not unexpected," he said. "Violent storms sent down large numbers of vessels off the Carolina coasts, but few have been located because of the difficulties of depth and working in an offshore environment."

Bob Waters of WHOI piloted Alvin to the site of the newly discovered shipwreck after Sentry's sonar-scanning system detected a dark line and a diffuse, dark area which they thought could be the missing scientific mooring. Bernie Ball of Duke and Austin Todd of NC State were aboard Alvin as science observers.

The expedition has been focused on exploring the ecology of deep-sea methane seeps along the East Coast. Van Dover is a specialist in the ecology of deep-sea ecosystems that are powered by chemistry rather than sunlight, and Eggleston studies the ecology of organisms that live on the seafloor.

For more information, visit www.today.duke.edu.

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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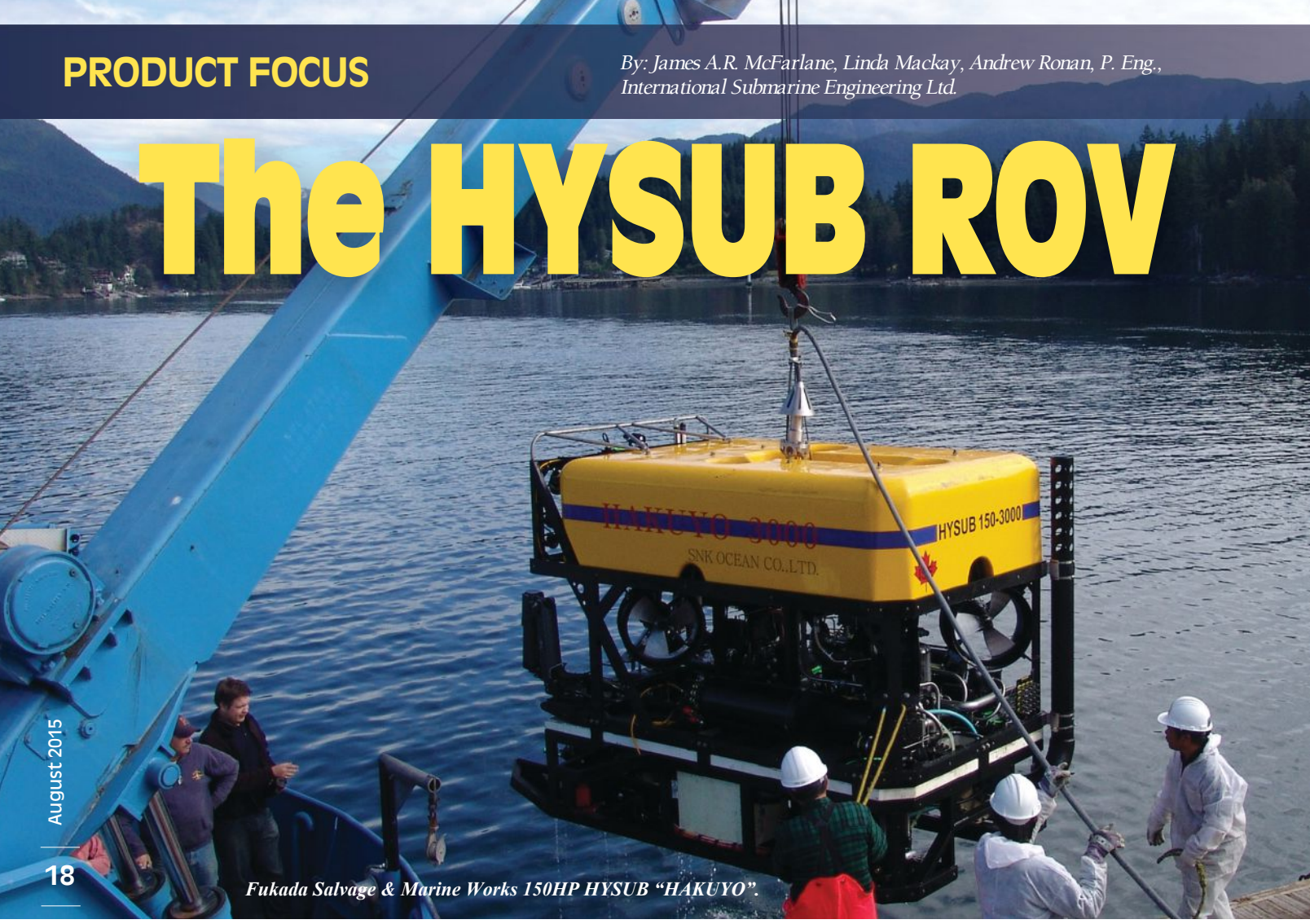
We put you first.
And keep you ahead.

By: James A.R. McFarlane, Linda Mackay, Andrew Ronan, P. Eng.,
International Submarine Engineering Ltd.

The HYSUB ROV



Fukada Salvage & Marine Works 150HP HYSUB "HAKUYO".

The HYSUB (HYdraulic SUBmersible) ROV is no stranger to diverse, global subsea markets that include, among other things, oil and gas, military, science, and survey. ISE ROVs are based on a modular design allowing customers the capability of modifying their systems to meet changing mission requirements. The HYSUB ROV design and functionality has evolved over time based on feedback from ISE's customers and ongoing internal product development. This scalability and adaptive controls methodology has put the ISE HYSUB at the forefront of science/work class category of ROVs.

This month, ISE delivered a custom 50-HP HYSUB ROV to Fukada Salvage & Marine Works, Japan—a custom build that was completed in 4 months. Fukada and ISE have enjoyed an ongoing relationship for over 20 years, with ROV and AUV systems being delivered to them and their customers. The Fukada HYSUBs are named HAKUYO and range from 50 to 150 HP. Today, Fukada operates three ISE ROVs and an ISE Explorer AUV, providing commercial and science operations to a diverse customer base.

The combination of ROVs and AUVs provide Fukada with broad capabilities in the subsea market place. The Explorer AUV allows them to survey broad areas in high resolution, thus identifying targets of value. These survey capabilities are needed for the oil and gas industry, accident location identification, and deep ocean mining operations to name a few. Once specific targets are located, the ROV systems provide the platform for more detailed investigations and sampling operations. As an example, there is currently great interest in the exploitation of seafloor massive sulfides (SMS) mineral deposits. Once the Explorer AUV locates the SMS deposits, the HYSUB ROV will perform high-resolution video imaging quantifying the size of the deposit. Samples are also collected with the ROV either by manipulator or custom rock coring tool sleds mounted to the bottom of the vehicle. Since the AUV can operate in an unsupervised manner, the ship can operate both vehicles simultaneously thus reducing operational costs as a second support vessel is not required.

Science/Work Class Hybrid Design

HYSUB is an electro-hydraulic ROV system composed of components that are selected for functionality and ease of procurement. The electro-hydraulic HPU is sized to allow operators the capacity of adding additional hydraulic sub-systems as required. ISE manufactures HYSUBs from 5 to 250 HP and can meet any operational depth requirements the customer desires. The overall system design is configured for easy access for maintenance and modifications over the life of the system. System reliability is also a major design criteria to ensure maximum operational capacity. With over 40 years of ROV development, ISE has created mature, robust and reliable technology that can be found in all ISE products.

The HYSUB 50-3000 system is a platform that can quickly be modified to meet mission-specific requirements using interchangeable tool sleds. The core vehicle is designed with two fore and aft, two lateral, and two vertical thrusters in a non-vectored or traditional ROV configuration. By eliminating forward vectored thrusters, the vehicle is able to closely approach objects without disturbing the biota under investigation. Vehicles with thrusters in

a vectored configuration cannot perform this type of observation, as all horizontal thrusters are active when maneuvering the ROV. Any thruster output will cause water turbidity in front of the vehicle that will impact the environment under investigation. The ISE traditional thruster configuration is superior for performing high-resolution data collection of even the smallest "critters" in benthic and pelagic areas of operation. This is because the vehicle can be positioned without disturbing the water at the front of the ROV.

The standard HYSUB system supports six video channels, four Ethernet interfaces, and 20 serial data ports. The HYSUB provides six 250-W lighting channels; this is upgradeable for users wishing to obtain broadcast quality video for science or documentaries. The telemetry system also integrates altimeter, DVL, ADCP, sonar, depth, acoustic navigation (USBL or LBL), CTD, fluorometer, and other science packages. This extensive capability provides a solid foundation for performing oceanographic research and a very capable offshore work class ROV.

Sampling sub-systems the HYSUB can support are detritus samplers, high flow suction samplers, push cores, rock corers, basalt samplers and sediment bags. The HYSUBs are all equipped with interchangeable tool sleds that provide space for sensors, samplers and experiment packages. By having multiple tool sleds, the operator can reconfigure the ROV for different operations rapidly minimizing operational downtime. The light bars are designed to allow for flexibility in mounting lights, detritus samplers and other science equipment. Other mounting options such as swing arms are available if the operator requires expanded collection capacity.

The HYSUB supports various manipulator packages; two seven-function spatially correspondent manipulators provide the best dexterity for the operator.

Spare power conductors were provided within the umbilical on the new Fukada system to allow for the future addition of a Tether Management System or an auxiliary HPU to power additional tooling such as a dredging skid, suction pump or rock coring systems.

ISE science HYSUBs have passed the test of time showing a return on investment with system longevity. ISE science systems of note that are still in operation today are ROPOS 1986, Ventana 1987, Oceanic Explorer 1998, Hyper-Dolphin (2 units) 1999 and GMGS 2009. The number of dives and total hours of work accomplished by these systems is impressive.

Software and Control

For the new Fukada ROV, ISE provided a custom control van that houses the consoles, video displays, pilot chairs with integrated controllers, winch remote control station, the power distribution unit, boost transformers and HVAC. This control van was purpose built for the new system to the customer's specifications.

ISE's flexible software architecture is perfectly suited for systems that need room to grow. The Fukada Hysub-50 was delivered with a basic sensor package that does not support some of ISE's more advanced functionality. However, the modular architecture allows for that functionality to be activated in the future when new hardware is added.

Control Console – Fukada's 50-HP ROV.

The latest version of ISE's control software provides pilots and operators with an unprecedented level of customization. This is of critical importance with a hybrid system such as the Fukada HYSUB-50 where pilots may be called upon to carry out drastically different tasks during a single operation. When transitioning from benthic or pelagic operations, a pilot can easily reconfigure the control interface, button mapping, thruster tuning and display layout to optimize performance and comfort. The recent system also includes an updated Heads Up Display, presenting even more information to pilots while maintaining focus on the task at hand.

Simulator and Control Advances

Control options for HYSUBs now include a 6-DOF vehicle dynamics simulator that is integrated with ISE's ACE vehicle controller. HYSUB models are "auto-built" from generic vehicle data making it possible to efficiently model not only HYSUB ROVs, but also third-party vehicles. ISE's new nonlinear model-based ROV controllers make ISE ROVs well suited for mapping applications due to their exceptional smooth depth and station-keeping capability.

Fukada's 50HP ROV ready to ship together with integrated LARS.

This agility is even evident in the Launch and Recovery system design; this system was manufactured by Sound Ocean Systems in Redmond, Washington. The A-frame and winch skid are configured on a single integrated package, resulting in a small system footprint. This allows for the entire system to be loaded with two lifts, the system skid and the control van. The umbilical is terminated at the top of the ROV through a lifting latch body that allows for safe and easy launch and recovery operations. For the Fukada system, the A-frame was sized to allow the addition of a TMS in the future if required by the operator.

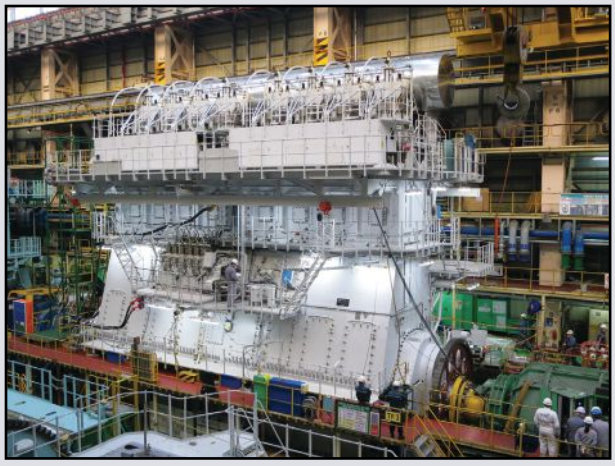
The key to vehicle development is to know what works and what doesn't—lessons learned over 40 years of experience. ISE works with our customers closely to clearly understand their mission requirements. Just like there is no one-size-fits-all aircraft or automobile, undersea vehicle design and development must consider operational needs. These interactions with customers and our extensive field experience are how the HYSUB ROV has evolved into a highly capable system.

International Submarine Engineering (ISE) was founded in 1974 by Dr. James R. McFarlane, OC, CD, P.Eng, FCAE. Since that time, ISE has manufactured over 300 underwater vehicles that include Remotely Operated Vehicles (ROVs), Autonomous Underwater Vehicles (AUVs) and Human Occupied Vehicles (HOVs). In addition to these underwater vehicles, ISE has also produced semi-submersible vehicles, Unmanned Surface Vehicles (USVs), advanced control systems and diverse robotic systems.

China ship orders drop 72.6% in first half of 2015
According to the Ministry of Industry and Information Technology, during the first 6 months of 2015, shipyards across China recorded a 72.6% decrease in new ship orders compared to the same period one year before. Chinese shipyards saw 11.9 million tons added to their orderbooks from January to June 2015. Orders for sea-going vessels totaled 4.13 million compound gross tonnage for the period - a decrease of 66.5%.

Harvey Gulf continues to grow
Harvey Gulf International Marine (HGIM) announced it is launching a new affiliate, Harvey Shipyard Group, to manage its shipbuilding assets. Harvey Shipyard Group is acquiring Gulf Coast Shipyard (Gulfport, Mississippi) and Trinity Yachts (New Orleans, Louisiana). HGIM Chairman and CEO Shane J. Guidry said, "These shipyard acquisitions will position Harvey Gulf as America's only builder, owner, and operator of dual-fuel (diesel/LNG) offshore supply vessels and allow us to pass along the savings of lower operating costs and environmental protection to the Marine Transportation industry." Building on Gulf Coast Shipyard's success in constructing the nation's first LNG OSVs for the offshore market and building top of the line tank and hot oil barges, HGIM and its affiliates will catapult the Gulf Coast Shipyard into a state-of-the-art builder of world-class vessels. HGIM alone is investing $350 million to construct its dual-fuel fleet. This July, HGIM will be opening its first of its kind marine fueling station at Port Fourchon, Louisiana to bring LNG as a marine fuel to the offshore and inshore industry. HGIM's $25 million Phase I construction will be capable of fueling Harvey Gulf's fleet of dual-fuel offshore supply vessels and will accommodate America's growing fleet of over-the-road vehicles operating on safe, efficient LNG. Harvey Gulf is the only American shipbuilder to meet the stringent requirements of the ABS "ENVIRO+, Green Passport Gas Fueled Ships" certification and will continue building and operating the most environmentally–friendly vessels in the Gulf of Mexico.

Wärtsilä X92 engine for mega containership
The first in a series of 'mega-class' container vessels being built for French Ship owner CMA CGM will be powered by the Wärtsilä X92, low-speed, 2-stroke engine. The vessel is to be built by Hanjin Heavy Industries & Construction (HHIC) in Subic Bay, Philippines. WinGD is the joint venture company between Wärtsilä and China State Shipbuilding Corporation (CSSC), which took over Wärtsilä's 2-stroke engine business in January 2015. The company is owned 70% by CSSC and 30% by Wärtsilä. The new vessel will have a cargo capacity of more than 20,000 TEU and will be the largest container ship in the CMA CGM fleet. The Wärtsilä X92 engine chosen to power this huge vessel is the largest of Wärtsilä's Generation X series of engines. It has a power range from 24,420 to 73,560 kW at 70 to 80 rpm. The low revolutions enable higher ship propulsion efficiency for the large and ultra large vessels the engine is designed for. The engine features low fuel consumption across the entire operating range, thanks to the application of common rail technology.



DNV-GL approves latest Kongsberg Maritime's engine room simulator

Kongsberg Maritime has received DNV-GL certification for three of its latest engine room simulator models designed to provide in-depth training on the K-Sim Engine simulator platform. The DNV GL-ST-033:2014-08 Maritime Simulator Systems certification, which is based on the on the requirements of STCW Convention, Regulation I/12, was given to the DE88 Oil Rig, DE66 Drill Ship and M42 AHTS (Anchor Handling Tug & Supply) K-Sim Engine models in June 2015.

Now commercially available to all K-Sim Engine users, the DE88 and DE66 models were originally developed together with Maersk Drilling to meet the training needs of its new generation of advanced deep-water drilling units, at Maersk's own MOSAIC training centre in Denmark. The DE88 model was designed based on the semisubmersible rig Maersk Developer and sister rigs Maersk Deliverer and Discoverer. The DE66 model was based on the 7th generation ultra-deepwater drillships Maersk Viking, Maersk Valiant, Maersk Venturer and the most recent Maersk Voyager. The models have advanced Power Management Systems and systems to train understanding and operation of redundancy in complex DP operations.

According to Maersk Training Instructor Per Larsen, the accuracy and fidelity of the engine room models are vital in order to provide full vessel, also known as Crew Resource Management (CRM), training at MOSAIC: "Take for example contamination of the fuel supply. It affects all departments on the rig. The DP operators must ensure station keeping with the power they have left and quickly evaluate if they can keep position. The crane needs to stop operation and try to get the bulk hose disconnected so the supply boat can exit the 500-m zone, whilst the drilling department needs to start securing the well and preparing for disconnection. So from an engine room perspective, everyone involved in the operation on board has to react to keep the vessel safe."

Maersk Training is also one of several global users of the M42 AHTS K-Sim Engine model, which is based on a medium speed Engine Room configuration from a modern Anchor Handling Tug & Supply vessel with 4 Krupp Mak medium speed engines and 2 x controllable pitch propellers. The main objective for the model is to cover the operation and system understanding of the vessel's configurations including the four main engines, which are geared down to two propellers, and four shaft generators with electrical transmission to switch boards and thrusters.

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

Harris Corporation and exactEarth team to provide real-time global maritime tracking solutions

Harris Corporation and exactEarth have formed a strategic alliance to offer new advanced data services that will help track maritime vessels faster and more accurately than ever before.

The automatic identification system (AIS) services will, for the first time, provide constant, real-time, global coverage — enabling customers to reliably track the location of vessels anywhere in the world. This helps improve efficiency, safety and security.

The services take advantage of exactEarth's proven and patented signal de-collision detection technology and Harris' expertise in satellite hosted payloads, advanced radio frequency communications, and satellite antenna solutions. The services are made possible by a sensor that is based on Harris' AppSTAR™ reconfigurable payload technology and hosted on the Iridium NEXT satellite constellation — which will have 66 satellites to greatly expand global maritime traffic coverage versus the eight satellites used today.

New AIS-based data products and services are expected to be available in 2017, once the Iridium NEXT satellites are on orbit. Harris becomes the exclusive provider to the U.S. government of AIS products and services produced under the alliance, including exactEarth's exactAIS product portfolio, while exactEarth serves all other global markets.

"The solution's real-time data will transform today's concept of maritime domain awareness," said Bill Gattle, vice president and general manager, National Programs, Harris Government Communications Systems. "This alliance will expand our IntelliEarth™ family of innovative solutions, which take advantage of Harris' world-class remote sensing capabilities to help customers around the globe make smarter operational and business decisions."

"We're committed to providing the best maritime intelligence solutions to our customers worldwide," said Peter Mabson, president, exactEarth. "The new capabilities that we are building through our relationship with Harris will allow us to significantly expand the range of advanced value-added services and information solutions that we can bring to the global maritime market."

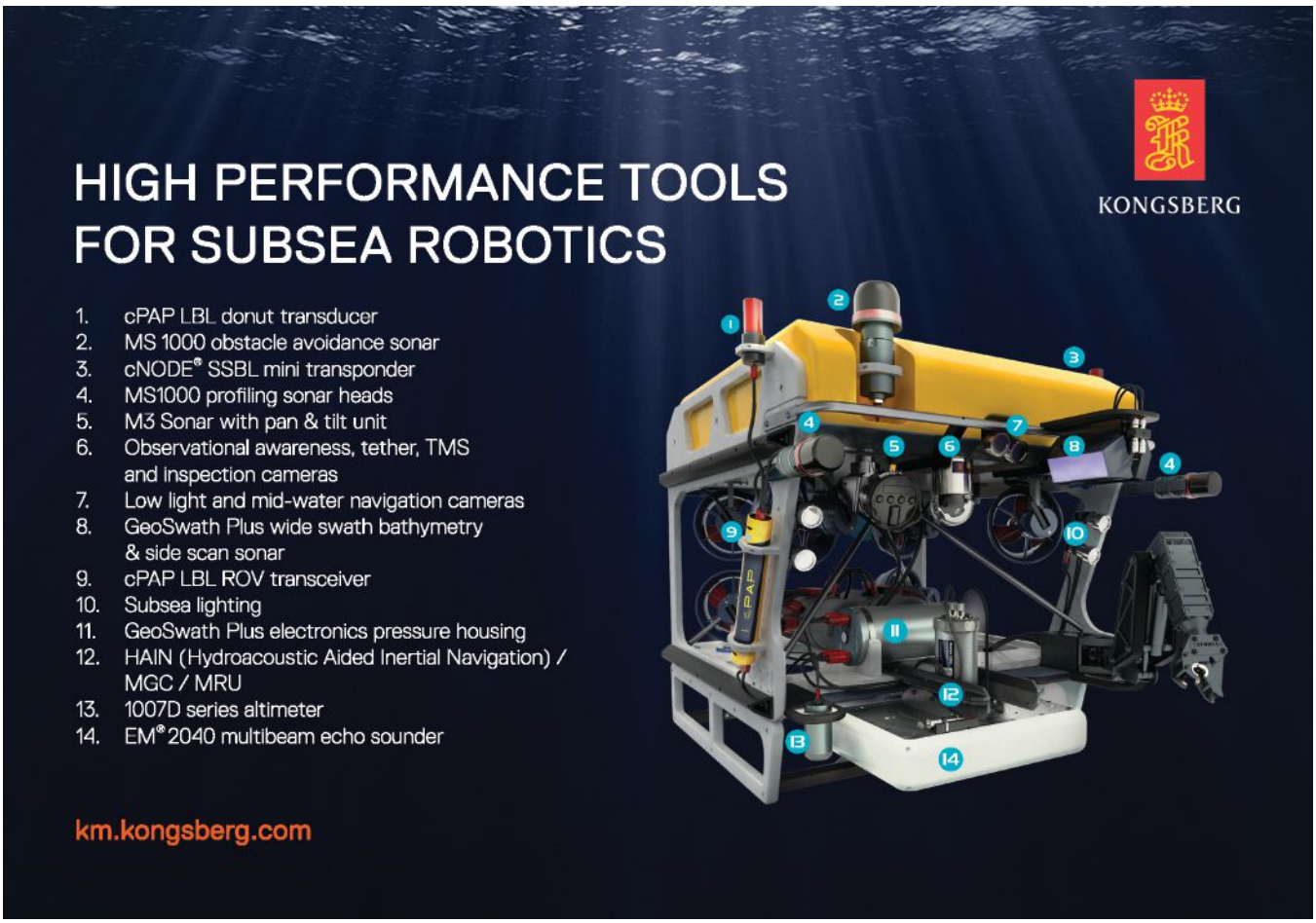
For more information, visit www.harris.com.

CTruk hands over first workboat built at new Colchester facility

CTruk Boats formally handed over the first new craft built at its River Colne production facility in Colchester when the latest MPC22 offshore wind farm service vessel (WFSV) was officially named by owner CWind at the Seawork show in Southampton.

Utilizing the unique CTruk flexible pod system that allows the vessel's payload to be reconfigured in a matter of hours, the MPC22 is based on a proven workboat design. CWind Artimus, named by Jemma Eaton, commercial director of CWind, is the first of the two latest boats being built by CTruk for CWind, augmenting a fleet of more than 20 already in service with CWind.

CTruk chief executive officer Andy White explained: "This latest vessel extends our long association with CWind. The MPC22 is a proven workhorse in the offshore wind sector and provides unique operational flexibility through our patented moveable wheelhouse and flexible deck pod system. While other operators need months to refit and reconfigure their vessels, CTruk vessels can achieve this in just eight hours.



"It allows operators to employ the boats in multiple roles, which has been a key feature in ensuring that they are in constant demand."

The MPC22's versatility can extend from transferring 12 technicians in ultimate comfort or removing its passenger pod to make use of 72 sq. m of deck space for equipment transfer, carrying cranes, transfer systems and amphibious rescue vehicles such as the CTruk Avenger.

The boat comprises a 22-m composite twin-hull with 7.6-m beam and 1.25-m draft. It has a 20 tonne flexible payload capability and the ability to carry 24,000 liters of fuel, an invaluable function in servicing round 3 zones.

The innovative boat also features the Volvo IPS system for optimal bollard pull and service speeds, significantly increasing the already renowned fuel efficiency of CTruk's composite catamarans.

For more information, visit www.ctruk.com.

Maritieme Academie Holland selects VSTEP simulators for new Inland Navigation Center

The Maritieme Academie Holland has selected VSTEP as simulator partner for their new Inland Navigation Center in Harlingen. The deal includes the purchase of a Full Mission Inland Navigation Simulator and three Inland console trainers. The simulator center will be the first to provide simulator training in full accordance with the requirements for Inland simulators by the Central Commission for the Navigation of the Rhine (CCNR).

Last month, Maritieme Academie Harlingen and ROC Nova College as partners within the academy and VSTEP signed an innovation partnership for delivery and installation of a NAUTIS Full Mission Bridge Inland Vessel Simulator, including an Instructor Station and three additional Trainee Stations at the new Inland Navigation Simulator Center currently under construction at the premises of the Maritieme Academie Holland in Harlingen.

The Maritieme Academie Holland is a renowned training academy and one of the longest-standing maritime training institutes in the Netherlands. The academy's educational curriculum includes training and education courses for professional fishermen, inland shipping personnel and seafarers. The addition of this VSTEP NAUTIS Inland Vessel Simulator to the center means students will be able to practice their skills efficiently and in a safe virtual environment.

Arjen Mintjes, director of the Maritieme Academie Harlingen, "The Maritieme Academie Holland, as one of the leading educational institutions in European inland and maritime navigation, has always been a forerunner in terms of providing state-of-the-art learning facilities for our students and clients such as Europe's most advanced inland training vessels. We are proud to have VSTEP as our partner to introduce the very first Full Mission Inland Navigation Simulator Center built entirely in accordance to the currently developed requirements for Inland Simulators by the Central Commission for the Navigation on the Rhine (CCNR). The Maritieme Academie Holland found the innovative technology and professional approach of VSTEP particularly convincing. The NAUTIS simulators are more efficient and require less hardware than simulator solutions of competitors."

Implementation, delivery and installation of the simulator will take place in Q4 2015 in different phases. Following delivery, VSTEP will provide instructor training for the inland vessel simulator to academy simulator instructors.

For more information, visit www.vstepsimulation.com.

Oranjewerf Ship Repair becomes Damen Shiprepair Oranjewerf

Oranjewerf Ship Repair, which joined Damen Shipyards Group in 1989, will officially change its name to Damen Shiprepair Oranjewerf. This name change will be the final step of integration for the yard into Damen Shiprepair & Conversion, part of the Damen Shipyards Group. This will enable Damen Shiprepair Oranjewerf to continue to deliver a high level of service to its customers.

Oranjewerf was founded in 1949 and boasts an extensive history and acquired expertise within ship repair. The collaboration between Damen Shipyards Group and Oranjewerf also has a long history, which began 26 years ago.

Damen Shiprepair & Conversion offers a network of 15 repair and conversion yards worldwide. The past 5 years has seen the names of shipyards change to integrate them into the division and Oranjewerf's new name will be official effective as of 1 July 2015.

Earlier this year Shipdock Amsterdam and Shipdock Harlingen changed their names to Damen Shiprepair Amsterdam and Damen Shiprepair Harlingen, respectively.

This has strengthened Damen's already extensive network and created a united front. "We are already collaborating with other Damen repair yards," says Mr.Otten. "We sit together every quarter and especially work closely with Damen Shiprepair Amsterdam. This collaboration is only getting better."

For more information, visit www.damenshiprepair.com.

Filtersafe introduces new line of compact filters for ballast water

Filtersafe has launched the "Compact" line of ballast water filters, a new range of self-cleaning filtration systems designed specifically for use in vessels with limited space or for retrofit installations.

The new, single screen compact filters are designed to handle flow rates of between 50 to 550 cu. m an hour using 25, 40 or 50 micron screens, with the ability to operate in vertical or horizontal configurations.

Produced with fewer parts, the service area has been significantly reduced by 40%, meaning the Compact filters

are easier to maintain and resulting in a longer service life.

IMO regulations require all ships to implement a Ballast Water Management Plan and the new filters, which are approved by the Administration, comply with expected changes to the 'International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWMS).

"The superiority of Filtersafe's technologies and its emphasis on collaborative R&D brings unrivalled value, effectiveness and durability to even the most demanding filtration needs," said Etai Dagan, CEO of Filtersafe. "Thanks to Filtersafe's growing team of experienced and talented filtration specialists, by introducing the Compact line, Filtersafe technologies will continue to be renowned for their performance and durability around the globe."

The line will also be available with 15 to 200 micron screens, meaning Filtersafe Compact can also be used in the shipping of oil and gas and other industrial applications.

For more information, visit www.filtersafe.net.

Wärtsilä Tunnel Thruster granted ground-breaking type approval certificate by Lloyd's Register

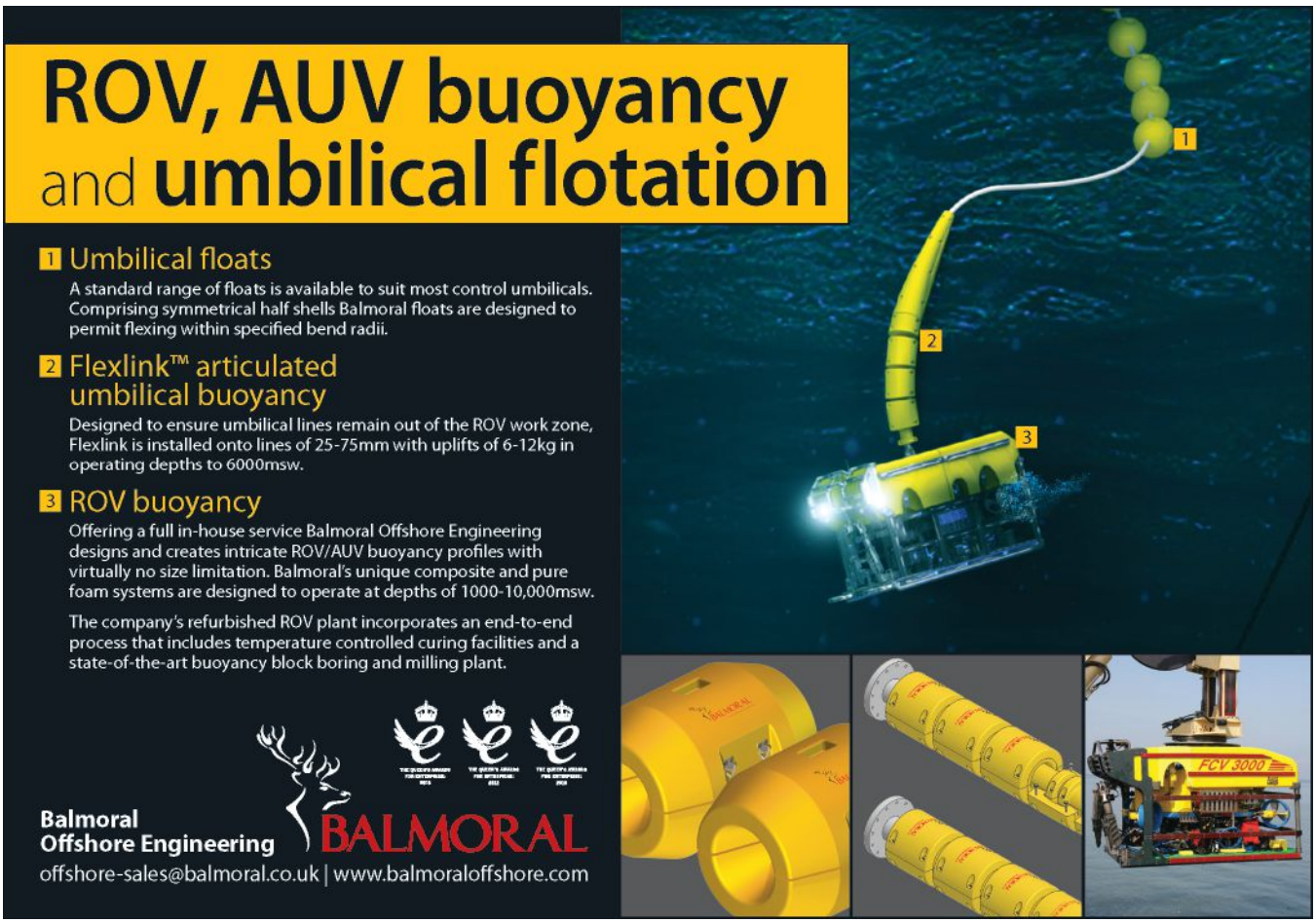
Wärtsilä has successfully passed the final step of the Lloyd's Register (LRS) classification society's Type Approval process to obtain an LR Type Approval Certificate for the Wärtsilä WTT11 tunnel thruster. Having Type Approval means that the thruster will not have to undergo a design review for each individual vessel or hull number. It is anticipated that the approval certification will deliver significant cost savings as well as considerable reductions in production time, thereby giving a shorter lead time for the customer. The approval also demonstrates that the WTT11 conforms to recognized industry quality standards and that it is in full compliance with the LR Rules.

The WTT11 belongs to the company's new generation portfolio of thruster solutions. This final step in the approval process involved a production quality assurance (factory audit) at the specific location where the thrusters are to be produced, namely the company's dedicated manufacturing facility in Wuxi, China. The Wuxi factory is now recognized as being able to produce these thrusters according to the design specification and test plans. This is the first time ever that a Chinese producer of thrusters has been part of a Type Approval Certificate by LRS.

This is also the first time that a complete tunnel thruster has been considered for an LR type approval certificate. The first step towards approval was the design review (plan approval) in which the design was assessed as to its compliance with the technical requirements (LRS rules). The design review of the WTT11 covers the entire thruster system and its options, not merely the components, and is applicable to the variants in the new portfolio of Wärtsilä thrusters.

The new Wärtsilä WTT series of thrusters covers variants up to a maximum power rating of 4,500 kW. The LR Type Approval is applicable for all WTT11 options and can be used as an example for the other variants (sizes) within the WTT series.

For more information, visit www.wartsila.com.



Governments advance new legally binding Law of the Sea agreement
The U.N. General Assembly (UNGA) adopted a formal resolution to develop a legally binding treaty for the conservation of marine biodiversity on the high seas. The new ocean regulations are proposed to include area-based management tools, such as marine planning and marine protected areas; environmental impact assessment (EIA) requirements; the transfer of marine technology; and a regime for managing marine genetic resources, including benefit-sharing. These developments have potentially significant implications for ocean economic activities, such as shipping, oil and gas, cruise tourism, fishing, marine mining, biotechnology, and submarine cable, as well as for related sectors, such as maritime law, insurance and investment. Leadership companies concerned about the effects these new ocean laws will have on high seas operations are encouraged to participate in the Ocean Governance and Policy session at the Sustainable Ocean Summit (SOS), Singapore, 9-11 November 2015. The SOS 2105 provides a unique opportunity for ocean business representatives to plan for coordinated industry engagement in the development of this new ocean treaty as it is negotiated by governments over the next few years. The UNGA resolution identifies "the need for the comprehensive global regime to better address the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction." The resolution calls for a 2-year preparatory process in 2016-2017 to develop the treaty elements. Industry involvement in this stage of defining a new ocean treaty is critical to ensuring that these new regulations are developed with full and balanced information, are based on good science and risk assessment, are practical and implementable and engender the constructive engagement of the ocean business community.

Seafood supply altered by climate change
The global supply of seafood is set to change substantially and many people will not be able to enjoy the same quantity and dishes in the future due to climate change and ocean acidification, according to UBC scientists. These findings were released in Japan by the Nereus program, an international research team led by UBC scientists and supported by the Nippon Foundation. The Nereus program was formed to study the future of the world's oceans and seafood resources. It released a summary of the first phase of its research in a report titled 'Predicting Future Ocean.' Researchers say that the future supply of seafood will be substantially altered by climate change, overfishing and other human activities. "The types of fish that we will have on our dinner table will be very different in the future," said William Cheung, UBC associate professor and the co-director of the Nereus program. "Fisheries will be catching more warm-water species, with smaller size, and that will affect fish supply through our domestic and oversea fisheries as well as imports." The report highlighted climate change, ocean acidification, overfishing and destruction of marine ecosystems as the primary drivers of ocean change. Researchers say these changes will lead to a decline in fisheries in many regions and alter marine biodiversity and food web structures. Researchers say there are solutions to help the ocean and communities prepare for the future. These include improving ocean governance globally to ensure sustainable fisheries and the need to limit carbon dioxide emissions. "Global marine ecosystems have already been largely altered by overfishing," said Daniel Pauly, professor at UBC and an advisor to Nereus. "This report clearly points out that any solution needs to deal with the CO_2 problem as well." The Nippon Foundation committed US$12.25 million in 2010 to UBC to establish NF-UBC Nereus – Predicting the Future Ocean, a 9-year interdisciplinary research project that was created to further knowledge of how best to attain sustainability for our world's oceans. In addition to the Nippon Foundation and UBC, the Program is comprised of several other partner institutions, including the University of Cambridge, Duke University, Princeton University, Stockholm University, United Nations Environment Programme-World Conservation Monitoring Centre and Utrecht University.

SAMS scientists to use robots to explore the deepest parts of the ocean

Scientists from the Oban-based Scottish Association for Marine Science (SAMS) will use custom-built robots to explore the deepest parts of the ocean in a bid to discover how life is sustained thousands of metres below the surface.

The research team led by Professor Ronnie N. Glud, who is based at the University of Southern Denmark and SAMS, will take the unique step of studying and sampling organisms in their own environment, thousands of metres below sea level. These extreme ocean regions, known as "hadal zones", occur where one plate of the Earth's geological crust is sliding underneath a neighboring plate, forming deep trenches in the seafloor.

The Hades Project requires three purpose-built robots to operate at depths of up to almost 11 km. Previous expeditions led by Professor Glud–most notably to the Mariana Trench (2013)–have revealed surprisingly high levels of biological activity at nearly 11 km deep. Now the aim is to investigate how life is sustained at these depths and how its activity affects the biogeochemical functioning of the oceans and the Earth.

Professor Glud said, "It is extremely difficult to investigate what actually happens in the extreme deep. Organisms that are removed from their natural extreme environment and studied in a laboratory will inevitably be affected–and potentially killed–by the large pressure difference during sample recovery. In on-board laboratories researchers generally only study organisms that can withstand the recovery–and they are not necessarily the ones that are most important in the deep. It is therefore important to examine the organisms and their metabolic activity in that environment."

The three trenches to be visited by the researchers are in the Pacific Ocean: the Atacama Trench off Chile (max depth 8,068 m), the Japan Trench southeast of Japan (max depth 9,504 m), and the Kermadec Trench north of New Zealand (max depth 10,047 m).

The team believes it is necessary to investigate more of the unexplored trenches and their specialized microbial communities to understand how organisms function at extreme pressures and what role they play in the global carbon cycle. The three trenches have been selected as they are expected to receive very different amounts of organic matter (food) because of different nutrient conditions in the overlying surface waters and different physical-oceanographic conditions.

Various components for the new robots are being produced around the world before finally being assembled at University of Southern Denmark. One robot will be designed to quantify the oxygen uptake by the sediments (which expresses how much organic material or 'food' is turned over), and another will be designed to investigate the different processes that may be used by sediment organisms to convert the organic material (if they use, for instance, oxygen, nitrate or sulfate for respiration). The third instrument will be designed to collect sediment samples to be brought to the surface. This instrument will ensure the sampled microorganisms are fixed in situ and can be retrieved without being modfied during sample retrieval.

For more information, visit www.sams.ac.uk.

Carbon capture and storage safety investigated

A significant step has been made for potential Carbon Capture and Storage (CCS) deployment, with the publication of the results from the world's first experiment into the realistic simulation of potential environmental impact of a submarine CO_2 leakage. These results were published in a special issue of the International Journal of Greenhouse Gas Control (IJGGC) recently.

This innovative research was conducted as part of the QICS project and forms part of a wider program of UK research into CCS technology.

The research found that, for a leak of this scale, the environmental impact was limited, restricted to a small area and with a quick recovery of both the marine chemistry and biology.

This ground-breaking experiment involved the injection of 4.2 tonnes of CO_2 into to a site 11 m below the sea bed and overlying water-column 15 m in depth in Ardmucknish Bay, West Scotland. The injection took place over 37 days via a borehole drilled through the seafloor bedrock. The progress of this injection was then monitored using a combination of geochemical and geophysical sensors and observations from divers.

Scientists from the NOC were able to assess the impact of escaped CO_2 on calcifying organisms, such as sea urchins. This was achieved by monitoring levels of acidity during and after the leak.

Dr. Anna Lichtschlag, from the NOC and lead author of one of the studies published in the IJGGC special issue, said "NOC's geochemical tools enabled us to track chemical changes in marine sediment resulting from the CO_2 release. This way we were able to see that the impact was highly localized and recovered back within few weeks to its pre-injection state."

The QICS project has made a series of recommendations for enhancing the safety of CCS based on the results of this experiment. For example, CCS sites should be below dynamic bodies of water to promote the rapid dispersal of leaked CO_2.

QICS (Quantifying and Monitoring Potential Ecosystem Impacts of Geological Carbon Storage) was led by Plymouth Marine Laboratory (PML) and funded by the Natural Environment Research Council (NERC) and the Scottish and Japanese Governments. A number of UK and Japanese research institutes and universities collaborated with the experiment. The experiment was coordinated by the Scottish Association for Marine Science.

For more information, visit www.noc.ac.uk.

Deep-sea images give new view of Arctic ocean methane seeps

Working with colleagues from the Centre for Arctic Gas Hydrate, Environment and Climate (CAGE) in Norway, Dan Fornari from Woods Hole Oceanographic Institution's (WHOI) Geology & Geophysics Department collected nearly 30,000 high-definition images at known methane release sites in the Arctic Ocean north of Norway. The detailed images will provide new insights into the most remote areas of natural methane releases in the world.

Guided by the new sampling and imaging system developed by Fornari with CAGE colleagues, the research team collected seafloor sediment samples of gas hydrate—methane trapped in a solid ice-like structure stored in sediments in the ocean floor—during the 2-week expedition in May.

"We have taken so many samples all over these areas, but we were sampling blind. We needed to see what was going on down there," said expedition leader Giuliana Panieri of CAGE. "This is the first time that we have seen these methane seeps in the deep Arctic Ocean areas. The images are amazing."

Utilizing technology based on the WHOI MISO Facility's towed deep-sea camera system (TowCam), Fornari converted CAGE's multicoring system to permit real-time imaging in addition to sediment core sampling, bottom water sampling, and conductivity, temperature, and depth (CTD) data acquisition. During the cruise, the system was used to guide sampling so that the cores would be taken directly from areas where seafloor exposures of gas hydrate were observed. Images and samples were collected at seven different areas of known active seep sites between ~78-80°N in the Norwegian Arctic, including the Vestnesa Ridge, which has over 1,000 methane seeps at a depth of more than 1,000 m (3,281 ft).

For more information, visit www.whoi.edu.

Centre for Arctic Gas Hydrate, Environment and Climate.

Ocean algae will cope well in varying climates

Tiny marine algae that play a critical role in supporting life on Earth may be better equipped to deal with future climate change than previously expected, research shows.

Scientists investigated the likely future impact of changing environmental conditions on ocean phytoplankton, a microscopic plant that forms the basis of all the oceans' food chains.

Phytoplankton is important for absorbing carbon dioxide from the atmosphere, while generating much of the oxygen needed to sustain life on Earth.

The study grew phytoplankton at the high carbon dioxide levels predicted for the year 2100 and beyond. The algae was allowed to evolve through 400 generations, with some exposed to varying levels of CO_2 and some kept at constant CO_2 levels.

Researchers found that phytoplankton exposed to fluctuating CO_2 levels was better able to cope with further changes in conditions, compared with algae grown in stable CO_2 levels. The finding suggests that populations of the algae will adapt more to the varied conditions expected in future than was previously thought based on experiments at stable conditions.

Scientists found however that the algae developed in changing CO_2 conditions evolved more and were smaller than those grown in stable conditions. These factors may impact how well marine animals can feed off phytoplankton and how efficiently the algae is able to take carbon out of the atmosphere and sink to the deep ocean. Plankton in some regions of the ocean may evolve more than others under global climate change because some regions of ocean are currently more variable than others.

The studies, published in the International Society for Microbial Ecology journal and Proceedings of the Royal Society B, were supported by the Royal Society, the European Commission, and the Scottish Universities Life Sciences Alliance.

Dr. Sinead Collins, of the University of Edinburgh's School of Biological Sciences, who led both studies, said: "Predicting how populations of ocean algae will respond to changing ocean conditions is difficult, but these results suggest that populations from highly changeable environments are better placed to deal with additional environmental change than previously suspected."

For more information, visit www.ed.ac.uk.

Ocean warming leads to stronger precipitation extremes

That the temperatures on our planet are rising is clear. In particular, the increasing emissions of greenhouse gases such as carbon dioxide continue to warm the atmosphere. The effects of global warming on the hydrological cycle, however, are still not fully understood. Particularly uncertain is how the strength of extreme summertime thunderstorms have changed, and how it may change in the future. In coastal regions neighboring warm seas, the sea surface temperature can play a crucial role in the intensity of convective storms.

The Black Sea and eastern Mediterranean have warmed by about 2°C since the early 1980s. Russian and German scientists investigated what impact this warming may have had on extreme precipitation in the region.

"Our showcase example was a heavy precipitation event from July 2012 that took place in Krymsk (Russia), near the Black Sea coast, resulting in a catastrophic flash food with 172 deaths," said Edmund Meredith, lead author of the study. "We carried out a number of very high-resolution simulations with an atmospheric model to investigate the impact of rising sea surface temperatures on the formation of intense convective storms, which are often associated with extreme rainfall," Meredith continued.

Simulations of the event with observed sea surface temperatures showed an increase in precipitation intensity of over 300%, compared to comparable simulations using sea surface temperatures representative of the early 1980s. "We were able to identify a very distinct change, which demonstrates that convective precipitation responds with a strong, non-linear signal to the temperature forcing," Prof. Douglas Maraun, co-author of the study added.

At the end of June 2015, the nearby Olympic city of Sochi experienced an unusually intense precipitation event. Over 175 mm of rain was recorded in 12 hours, showing the relevance of the scientists work. "Due to ocean warming, the lower atmosphere has become more unstable over the Black Sea and eastern Mediterranean. We therefore expect that events like those in Krymsk or Sochi will become more frequent in the future," added the Kiel-based climate scientist.

For more information, visit www.geomar.de.

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Stonehenge, Cal Poly sign wave technology agreement
Stonehenge Metals Limited has entered into a Memorandum of Understanding (MOU) with the California Polytechnic University at San Luis Obispo (Cal Poly) to support joint applications for two major funding opportunities with a combined total value pool of US$3.75 million being offered by the U.S. Department of Energy (DOE). The MOU includes the previously announced funding application for US$1.5 million. This application was in response to a specific request made by the DOE to Cal Poly for "follow-on funding" to support their wave energy program. In addition, Cal Poly and wave technology experts from the CalWave team have now also agreed to work with Stonehenge and Sean Moore to submit an application for the US$2.25 million total prize pool for the DOE funded "Wave Energy Prize" competition. The DOE anticipates that the value of each wave energy prize grant award will be between US$250,000 and $US1.5 million.

CETO 5 reaches 10,000 operational hours milestone
Wave energy developer Carnegie Wave Energy Limited has reached a significant milestone in its ground breaking Perth Project, with the CETO 5 units reaching 10,000 hours of cumulative, continuous operation. The milestone was achieved last week as a result of continuous operation of the project to date. During this period the units have seen a wide range of sea states, including waves of up to 5.7 m in height. Carnegie's CEO, Dr. Michael Ottaviano, said, "Achieving 10,000 hours of continuous operation is a significant milestone not just for Carnegie but for the wave energy industry as a whole. The industry has faced a lot of challenges, especially around reliability and survivability. By demonstrating the continuous operation of our product, we're addressing these challenges. Our understanding is that this is the longest continuous period of operation any in-ocean wave energy project has ever achieved, anywhere in the world."

OPT's PB40 PowerBuoy receives final permit approvals
Ocean Power Technologies, Inc. (OPT) announced that the PB40 has received final permit approval from the New York District Army Corps of Engineers. In addition, after receiving permit approval, the company has also provided the required notice periods to the U.S. Coast Guard and other parties involved in the permitting process. The PB40 PowerBuoy® will be deployed approximately 30 nmi southeast of the New York City Harbor. Buoy operation is planned at this location, including the gathering of operating performance and wave data for up to one year, in accordance with the U.S. Bureau of Ocean Energy Management requirements. George Kirby, president and chief executive officer of OPT, commented, "I am happy to say that we remain on track to meet the deliverables that we set out earlier this year. We are excited to have achieved a fully permitted status which brings us significantly closer to deployment. We have begun the process of deploying mooring lines for the buoy and are monitoring for a suitable weather window for buoy deployment. The upcoming deployment of the PB40 will provide invaluable performance data and will continue to deepen OPT's expertise in the use of renewable marine hydrokinetic devices of various sizes in providing autonomous power for customers in the ocean observing, offshore wind, oil & gas, and security and defense markets. We believe this deployment will enhance dialogue with potential customers and partners interested in enabling and cost-effective energy solutions for their offshore energy needs." Mr. Kirby expressed his thanks to the New York District Army Corps of Engineers, U.S. Bureau of Ocean Energy Management, and the U.S. Coast Guard for their roles and diligence during the permitting process. Mr. Kirby acknowledged the role that the U.S. Department of Energy along with the European Union and consortium partners played in developing the PB40 PowerBuoy. Mr. Kirby also noted that the permitting process for the Company's APB-350 A1 deployment is well underway, and is anticipated for the summer of 2015.

Northwest Energy Innovations launches wave energy device in Hawaii

After a several months of preparation, Northwest Energy Innovations (NWEI) has successfully deployed its Azura™ wave energy device at the U.S. Navy's Wave Energy Test Site (WETS) near Kaneohe Bay, Oahu, Hawaii. The device will be deployed for 12 months of grid-connected testing as part of a rigorous program to commercialize the Azura technology.

"As the first grid connected wave energy device in the U.S. that will be tested and validated by an independent party, this deployment marks a major milestone for our team and the marine renewable energy industry," said NWEI founder and CEO Steve Kopf. "A special thanks to Sea Engineering, our deployment contractor, for their tireless efforts in completing the assembly, launch, and installation of the Azura at WETS," Kopf added.

Deployment and testing of the Azura at WETS is supported by the U.S. Department of Energy, the U.S. Navy, and the University of Hawai'i. The University of Hawaii is responsible for data collection, analysis, and reporting as a means of independently validating the technology performance. The data will also be delivered to the U.S Department of Energy and the U.S. Navy for their use in ongoing efforts to validate wave energy technology and advance the marine renewable energy industry.

In addition to evaluating system performance in the open ocean over an extended period of time, data collected during the deployment will enable NWEI to develop a more accurate assessment of the technology's Levelized Cost of Energy (LCOE), which accounts for capital cost, project development cost, life cycle costs, and annual energy production. The data will also be used to validate computer simulations to support commercialization of the Azura technology.

This pilot project builds on NWEI's deployment of a prototype at the Northwest National Marine Renewable Energy Center's test site off the coast of Oregon in 2012. The 2012 deployment was also supported by the U.S. Department of Energy, and NWEI applied experience gained from that testing to refine the Azura design, with a focus on optimizing the technology's LCOE through increased power output and improved durability, maintainability, and survivability.

For more information, visit www.azurawave.com.

Van Oord signs contract for Burbo Bank Extension

Van Oord has signed a contract with DONG Energy for the installation of foundations at the Burbo Bank Extension offshore wind farm in the UK. Van Oord will install the project's 32 monopiles and transition piece foundations, supply and install the scour protection and provide the logistics between the fabrication ports in Germany, Denmark, the United Kingdom and the offshore wind farm. The installation works are planned to take place during the summer of 2016.

The Burbo Bank Extension offshore wind farm is located 8 km off the coast in Liverpool Bay, United Kingdom. With a total of 32 Vestas wind turbines of 8 MW each, the offshore wind farm will have a total capacity of 258 MW.

DONG Energy's senior project director, Klaus Skoust Moller, said, "Burbo Bank Extension is an exciting project with the potential to power over 180,000 UK homes, and it's great to sign this agreement with Van Oord for the installation of foundations. This is the last of our main contracts to be signed which reflects that the project is progressing in accordance with the plan. Offshore construction work is expected to begin in 2016, and Van Oord will play an important role in taking this forward."

For installing foundations at the Burbo Bank Extension offshore wind farm, Van Oord will use its heavy lift vessel Svanen. The installation strategy is based on the feeder concept bringing foundation components floating to the Svanen at the installation site. This method has been optimized over recent years resulting in highly efficient installation cycles. To date, Svanen has successfully installed nearly 500 offshore wind turbine foundations.

The project fits perfectly in the strategy of Van Oord, which is aimed to deliver innovative and sustainable solutions to the offshore wind industry. By optimizing logistic and installation solutions, Van Oord responds to the need for lower cost of sustainable energy and supports the further development of offshore wind energy.

For more information, visit www.vanoord.com.

World's 2nd largest offshore wind farm officially inaugurated

The Gwynt y Môr wind farm, located 8 mi offshore in Liverpool Bay, was officially inaugurated by Carwyn Jones, First Minister of Wales. With an installed capacity of 576 MW, Gwynt y Môr is the world's second largest offshore wind farm. In total, 160 wind turbines will produce enough power to supply some 400,000 residential households with renewable electricity per year. The inauguration of the more than £2 billion wind farm is a significant achievement for RWE (60%) and its partners in Gwynt y Môr, Stadtwerke München (30%) and Siemens (10%).

The inauguration was welcomed by Secretary of State for Energy & Climate Change, Amber Rudd MP, who said, "This offshore wind project will generate enough clean electricity to power hundreds of thousands of homes and will support 100 long-term, skilled engineering jobs, giving more people the financial security of a regular pay packet. Gwynt y Môr has a key role to play in our long-term plan to develop a secure energy mix in this country that is diverse and home grown. There really is

no better place in the world to invest in offshore wind. With the help of RWE's £19 million community benefit fund, the development of Gwynt y Môr offshore wind farm will make a real difference to local hard-working families as well as bringing economic and environmental benefits to the north Wales region."

The wind farm extends over an area of some 80 sq. km. The 160 Siemens turbines with a capacity of 3.6 MW each and the 160 steel monopile foundations, some weighing up to 700 tons, were installed by means of installation vessels at water depths of up to 28 m. Each turbine rises 150 m above the mean sea level. In addition, RWE and its contractors installed two massive offshore substations each weighing 1,300 tons and 134 km of onshore cable installed.

For more information, visit www.rwe.com.

AXYS joins NORCOWE

AXYS Technologies Inc. is very pleased to have joined the Norwegian Centre for Offshore Wind Energy (NORCOWE) to further the shared goal of developing innovative and cost-efficient offshore wind solutions for deep waters and harsh offshore environments. Through joining this consortium, AXYS looks forward to collaborating with the other NORCOWE partners to conduct research and development focused on reducing costs and increasing efficiencies of offshore wind development. Specific areas of common interest include R&D initiatives that will explore the use of floating LiDAR to measure turbulence intensity, test power performance, trial & validate novel measurement systems, and develop environmental baselines.

AXYS has recently deployed its market leading dual LiDAR WindSentinel buoy next to the FINO1 standard mast to perform validation studies and learn more about wind/wave interactions, microwave temperature profilers, and O&M decision support applications over the next 4 to 6 months.

For more information, visit www.axystechnologies.com.

Tocardo to generate renewable energy in Dutch Eastern Scheldt

Tocardo Tidal Turbines, producer of tidal and free-flow water turbines, will install five tidal turbines in the Eastern Scheldt storm surge barrier (Oosterschelde barrier) to generate clean energy. This installation will be both the largest tidal energy project in the Netherlands as well as the world's largest commercial tidal installation of five turbines in an array.

The Eastern Scheldt storm surge barrier is the largest of the world-renowned Delta Works series of dams and storm surge barriers, designed to protect the Netherlands from flooding from the North Sea. The location will now deliver the combination of water defences and hydroelectric power. The fast-flowing water of the Eastern Scheldt estuary makes it the ideal location in the Netherlands for generating tidal energy. The rhythmic ebb and flow of the estuary has very powerful water flows that will be used by Tocardo's turbines for safe and reliable electricity generation. The turbines will be operational this autumn and have a total capacity of 1.2 MW, which will supply electricity to 1,000 households.

"This project marks an important step in the development of tidal energy. Tidal technology is innovative and could grow into a significant Dutch export product. With our turbines in the Eastern Scheldt storm surge barrier, we can now show the world what tidal energy is all about, namely providing a clean and reliable source of energy that could fulfil 10% to 20% of the world's electricity needs," says Tocardo CEO Hans van Breugel.

For this project, Tocardo is working with co-shareholder Huisman, the designers of the turbines' suspension structure. Strukton has also been actively involved in the project planning from the outset and will be responsible for project management during installation. Another partner in the installation project is Mammoet, while Zeeland companies Istimewa Elektrotechniek, Van der Straaten and Hillebrand also play an important role in terms of the electrotechnical installation and steel structures. Together with these partners, Tocardo has future plans to increase the number of turbines.

For more information, visit www.tocardo.com.

Fukushima floating wind farm project reaches second phase

A consortium composed of Marubeni (project integrator), the University of Tokyo (technical advisor), Mitsubishi, Mitsubishi Heavy Industries, Japan Marine United, Mitsui Engineering & Shipbuilding, Nippon Steel & Sumitomo Metal, Hitachi, Furukawa Electric, Shimizu, and Mizuho Information & Research has been participating in an experimental offshore floating wind farm project sponsored by the Ministry of Economy, Trade and Industry since March 2012. Assembly works of the 7-MW oil pressure drive-type wind turbine, which is the world's largest scale one, on the three-column semi-sub floater at Onahama port has been successfully completed and delivery of the floater to testing area is going to start shortly as part of the second phase.

The second phase of the project will include the assembly and setting of 7-MW oil pressure drive-type and 5-MW downwind-type floating wind turbines, delivery of the facilities to the testing area, and connection to the undersea cable, the operation & maintenance of the facilities and the data acquisition and analysis.

So far, the installation of chains, anchors and undersea cables at the testing area has been successfully completed as have the delivery of the three-column semi-sub floater from Nagasaki to Onahama port and the installation of the 7MW oil pressure drive-type floating wind turbine on the floater at Onahama port.

The procurement of chains and anchors, and production of high-voltage riser cable also have been completed and parts procurement and construction of 5 MW downwind-type floating wind turbine is in progress.

For more information, visit www.mhi.co.jp.

Seanamic Integrated Subsea Intervention Systems

With growing demand for deepwater well intervention, the offshore services industry is grappling with the competing demands of ever more challenging projects against a background of tighter budgets. The industry is ripe for innovation. Leaner, more integrated intervention systems that 'raise the bar' for subsea intervention performance and cost-of-ownership, are now offered by the Seanamic Group.

Specializing in surface to seabed systems, the Seanamic Group is headed by former Wellstream International Plc CEO, Alasdair MacDonald. "The technical challenges of deepwater intervention are well documented, not least of which is the cost of rigs and vessels to undertake this work. With budgets under scrutiny as never before, we anticipate significant market demand for integrated, lightweight portable systems, which will support deepwater fields facing increasingly complex issues—as opposed to one-off solutions. Our aim is to provide operators and contractors with these integrated systems."

Umbilicals International - dynamic thermoplastic subsea umbilicals and cables.

Surface to Seabed

The Seanamic Group comprises Houston-based, Umbilicals International (UI) and Scotland-based Caley Ocean Systems with further companies to join in due course. Formally HL Technologies, UI designs and manufactures custom dynamic thermoplastic subsea umbilicals and cables for harsh environments. Caley Ocean Systems has over 40 years offshore handling systems experience that includes deepwater lowering and IWOCS deployment systems, saturation diving and A-frame ROV and manned submersible LARS. Flexible, modular, high performance offshore handling systems are its trademark.

"There is a critical mass of maturing subsea wells and architecture in place, that is set to drive an increasing demand for well intervention services," notes Gregor McPherson, sales director at Caley. "Portability, rapid mobilization and the ability to use vessels of opportunity have been the guiding principle of Caley handling systems for a number of years."

Caley Ocean Systems – IWOCS deployment systems for deepwater intervention.

According to MacDonald, setting the standard for surface to seabed systems is about offering a leaner, more integrated subsea intervention system. "Many companies talk about offering integrated systems but only at a fairly superficial level. Our aim is to drill down into the engineering to achieve unprecedented levels of integration that translate into industry-leading performance."

Integration and Customization

Seanamics' focus on manufacture and engineering gives it the edge. "Customization has long enabled the oil and gas industry to meet ever more demanding subsea challenges. Our proposition is that Seanamic looks at the client's requirement from the surface to seabed as a whole, defining the level of customization required for optimum performance based on our knowledge and experience," explains McPherson.

An example of Seanamic's approach is its IWOCS deployment system, combining Caley's engineering with UI's umbilical design. Colin Zak, CEO, Umbilicals International, explains. "Working together with the client, we're able to design and manufacture the umbilical and jumper so as to fully optimize the mechanical capability of the intervention deployment system and its performance subsea."

To find out more about how Seanamic can improve the performance and cost-effectiveness of surface to seabed interventions visit www.seanamic.com and email info@seanamic.com.

Navy installs C4I aboard mobile landing platform ships
Naval Surface Warfare Center Panama City Division (NSWC PCD) installed the Command, Control, Communications, Computers, and Intelligence (C4I) suite aboard the afloat forward staging base variant of the mobile landing platform USNS Lewis B. Puller (MLP 3/AFSB) following recently completed acceptance trials. The C4I installation efforts were successfully completed to support this first-purpose built afloat forward staging base (AFSB) on the mobile landing platform (MLP). It is the third of five total MLPs planned to augment amphibious assault ships. The AFSB variant of the MLP, managed by the Strategic Sealift Program Office in Program Executive Office, Ships, is based on the design of the Alaska-class oil tanker and includes a flight deck for maritime air operations. It is slated to replace the USS Ponce (AFSB 1), the U.S. Navy's interim AFSB in the Arabian Gulf.

AAI Corp. awarded $11M for Unmanned Influence Sweep System work
AAI Corp. of Hunt Valley, Maryland, is being awarded a $10,966,798 modification to previously awarded contract (N00024-14-C-6322) to exercise options for engineering services for the Unmanned Influence Sweep System (UISS) program. The UISS is one of the systems, which will allow the Littoral Combat Ship to perform its mine warfare sweep mission. UISS will target acoustic, magnetic, and magnetic/acoustic combination mine types only. The UISS Program will satisfy the U.S. Navy's need for a rapid, wide-area coverage mine clearance capability required to neutralize magnetic/acoustic influence mines. UISS seeks to provide a high area coverage rate in a small, lightweight package with minimal impact on the host platform. Work is expected to be completed by December 2016. Fiscal 2015 research and development funding in the amount of $1,300,000 will be obligated at time of award and will not expire at the end of the current fiscal year. The Naval Sea Systems Command, Washington, District of Columbia, is the contracting activity.

First female divers crew and operate a dual-mode underwater vehicle
Huntington Ingalls Industries' Undersea Solutions Group (USG) subsidiary made history in June as its two female divers became the first women to crew and drive a dual-mode underwater vehicle (DMUV). Chloe Mallet, an ocean engineer, and Andrea Raff, a mechanical engineer, crewed and operated USG's Proteus, a submersible able to operate as a manned swimmer delivery vehicle (SDV) and as an unmanned undersea vehicle (UUV). Mallet and Raff are certified as rescue divers. They have undergone extensive training with Proteus and assist with its maintenance. To prepare for operating the vehicle, the women trained in the company's test tank and supported pre- and post-dives with USG's more experienced pilots. Mallet and Raff individually took Proteus out and co-piloted it in Florida's Saint Andrews Bay with USG Vice President Ross Lindman as the pilot. Mallet and Raff are the only two women on USG's seven-person dive team that works with Proteus. When in use in the manned mode, the vehicle is flooded with water and can submerge to depths up to 150 ft. Proteus weighs 8,240 lbs and is designed to operate as a manned SDV or UUV. It can be used for integrating and testing payloads, transporting and installing equipment on the sea floor, inspecting undersea infrastructure, and transporting a team of combat swimmers and cargo.

Submarine John Warner delivered ahead of schedule

Huntington Ingalls Industries' Newport News Shipbuilding division delivered the submarine John Warner (SSN 785) to the U.S. Navy in June. The Virginia-class submarine, the first to be named for a person, was delivered 2.5 months ahead of schedule.

"This submarine embodies the spirit of Senator Warner and symbolizes his unwavering support for the Navy and the shipyard," said Jim Hughes, Newport News' vice president of submarines and fleet support. "It's truly special to have a boat named after a living person, and we as shipbuilders are proud to deliver John Warner to the Navy because this submarine will continue Senator Warner's enduring legacy."

John Warner is the 12th Virginia-class submarine and the sixth to be delivered by Newport News. Nearly 4,000 shipbuilders have worked on the submarine since construction began in 2010. The submarine was named for John Warner, who served as Secretary of the Navy and represented Virginia in the Senate for 30 years. John Warner was christened by Senator Warner's wife, Jeanne Warner, on 6 September 2014. Commissioning is scheduled for 1 August.

"We are excited to join the operational fleet and to bring Senator Warner's legacy back to the Navy, carrying on his tradition of service to our nation," said Cmdr. Dan Caldwell, the submarine's commanding officer. "The crew and the ship have performed exceptionally well during the acceptance trials, and we are prepared and excited to conduct the operational missions which await us."

Newport News is teamed with General Dynamics Electric Boat to build Virginia-class submarines, which use advanced technologies to increase firepower, maneuverability and stealth. The 377-ft-long submarines are capable of submerged speeds of more than 25 kts and can stay submerged for up to 3 months at a time.

For more information, visit www.huntingtoningalls.com.

HMS Queen Elizabeth's engines fired up

HMS Queen Elizabeth's diesel generators have been powered-up, marking a major milestone on the way to becoming an operational warship. The 65,000-ton future flagship of the Royal Navy has undergone months of preparation work by the Aircraft Carrier Alliance (ACA) to start the first of her four diesel engines, which are directly coupled to the generators. Together, each power unit weighs approximately 200 tons.

Minister of State for Defence Procurement, Philip Dunne, officially started the first of the ship's four diesel generators at the home of the UK's aircraft carrier program in Rosyth (Scotland), bringing the ship to life for the first time.

The diesel generator sets will provide sufficient electrical power to drive the ship at cruise speeds, but when higher speed is required, two Gas Turbine Alternators will also be used. Together they will produce 109 MW of power, enough to power a medium-sized town.

Following sea trials (from 2017) and First of Class Flying Trials for helicopters and the F-35B Lightning II (starting in 2018), HMS Queen Elizabeth will undertake a coherent build up towards achieving an Initial Carrier Strike Capability in 2020.

Second of class HMS Prince of Wales is now almost half complete at 30,000 tonnes, the forward island was installed in May 2015 forming the iconic carrier shape of the vessel. Initial Operating Capability of HMS Prince Of Wales is expected in 2023.

The aircraft carriers HMS Queen Elizabeth and HMS Prince Of Wales are being delivered by the Aircraft Carrier Alliance, a unique partnering relationship between BAE Systems, Thales UK, Babcock and the Ministry of Defence.

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

U.S. Navy Laser Weapon System team wins award

The Navy's Laser Weapon System (LaWS) engineering team received the 2014 Dr. Delores M. Etter Top Scientists and Engineers of the Year Award for groundbreaking research, Naval Surface Warfare Center Dahlgren Division (NSWCDD) announced 19 June.

Sean Stackley, Assistant Secretary of the Navy for Research, Development and Acquisition, presented the award to the NSWCDD team that researched, developed and installed the Laser Weapon System on board USS Ponce.

The Delores M. Etter Top Scientists and Engineers Award recognizes Navy and Marine Corps civilian and military personnel for exceptional science and engineering achievements. Etter, formerly an assistant secretary of the Navy for research, development and acquisition, now presides over the Caruth Institute for Engineering Education at Southern Methodist University.

The NSWCDD LaWS Team award recipients were Joseph Barrasse, Ronald Flatley, Theresa Gennaro, David McCormick, David Newton, Melissa Olson, Dr. Robert Pawlak, Gunendran Sivapragasam, and David Sullins. In addition, Lt. Cmdr. Michael Putnam from the Naval Sea System Command (NAVSEA) Ship Design & Engineering directorate received the award.

The LaWS team worked with Sailors aboard Ponce to demonstrate a laser weapon working aboard a deployed U.S. Navy ship while operating seamlessly with existing ship defense systems.

During the tests, LaWS–a collaborative effort between ONR, NAVSEA, Naval Research Laboratory, NSWCDD, and industry partners–hit targets mounted aboard a speeding oncoming small boat, shot down a Scan Eagle unmanned aerial vehicle (UAV), and destroyed other moving targets at sea.

Ponce Sailors–trained by the NSWCDD team on LaWS operation–reported the weapon performed flawlessly, including in adverse weather conditions of high winds, heat and humidity. They noted the system exceeded expectations for both reliability and maintainability.

The system is operated by a video game-like controller, and can address multiple threats using a range of escalating options, from non-lethal measures such as optical "dazzling" and disabling to lethal destruction if necessary. It could prove to be a pivotal asset against "asymmetric threats," which include small attack boats and UAVs.

For more information, visit www.navy.mil.

Contracts awarded for LHD for Italian Navy

Fincantieri and Finmeccanica have been awarded the contract for the construction and equipment of one multipurpose amphibious unit (LHD) for the Italian Navy. The total value of the contract is over 1.1 billion euros, with Fincantieri's share amounting to approximately 853 million euros and Finmeccanica's to about 273 million euros. The delivery of the unit is scheduled in 2022.

The contract with the consortium (Raggruppamento Temporaneo di Impresa – RTI), consisting of Fincantieri, agent, and Finmeccanica, through its subsidiary Selex ES, principal, was signed on behalf of the Ministry of Defence by the Central Unit for Naval Armament (NAVARM) of the General Secretariat.

The consortium (RTI) was established in accordance with the tight cooperation agreement in the field of naval vessels construction, signed between Fincantieri and Finmeccanica last October. Pursuant to the agreement, Fincantieri acts as a sole interface to the client, while at the same time allowing to enhance Finmeccanica's products' range in the naval field and the technical and commercial synergies between the two largest national groups in the naval field.

The LHD is part of a multi-year program for the renewal of the Italian Navy's fleet with a total funding of 5.4 billion euros and, in addition to the LHD, foresees the construction of six patrol vessels, with four more in option, and one logistic support unit.

The fundamental characteristic common to all three classes of ships is their high level of innovation providing them with a considerable degree of efficiency and flexibility in serving different mission profiles. These ships may be used for both standard military purposes and for civil protection and rescue at sea operations. They also have a low environmental impact thanks to a state-of-the-art auxiliary propulsion system generating a low level of pollution emissions (electric engines) and biological waste control system.

The LHD's main mission is the transport of people, vehicles and loads of different kinds and in their transfer on land in port areas through on board systems and in not equipped areas with various kinds of vessels (such as the small LCM landing craft units with a load capacity up to 60 tons, four of which can be admitted, launched, and recovered through a flooded basin, located on the stern of the vessel).

For more information, visit www.fincantieri.it.

Singapore Navy launches first Littoral Mission Vessel

The Republic of Singapore Navy's first Littoral Mission Vessel (LMV), Independence, was launched recently at the Singapore Technologies Marine's Benoi shipyard.

The launch of Independence is a significant milestone in the RSN's continued transformation to keep Singapore's seas safe. The new LMVs are smarter and faster ships, equipped with sharper capabilities to further strengthen the RSN's ability to ensure the seaward defense of Singapore. They possess lethal and non-lethal options to deliver calibrated responses to deter and defend against a wide range of threats. The advanced radars and sensors, as well as the bridge with a 360° out-of-window view, enable the LMVs to have an all-round visual awareness of its immediate surroundings in congested waters.

The LMVs–with its Integrated Command Centre comprising the Bridge, Combat Information Center and Machinery Control Room–will boost operational effectiveness and efficiency, especially during maritime security operations. The networked-centric ships also possess numerous sense-making and decision support systems that are supported by a high level of automation, so that they can be manned by a leaner crew. In addition, logistics and engineering support were considered during the design of the ship to enhance the operational readiness of the ship.

Independence will be delivered to the RSN in 2016 and is expected to be fully operational by 2017. The keel for the second LMV was recently laid in May 2015. All eight LMVs are expected to be fully operational by 2020 and will replace the existing Fearless-class PVs, which have served the RSN well for 20 years.

For more information, visit www.mindef.gov.sg.

Navy divers test new equipment

Navy Diving is celebrating the Year of the Military Diver in 2015, with 100 years since the Mark V diving helmet was first developed, later becoming the cornerstone piece of equipment for the community for more than 65 years.

Though current divers no longer wear the iconic helmet, many other facets of diving have remained the same. With the recent acquisition of the Diver 6 telemetry system, Navy diving is poised to plunge into its next century, which began with a practice dive at Joint Expeditionary Base Little Creek-Fort Story in June.

"We are testing the first generation of diver telemetry," said Chief Warrant Officer Coy Everage, assigned to Explosive Ordnance Disposal, Group 2 Mobile Diving and Salvage Unit (MDSU) 2. "It tells us a diver's loca-

tion, diver's depth, diver's air pressure, breathing rate and how long they have left to breathe based on the depth."

The Diver 6 is one of a few new systems that has been approved for use by the Navy and is now in the next phase of implementation and evaluation for use by diving commands. It will allow dive supervisors to keep better track of divers once they are submerged, thus allowing the supervisor to better monitor the diver.

Before Diver 6, dive supervisors had little knowledge of what was happening under water during a SCUBA dive. With the new system, supervisors will now have real-time information on a submerged diver, essentially getting eyes under the water. Previously, this information was provided only by the diver themselves.

Commands from around the Virginia Beach area will be some of the first to test the new system and practice putting it into use before it can be used for mission essential dives.

For more information, visit www.navy.mil.

CMRE at the forefront of NATO's interoperability

NATO STO CMRE (Centre for Maritime Research and Experimentation) scientists and engineers at the Joint Force Training Centre (JFTC) in Bydgoszcz (Poland) took part in the annual NATO-led Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX). This year CWIX hosts participants from 15 NATO and 4 Partnership for Peace (PfP) Nations working on system interoperability before operational use to improve the effectiveness of the Alliance.

CWIX is a key tool to help in discovering the interoperability challenges of tomorrow, providing active support for the Readiness Action Plan (RAP), the Federated Mission Networking (FMN), and the Smart Defence and Connected Forces Initiative (CFI) by pooling and sharing resources among NATO and Partner Nations. Interoperability and readiness are crucial to the success of the Alliance allowing national forces to deploy together and be effective from the beginning of an operation through effective communications as one cohesive force.

As NATO's maritime research centre, CMRE plays a crucial role in the exercise with six experimental capabilities fully integrated in the CWIX scenarios, such as the Geospatial and Meteorological and Oceanographic (GeoMETOC), the Maritime, and the Joint/Operational Command focus areas. In particular CMRE is providing to the Nations in 2015 new scientific products focused on oceanographic information and forecast; data fusion from multiple and heterogeneous sources; environmentally conditioned risk maps, such as small boat attack risk maps; sonar performance surfaces for tactical planning; maritime traffic patterns of life and detection of vessels outside normal traffic schemes; and automatic planning of sea surface and underwater assets.

The main challenge of CMRE for this 2015 exercise is to correctly provide these scientific products to command and control (C2) NATO and PfP systems. State-of-the-art web services, protocols and NATO standards are used to effectively communicate with these systems.

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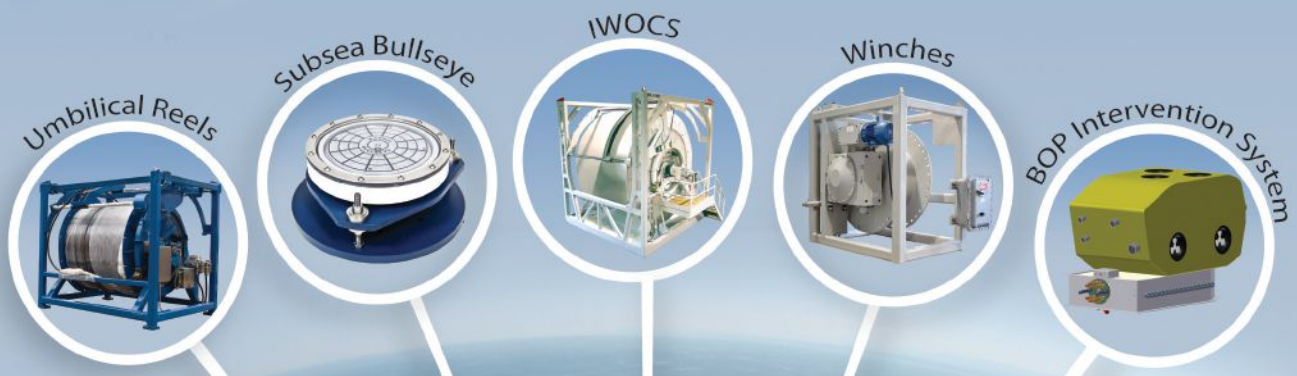

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OFFSHORE INDUSTRY

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United States displaces Russia as world's top oil and gas producer

The United States has taken Russia's crown as the biggest oil and natural gas producer as U.S. oil production rose to a record last year, gaining 1.6 million barrels a day, according to BP Plc's Statistical Review of World Energy. Gas output also climbed, putting America ahead of Russia as a producer of the hydrocarbons combined.

The data showing the U.S.'s emergence as the top driller confirms a trend that's helped the world's largest economy reduce imports, caused a slump in global energy prices and shifted the country's foreign policy priorities.

Spencer Dale

"We are truly witnessing a changing of the guard of global energy suppliers," BP chief economist Spencer Dale said in a presentation. "The implications of the shale revolution for the U.S. are profound."

The other major shift BP's report shows is China's energy demand growing at the slowest pace since the Asian financial crisis of the late 1990s as the economy slows and the country tries to reduce its reliance on heavy industry.

"Growth in some of China's most energy-intensive sectors, such as steel, iron and cement–which had thrived during China's rapid industrialization–virtually collapsed in 2014," said Dale, a former Bank of England chief economist who joined BP last year.

Cost of oil field activities in U.S. plummeted amid the crude crash

The costs for drilling activities in the U.S. oil patch fell about 20% during the oil crash, rates that fall in line with recent industry estimates, according to recent federal statistics.

The Bureau of Labor Statistics Producer Price Index that tracks the costs oil and natural gas firms are receiving for goods and services found that drilling rates, which represent service fees for contractors to drill oil and gas wells, dipped by 19.6% from June 2014 to May 2015. Oil and gas prices measured by the Producer Price Index fell by 49% during the same timeframe.

Meanwhile, the U.S. Energy Information Administration said that, as exploration and production companies curtail capital expenditures in response to lower oil prices, the "downward pressure" impacts the rates charged by drillers and support services.

Likewise, a report by the Federal Reserve earlier in June reinforced the theme. The cost of drilling and bringing wells into production dropped 20% to 30% since the beginning of the year, according to the Fed's Beige Book, a monthly assessment of economic activity in 12 regional districts across the U.S.

Crash in oil prices proving to be difficult on FPSO contractors

The steep drop in oil prices has led to a dramatic decline in the number and value of awards for FPSO units, according to research firm Douglas-Westwood. There had only been three contracts awarded this year -- a conversion for the Sankofa-Gye Nyame development in Ghana, a small conversion in Iran and an upgrade in Indonesia. In total these awards account for around $1.5 billion.

By comparison, in the first half of 2014 there were six orders and crucially, the value of those six was 528% higher than the three this year, demonstrating the lack of high capital expenditure orders in the current low oil price environment. The first half of 2014 saw two newbuild contracts worth over $1 billion each, in addition to the awarding of a $4 billion contract for two converted FPSOs on the Kaombo field in Angola.

Expectations for the rest of this year aren't much better. Many awards have been pushed into 2016. Douglas-Westwood forecasts that four more awards are likely this year while a further five could potentially be awarded if there is an improvement in the oil price.

The future of FPSOs is still considered encouraging as FPSO solutions will be vital for the development of oil and gas fields in deeper waters as well as for marginal fields in mature regions, Douglas-Westwood said, but cautioned that current low oil price may lead to a decline in orders that continues well into 2016. However, the research firm still forecasts FPSOs with a total value of $60 billion will be installed 2015-2019, and within in-house data the firm is tracking over 130 potential future deployments.

Lewek Constellation sets pipelay record in deepwater Gulf of Mexico

Singapore-based EMAS AMC said its flagship subsea construction vessel Lewek Constellation established an industry record for pipelay in the U.S. Gulf of Mexico.

The record was set in 2,246 m (7,368 ft) of water during sea trials. In preparation for the execution of three subsea tie-back projects for Noble Energy, the vessel performed its final pipelay trial, and during the deployment of the 1.9-mi (3.2-km), 16-in. diameter, 28-mm wall thickness pipeline, complete with the second end pipeline end termination (PLET), the tension recorded was 632 metric tons, rendering this the highest tension ever experienced in the history of rigid reeled-lay operations, according to the company.

"What this record means for clients going forward is that we can offer a more efficient pipelay solution in ultra-deep water for pipelines up to 16-in.

Pipelay vessel Lewek Constellation.

diameter when compared to traditional S-Lay or J-Lay methods, even with thick insulation coatings, thereby giving our clients more options to consider," said John Meenaghan, EMAS AMC vice president of global operations.

The Lewek Constellation is an ice-classed, multi-lay offshore construction vessel with ultra-deep water pipe laying and heavy lift capabilities. It was initially conceptualized in 2009 and its hull was successfully launched in 2012. It measures 178.27 m by 46.0 m, features all single berth cabins and is designed to deliver complex projects in water depths exceeding 3,000 m.

The Lewek Constellation is said to be the only one of two vessels in the world in its class achieving the highest environmental and comfort notations.

Capex to fall in 2015 but rebound in 2016 if oil prices stabilize: survey

Capital expenditures for global exploration and production (E&P) spending are expected to fall by 20.2% this year to about $590 billion -- the first time that spending has dipped below $600 billion since 2011 -- but is poised to rise in 2016 if oil prices stabilize at or above the $65 to $70/bbl threshold, according to the majority of companies surveyed in Evercore ISI's 2015 Mid-Year Global E&P Spending Outlook.

The spending outlook reflects a significant decline relative to the 5% decline from the firm's initial January survey and follows five consecutive years of gains and a 12% compound annual growth rate since 2009.

However, more than 95% of survey respondents said that continued upward oil price momentum would result in increased budgets for 2016, the survey of the financial and strategic documents of about 300 oil and gas companies worldwide found. Oil prices above $70/bbl would prompt more than 70% of the survey respondents to revise budgets upward by at least 10%, while around 90% would raise budgets by at least 10% if oil reached $80/bbl levels.

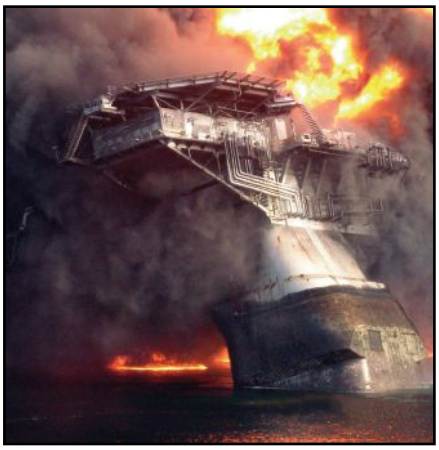
About one-third of respondents are expecting 2016 spending levels to remain flat, while 11% of respondents expect spending to decline. Sixty-two percent of companies surveyed said they would reduce spending if prices fell to between $45 to $50/bbl, and that $47/bbl was the average WTI price would warrant a further decline in spending.

North American spending has experienced the steepest declines as low oil prices have deterred investments, with capital budgets expected to fall 34.2%, compared with an 11% decline forecast in Evercore's prior survey, but mostly in line with the firm's estimated decline of 35% to 40%.

International upstream spending is now expected to decline by 13.8%, significant lower than Evercore's initial outlook of minus 2.1% in January. Evercore still sees the Middle East as the one bright spot in upstream spending, but now estimates that spending to be relatively flat versus its previous 15.3% growth forecast.

BP agrees to settle 2010 Deepwater Horizon oil spill claims for $18.7B

More than 5 years after the worst offshore oil spill in U.S. history fouled the Gulf of Mexico, BP has agreed to pay a record $18.7 billion settlement to affected states. The company said the settlement would bring its full obligations for the spill to an estimated $53.8 billion.



The 2010 Deepwater Horizon disaster killed 11 rig workers and spewed millions of gallons of crude into the U.S. Gulf.

The agreements have been carried out with the U.S. Department of Justice and five Gulf Coast states including Alabama, Florida, Louisiana, Mississippi, and Texas.

Under the terms of the agreement, BP will pay a civil penalty of $5.5 billion for over a period of 15 years to the federal government under the Clean Water Act.

Besides $1 billion, which was already committed for early restoration, the company will pay $7.1 billion to the United States and the Gulf Coast states over 15 years for natural resource damages that were caused due to the spill.

An additional $232 million has been earmarked to be added to the natural resource damages interest payment at the end of the payment period so that any further natural resource damages that are unknown at the time of the agreement can be covered.

Economic and other claims made by the five Gulf Coast states will be settled by paying a total of $4.9 billion over 18 years, and up to $1 billion would be paid to resolve claims made by over 400 local government entities.

The impact of the settlement is expected to increase the cumulative pre-tax charge associated with the accident and spill by around $10 billion from $43.8 billion at the end of the first quarter.

According to BP, natural resources damages and Clean Water Act payments are due to start 1 year after the agreements becomes final.

"It resolves the company's largest remaining legal exposures, provides clarity on costs and creates certainty of payment for all parties involved," BP chairman Carl-Henric Svanberg said.

BP Group chief executive Bob Dudley added: "For the United States, and the Gulf in particular, this agreement will deliver a significant income stream over many years for further restoration of natural resources and for losses related to the spill."

The agreements in principle are subject to execution of definitive agreements, which consist of a consent decree with the U.S. and the five states regarding the civil penalty as well as natural resource damages.

DNV GL proposes new guideline to slash offshore P&A costs

DNV GL was ready to introduce new plugging and abandonment (P&A) guidelines for offshore wells, which are expected to result in reduced costs of 30% to 50%. The certification body said that optimized project execution and new technology could offer a cost saving of $32 billion in the Norwegian Continental Shelf (NCS) alone.

In its guidelines, which were to be released during the second half of this year, DNV will use accepted risk-approach methodology taking into consideration environmental, as well as safety risk aspects.

Authorities are required to decommission the offshore wells when they find no production from an oil or gas reservoir or if it is no longer profitable. Using the process, migration of hydrocarbons to the surface can be avoided. This means that hazardous wells will get the attention they deserve, and benign wells will avoid excessive rig-time and expenditure.

DNA estimates that there are around 2,350 wells in the NCS that will require P&A, and 3,000 more wells are set to be drilled in the future. There are close to 5,000 offshore wells in the UK that need to be decommissioned. The wells on the NCS will require the deployment of 15 rigs full-time over the next 40 years.

Oil layoffs top 150,000 amid weak oil prices, recruiting firm reports

Oil industry job losses reached 150,000 at the end of May and continued into at least early summer but at a slower pace, according to oil recruiting firm Swift Worldwide Resources. The job cut rate was fastest in the United States, though operations in the North Sea also have been hit hard by the weak oil price environment.

Swift said the layoffs are ubiquitous, impacting western oil producers, state-owned oil companies, oil field service firms, engineering and construction companies and manufacturers. Contractors, the kind of labor Swift specializes in, are "often the first to get let go, with little fanfare," though direct employees have been affected, as well. The firm tracks public and non-public data, and it's possible the layoffs exceed Swift's numbers, Swift CEO Tobias Read said in a report.

NASA tests oil spill identification system called UAVSAR off Norway

The U.S. National Aeronautics and Space Administration (NASA) has used Norway's annual offshore North Sea spill exercise to test the use of Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR) to distinguish different types of oil slicks.

To calibrate UAVSAR returns, Norway released emulsions of differing thicknesses so that the scientists could have a known range of conditions to compare results against. The experiment also tested the instrument's ability to distinguish between petroleum and plant-based oil found in algal blooms.

During previous Gulf of Mexico oil spill observations NASA found that UAVSAR could not only "see" the smoothing affect oil has on the sea surface, but also could indicate the thickness of a slick based on radar wave reflection differences between seawater and oil slicks.

Center for Offshore Safety (COS) recognized for SEMS audits

Recent federal regulatory changes now require U.S. Outer Continental Shelf operators to use accredited and independent third parties to audit their safety programs. The Center for Offshore Safety (COS), which has already certified more than 70 companies, has been recognized by the Bureau of Safety and Environmental Enforcement (BSEE) as the first and currently only official accreditation body for audit service providers.

Previously, companies either performed their own safety audits or would voluntarily use third party auditors. The 5 June changes to BSEE regulations now means that Safety and Environmental Management Systems (SEMS) audits conducted on the U.S. Outer Continental Shelf must be in compliance with the SEMS II Rule, which requires that the team lead for an audit be independent and represent an accredited audit service provider.

SEMS II, finalized in April 2013, is intended to enhance the original SEMS rule, or Workplace Safety Rule, issued in October 2010 in response to the Deepwater Horizon incident earlier that year. SEMS II took effect last year, but did not impact the first audit cycle.

BOEM, state geologists group agree on OCS cooperation

The U.S. Bureau of Ocean Energy Management (BOEM) and the Association of American State Geologists (AASG) have agreed to foster interaction, cooperation, and coordination on marine minerals and oil and gas resources on the U.S. outer continental shelf.

Under the agreement, BOEM's Office of Strategic Resources may provide information to the association on BOEM permitting, research, and planning activities for informal review and comment by the affected states. The AASG, through individual state geological surveys, may provide information to BOEM on state projects for informal review and comment.

BOEM said the purpose of these reviews is to facilitate information sharing that will foster mutually beneficial interaction, increase opportunities for cooperative BOEM-state geological survey activities and minimize conflicts and misunderstanding.

Meanwhile, BOEM has agreed for the national academies to form a new advisory committee on "environmental science and assessment for offshore energy and minerals resources."

The committee will "provide independent information on issues relevant to BOEM's environmental studies and assessment activities and support discussions on relevant issues."

The committee will operate under a 3-year contract with the National Research Council (NRC), the operating arm of the National Academy of Sciences (NAS), and the National Academy of Engineering (NAE).

The panel will comprise 15 experts from academia, the private sector, and other organizations with scientific disciplines relevant to BOEM's environmental assessment and studies programs. NRC accepted nominations until 15 July. Committee members will not be compensated.

Topics that may be considered include such things as strategic approaches to environmental monitoring to assess ecosystem health and mitigation effectiveness; stakeholder discussions on controversial issues; and reviews of proposed BOEM studies.

Fugro completes wellhead monitoring project for BP

Fugro has successfully completed a year-long wellhead monitoring project for BP Americas Inc. measuring blowout preventer (BOP) stack motions and calculating wellhead fatigue in the Gulf of Mexico, BP said. The drilling campaign was conducted in 6,000 ft (1,829 m) of water and used the Fugro Wellhead and Riser Instrumentation Service (WARIS).

This installation included transmission of motion spectra from the BOP stack and riser using standard hydroacoustic modems and the automatic processing of this data with topsides environmental data to show levels of motion and fatigue and their correlation with sea states and ocean currents. This provided BP with access to real-time subsea data to aid its decision making throughout the deployment.

DeepData pods being readied for deployment with a lower marine riser package. (Photo courtesy of Fugro)

Communications from the lower marine riser package (LMRP) and riser remained successful even with surface wave heights greater than 3 m (10 ft) at times during the campaign. The DeepData subsea motion monitoring pods, the main components in the system, were deployed to positions on the BOP stack and riser by an ROV. The pods were integrated with hydroacoustic modems and had battery capacity to last for one year of deployment. A topsides system was supplied that included vessel motion monitoring and links to existing environmental monitoring systems.

To ensure that the data could be accessed and used by BP engineers anywhere in the world, Fugro's onshore data delivery system was used to plot and display all the processed data from the WARIS system.

The success of the project indicated the technology could be deployed on other wells where fatigue capacity and potential loading is of interest.

"This was a project with challenging timescales and some demanding engineering. By working closely with BP and with Fugro staff in our Houston office, we managed to create success for both companies," said Stuart Killbourn, principal engineer at Fugro.

John Henderson, team Leader for subsea wells engineered solutions and mitigations at BP, added: "The collaboration between BP and Fugro demonstrates a leap forward in monitoring capability for the industry."

Kvaerner, KBR land $842M platform construction deal
Statoil has awarded a $842 million contract to Kvaerner and KBR to construct the topside for the utility and living quarters platform at Johan Sverdrup field in the North Sea. Under the contract, the companies will provide engineering, procurement and construction (EPC) services, with work consisting of utility and accommodation modules. Subcontractors in Poland under management of Kvaerner will fabricate the utility module accounting for 9,700 tons, while the engineering and procurement of equipment would be performed by KBR. The fabrication will be completed at Stord, Norway. According to Statoil, the accommodation module weighing 9,300 tons will be constructed at Apply Leirvik's yard in Stord Norway and in Emtunga Sweden. The topside modules will be assembled at Kvaerner Stord and have a total weight of around 19,000 tons.

Image of Johan Sverdrup utility and living quarters platform.

Antrim awards OIS North Sea decommissioning contract
Offshore Installation Services (OIS) was awarded a contract by Antrim Energy to decommission four subsea wells in the central North Sea. The offshore scope of the campaign, which also includes six wells from Centrica Energy, will include complete offshore and onshore project management, vessel charter, equipment and personnel. The wells, in categories 2.1 and 1, will be abandoned using Acteon sister company, Claxton's, suspended well abandonment tool (SWAT). SWAT is a diver-less, vessel-based approach and was to be completed as part of a multi-operator campaign in summer 2015. The offshore campaign will be conducted from an anchor-handling tug supply vessel (AHTS), the Island Valiant. During phase one, SWAT will be deployed through the vessel's moon pool to set cement plugs in the bore and across all the casing annuli. The second phase will use an abrasive severance system for the cutting of the wells and sequential removal from the seabed.

Expro secures $100M Tullow oil contract across Ghana
International oilfield services company, Expro, was awarded new contracts from Tullow Oil plc. Worth in excess of $100 million over 3 years, the contracts will see Expro work across Tullow Oil's assets in Ghana, including the Jubilee field and the Tweneboa-Enyenra-Ntomme (TEN) field project. Following on from Expro's phase one contract for Jubilee, involving more than 10 completions, the company has been awarded continued services for phase 1a. This covers completions on new wells for Jubilee, as well as interventions and remedial work. A number of Expro's product lines and services will be utilized, including large bore subsea completion landing strings, subsea exploration and appraisal landing strings, high flow rate surface well testing and sampling services.

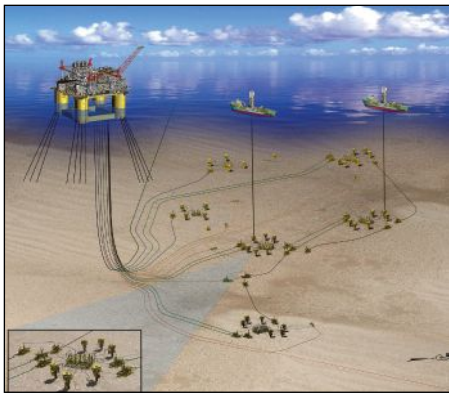
FMC awarded $297M contract for Shah Deniz project
FMC Technologies received an order from BP to supply subsea production systems for well clusters 3-5 of the Shah Deniz Stage 2 project in the Caspian Sea. The order has an estimated value of $297 million in revenue and is in addition to the initial order for Well Clusters 1-2 received in 2014 from BP, the operator of the Shah Deniz Stage 2 project. The Shah Deniz field is located offshore in the Azerbaijan sector of the Caspian Sea.

Shell approves giant Appomattox project in U.S. Gulf of Mexico

Royal Dutch Shell is set to advance the Appomattox deepwater development in the U.S. Gulf of Mexico after announcing the final investment decision. Following its decision the company said it will construct and install its eighth and largest floating platform in the Gulf of Mexico. Shell did not provide cost estimates for the project.

The project will be located about 80 mi offshore Louisiana in roughly 7,300 ft of water, and includes capital for the development of 650 mmboe of resources at Appomattox and Vicksburg, with start-up estimated around the end of this decade.

Average peak production from the Appomattox development, which will initially produce from the Appomattox and Vicksburg fields, is expected to reach around 175,000 boe per day, according to the company.

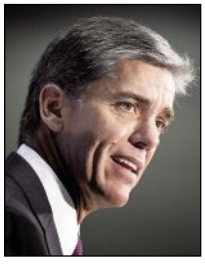


Shell will own the platform and the Appomattox and Vicksburg fields with 79%, and the remaining 21% would be owned by CNOOC (China) wholly owned subsidiary Nexen Petroleum Offshore.

The company said it reduced the total project cost by 20% during design work for Appomattox through supply chain savings, design improvements, and reducing the number of wells required for the development.

The cost reduction program included advancements from previous four-column hosts, such as the Olympus tension-leg platform, in addition to ensuring a high-degree of design maturity prior to commencing construction, Shell said.

Shell Pipeline also made a final investment decision on the 24 in Mattox Pipeline that will transport crude oil from the Appomattox host to an existing offshore structure in the South Pass area, according to the company.



Marvin Odum

"We have again delivered a globally competitive investment scope for another significant deepwater project," Shell Upstream Americas director Marvin Odum said."Appomattox opens up more production growth for us in the Gulf of Mexico, where our production last year averaged about 225,000 boe per day, and this development will be profitable for decades to come."

Only 5 mi away from the Appomattox field, Shell and Nexen made major discoveries in the Vicksburg oil field trapped in a Jurassic reservoir in about 28,700 ft of total depth. Shell and Nexen acquired the license in 2002 and made the first oil discovery in Appomattox in 2009, but because of the ultra-deep water of the field, the high pressure and high temperature of the oil and gas in the reservoir, Shell and Nexen wanted to proceed step by step in their strategy to develop Appomattox and Vicksburg projects in the Mississippi Canyon area.

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ABS to class new semi-submersible and liftboat for Baoham Offshore

ABS, a provider of marine and offshore classification services, has been selected by Baoham Offshore (HK) Ltd. to class a drilling semi-submersible and a liftboat.

"This award is a reflection of the solid reputation ABS has built as a classification society over more than 30 years in China," said ABS executive vice president of energy project development Ken Richardson.

Artist's rendering shows the three units that will make up the Baoham fleet upon delivery of the newbuilds now on order. Image courtesy of Global Maritime.

"We are particularly excited about working with Baoham Offshore as an emerging Chinese company."

According to Baoham Offshore General Manager Xu Jun, the company's goal is to be a first mover in China.

"We are not building on speculation. On top of our first 300-ft harsh-environment ABS-classed liftboat (GM-J1000) already under construction, the addition of these units extends our ambition of building a flexible fleet," he said. "We believe partnering with ABS will strengthen the foundation we are creating to build our fleet development program."

The GM-4E mid-water semi-submersible drilling unit will have both an eight-point mooring system and Class 3 dynamic positioning and will feature a variable deck load that exceeds 4,000 metric tons. The GM-J1450 has a water depth capability of 80 m and will be equipped with a 400-metric-ton deck crane.

"We are pleased to continue our working partnership with Baoham Offshore," said Global Maritime engineering services manager Mark Cooper, whose company provided the designs for an earlier unit as well as both of the contracted newbuilds. "We are excited to be introducing this flexible design on a groundbreaking project with not only an owner with a strong vision, but a very experienced class society."

Singaporean engineering house Gulf Offshore will carry out detail engineering and production design. The liftboat will be built at the PaxOcean yard in Zhoushan, China. A yard has not yet been selected for the semi-submersible unit. Hydraquip Custom Systems Inc., which has produced more than 100 jacking systems over the past two decades, will provide the jacking system for the liftboat, while Gulf Offshore Pte Ltd will provide detail engineering and production design.

Seadrill Operating in transaction for ultra-deepwater West Polaris

Seadrill Operating has agreed to acquire all of the shares of Seadrill Polaris, which owns and operates the ultra-deepwater drillship, the West Polaris, from Seadrill. The total consideration for the acquisition comprises $204 million in cash and $336 million of debt outstanding under the existing facility financing the drillship.

Delivered by Samsung shipyard in 2008, the dynamically positioned drillship is expected to carry out operations in Angola until the end of its contract with ExxonMobil, set to conclude in March 2018. At present, the West Polaris is contracted with ExxonMobil on a daily rate of $653,000.

The balance of the purchase price would be funded by Seadrill Operating with a seller's credit of $50 million due in 2021. Seadrill's board of directors estimates that the total value proposition of the Polaris acquisition for the company is around $750 million.

Under the acquisition agreement, Seadrill Polaris has agreed to pay Seadrill any day rate it receives that is more than $450,000.

From the current ExxonMobil contract, Seadrill is expected to receive around $60 million in cash a year assuming an average economic usage of 95%.

Once the existing contract until 2025 concludes, Seadrill Polaris has also agreed to pay Seadrill 50% of any dayrate above $450,000 per day.

West Polaris was delivered by the Samsung shipyard in 2008. Photo courtesy of Seadrill Ltd.

Fugro Synergy.

Fugro, Cross Group receive Gulf of Mexico intervention contract

Fugro's dynamically positioned multi-purpose drilling, well intervention, and geotechnical vessel, Fugro Synergy, will go to work on a multi-well intervention campaign in the Gulf of Mexico.

The well intervention campaign involves use of a top tensioned 6⅝-in. riser and coiled tubing, and fieldwork for the contract is being jointly undertaken by Cross Group Inc. and Fugro.

Designed and purpose built for well intervention services, Fugro Synergy will be used in conjunction with a mobile offshore drilling unit. Complete with a top-tension riser system, this allows through-riser intervention activities.

Fugro said that the tower on the 2009-build allows the company to run pipe, as opposed to either using a crane over the side or running riserless well intervention equipment. Cross Group's 7-in. workover riser packages will be run from Fugro Synergy.

Songa Offshore takes delivery of Equinox drilling rig from DSME

Songa Offshore has taken delivery of the Songa Equinox from Daewoo Shipbuilding & Marine Engineering. The rig was expected to leave South Korea soon for its 8-year drilling contract with Statoil. The first assignment is at Troll field on the Norwegian shelf.

Songa Equinox is a sixth generation, high-specification, harsh environment, midwater rig designed for efficient year-round drilling, completion, testing, and intervention operations in water depths to 1,640 ft. The rig is certified DP-3 and is equipped with a state-of-the-art drill floor and a layout with improved safety and working environment features.

Songa Equinox is the first rig in a series of four Category D rigs to be built specifically for and contracted to Statoil. Songa will soon have a fleet of seven midwater semi-submersibles and holds position as Statoil's largest drilling services provider.

More ultra-deepwater rigs set to be stacked: Seadrill

Seadrill has agreed with Saudi Aramco to reduce its dayrate for four jack-ups over a period of 1 year. The rigs concerned are the West Callisto and the three Asia Offshore Drilling-owned jack-ups AOD I, AOD II, and AOD III.

Seadrill has a three-year firm contract from Aramco for the AOD rigs that is due to expire next year, although there is an option to extend until 2017.

During the first quarter, Seadrill signed one new contract, with a duration of a year, with Coastal Energy for the jack-up West Cressida, with potential revenue of $35 million

Currently the contractor has 15 rigs under construction, comprising four drillships, three semis and eight jack-ups. Total remaining yard instalments for these newbuilds are around $4.3 billion, with $1.1 billion already paid to the yards in pre-delivery instalments.

Seadrill said the downturn in the offshore drilling market has continued so far this year and signs point to demand remaining significantly lower than in 2014.

The outlook for ultra-deepwater activity beyond 2015 is difficult to judge, it added, with most oil companies not looking to add rig capacity at this point. Capacity utilization will likely dip further as the year progresses, leading to a significant number of ultra-deepwater rigs being stacked by the end of the year.

At June the global order book for new ultra-deepwater rigs totaled 89 units, of which 29 are Sete newbuilds. At the same time, however, around 70 units were coming off contracts, many of which are due for a 15- or 20-year classing between now and the end of 2017.

First Åsgard subsea compression kit heads to seafloor

The North Sea Giant vessel has begun offshore installation of the modules for the Åsgard subsea gas compression project in the Norwegian Sea. This is designed to extract a further 282 mmbbl from the Åsgard field.

According to operator Statoil, 22 modules will be installed and connected at a water depth of 984 ft to form two identical compressor trains, each weighing 1,653 tons. They will be housed in a large subsea frame installed on the seafloor in summer 2013. All the modules are being shipped from Vestbase in Kristiansund, having undergone commissioning and testing in Egersund. They vary in size. The smallest modules–up to a maximum weight of 77 tons–are being lowered through the vessel's moonpool. Larger modules will be installed using the ship's crane handling system, which can lift loads of up to 463 tons and operate in waves up to 30 ft high. In this case, the modules are guided into position subsea via an ROV and cables.

The North Sea Giant.

Installation sequence has been planned to allow start-up work to be performed on the first compressor train while installation of modules for train 2 continues.

Sentinel Marine christens new vessel Cygnus Sentinel

Sentinel Marine has christened the new vessel Cygnus Sentinel at Aberdeen Harbor as the ship began its 5-year contract to serve Gaz De France in the southern sector of the UK's continental shelf.

The Cygnus Sentinel is the second of four emergency response and rescue vessels (ERRV) that Sentinel has on order. It is 200-ft long and has a gross tonnage of 1,890 2,083 tons and cargo capacity of 1,543 tons. The vessel is expected to operate with a 12-man crew working 28 days on, 28 days off.

The Cygnus Sentinel.

Sentinel's fleet of new vessels can serve as ERRVs and also perform platform supply roles. The company currently operates five vessels, with another seven on order. The Cygnus Sentinel was built in the Fujian Southeast shipyard in China.

Shelf rig fleet undergoes communications upgrade

Satcomms specialist ITC Global has completed installation and commissioning of communications systems for 35 rigs for Dubai-based Shelf Drilling. Shelf Drilling is said to be the world's second largest contractor of independent-leg cantilever jack-ups, with operations in 12 countries in Southeast Asia, India, West Africa, and the Middle East, North Africa and Mediterranean region.

Following the award of the contract last August, ITC Global equipped the rigs with a system designed to support corporate and crew communications via a TDMA private network solution.

"Our goal was to provide maximum flexibility for Shelf Drilling before, during and after deployment–both in terms of capacity and geographic coverage," said Joe Spytek, ITC Global's chief executive office. "Our deployment team was able to migrate services from the incumbent in a short timeframe, minimizing downtime, and now that we've successfully completed the fleet transition, we're seeing a significantly enhanced end-user experience on the rigs."

Construction under way on Rotan FLNG at Samsung

First steel has been cut for Petronas' second floating liquefied natural gas (FLNG) vessel at the Samsung Heavy Industries shipyard. The hull and topsides of the PFLNG2 will eventually weigh 152,000 tons. Petronas will deploy the vessel to liquefy, produce, and offload processed natural gas from the Rotan field, 80.7 mi offshore Sabah. PFLNG2, designed for deepwater operations, will have a capacity of 1.5 million tons per year.

Aibel Haugesund secures yard stay contract with Odfjell

Norway's oil and gas services supplier Aibel Haugesund has secured a yard stay contract with Odfjell Drilling for the Deepsea Bergen rig. The rig is set to arrive Aibel's yard in Haugesund in early autumn 2015. During its stay for a period of around a month, the company plans to conduct various tasks with regard to special periodic survey (SPS).

As part of the contract valued at Nkr40 million ($5 million), the company will perform inspection and modifications within structure and piping. According to Odfjell, the periodic survey and the yard stay are planned based on the company's survey strategy, minimizing the time of hire as well as the length of the stay.

New Act introduced to implement Canada-Quebec offshore accord

The Canadian government has introduced the new Canada-Quebec Gulf of St. Lawrence Petroleum Resources Accord Implementation Act, for responsible offshore resource development in the area.

The Gulf of St. Lawrence and surrounding areas have the potential for more than 39 tcf of gas and 1.5 Bbbl of oil, in estimates by the government.

Under the new legislation, Quebec can earn revenues, including royalties and many taxes and fees, which would be generated from the development of oil and gas resources in the Gulf of St. Lawrence. The legislation is expected to incorporate the safety and environmental protections found in the Energy Safety and Security Act in Canada.

"Our government is focused on creating jobs, growth and long-term prosperity in Quebec and across Canada," Canada's Natural Resources Minister Greg Rickford said. "Our collaboration with the Government of Quebec on this historic legislation will enable the safe and environmentally responsible development of petroleum resources in the Gulf of St. Lawrence, creating economic opportunities throughout the region."

Map of the Gulf of Saint Lawrence.

The accord was originally signed in 2011 and established two different phases of joint management. In the initial transitional phase, the governments will create a joint regulatory function and the second, permanent phase would be triggered by a commercial discovery of oil or natural gas resources.

ONGC taps research vessel Chikyu to study India's gas hydrate potential

The Oil and Natural Gas Commission (ONGC) of India has contracted the research vessel Chikyu from Japan Drilling Co. Ltd. to explore offshore India in the Krishna-Godavari and Mahanadi areas for gas hydrates. India's Directorate General of Hydrocarbons, Oil India Ltd., GAIL (India) Ltd., and scientific institutions such as the Council of Scientific and Industrial Research, the National Institute of Ocean Technology, and the National Geophysical Research Institute are working with Japan and U.S. researchers to develop commercial gas hydrate production.

Rosneft claims Arctic expedition is 'widest-ranging' in past 20 years

Rosneft said it will use results from this year's recently completed Kara-Winter 2015 scientific-exploratory program and previous ice research expeditions in the Arctic to determine safe locations for future exploration drilling; design of drilling platforms and other facilities for oil production; and selecting possible routes of offshore pipelines.

The 10-week Kara-Winter 2015 campaign was the world's widest-ranging Arctic expedition of the past 20 years, the company claimed, supported by the Arctic Research and Design Center and the FSBI Arctic and Antarctic research institute.

Works were performed in the Barents Sea, Kara Sea, East Siberian Sea, and Laptev Sea, in the Novaya Zemlya and Severnaya Zemlya archipelagoes, the Novosibirsk islands, and for the first time on Franz Joseph Land.

Nalcor delivers first Newfoundland and Labrador metocean findings

Nalcor Energy Oil & Gas has issued results of the first regional metocean study offshore Newfoundland and Labrador. This was designed to improve understanding of weather and ice conditions in the area in order to reduce exploration risk and uncertainty ahead of this November's first offshore license round for the two provinces.

Nalcor conducted the study in partnership with C-CORE, a Canadian research and development center that specializes in environments that include ice-prone oceans.

The program covered winds, waves, currents, fog, vessel icing, pack ice, icebergs and ice islands and the influence of environmental changes on these conditions. It also produced a comparison with other globally comparable frontier oil and gas regions such as the North Sea, Barents Sea, and west Greenland.

The study covered the entire Labrador Sea and Northern Grand Banks, Flemish Pass, and Flemish Cap areas. The study area is divided into 391 grid cells with each cell covering on average 1,452 sq. mi, in total around 579,000 sq. mi. Data summaries for metocean parameters are available for each cell and for the region.

To help facilitate use of the data, Nalcor has released an interactive, map-based system, the Nalcor Exploration Strategy System or NESS. The company's exploration team developed NESS in 2013 in partnership with ICI Solutions to help capture data and scientific insights from the work the team is undertaking in the frontier regions offshore Newfoundland and Labrador.

In addition, NESS provides geographic and geophysical data for these regions that includes sedimentary basins, offshore boundaries, well data, and licenses.

"It captures data that would not otherwise be easily available to the industry and makes it available in a user-friendly and accessible manner," said Murray Brown, vice president of Oil and Gas C-CORE.

Husky Energy begins oil production from Canada's South White Rose

Canada-based Husky Energy has started oil production from the South White Rose project in the Jeanne d'Arc Basin offshore Newfoundland and Labrador. South White Rose is Husky's second major subsea satellite tieback following the successful North Amethyst subsea project.

"Both of these projects extend the life of the main White Rose field and use the SeaRose FPSO vessel," said Asim Ghosh, Husky Energy's chief executive officer. The company brought the first well online with plans to start the second one in the next couple of months. Once the second well commences, the South White Rose extension is expected to increase net peak production to around 15,000 bbl per day. According to the company, the Hibernia-level formation well down the North Amethyst field is expected to begin production in the fourth quarter and will have net peak production of 5,000 bbl per day. Regarding the development of the West White Rose satellite field, Husky Energy plans to continue to advance its assessment of the subsea, as well as wellhead platform concepts.

The West Hercules rig in the northern Flemish Pass Basin will continue its exploration and appraisal program for 18 months in the Bay du Nord discovery, which the company holds a 35% working interest. Husky operates South White Rose, holding a 72.5% working interest in the main White Rose field and a 68.9% interest in the satellite fields.

Eirik Raude moves to 3rd Falkland well.

Eirik Raude spuds 3rd exploration well in Falkland Islands campaign

The semi-submersible Eirik Raude has spudded the third exploration well of its current campaign off the Falkland Islands on the deepwater Humpback prospect in the Fitzroy sub-basin.

The well is being drilled on license PL012, southeast of the islands in which Falkland Oil and Gas Ltd. (FOGL) has a 52.5% interest. It is the first to test a new geological play concept in the area.

Humpback, in 4,134 ft of water, is one of a cluster of lookalike prospects in the Fitzroy sub-basin identified from 3D seismic, with total prospective oil resources of more than 1 Bbbl.

The well will test multiple stacked reservoirs within the Cretaceous Diomedea fan complex. It was expected to take around 65 days to drill.

Shell expecting to drill offshore Alaska this summer despite snag

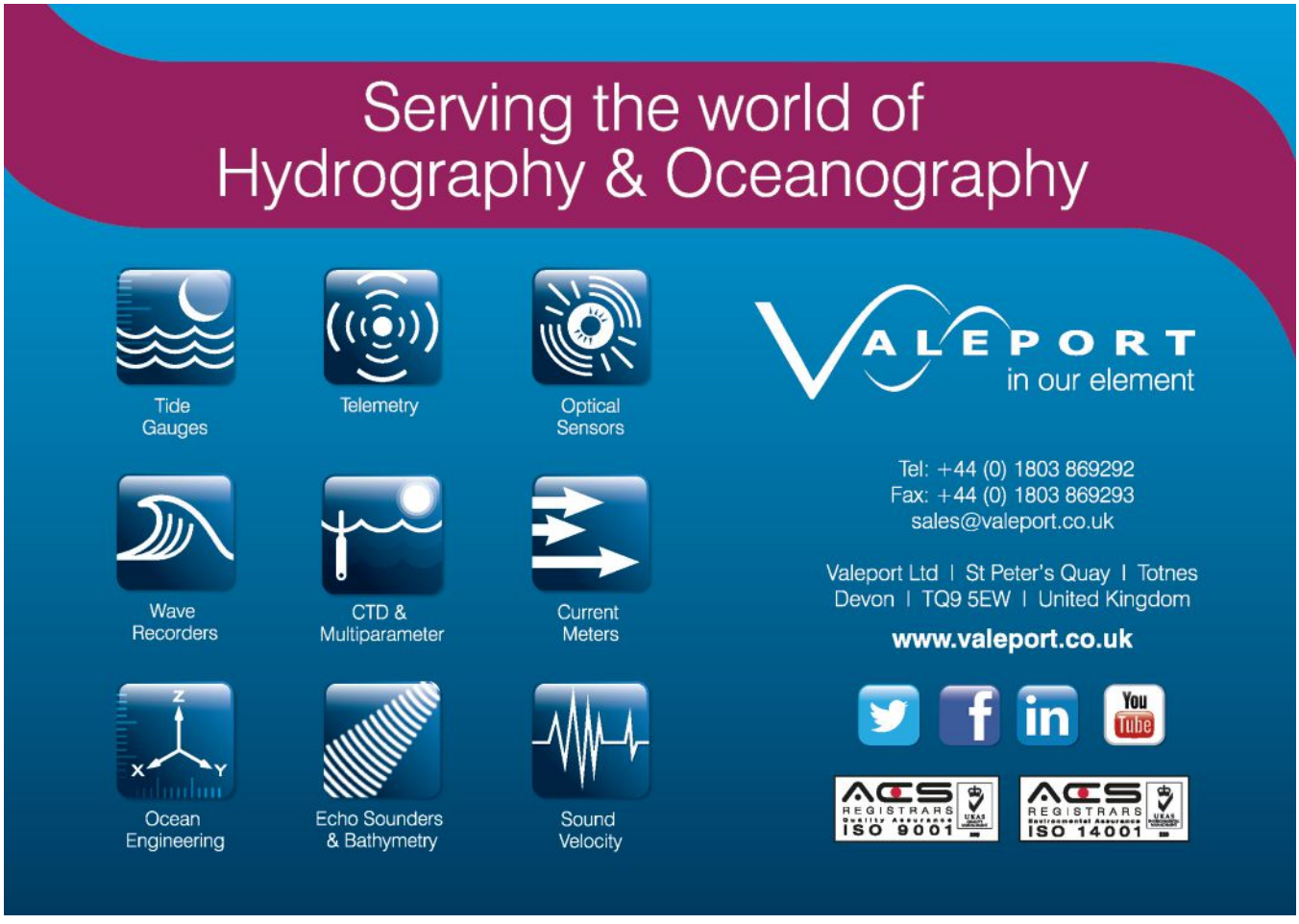
Shell hit a snag in early July in its latest attempt to resume drilling this summer for oil in Arctic waters off Alaska. The MSV Fennica, one of the ice-breakers it was planning to use, was holed in the ballast tank and returned to port. The company said systems on board the ship warned there was a leak, and the crew found a 1 m long tear in the hull. It did not say how the damage occurred.

The company did not expect the setback to delay drilling, but could not be sure until it received a damage report. "Any impact to our season will ultimately depend on the extent of the repair," Shell spokeswoman Kelly op de Weegh told Reuters in an e-mail.

Shell was given a conditional approval by the U.S. Department of the Interior in May to return to the Arctic for the first time since its mishap-plagued 2012 drilling season. The company said in June it planned to restart drilling as early as the third week of July.

The Fennica is just one of the 29 vessels in Shell's Arctic fleet, which includes another icebreaker, the MSV Nordica, and at least two other anchor handlers tasked with helping to keep ice away from the company's drilling site. But Shell's contracted Fennica is unique in that it is carrying a critical piece of the company's Arctic containment system: a capping stack designed to fit on top of a damaged well in case of a blowout or other emergency.

The ice-breaker MSV Fennica.



CNOOC discovers oil on Liuhua structure in the South China Sea

CNOOC Ltd. said it made a mid-sized discovery on the Liuhua 20-2 structure in the eastern South China Sea. The discovery well, LH20-2-1, was drilled and completed at a depth of about 9,744 ft, encountering oil pay zones with a total thickness of 115 ft. The oil production of the well tested around 8,000 bbl per day and the crude oil density is about .75.

The Liuhua 20-2 structure is located in the Northern Slope Belt of Baiyun Sag in the Pearl River Mouth basin of the South China Sea with an average water depth of about 1,280 ft.

Meanwhile, CNOOC said it began production ahead of schedule from the offshore Dongfang1-1 gas field Phase I adjustment project. The field is in the Yinggehai basin of the Beibu Gulf in the South China Sea, in an average water depth of around 230 ft.

To fully exploit the existing Dongfang1-1, the company added a wellhead platform connected to seven producing wells. Currently five wells are producing a total of 53 mmcf per day slightly below the planned plateau.

Petronas starts production from Bukit Tua offshore Indonesia

Petronas has delivered first oil from the Bukit Tua field development in the Ketapang block, 68 mi offshore East Java. This is the company's biggest upstream project in Indonesia, according to general manager Hazli Sham Kassim.

Production heads to the Ratu Nusantara FPSO, with oil offloaded to tankers and gas exported to Gresik, East Java via a 65-mi subsea pipeline.

During its early phase, Bukit Tua is set to produce 3,700 bbl per day of oil and 2 mmcf per day of gas, eventually building to a peak of 20,000 bbl per day of oil and 50 mmcf per day of gas.

Pemex unveils shallow-water oil discoveries in the Gulf of Mexico

Mexico's state-run oil and gas company Pemex said it discovered new shallow water oil fields in four locations in the Gulf of Mexico. The oil fields are located near the Cantarell oil field and Pemex's existing filed Ku Maloob Zaap, and will reportedly yield 200,000 bbl per day.

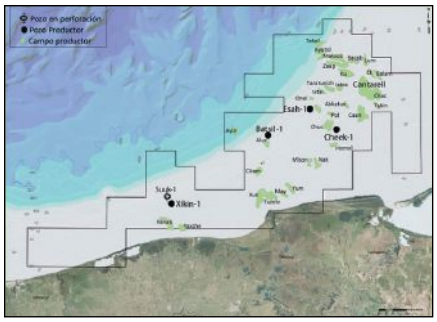
Pemex chief executive officer Emilio Lozoya said that the company plans to begin production at the fields in around 16 months. The four filed locations off the coast of Tabasco and Campeche states in the Gulf of Mexico together estimated to hold 350 mmbbl.

Pemex said that the new fields consist of three of light crude and one of heavy crude. Lozoya told the Guardian: "It's a recent achievement and one of great magnitude."

Pemex's new hydrocarbon finds are also expected to produce 170 mmcf of gas per day.

In July, Mexico planned to launch the initial auction for 14 oil and gas exploration and production blocks that are located in the Gulf of Mexico.

Pemex income contributes about a third of the Mexico's budget and government expects to generate more revenue from the company's latest finds.



Pemex oil fields in the Gulf of Mexico are set to yield 200,000 bbl per day.

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First Clair Ridge topside modules safely installed west of Shetland Islands

BP and its co-venturers, ConocoPhillips, Chevron and Shell, confirmed the safe installation of the new Clair Ridge platform's quarters and utilities (QU) topside modules, a major milestone in the Clair Ridge project.

The QU platform comprises three modules–the quarters and utilities integrated deck (QUID) that has a lift weight of 9,400 te; the power generation (GM) module that has a lift weight of 4,550 te; and the living quarters (LQ) module that has a lift weight of 2,210 te. They were safely lifted onto the pre-installed jackets by the Heerema Thialf heavy lift vessel.

The hook up and commissioning of these modules created more than 600 jobs, including six electrical apprentices, all of which have recently been recruited through Amec Foster Wheeler.

Heerema Thialf vessel lifts QU topside modules onto pre-installed jackets.

Clair Ridge is a multi-billion investment in the second phase of development on the Clair field, which lies 75 km to the west of the Shetland Islands. The project comprises two new bridge-linked platforms and new pipeline infrastructure to connect storage and redelivery facilities on Shetland. The next major milestone will be the installation of the production and drilling (DP) platform topside modules, scheduled for summer 2016, with production expected to commence in late 2017.

Trevor Garlick, regional president for BP's North Sea business said: "The safe installation of these three topside modules is a fantastic achievement by the project team. In a challenging time for the industry, this project shows the potential of our basin and why it is so important that we work to ensure a competitive future business."

Approximately half of the Clair Ridge investment is occurring in the UK, with over 80 British companies providing engineering design and support service, hook-up and installation services, manpower and a wide range of engineered equipment.

The Clair Ridge development will have the capability to produce an estimated 640 mmbbl of oil over a 40-year period, with peak production expected to be up to 120,000 bbl per day of oil.

L&T gets $427M contract for Bassein gas field project

India's L&T Hydrocarbon Engineering has secured a Rs27 billion ($427 million) offshore contract for the Bassein development project of state-run hydrocarbons explorer Oil and Natural Gas Corporation (ONGC).

L&T's subsidiary won the contract in an international competitive bidding, and as part of the contract the company will provide engineering, procurement, construction and installation services to the project. The company will build one new process platform with gas processing and compression facilities, with one nine-slot well head platform also built.

In addition, work will also include topside modification on existing platforms, associated subsea pipelines and one living quarter platform in the Bassein Field in western offshore basin of India. According to L&T, the offshore project is part of ONGC's strategy to improve the field life, while increasing recovery of Bassein gas field. The project is scheduled for completion by December 2017.

The field is expected to produce 19.56 bcm of gas, 1.97 mmcm of condensate and 1.83Mmt of oil up to 2027-28. Located along the west coast of India shallow water, the Bassein project lies 70 m water deep in the Arabian Sea. The field gas field stands 80 km northwest of Mumbai city in the Indian state of Maharashtra.

Orca to proceed with first phase of Songo Songo

Orca Exploration Group is planning to start the first phase of the Songo Songo development program in Tanzania following World Bank approval for International Finance Corp. financing. IFC will invest up to $60 million in the company's operating subsidiary PanAfrican Energy Tanzania.

Following approval, Orca entered a drilling contract with Paragon Offshore to use its M826 mobile drilling workover rig to carry out the offshore phase of the development program for the Songo Songo gas field.

Under the contract, the rig will operate in the unique shallow water operating environment around Songo Songo Island. The contract was set to take place when the drilling rig arrived at the company's first well location in Songo Songo. According to Orca, the drilling contract was start between 1 August and 21 September of this year.

With a minimum duration of 90 days, the contract has a minimum financial commitment of $21 million excluding withholding tax. By the end of September, Orca hoped to start operations that include workovers to remove and replace production tubing strings on SS-5, SS-7 and SS-9 wells, as well as drilling new well SS-J. Once the workovers are complete, the company has the option to drill a further two wells.

McDermott awarded Otis field subsea tieback in GoM

McDermott International, Inc. has been awarded a sizeable lump sum contract by LLOG Exploration Offshore, LLC in support of LLOG's Otis development located in the Gulf of Mexico. The lump sum contract was to be included in McDermott's second quarter 2015 backlog.

The Otis field, located in Mississippi Canyon Block 79, will be developed as a subsea tieback to the Delta House floating production system (FPS) and lies in about 3,800 ft of water. The contract scope includes project management; engineering, fabrication and installation of a 75,000-ft insulated rigid flowline and insulated steel catenary riser (SCR) with associated pipeline end termination (PLET) and jumper; and pre-commissioning. McDermott's Houston office will perform the overall project management and engineering. The flowline and SCR are scheduled to be assembled and fabricated at McDermott's new spoolbase facility in Gulfport, Mississippi. Offshore installation is scheduled to be completed in early 2016 by McDermott deepwater rigid reel Lay Vessel 105 (LV 105).

"This is our first contract award for rigid reel lay in the area since the delivery of the LV 105 deepwater vessel and development of our new Gulfport marine facility and spoolbase," said Scott Munro, vice president, Americas, Europe and Africa.

BPC: Bahamas development may be profitable at lower oil prices

Bahamas Petroleum Co. said after updating its economic models to reflect current global oil prices, reduced well costs, and other factors such as the project's proximity to existing infrastructure, BPC now believes that the minimum field size for an economic development offshore Bahamas is less than 200 mmbbl, with a break-even oil price of $30-$40/bbl, meaning that the project would be profitable even in a lower oil price environment.

In anticipation of the islands' new Petroleum Act becoming law, the company initiated discussions last year with the government on planning for the first well and subsequent commencement of operations.

To support this work, BPC completed various tasks designed to de-risk technical aspects of the project. These included commissioning fluid inclusion analyses from Fluid Inclusion Technologies on retained core and cuttings from three historical wells drilled in the Bahamas that offset BPC's acreage. The wells demonstrated the presence of oil migration with a signature that indicates light oil across multiple horizons. Results suggest an active, local oil-generative source rock capable of generating large hydrocarbon volumes.

Hovercraft helps establish lifeline to Alaska's Endicott

About half a million barrels of oil is extracted each day from Alaska's Prudhoe Bay oilfields. One of its drilling sites, Endicott, is located on a spit of land connected by the gravel Prudhoe Bay road system and is normally accessible by truck -- until recently, when the road was washed out.

Faced with the dilemma of how to get workers, food and supplies to the work site, Hilcorp, a privately-held exploration and production companies in the United States, turned to Crowley and its hovercraft, Arctic Hawk.

Crowley hovercraft Arctic Hawk.

"With the road cut-off and heavy fog preventing helicopters from flying in and out, Hilcorp diverted the hovercraft Arctic Hawk from its normal duties of supporting Northstar Island, to shuttle people, groceries and other supplies to Endicott," said Bruce Harland, Crowley vice president.

"Hilcorp was already chartering the Arctic Hawk to provide a similar shuttle service to and from their (offshore) Northstar Island drill site, so this was a natural extension of that service ..."

Measuring 38.8 ft in length with a 15.5-ft beam, Arctic Hawk is considered a passenger vessel by the U.S. Coast Guard and carries a Certificate of Documentation and Certificate of Inspection issued by Coast Guard Sector Anchorage.

A hovercraft is the most practical mode of transport for this service as the route must be traveled over open water in summer and ice during the winter and a mixture of ice and water during freeze-up and break-up, Crowley said.

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Ikon Science's RokDoc expands CoViz Lite 3D visualization system

Ikon Science released its flagship RokDoc platform version 6.2.3, which includes the combination of a license of CoViz Lite, developed by California-based Dynamic Graphics, Inc., with the RokDoc 3D package, delivering a new RokDoc state-of-the-art visualization system. The new RokDoc release is ready for download on the Ikon servers.

CoViz Lite is an add-on 3D visualization system for RokDoc featuring select capabilities derived from the original CoViz 4D software that has been used by asset teams for over a decade.

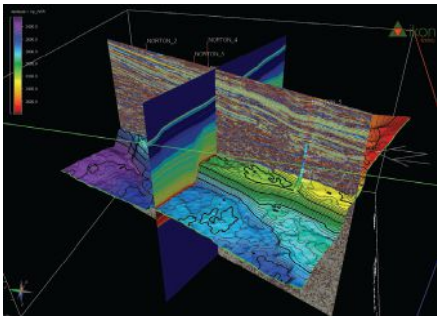
The beta version of RokDoc 3D 6.2.3 has been previewed at numerous recent trade shows and customer events, while developers were busy finalizing and documenting the new capabilities the company said, noting that users of the current RokDoc 3D package were impressed by the rich toolset of visualization capabilities, and the enhancements it brings to many workflows.

"Customer feedback from the demonstrations we have made to date of the new RokDoc 3D shows that we made the right choice to work with a leading visualization system development company such as Dynamic Graphics Inc.," said Martyn Millwood Hargrave, Ikon's chief executive officer. "Users commended the rich toolset and gorgeous rendering of the CoViz Lite system that helps the eye gain insights into intricate reservoir systems and their complexities; combined with the increased resolution of reservoir properties delivered by our new Ji-Fi® process, RokDoc 3D will allow our customers to make highly accurate reservoir predictions."

This first commercial release of the combination of RokDoc and CoViz Lite is just the beginning. RokDoc version 6.3 will be released this fall, and it will include a number of enhancements for the users of RokDoc 3D, according to the company.

Emerson enhances reservoir modeling with RMS 2013.1

Emerson Process Management has launched the latest version of its reservoir modeling software, Roxar RMS. The new version–RMS 2013.1–comes with enhanced structural modeling tools that acknowledge realistic uncertainties in the data and improve volumetric sensitivities. This makes it faster and easier for geomodelers to build geological scenarios, investigate the full effects of structural



uncertainty, and maximize the value of their reservoir assets.

"With our new version of Roxar RMS and our tightly integrated structural modeling and gridding tools, users will be able to quantify uncertainty more effectively and increase confidence when it comes to crucial decisions on where to drill, what production strategies to adopt, and how to maximize recovery," said Kjetil Fagervik, managing director of Emerson's Roxar Software Solutions.

RMS 2013.1 also sees fault uncertainty tools further integrated with structural modeling and 3D gridding. This enables users to build fault uncertainty models in full and investigate a wide variety of scenarios corresponding to the uncertainty in the input data.

Carbo Ceramics deploys proppant technologies in Lower Tertiary trend

Carbo Ceramics Inc. has applied two of its proppant technologies, Kryptosphere HD and Scaleguard, for an operator in the Gulf of Mexico's Lower Tertiary trend, which the company says marks the largest and deepest job for these proprietary technologies to date.

Kryptosphere HD, an ultra-high conductivity proppant technology for deep wells, is engineered to withstand high closure stresses and extreme cyclic loading conditions for the life of the well. This technology provides higher production and estimated ultimate recovery, maximizing the operator's return on investment, the company said.

The company added that Scaleguard is the first production enhancement technology in which scale-inhibiting chemicals are infused into a ceramic proppant. This technology provides a controlled release of the scale inhibitor, resulting in long-term protection against the formation of common oilfield scales.

Scaleguard is designed to safeguard the entire production network -- from the fracture through the wellbore to the subsea-surface processing equipment–without compromising fracture conductivity, thereby protecting the operator's entire asset. In this well, Kryptosphere HD was the base proppant for Scaleguard.

Combining Kryptosphere HD and Scaleguard enables the operator to maximize both conductivity and the treatment of scale, according to Carbo.

Delta SubSea, Zerlux collaborate on hydrate remediation technology

Delta SubSea (DSS) has signed a memorandum of understanding with Zerlux Hungary Kft. to intensify collaboration on laser-based hydrate remediation technology. DSS, through a partnership with ZerLux, is exploring the use of laser-based technology for the oil and gas industry's flow assurances needs.

Laser-based hydrate remediation technology is driven by the evolution of fiber and diode laser efficiency, reliability, and a drop in laser costs. It uses focused warming to create a relief path for pressure equalization and chemical flow across the hydrate plug.

The technology can create a path for chemical flow across the hydrate plug. This enhances the effectiveness of the hydrate remediation methods based on chemical inhibitors, allowing the media to attack the plug on multiple sides.

The tool is based on a string of laser heads that apply thermal energy to the subsea structure. Depending on the application, the string can be composed of several laser heads, from a few units for short sections up to 72 for long sections of pipeline. The tool clamps on the pipe with hydraulic cylinders and is electro-hydraulically connected to the ROV. DSS says that, relative to competing technologies for hydrate remediation, lasers benefit from precise thermal management, compactness and efficiency; higher efficiency, as laser heats pipe surface directly; and being carried by an ROV and operable up to 9,842 ft.

Weatherford International shows critical application liner hanger

Weatherford International released its IntegraLine liner system with swage technology. Aimed at critical environments, the IntegraLine targets applications such as ultra-deepwater, extended-reach, and sour-gas wells with high pressures and temperatures. The IntegraLine liner system comprises three components: the polished bore receptacle, liner-top packer, and rotational hanger.

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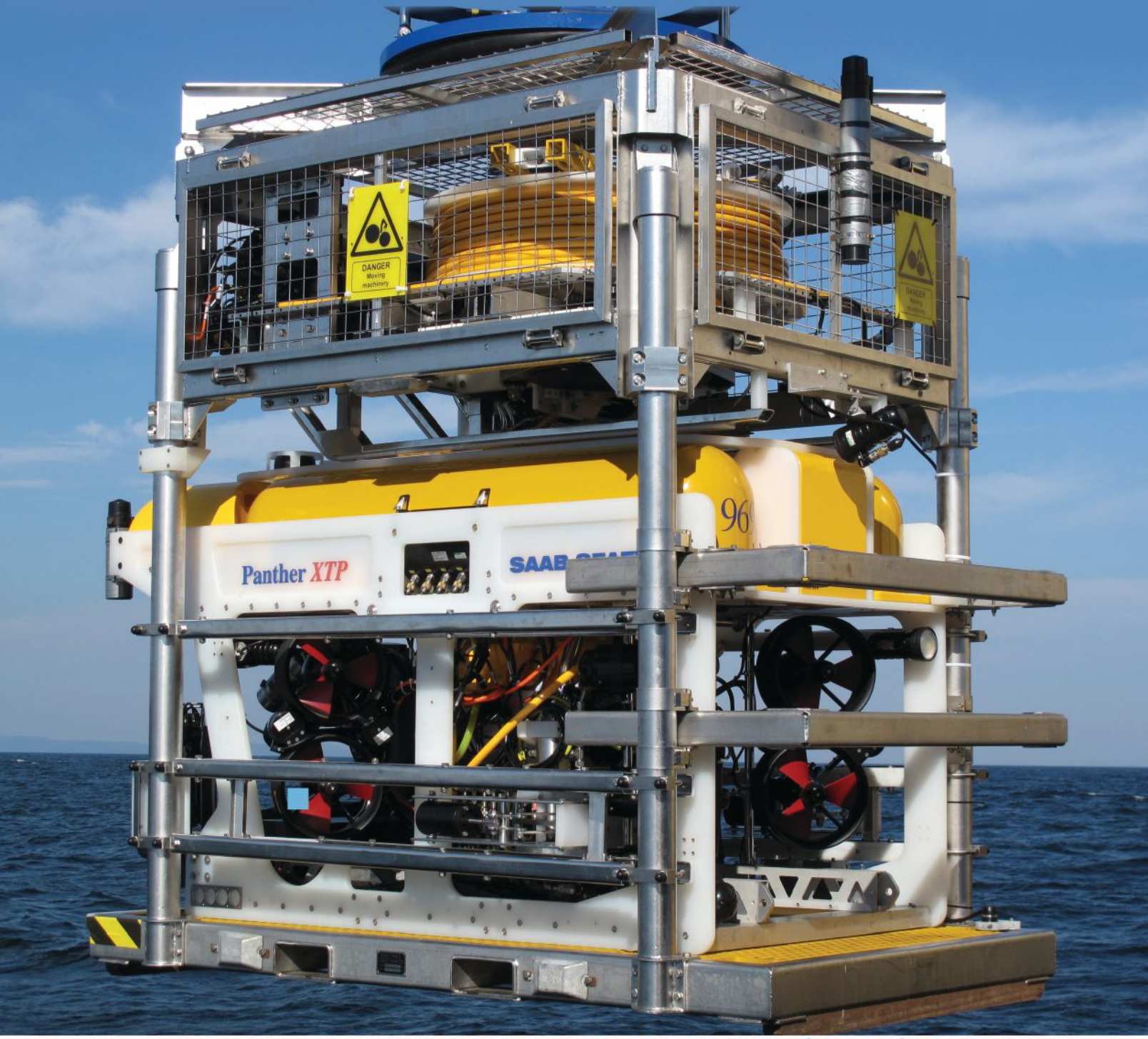

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Ziebel provides DFO-sensing system to Statoil's North Sea Huldra platform

Norway-based well intervention services provider Ziebel has completed a distributed fiber-optic (DFO) sensing campaign for Statoil on the North Sea Huldra platform. Ziebel gathered distributed temperature and distributed acoustic fiber-optic data on Statoil's first unmanned platform using its new gravity-deployed carbon composite cable Z-Line.

Production at Huldra ceased in September 2014, with the intervention campaigns aimed at optimizing Statoil's plans to plug and abandon the installation in 2016. Ziebel carried out the work on the platform by running the Z-Line in two wellbores to measure temperature and acoustic profiles. After completion of each operation, data displaying the conditions of each well in its entirety during each intervention was provided.

Statoil used the data to observe fluid movements, confirm wells' integrity, and plan the final abandonment.

"As Statoil prepares to plug and abandon the Huldra platform, we appreciate how important it is to have a comprehensive picture of well conditions in order to formulate the optimum approach," Ziebel chief executive officer Stig Hognestad said. "Given that it was the first time that Ziebel has worked for Statoil, it was very satisfying that we were able to use the Z-Line to provide them with critical data that will enhance their understanding of those conditions."

The 3/16-in. diameter carbon composite line Z-Line builds upon the Z-System carbon composite technology and is with embedded optical fibers at its core. Using Ziebel's fiber-optic composite rod technology, the complete well bore can be accessed and visualized in real-time. The Z-System has been used extensively in the North Sea, Middle East and U.S. to carry out well intervention runs.

Interventions were carried out at Huldra platform to optimize Statoil's plans to plug and abandon the installation in 2016. Photo: courtesy of Ziebel AS.

Motion compensation used for critical installation at Malampaya

Using its BM-T770 motion compensation platform, Barge Master successfully supported the installation of the permanent connection bridge for the Shell Malampaya production platform in the Philippines.

Barger Master was contracted by Boskalis to perform this delicate task. The motion compensation platform significantly increased the reliability and predictability of the critical operation by eliminating roll, pitch and heave motions of the vessel on its load.

The platform compensates waves up to significant wave height of 2.5 m. It consists of containerized units, which can easily be transported and be assembled within 10 working days. The triangular shaped platform is not moving relative to the fixed world in order to increase the safety and workability of various offshore operations.

For this project the Barge Master system was used for the installation of a permanent bridge between a newly installed depletion compression platform (DCP) and an existing gas producing shallow water platform (SWP) in the Malampaya field. The project is executed by Boskalis for Shell Philippines Exploration B.V.

INDUSTRY DEALS

Aker Solutions, Baker Hughes to cooperate on early-phase studies

Aker Solutions and Baker Hughes have agreed to cooperate on early-phase studies to help customers improve the overall economics and value of oil and gas field developments.

Aker Solutions' front end spectrum unit and Baker Hughes' reservoir development services group will provide customers with development concept studies that address the entire value chain, from reservoir understanding and well design to subsea and topsides facilities, including flow assurance and risk management. Each company has expertise from the full spectrum of field development. Initial customer studies are already under way.

"Our ability to maximize value is greatest when we can enter a project early at the appraisal and feasibility stages and evaluate the potential of a field's total development instead of parts of it," said Henning Østvig, head of front end spectrum at Aker Solutions.

"While we always want to find the best solutions for our customers, the current market environment gives us an added sense of urgency," said Scott Reeves, president of reservoir development services at Baker Hughes.

The new agreement comes after Aker Solutions and Baker Hughes in 2014 formed the Subsea Production Alliance to develop solutions that will boost output, increase recovery rates and reduce costs at subsea fields.

The alliance uses Aker Solutions' capabilities in subsea production and processing and Baker Hughes' expertise in well completions and artificial-lift technology to deliver integrated in-well and subsea systems solutions. The importance of cooperating during the early phase of a project was recognized quickly in the alliance.

The front end spectrum unit and reservoir development services group maintain independent offices in Houston, Oslo, London, Aberdeen, Kuala Lumpur, Perth, Dubai, Abu Dhabi and Moscow.

Shell-BG $70B deal crosses key milestone with U.S. clearance

U.S. regulators have given the green light for Royal Dutch Shell's proposed $70 billion acquisition of British rival BG Group, the first clearance for the biggest deal in the energy sector in over a decade. The two companies said recently that the United States Federal Trade Commission (FTC) had cleared the deal.

The deal, which the companies aim to complete by early 2016, will require further regulatory clearances from all the countries BG operates in, including the European Union, China, Australia and Brazil.

"We're well underway with the anti-trust and regulatory filing processes in relevant jurisdictions around the world and we're confident that, following the usual thorough and professional review by the relevant authorities, the deal will receive the necessary approvals," Shell chief executive officer Ben van Beurden said. "We remain on track for completion in early 2016," he added.

Ben van Beurden

Van Beurden has visited in recent weeks Trinidad, Brazil, Kazakhstan and China to discuss the deal. The deal, which followed the near halving of oil prices since June 2014, was expected to spark a flurry of mergers and acquisitions in the energy industry, but so far few deals have been announced.

Shandong Offshore to acquire Northern Offshore for $164M

Shandong Offshore International has agreed to acquire Northern Offshore for Nkr1.3 billion ($164 million). To be implemented by way of an amalgamation as per Bermuda law, which is subject to approval of Northern shareholders, the acquisition was expected to become effective during the first half of August.

Completion of the acquisition was subject to customary conditions, which included approval of the amalgamation by shareholders of Northern Offshore at a special general meeting that was to be held around 15 July.

As part of the acquisition, Northern Offshore will merge with Shandong International's subsidiary Blue Ocean Drilling.

"This transaction represents a major milestone in Northern Offshore's previously stated strategy to transform our company to a niche, premium jack-up drilling contractor with new, state-of-the-art assets," said Gary Casswell, Northern Offshore president and chief executive officer.

Following the acquisition, Northern Offshore will be able to operate in all major petroleum resource regions worldwide, excluding the Norwegian Continental Shelf. The company plans to combine the four high spec jack-ups of Blue Ocean Drilling with its two jack-ups that are under construction with deliveries expected to take place in 2016 through early 2018.

Israel offers guidelines to let Noble and Delek control Leviathan field

Israel has proposed a new plan that will involve the U.S.-based Noble Energy and Israel's Delek Group keeping control of the Leviathan offshore project.

Israel Energy Minister Yuval Steinitz told a news conference in Jerusalem that the new plan outlined for the country's natural gas sector would leave Leviathan in the control of a U.S.-Israeli consortium. At present, Noble Energy and Delek Group own a number of newfound gas fields.

In the second large field, Tamar Delek will be given a time frame of 6 years to sell its entire stake, while Noble has to cut its stake in the field to 25% from the existing 36% under the new proposal.

As part of the proposed offshore guidelines, both companies will also be compelled to sell two smaller fields, Tanin and Karish within a 14-month period. Israel's proposed plan still needs to secure the approval from Israeli parliament Knesset.

Bloomberg quoted Steinitz saying: "We have to get the gas out of the sea, and we will do everything to end the delays that have cost us heavy losses. The framework we have reached is the best one possible that will bring about the development of the key gas fields of Israel quickly."

The Leviathan filed development is expected to be delayed to at most 2019, from the planned 2018 target. The field is located in the Mediterranean Sea off the coast of Israel and roughly 130 km west of Haifa in waters 1,500 m deep in the Levantine basin.

KazMunayGas, Eni agree to jointly explore Isatay block in Caspian

KazMunayGas (KMG) and Eni have concluded an agreement for 50% of the subsoil use rights in the Isatay block in the Kazakh Caspian Sea to be transferred to Eni. KMG and Eni will establish a joint operating company to operate the Isatay block on a 50-50 basis. According to Eni, the block is estimated to have significant potential oil resources.

The joint operating company will make use of Eni's proprietary technology and its experience in the environmentally and technically challenging conditions of the Caspian Sea shelf. Prior to finalizing the agreement, KMG completed all the required procedures under Kazakh laws to acquire subsoil use rights in the block and completed related commercial agreements. Following this, 50% of the subsoil use rights will be transferred to Eni within a few months subject to the approval of the transaction by the Republic of Kazakhstan.

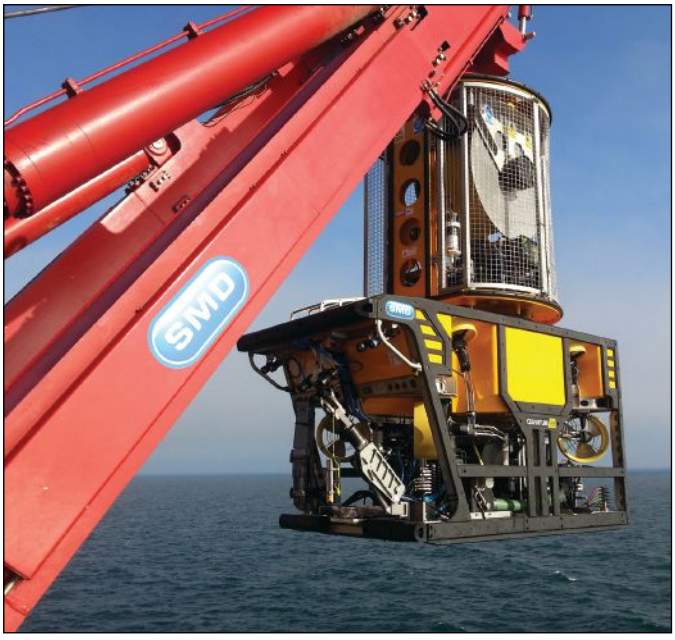
DeepOcean awarded 5 year contract by BG Group
DeepOcean has been awarded an inspection, maintenance, and repair (IMR) contract by BG Group. The 5 year contract covers all ROV-based IMR work for BG Group on UK and Norwegian subsea assets. DeepOcean will use vessels from its North Sea based fleet for work under this contract.

Phoenix ends search for MH 370
Phoenix International Holdings, Inc. (Phoenix) was directed by DRB-HICOM Defence Technologies Sdn Bhd (DEFTECH) on behalf of the Government of Malaysia to end the search for Malaysia Airlines Flight 370 (MH370) in the Southern Indian Ocean on the 20 June 2015. Since 5 October 2014, Phoenix and teammates from Hydrospheric Solutions, Inc. (HSI) and GO Marine have been working around the clock in the search to find MH370. Working aboard GO Phoenix, a DP2 vessel owned by GO Marine, Phoenix and Hydrospheric personnel deployed the highly capable and technologically advanced SLH PS-60 (ProSAS-60), a 6,000 m depth-rated synthetic aperture sonar (SAS) towed system, in the search for MH370. The Phoenix Team worked through severe weather conditions, and tropical cyclones that plague the Southern Indian Ocean area during the winter months in an effort to find MH370. Even while battling these severe weather conditions, the Phoenix search team was able to collect and analyze a significant amount of sonar data covering well over 90% of their assigned Search Area. The SAS technology used by the ProSAS-60 delivered a fully processed sonar image that provided an exceptionally clear picture of the seafloor – allowing the search team to effectively and efficiently cover the assigned Search Area with a high degree of confidence. The entire MH370 international search team organization, under the leadership of the Australian Transport Safety Bureau (ATSB), has searched more than 50,000 sq. km of seafloor and established an extraordinary record of hard work and focused commitment in the search for MH370. Phoenix is deeply honored to have the opportunity to be part of this international team assisting in the search for MH370.

EdgeTech announces 2015 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 6-8 October 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 & MPES bathymetry system
• 2000 Series Combined Systems - Combined side scan & sub-bottom profiler systems
• Acoustic Release Systems - Push off release transponder pop-up recovery package.

New online learning program for next generation of subsea engineers
Subsea UK has launched its new online learning program to support the development of new engineers and technicians entering the subsea sector and to develop graduates to become the next generation of engineers to help the UK's £9billion subsea sector achieve its global potential. The Introduction to Subsea Engineering course can be completed in around 60 hours, spread over 8 weeks. Students will study a series of modules to become fully inducted into a sector that has revolutionized the way in which hydrocarbons are extracted since its early days in the late seventies. The online program of four modules, designed by the Robert Gordon University, has been significantly upgraded and updated to include recent developments and new practices in the fast-growing sector. The new, enhanced course has become mandatory training for a number of companies in the industry. Aker Solutions will be putting its graduate engineers through the program which is delivered online through the university's virtual learning environments, CampusMoodle.

SMD ROVs accredited to DNV standards



Work Class ROV designer and manufacturer SMD have recently announced that their ROV systems can now be offered accredited to the latest DNV standards. Conforming components include control cabins, ROVs, tether management systems (TMS) and launch and recovery systems (LARS).

By pre-certifying the design with DNV, SMD customers can ensure that the equipment specification complies with the most stringent industry standards. "While not all operational regions require DNV certifications, we are seeing an increasing number of requests from certain regions," said Ian Griffiths, general manager at SMD's Houston office. "In addition, certification of the equipment during the build would sometimes become the customer's responsibility, potentially impacting cost, delivery and mobilization, whereas certification of the design means that it is no longer on the critical path. We think that is value that our customers appreciate."

ROV control cabins are available fully certified to Offshore Service Modules DNV 2.7-2, allowing customers to benefit from greater safety features relating to fire and smoke protection. Cabling and wiring is now low smoke, low halogen and a revised cabin lining offers better protection for occupants from fire and heat.

SMD ROVs including Quantum heavy work class, Quasar medium work class and Atom compact work class can now be offered to DNV 2.7-3. This means the units are fully certified to the highest standards for vessel-to-land, vessel-to-vessel and vessel-to-sea transfer. SMD's TMS can also be supplied conforming to the same standard.

SMD's LARS conforming to DNV 2.22 are now available. SMD have recently delivered the first fully certified 12te Telescopic A-frame and 12te 3,500 m umbilical winch to this standard. Updates relate to improved equipment safety and flexibility such as up-rated braking components on the winch and an increase in operating temperature range (-20°C to +45°C). Other LARS in the range will be available certified to the same standard in the near future.

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

Europe's deepest glider to be developed

Nineteen partners from across Europe have come together to develop Europe's first ultra-deep-sea robot glider. This glider will be capable of sampling the ocean autonomously at depths of 5,000 m, and maybe more in the future, for up to 3 months at a time. This project, which includes the National Oceanography Centre (NOC), has won €8M of funding from the European Union's Horizon2020 programme to develop and test this innovative new technology.

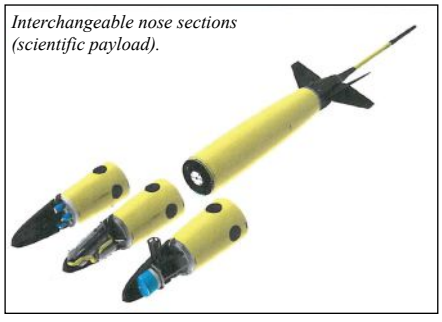
The capability of this new glider to reach at least 75% of the ocean will open up new possibilities for science and industry. These include monitoring submarine biodiversity and conducting environmental impact assessments for potential sea bed mining and exploration.

For example, the new glider will be able to detect the of presence of 'plumes' of sediment created by mining processes by using novel sensors developed by the NOC and housed in the 'nose' of the glider. These plumes are an important element of the submarine ecosystem.

Dr. Mario Brito, who is leading the project from the NOC, said "The development and integration of sensors that can work at these depths will be a real challenge…it is something that has not been done before and so the science behind it is really innovative. Furthermore the range of sensors this glider can carry makes it well suited to a wide range of applications, both within research and industry."

In addition, the NOC will also be responsible for the development of pressure tolerant structures within glider, its propulsion system, and testing it at sea. The final test is due to take place in September 2019 off southeast Ireland. NOC will use advanced 'risk and reliability' techniques to accurately quantify the risk of the glider failing under particular conditions.

"This glider will be designed to meet a well constrained reliability target, which will really help to ensure successful operations in the future," added Dr. Brito.



Interchangeable nose sections (scientific payload).

Funding for this project came from the European Union Horizon 2020 program on "Unlocking the potential of seas and oceans." This 4 year project, called BRIDGES, sees the NOC work closely with nine SME's from the UK and Europe.

Kevin Forshaw, director of enterprise and research impact at the NOC, said, "The NOC is really pleased to have the opportunity to work so closely with so many SMEs, and to use the world class expertise here to help them grow and produce a European first in submarine glider technology."

Pierre Bahurel who is the general manager of the French ocean forecasting center, MERCATOR OCEAN, observed that "Glider technology has proven to be one of most promising ocean observing techniques. Deep gliders have a strong role to play in operational oceanography, as well as enhancing our knowledge of the oceans."

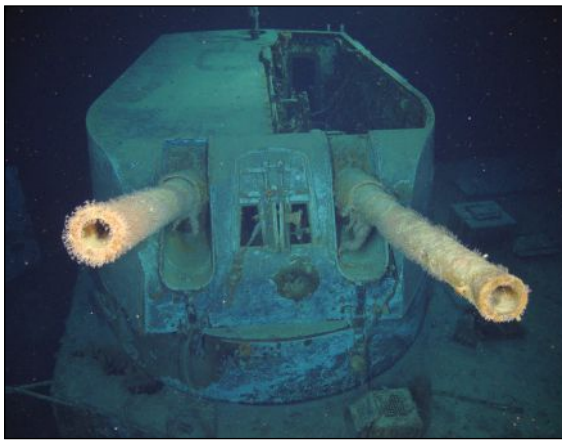
For more information, visit www.noc.ac.uk.

Kongsberg Maritime underwater cameras uncover the secrets of the HMAS Sydney

Kongsberg Maritime's state-of-the-art OE14-530 3DHD video camera has produced a wealth of stunning imagery during an expedition to survey the historic World War II shipwrecks of HMAS Sydney (II) and the German raider HSK Kormoran, off the coast of Western Australia. The Western Australian Museum and Curtin University survey, which took place in April 2015, also used six OE14-408E digital stills cameras on two ROVs operated by DOF Subsea.

The Sydney and Kormoran wrecks lay undiscovered in 2,500 m of water, 20 km apart, about 200 km west of Shark Bay until 2008, when Kongsberg Maritime underwater cameras were responsible for taking the first photos of them lying on the ocean floor. A follow-up expedition was undertaken in April this year with a more sophisticated spread of equipment to help better understand what happened during the battle to cause the destruction of both ships and the complete loss of Sydney's 645 crew–a loss that is still, to this day, Australia's greatest naval tragedy. Kongsberg Maritime was selected as the lead underwater camera partner for this work.

The data captured during the survey will form the basis of several exhibitions



Sydney Kormoran Expedition 2015 - HMAS Sydney (II) damaged "B" turret. Image courtesy of WA Museum and Curtain University.

at the Western Australian Museum, which will feature digital 3D reconstructions of the wreckage area that can be 'toured' digitally, an experience made possible by the use of Kongsberg Maritime cameras. The 3D reconstruction will be predominantly created using images from the OE14-408E digital stills cameras, which feature Ethernet operation that allowed immediate transfer of the images to the surface.

"The six Kongsberg OE14-408E cameras fitted to the vehicles were our primary photographic cameras and have captured amazing images of the wrecks and debris fields," said Dr. Andrew Woods of Curtin University. "These were used for feature photography and also for the important role of 3D reconstruction processing–to that end we have already generated some very realistic 3D models of items at the wreck site." 3D reconstruction is a recent development that enables highly realistic 3D models of physical objects to be created digitally from an array of 2D photographs.

"We appreciated the support of Kongsberg Maritime to help us design and integrate an innovative underwater camera system to meet our exacting requirements," continued Dr. Woods. Multiple Kongsberg OE14-408E cameras were setup as an array, capturing multiple photos from multiple angles, providing RAW image download in real-time at 5 second intervals. "We had limited bottom time and the Kongsberg cameras allowed us to maximize our time on site."

"The Kongsberg OE14-530 3DHD camera has captured a vast collection of absolutely beautiful footage. The camera performed flawlessly," added Dr. Woods. "We were feeding live 3DHD footage into our control room during the mission and the ROV team kept pop-

ping their heads into our space, jaws agape at how wonderful the 3DHD footage looked, and openly wishing they could have that capability in their control room."

As well as contributing to the Museum's exhibitions and online galleries, footage captured by the Kongsberg Maritime cameras will also be seen in a TV documentary by Prospero Productions, a professional documentary company that accompanied the expedition.

The high quality of the imagery from the Kongsberg Maritime cameras is helping to better understand how Sydney could have been so comprehensively disabled so quickly, with the loss of all 645 crew, during the battle with Kormoran on 19 November 1941, which ultimately saw both ships destroyed.

"The team have pulled off something fantastic, singular in the history of Australian maritime archaeology," said Andy Viduka, assistant director maritime heritage, Department of the Environment, Australian Government.

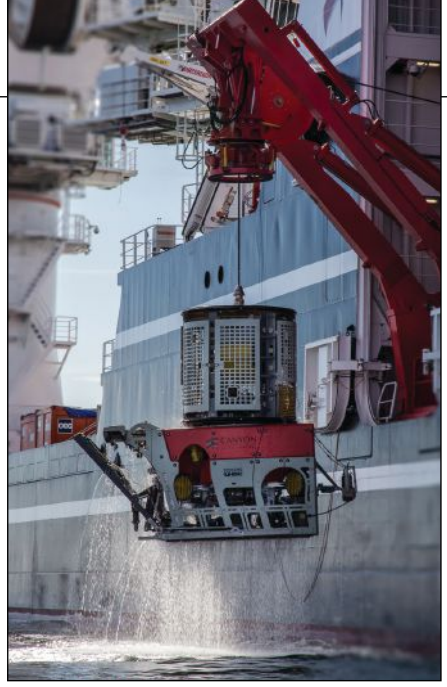
For more information, visit www.km.kongsberg.com.

Canyon Offshore mobilizes new UHD-III ROVs to Grand Canyon II

Canyon Offshore, subsea ROV operator, has mobilized two new UHD-III ROVs to their Grand Canyon II vessel. These new ROVs will enhance Canyon's reputation for having the most robust and flexible systems for subsea field work.

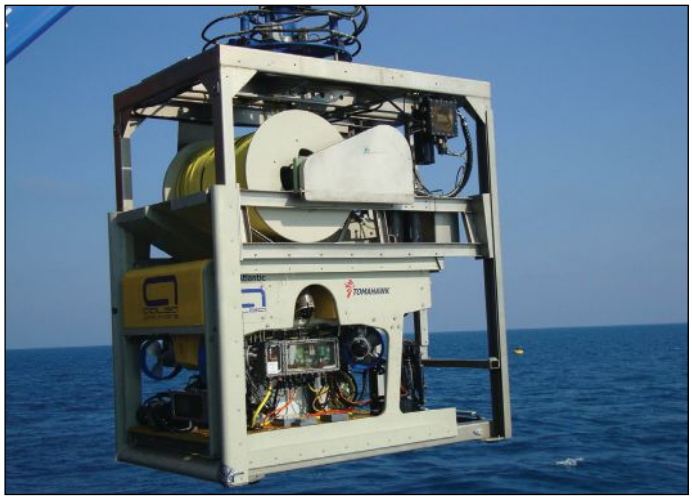
The Grand Canyon II is designed to perform a broad range of subsea operations, with DP3-class station keeping for work in severe weather conditions. It features a 250T heave compensated crane and facilities to launch port and starboard side ROVs simultaneously. The vessel's first project was for survey and trenching work in the UK. The UHD-IIIs were utilized continuously for a 4 week period, with only 1 hour of maintenance time.

"We are delighted to have installed two new UHD-III ROVs, complete with heave compensated launch and recovery systems onboard the Grand Canyon II, the second in the series of our flag ships. The UHD-III ROVs are already proving to be great assets," said Ian Edmonstone, president for Canyon Offshore.



"We are very pleased to continue our relationship with Canyon Offshore, in providing equipment as critical to their operations as ROVs. The reliability and versatility of the UHD-III ROV are great assets to their new Grand Canyon II vessel," stated Tyler Schilling, president for FMC Technologies Schilling Robotics.

For more information, visit www.helixesg.com.



Sub-Atlantic seals second ROV deal with AALEA Offshore

Global-leading manufacturer of specialist remotely operated vehicles (ROV), Sub-Atlantic, has won a second contract with Italian oil and gas subsea services provider, AALEA. The contract will see Sub-Atlantic deliver one of its class-leading Tomahawk observation ROV systems.

The Tomahawk has been optimized as a survey system. It is configured with intelligent interfaces, including an advanced subCAN control and diagnostics system, and is powered by Sub-Atlantic's powerful DC propulsion system that incorporates Statorshield™ technology. This high-performance control, coupled with powerful propulsion, provides a stable platform that enhances its survey and data collecting capabilities.

It is the second system of its kind that Sub-Atlantic has provided for AALEA with the first successfully completing a major 100-km pipeline survey through the strong currents of the Strait of Messina, a narrow passage of water in the Mediterranean Sea between Sicily and the Italian mainland. A total of nearly 2,000 km of survey has already been performed through both the cable route and pipeline, with nearly zero technical downtime and an average survey speed of 0.7/0.8 kts.

The survey involved Sub-Atlantic's Tomahawk system performing in deep water using a diverse range of sensors, including a dual-head, multi beam echosounder; a fiber optic gyroscope (FOG); a bathymetric system; a doppler velocity log; hydraulic boom cameras; a pipetracker, wheeled skid; CP with electric actuator; and laser measurement equipment.

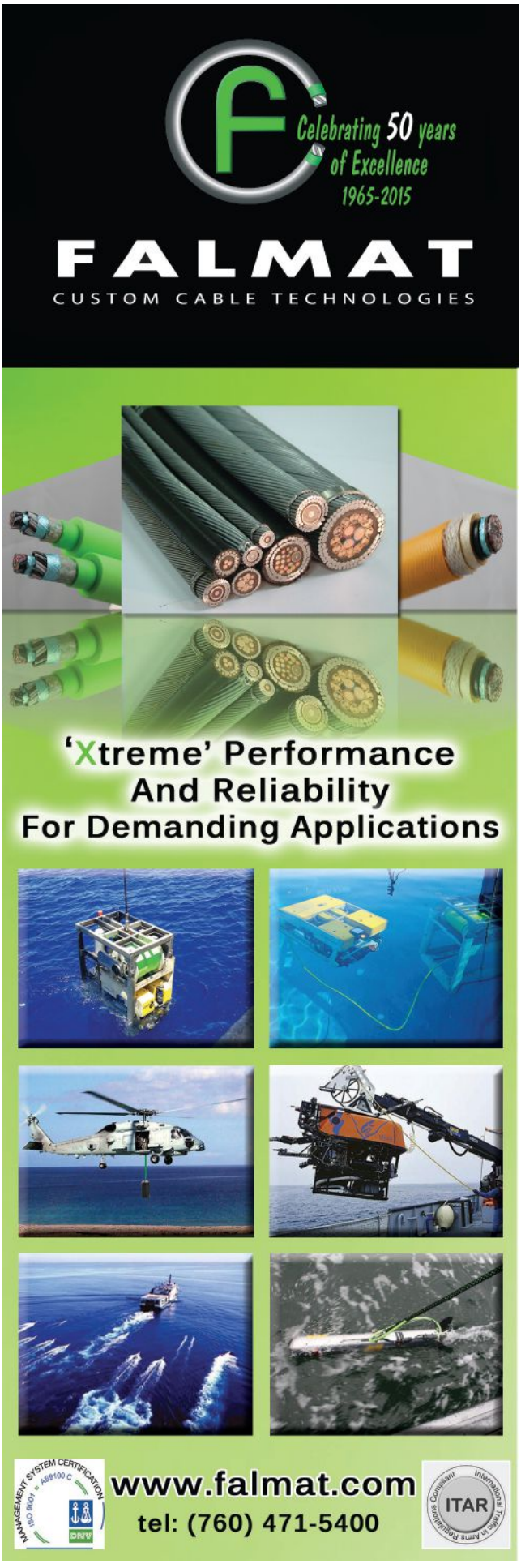
The latest Tomahawk ROV for AALEA will be manufactured at Sub-Atlantic's manufacturing base in Kirkbymoorside, Yorkshire, and is due to be delivered in Q3 this year.

For more information, visit www.f-e-t.com.

CMRE demonstrates systems for persistent, autonomous and real-time maritime surveillance

Conventional surveillance technologies cannot easily help to detect fast boats, which generally have small radar signatures and do not carry automatic identification systems (AIS). For this reason, the NATO STO CMRE (Centre for Maritime Research and Experimentation) has addressed this problem along with other project partners, as part of the European project PERSEUS.

The PERSEUS project (Protection of European BorRders and Seas through the IntElligent Use of Surveillance), coordinated by Spanish technological company Indra, is one of the most significant initiatives within the 7th Framework Program of the European Commission, and has constituted the flagship of R&D in the maritime security segment.



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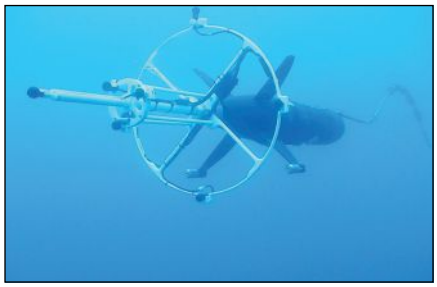


In the project's term, ended in June 2015, CMRE scientists and engineers worked to design, develop and demonstrate at-sea concepts of continuous, real-time passive underwater acoustic systems for maritime surveillance. The objectives have been successfully met by using innovative solutions integrated on board unmanned mobile platforms, i.e., both on an underwater glider (an autonomous underwater vehicle that uses shifts in mass to steer and changes in buoyancy to dive and surface) and a Wave Glider (an autonomous vehicle with a surface float and a submerged glider, generating forward movement by exploiting sea wave energy).

The embedded cutting-edge passive sonar surveillance system proved to be particularly effective due to its real-time continuous monitoring capability and the availability of several functionalities ranging from detection and localization to vessel classification. Furthermore, the platform/system combination has proven to be persistent and covert with wide area coverage and minimum environmental impact. Real-time detections and localizations have been made both on board the underwater glider and the Wave Glider, and the detection/tracking results have been disseminated to both CMRE and national control centers for display and further analysis. Also, target classification algorithms have been applied successfully in near real-time during at-sea demonstrations.

Adaptation of the Wave Glider for shallow coastal waters has also been tested by adding low-cost add-ons for above water sensing, in the form of inexpensive daylight and thermal cameras, and radar detection devices. This technology may help enable the detection of anomalous behaviors of marine traffic by fusing the above and the underwater picture. CMRE has been the first to demonstrate a complete system for underwater acoustic surveillance with highly persistent mobile robots. In the future, these systems could be used within a network to continuously monitor maritime areas of interest.

For more information, visit www.cmre.nato.int.

Scottish Association for Marine Science receives a Gavia AUV

A global leader in the provision of low logistic AUVs, Teledyne Gavia announced that it has completed the sale and recent delivery of a Gavia Offshore Surveyor AUV to the Scottish Association for Marine Science (SAMS) in Oban, Scotland.

The Gavia AUV, selected by SAMS, is rated to 500 m depth, and includes an interferometric bathymetry system as its primary scientific sensor and utilizes a high accuracy Doppler Velocity Log (Teledyne RD Instruments, Poway, California) aided Inertial Navigation System for subsea positioning. Additional modules can be added as SAMS AUV mission requirements evolve. The SAMS Gavia AUV will be known as "Freya" after the Norse goddess of beauty and will be employed for a variety of scientific applications including habitat mapping and geomorphology with initial archaeological surveys planned for July 2015.

Dr. John Howe, senior lecturer in marine geology stated, "SAMS are delighted to receive the Gavia AUV on behalf of the NERC Marine Autonomous and Robotics (MARS) community. We have been especially impressed by the vehicles' adaptability and ease of use and the GeoSwath+ data has been excellent. We look forward to working closely with Gavia in the future."

"We are delighted to have a world class scientific organization, such as SAMS, join our growing group of Gavia scientific users. The modular design of the Gavia AUV gives scientific organizations the flexibility they need to add or change modules or develop custom payloads in response to changing mission requirements," added Arnar Steingrimsson, director of vehicle sales at Teledyne Marine Systems.

The Gavia AUV is an autonomous sensor platform that is user configurable by the addition of one or more sensors, navigation, or battery modules utilizing a unique twist lock system. The Gavia is a fully low logistics modular system designed to be operated from vessels of opportunity and has the greatest depth rating of any vehicle in its class.

For more information, visit www.sams.ac.uk.

UTEC Geomarine successfully completes Caspian Sea project using geoROV™ technology

UTEC Geomarine, the geotechnical service line of UTEC Survey, an Acteon company, has successfully completed the first phase of a geotechnical site investigation in the Caspian Sea for a major oil and gas operator.

The project was completed using a cost-effective, time-efficient suite of ROV conveyed technology, comprising of UTEC's patented geoROV™ seabed cone penetration test (CPT) and sampling system, geoREACT suction skid, and a specially developed rotary core drill.

UTEC Geomarine's geoROV™ technology is an ROV-compatible, CPT, T-bar and push sampling tool. Key benefits include portability, cost-effectiveness and productivity. The geoROV™ returns high quality soils data at any water depth (depending on ROV). The geoROV™ drive unit mounts to all work class ROVs and after initial mobilization takes less than 1 hour to fit or remove. It can be deployed alongside or in between other subsea ROV works, and provides real-time data transmission. Additionally, geoREACT, an ROV tool skid designed to provide additional stability and reaction force for seabed investigation, enabled testing and sampling to take place over the full range of seabed types on this project.

The geoROV™ has a well-established track record in investigating drill cutting mounds beneath live platforms; establishing geotechnical parameters for design of subsea infrastructure in congested brownfield sites (adjacent to or beneath existing infrastructure); grid-style investigation to provide assurance of ground conditions for gravity base design; investigating geohazards; and conventional route surveys.

During 150 hours of operation in March and April 2015, the program of testing and sampling involved 91 cone penetration test locations using geoROV 5 cm² PCPT cone; 26 static and cyclic T-Bar test locations using geoROV 50 cm² T-Bar probe; 60 force probe test locations using geoROV 5 cm² PCPT cone with 2 cm² x 150 mm hardened spike extension; 13 push sample locations using geoROV™ P76 Piston Sampler; 11 rotary core locations using an HD400 drill with 1.0 m x 56 mm core barrel, with real-time logging of drilling parameters. The Caspian Sea has recently experienced significant growth as an oil-producing region, as more countries and oil and gas operators seek development opportunities. UTEC Geomarine has completed Phase 1 of a multi-phase program in the region and has supported major operators in the Caspian Sea for the past 3 years.

For more information, visit www.utecsurvey.com

Tampnet to acquire telecom infrastructure in the Gulf of Mexico from Broadpoint

Tampnet Inc., the US subsidiary of the Norwegian-based leading offshore high capacity and low latency communications provider Tampnet AS (Tampnet), has reached an agreement to acquire Broadpoint LLC (Broadpoint), a pioneer within offshore communications to the Oil & Gas industry in the Gulf of Mexico. In addition, Tampnet has entered into a long-term strategic roaming agreement with a leading telecom carrier. Broadpoint owns and operates a 2G/GSM network consisting of around 50 base stations with placements on rigs and platforms in the GoM, as well as certain telecom frequency licenses, and is serving the offshore industry in the GoM. Broadpoint also provides roaming services to telecom carriers who, in turn, offer voice and data services to their clients in remote offshore areas. Tampnet will with the acquisition offer premium, Gulf-wide 4G/LTE coverage to the O&G industry in the region, its resellers and its roaming partners by upgrading the existing 2G network to offer robust and reliable 4G service. In parallel to the very strategic acquisition of Broadpoint, Tampnet has entered into a long-term roaming agreement with a leading telecom carrier – enabling the carrier to utilize the state-of-the art, offshore 4G infrastructure to offer high-capacity and low-latency data and voice services to its clients in the GoM.

RigNet wins contract for remote managed offshore services

RigNet, Inc. has been awarded a multi-year contract to deliver high quality remote offshore communications services to a major operator of offshore drilling and production assets in Southeast Asia. “Remote connectivity is not a commodity service in the markets we serve. The combination of higher-specification assets working in increasingly remote locations, while utilizing smarter tools and networked teams, makes secure and reliable access a critical aspect of today’s energy industry,” said Mark Slaughter, RigNet’s CEO and president. “To meet these needs, RigNet delivers a communications architecture designed from the outset to include real-time traffic management and around-the-clock support to enable operations to flourish in the most challenging conditions.” RigNet will provide comprehensive managed remote communications solutions on the customer’s mobile offshore production unit (MOPU), including telephony, network support and onboard crew WiFi service. A fiber optic backhaul will connect the client’s headquarters to RigNet’s Singapore teleport. Network monitoring and support will be managed 24/7 from RigNet’s Global Network Operations Center, with in-country support services provided on their offshore site as required.

Inmarsat and KVH announce reciprocal distribution agreement

Inmarsat and KVH Industries, Inc., announced the signing of a reciprocal distribution agreement with immediate effect. Under the agreement, KVH becomes a non-exclusive, global distributor of Inmarsat’s Fleet One and FleetBroadband services, and Inmarsat becomes a non-exclusive distributor across all vessel types for KVH’s Videotel Basic Training Package, as well as for its NEWSlink newspapers within the leisure and non-passenger merchant vessel segments, which will be offered as enhancements to Inmarsat’s Fleet Media service. Fleet One, delivered through a small, lightweight terminal, is a cost-effective voice and data service that has been specifically configured to be accessible and affordable for small vessels. Videotel’s Basic Training Package is directed towards the training of crew members in the maritime industry covering subjects such as basic firefighting, coping with hazardous weather, and entry into enclosed spaces. NEWSlink newspapers, delivered daily by email, incorporate a portfolio of 75+ publications in 17 languages customized specifically for seafarers.

OceanWorks International receives 2nd seafloor network node pod from CSnet

A second Node Pod recently arrived at OceanWorks International to be refurbished and upgraded to the latest standard showcasing OceanWorks continued support of the ongoing operation and maintenance of CSnet International’s Offshore Communications Backbone (OCB) system. The delivery of this Node Pod follows the successful upgrade and refurbishment of the first Node Pod which is scheduled to be delivered to CSnet in July 2015.

OceanWorks delivered CSnet’s OCB subsea infrastructure, including five seafloor nodes that form the existing seafloor observatory portion of the system. The ongoing upgrade and serviceability of the Seafloor Network Infrastructure displays the ease of upgradability designed into the system and the ability to support the required 25 year lifespan of the cabled observatory.

OceanWorks International is a recognized subsea solution engineering company, providing over 20 years of service to the Scientific & Environmental, Oil & Gas, and Military markets. The continued work on the OCB subsea infrastructure involves design, engineering, analysis, manufacturing, testing, documentation, and a close working relationship with CSnet.

For more information, visit www.oceanworks.com.

Making data a priority is key to the future of the maritime industry

The future competitiveness of the maritime industry will be affected by how rapidly shipping operators take advantage of big data, according to one of the world’s leading suppliers of satellite communications to the maritime industry.

Martin Kits van Heyningen, CEO of KVH Industries, Inc., spoke at the Maritime CIO Forum at Nor-Shipping in Oslo, addressing technology issues faced by maritime leaders. “Probably the most important thing for maritime managers to do is make big data a priority,” Mr. Kits van Heyningen said. “It’s important to adopt a big data mindset, even if you don’t think of yourself as a data company. Data is becoming a resource in its own right, and offers incredible possibilities for understanding every aspect of your business better.”

During his presentation, entitled "Turning Big Data into Big Value," Mr. Kits van Heyningen noted that the maritime industry has been slow to adopt big data even though the industry faces many challenges for which data capture and analysis can provide answers–from meeting an increasing number of maritime regulations to improving the fuel efficiency of vessels underway. "The maritime industry has spent the past 20 years trying to limit the amount of data going on and off vessels, while the rest of the world has been doing the exact opposite in adopting big data," he said.

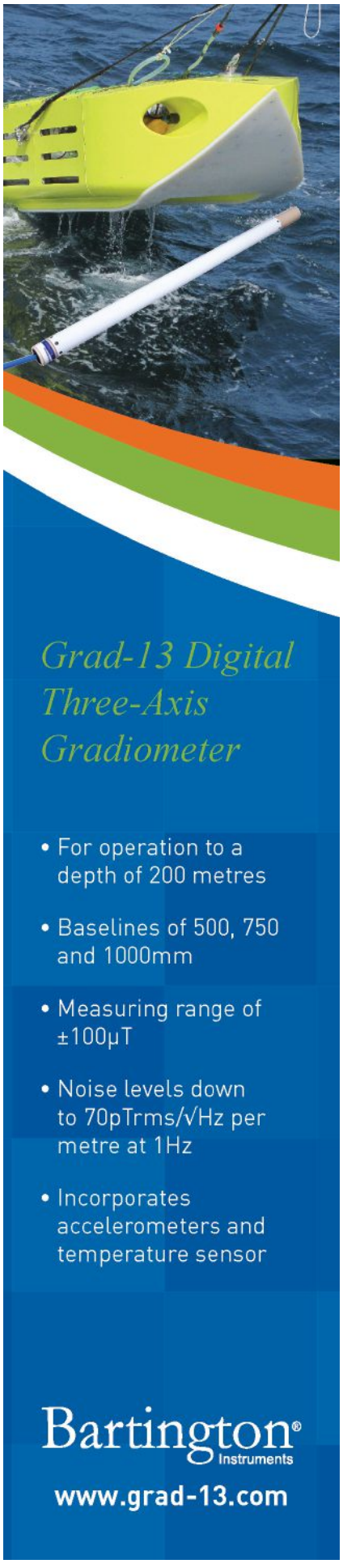
Computer analysis of big data goes far beyond human capacity in providing information that can make a maritime operation more efficient. For example, with real-time analysis of such data as engine monitoring, consumption rates for various fuel types, the fixed running costs of a ship, and weather data, a maritime operation can optimize a voyage for financial performance rather than just time or distance. "This is not a calculation that can be done by a human, no matter how much experience with a given route the people onboard may have," said Mr. Kits van Heyningen. Utilizing experts for remote analysis of big data can also help with preventative maintenance to avoid costly repairs.

The business benefit of utilizing big data is widely known; a study by the Massachusetts Institute of Technology (MIT) found that data-driven firms perform 5% to 6% better each year. "There's a growing divide between companies that use big data and those that don't," said Mr. Kits van Heyningen, who added that dramatic changes in the affordability of data analysis make this the right time for maritime operators to embrace big data. "You need to be creative about the questions you want big data to answer for you. It's more important than ever to work with IT partners and satellite communications providers that can do more than just provide connectivity, but can also help you solve your real-world problems," he said.

For more information, visit www.kvh.com.

World-Link strengthens its market position with a new Inmarsat agreement

Inmarsat has signed an agreement with World-Link Communications, Inc., appointing the innovative satellite services provider as a Partner for FleetBroadband, serving the maritime market globally. Alongside the agreement, World-Link plans to strengthen



its infrastructure and integrate with the Inmarsat network through significant investment in building an Inmarsat Point-of-Presence (PoP). The plan will advance World-Link's ability to deliver enhanced value-added services to its global maritime customer base.

"World-Link is committed to delivering solutions that bring value and strengthen clients' ship-to-shore connectivity," commented Asad Salameh, World-Link-Communications president. "Following the acquisition of BSM's Telaccount Overseas in March 2015 and our agreement with Inmarsat, we are investing heavily to strengthen our infrastructure and investment with Inmarsat, as well as in our value-added services. We want to ensure that World-Link customers benefit from industry leading technology and seamless connectivity at sea in a cost effective manner."

Commenting on the agreement, Ronald Spithout, Inmarsat Maritime president remarked, "World-Link has been a valued service provider of Inmarsat for over 25 years, and I'm delighted to welcome them as one of our FleetBroadband Partners. World-Link has made a significant investment to enhance its Inmarsat network infrastructure that will bring increased benefit to their customers and the maritime market."

For more information, visit www.inmarsat.com.

O3b connects Royal Caribbean's Anthem of the Seas

O3b Networks announced it has enabled high-speed broadband internet access and SMART Connect mobile service on Royal Caribbean International's with the O3bMaritime product while it is in the Mediterranean.

The use of O3b satellites, which are closer to the earth than traditional geostationary satellites, reduces latency, increases internet speed and improves voice and video quality for the user. O3b's next generation IP trunking solution boosts existing link capacities to rival the affordability and latency of fiber.

The O3b system is uniquely designed for broad coverage. Because O3b is a constellation of satellites, when Royal Caribbean moves one of its top-of-the-line Oasis- or Quantum-class ships to another region around the world, the global O3b satellite constellation can provide its signature fiber-like throughput and low latency in the new location as well.

O3bMaritime has already provided four of Royal Caribbean's largest ships (Oasis of the Seas, Allure of the Seas, Quantum of the Seas and Anthem of the Seas), each with more bandwidth than the rest of the cruise industry combined. In the near future, Royal Caribbean's Quantum of the Seas will move across the Pacific, bringing exceptional cruising experiences and at-sea high speed broadband to the Japanese ports of Okinawa and Kyoto, as well as other Asian destinations.

"With O3b we have added a dimension to cruising that has never existed before," said Michael Bayley, president & CEO of Royal Caribbean International. "Our new internet capabilities allow our guests to surf, stream and share their vacation experiences with their friends and family back home. It also allows us to provide our business clientele a new way to stay connected with their colleagues."

"We are honored to support Royal Caribbean's innovative use of technology, and to bring this capability to guests in a new destination," said Steve Collar, CEO of O3b. "By moving Anthem to the Mediterranean, Royal Caribbean will bring guests there the extraordinary level of instant connectivity that has thrilled Caribbean guests. Guests can tweet, post, Skype, stream video, even play Xbox with friends—just like they do at home—while cruising on Anthem."

For more information, visit www.o3bnetworks.com.

KVH enhances its mini-VSAT network with global MPLS

KVH Industries, Inc., announced that it recently implemented a global private multiprotocol label switching (MPLS) network connecting all of the teleports and satellite beams in its mini-VSAT Broadband network. The benefits of MPLS for the thousands of mini-VSAT Broadband users on commercial and recreational vessels worldwide include increased security, enhanced quality of service, and increased network reliability and uptime. The MPLS network is designed to aggregate all customer satellite traffic and provides Internet egress at KVH's "MegaPOPs" (point-of-presence access points) located in North America, Europe, and Asia.

The MPLS network also enables the KVH mini-VSAT Broadband network to provide state-of-the-art firewalls and redundant high-speed Internet connections at each MegaPOP to ensure security and reliability of all customer traffic. MPLS enables a level of security and quality above that of a virtual private network (VPN), a configuration that corporate customers have utilized for years to protect the security of their data.

"There are tremendous advantages to an MPLS network in terms of quality of service, reliability, and security," said Rick Driscoll, KVH vice president of satellite products and services. "We are now moving traffic to and from our hubs over state-of-the-art private network connections, as opposed to the public Internet. As a result, we can more effectively control the path that traffic takes through the network. This has enhanced the terrestrial backbone for the entire mini-VSAT Broadband network."

In addition, MPLS allows KVH to supply its mini-VSAT Broadband customers with a Global Static IP service, where customers can be assigned a unique public IP address for use globally. This option makes authorized communications to a vessel less complex and more secure.

The mini-VSAT Broadband network provides connectivity to commercial vessels and recreational yachts around the world and is the market share leader in maritime VSAT, according to independent industry reports. KVH designs and manufactures the TracPhone V-IP series of satellite communications antenna systems for use with the mini-VSAT Broadband network. In addition to providing connectivity to vessels, the mini-VSAT Broadband solution also includes content delivery, via the IP-MobileCast service that KVH developed and introduced in 2014. The IP-MobileCast content delivery service utilizes multicasting technology to affordably broadcast entertainment and operational content to ships at sea.

For more information, visit www.kvh.com.

Marlink launches SMARTconnect hybrid solution

Marlink unveiled a new approach to vessel communication services during Nor-Shipping 2015. Designed for users of Marlink's customized Sealink VSAT services, the new SMARTconnect hybrid solution seamlessly combines multiple communication carriers to provide the best available link based on pre-defined parameters set and managed by the customer. With a service delivery independent of specific carriers, cost can be reduced and greater flexibility and control provided for the customer.

SMARTconnect integrates Ku-, Ka-, C- and L-band satcom services with 3G/4G LTE, WiFi and Tampnet LTE to provide one unified link for the ship owner. Further carriers or new technologies can be easily added to the solution. For example, the recent agreement between Marlink and the North Sea focused LTE provider Tampnet will ensure that the multi-carrier approach of the new hybrid solution can better support the large customer base of Marlink in the North Sea.

"Our direct sales arm Marlink has successfully provided multi-carrier services to customers in the past, but with new and emerging communication services now more available, we feel that the time is right to introduce a much wider consolidated bandwidth approach, focusing on the application of connectivity by our customers and not on the channel it is delivered on," said Eric Ceuppens, Head of Satcoms at Airbus Defence and Space.

SMARTconnect is optimized by providing the availability of high throughput 3G/4G LTE services on offshore fields and along coastal shipping routes. The system demonstrates that alternative communication carriers can supplement existing VSAT services, providing Quality of Service based connectivity at the levels demanded by users for regular and critical operations. By end of 2015 the new SMARTconnect service will be an integral part of the XChange service delivery platform to further enhance and complement the XChange value proposition.

In operation, selection of alternate carriers is based on multiple criteria, including backup parameters, low-latency access, high bandwidth, better throughput and/or a combination of all of these. Routing logic can be established to enable automatic, seamless switching and ship owners have full control of how communication is routed via a management interface, allowing them to manually set priorities according to their own requirements at any given time.

"We believe that the provision of seamless throughput to meet the bandwidth and cost demands of each customer, regardless of the carrier type, is one of the most important aspects of maritime broadband services today," said Tore Morten Olsen, Head of Maritime Satcoms at Airbus Defence and Space. "We will continue to utilize available services, accommodate emerging technologies and build strong partnerships with third parties to future-proof SMARTconnect and generate significant savings and operational benefits for ship owners."

For more information, visit www.marlink.com.

DOF Group extends VSAT contract with Marlink

DOF Group has renewed its VSAT services contract with Marlink for 5 more years, with options to further extend the services. Under the new contract, Marlink will provide customised VSAT services to 60 DOF-owned offshore and subsea vessels, counting an additional eight vessels on the previous contract, including several imminent newbuilds.

As an international group of companies, DOF owns and operates a modern fleet of supply and subsea vessels, offering a strong engineering capacity to service the global offshore energy market. Marlink's continuous service development, which in addition to technical enhancements includes improved global support and enables vessel owners such as DOF to provide reliable connectivity to clients.

Marlink currently meets DOF's fleet-wide connectivity requirements, using both dedicated and shared bandwidth services according to specific vessel needs. Marlink and DOF are currently monitoring the throughput perfor-

mance of the vessels using the iDirect shared platform; so far the experience is that vessels receive more throughput on a shared service. It is expected that most of the fleet will move to the iDirect platform to improve DOF's overall bandwidth requirements.

"We are keen to continuously improve our support by developing the best solution for each vessel and the fleet going forward," said Gunhild Moen, director key accounts, Marlink. "Our goal is to deliver the best cost vs bandwidth return on investment, whilst ensuring access to advanced features such as the ability to dynamically increase bandwidth, so DOF can demonstrate flexibility towards clients that may have changing communication needs for specific projects."

"Marlink's VSAT services have proven to be highly beneficial to our own and our clients' operations," said Tor Skeie, CEO Marin IT, the IT service provider for the DOF Group. "With reliable communication on board, we are able to operate smarter and more efficiently, whilst being confident in a stable, available link. We are so far pleased with the extra throughput achieved over a shared platform which has made us more cost efficient in our operations and the extra bandwidth is much appreciated by our crew."

For more information, visit www.marlink.com.

Lockheed Martin awarded next contract to support USCG C4ISR

Lockheed Martin received a $72 million contract to support the U.S. Coast Guard's efforts to enforce maritime sovereignty and address at-sea threats through the National Security Cutter (NSC) program.

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 eighth National Security Cutter, the future USCGC Midgett.

Lockheed Martin's C4ISR system offers comprehensive, real-time situational awareness, communications and interoperability, which allows the crew to assist vessels in distress; track and engage targets of interest; collaborate with other Coast Guard air, sea and land assets; and act on the most up-to-date information available.

In 2014, the second NSC, USCGC Waesche, aided in a law enforcement encounter at sea that resulted in the confiscation of a large amount of contraband. During the interdiction, the U.S. Coast Guard utilized the command and control system onboard to pursue a low-profile, fast vehicle, which led to the capture of the illegal cargo.

Lockheed Martin has a rich legacy in supporting the Coast Guard and has provided the C4ISR systems to all 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.

For more information, visit www.lockheedmartin.com.

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www.oceannews.com/newsletter-subscription

Nexans' cables to increase security of power supply in Denmark

Denmark's electricity grid is to be reinforced with more than 290 km of Nexans' XLPE cables as part of ENERGINET.DK's JFK & Storstrømmen project. Nexans will supply two submarine cable systems and two underground cable systems in Denmark in a contract worth approximately €25 million. Nexans' 3-core 150 kV XLPE submarine cables will run from Jutland in central Denmark to the island of Funen in the east and on to the island of Als in the south. Further, a 132 kV submarine cable will connect the substation at Rosenfeldt on the island of Zeeland to the Orehoved substation on Falster Island. The cables will be used to increase the security of supply in the region. The JFK & Storstrømmen project is part of a Danish national initiative to move the majority of power cables underground by 2030. The Cable Action Plan will see 2,900 km of new power lines installed as underground cables and replacement of 3,200 km of existing 132 kV and 150 kV overhead lines. Nexans and ENERGINET.DK previously collaborated on the Køge Bugt project, also part of the Cable Action Plan, and will start working to connect Kriegers Flak offshore wind farm to the Danish Grid thereafter. The cables will be manufactured at Nexans' plants in Hanover, Germany and Halden, Norway. Delivery will start in March 2016.

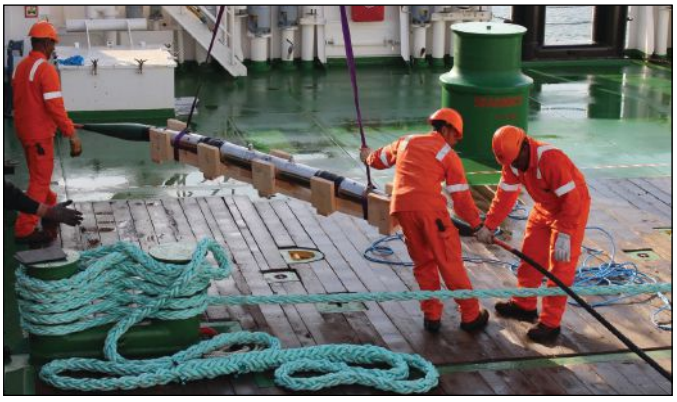
JDR wins Veja Mate contract

JDR has been awarded a subcontract by Siem Offshore Contractors GmbH (SOC) to supply submarine composite power cables and related accessories as well as termination and testing services for the Veja Mate offshore wind farm. The project has been developed with the support of K2 Management as technical, Green Giraffe as financial and CMS Hasche Sigle as the legal advisor on behalf of the owner consortium consisting out of Highland Group Holdings Ltd., Siemens Financial Services and Copenhagen Infrastructure II, a fund managed by Copenhagen Infrastructure Partners. The Veja Mate OWF is located 115 km off the German coast, within the German Bight sector of the North Sea. The 67 x 6 MW Siemens supplied wind turbine generators shall be inter-connected by an inner array grid of JDR-designed and manufactured 33 kV medium voltage alternating current submarine composite cables with a total length of up to 97 km. JDR will also deliver hang-offs, connectors and a range of other cable accessories. Additionally, JDR will be providing topside termination and testing services through their Global Services division. The full scope of the award will be manufactured and deployed from JDR's Hartlepool facility.

EC to support Brazil-Europe cable

The European Commission (EC) has announced that it will support a submarine fiber optic cable project between Europe and Latin America that will link Lisbon, Portugal, with Fortaleza, Brazil. This initiative will bring the two continents closer and boost education, research and innovation as well as business exchanges. It should reduce connection costs and provide many more households, organizations and companies with a very high-speed Internet connection. A EULALINK Joint Venture agreement between the two consortium partners, Telebras of Brazil and Islalink of Spain, has been signed. The European Commission will support a group of public players gathered in the consortium BELLA (Building European Link to Latin America) who can take advantage of the new capabilities offered by the future cable. The goals are to improve the interconnection of the regional research and education networks of Europe and Latin-America and the intra-regional academic connectivity in Latin-America, in order to achieve policy objectives related to international cooperation and regional development, e-infrastructure, security and space. BELLA is composed of 12 European and Latin American Research and Education Networks: RedCLARA (the Latin American regional network), GEANT (the European regional network), and the networks from Brazil, Colombia, Ecuador, Peru, Chile, Portugal, Spain, France, Italy and Germany. BELLA will count on the support of several European and Latin American public actors, and the expected contribution of the European Commission is around 26 million euros.

Xtera upgrades HUGO with its next generation repeater



Xtera Communications, Inc. announced the deployment of its next generation repeater into the High capacity, Undersea Guernsey Optical-fiber (HUGO) subsea cable system connecting Porthcurno (UK), Guernsey (UK) and Lannion (France), partly owned by Sure, leading supplier of telecommunication services in Guernsey, Jersey and the Isle of Man. This project represents the first deployment of Xtera's repeater in a commercial system, as well as the industry's first deployment of a Raman-based submarine repeater.

The repeater insertion extends the lifetime and capacity of the HUGO subsea cable, which is a redeployment of parts of the decommissioned Gemini system. HUGO had initially been an unrepeatered system, but had become limited by the relatively high loss of the cable. The addition of Xtera's repeaters removes these limitations and creates the highest possible capacity system with minimum disruption to service.

Having no legacy, Xtera was in a position to design and develop a completely new repeater with a number of electrical, optical and mechanical innovations. The enhanced electrical and optical designs enable Raman amplification in repeatered cable systems, leading to excellent optical noise performance and a spectrum significantly greater than that offered by repeaters based on erbium-doped fiber amplifiers.

"This revamping of an unrepeatered cable system into a repeatered one is a perfect illustration of Xtera's innovative, flexible solutions for building new subsea infrastructure or upgrading existing cable assets under water," said Stuart Barnes, senior vice president and general manager, Xtera Submarine Business. "Due to its spectrum flexibility, Raman amplification allows us to fine-tune the repeater performance with respect to the optical characteristics of the line fiber, which was optimized for 20-year-old transmission technologies, thus maximizing the system capacity."

For more information, visit www.xtera.com.

Saudi Aramco breaks world cable length record

Saudi Aramco has achieved a landmark by energizing its largest Tie-in Platform with a 230-kv, 46-km submarine composite cable, making it the longest of its kind.

The Tie-in Platform, named 'TP-20' lies in the world's largest offshore field, Safaniya, and energizing it was the first phase of long-term plans to upgrade the Safaniya offshore field, referred to as the Safaniya Master Plan.

TP-20 will be the main crude oil gathering and power supply hub for North Safaniya offshore field. It is designed to provide 152 MW of electric power via a 46 km, 3-core 230 kV

submarine composite cable (power and fiber) from a Saudi Electricity Company, newly-built 380/230 kV onshore substation.

This 46 km, 3-core 230 kV submarine composite cable is the longest of its kind in the world and was installed as a single piece without a field splice. Considering the value of equipment at stake, the laying of the submarine cable was an extremely critical and complex operation.

The entire length of the submarine cable was transported from the manufacturer on a single vessel, known as a deep water cable laying vessel. Then, with the help of a shallow water cable laying barge, the cable was installed from onshore to offshore TP-20.

With the complete 230 kV electrical substation, the weight of TP-20 exceeds 6,000 metric tons. This staggering load cannot be handled by an industry standard marine crane. Therefore, the installation of TP-20 was performed using a unique float-over method.

Subsequent to the energization of TP-20, TP-18 and the nine wellhead platforms in central Safaniya field were also successfully energized under the same project. TP-18 is designed to provide 62 MW of electric power being fed via a 44 km, 3-core 115 kV submarine composite cable from a newly-built 230/115 kV onshore substation.

A complete electrical power system is delivering power to Safaniya's remote offshore loads and has increased crude oil production more than 70 MBOD from the central Safaniya field– all this after a complex and challenging commissioning operation.

For more information, visit www.saudiaramco.com.

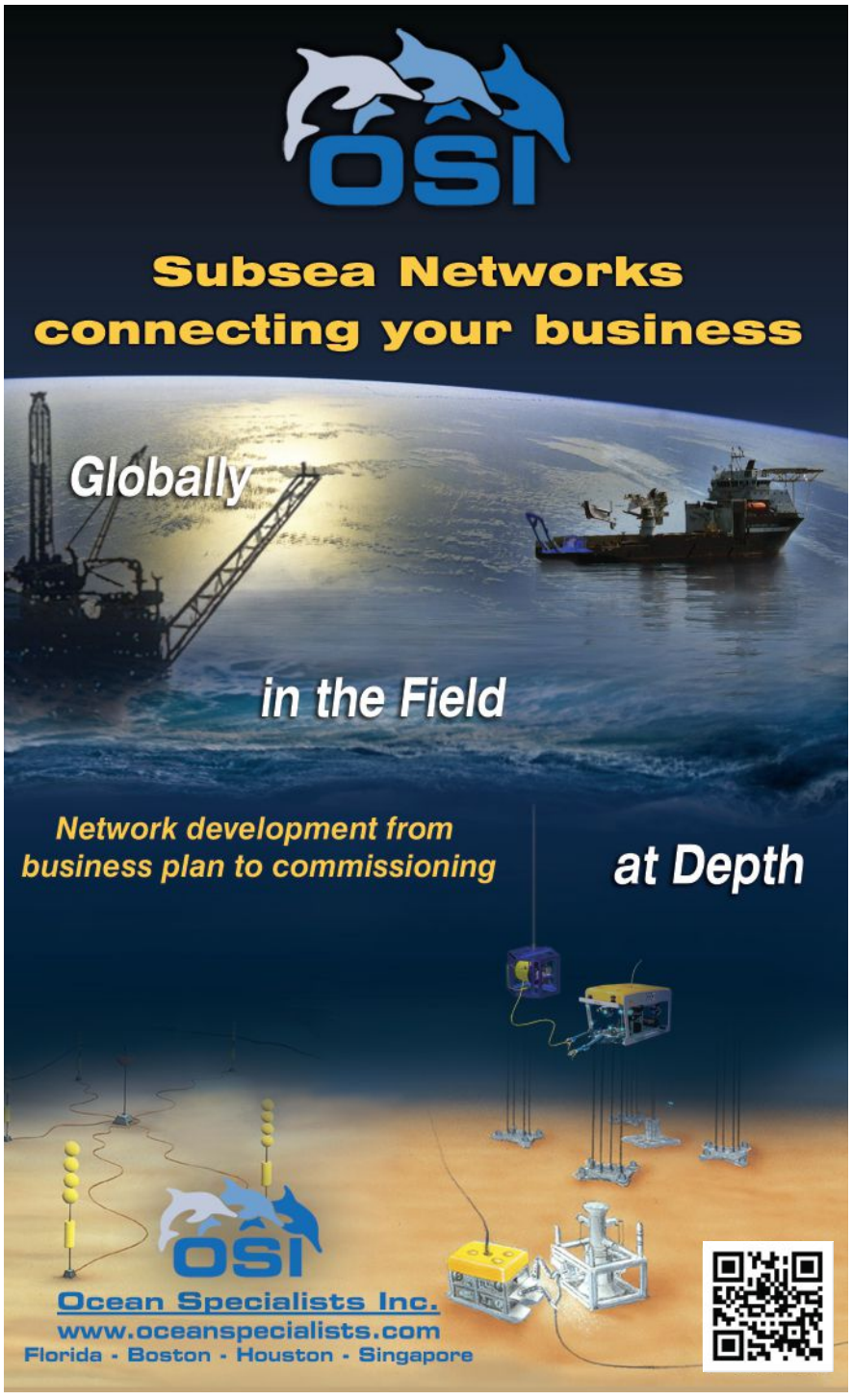
Successful commissioning of HelWin2 announced

Prysmian Group announces the successful commissioning of the High Voltage Direct Current (HVDC) offshore grid connection project HelWin2 realized off the North Sea coast of Germany in a contract with the Dutch-German transmission system operator TenneT. Prysmian secured this project in July 2011 as one of several contracts awarded to consortia between the Group and Siemens Energy for the grid connection of offshore wind farms to the mainland.

HelWin2 now links the offshore wind park Amrumbank West with a 690 MW cable connection operating at the highest commercially available voltage of ±320 kV DC, along a total route of 130 km (85 km submarine and 45 km land) to the mainland Germany land converter station in Büttel, northwest of Hamburg and is ready to start commercial operations.

HelWin2 uses extruded HVDC cable technology from Prysmian together with Siemens HVDC Plus® converter technology at the offshore platform and onshore stations. Prysmian Group has also installed the 155 kV HVAC submarine cables, which connect the converter platform HelWin Beta to the respective individual offshore wind farm transformer platforms.

In addition, HelWin Beta has been connected to the neighboring platform HelWin Alpha by ways of Prysmian's Feltoflex HV 155 kV, a new generation of high voltage, rubber insulated cable systems that combine the Group's exten-

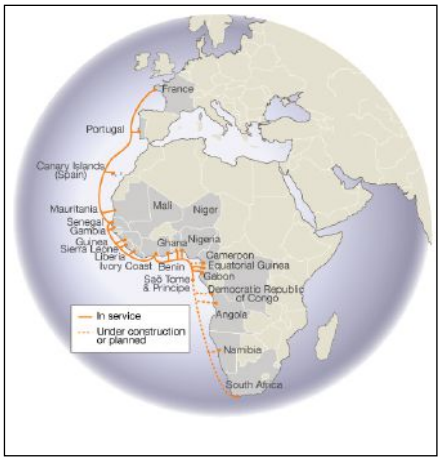


sive expertise in MV heavy duty cable systems with the specific application requirements for mobile interconnections between 2 platforms into a full turn-key ultra-flexible cable system easy to lay even in the harshest climate conditions. The completion and hand-over of this important project re-affirms the Group's continued successful relationship with TenneT who have awarded Prysmian the submarine and land cable systems for a total of six HVDC grid connection projects in recent years. HelWin2 is the fourth grid connection to be handed over this year following the BorWin2, HelWin1 and SylWin1 projects commissioned in late January, early February and late April, respectively.

For more information, visit www.prysmian.com.

Orange connects Benin, Canary Islands to ACE

Orange, together with the other members of the ACE consortium, announced the launch of the ACE cable in Cotonou, Benin, and Tenerife, Canary Islands, Spain. The connection of these two stations is part of the second phase of deployment of the ACE submarine cable, which now serves 18 countries: France, Portugal, the Canary Islands (Spain), Mauritania, Senegal, Gambia, Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Benin, Ghana, Nigeria, Equatorial Guinea, Gabon, and São Tomé and Príncipe. Two landlocked countries, Mali and Niger, are connected via a terrestrial extension.



The ACE cable, which expands broadband internet access in Africa and provides additional capacity to existing national networks, will cover 17,000 km and will be extended to South Africa by the end of the second phase. Branches are planned in order to connect Cameroon, as this country has just signed the agreement that formalizes its entry into the ACE consortium, the Democratic Republic of the Congo, Angola and Namibia.

Since the first phase was launched in December 2012, seven of the connected countries–Gambia, Guinea, Equatorial Guinea, Liberia, Mauritania, São Tomé and Príncipe, and Sierra Leone–have had a direct connection to a submarine cable for the first time, enabling them to access the international broadband network in an optimal manner.

To carry out this ambitious project, Orange, together with its subsidiaries Côte d'Ivoire Telecom, Orange Cameroon, Orange Mali, Orange Niger and Sonatel, combined forces with other major partners to form an international consortium.

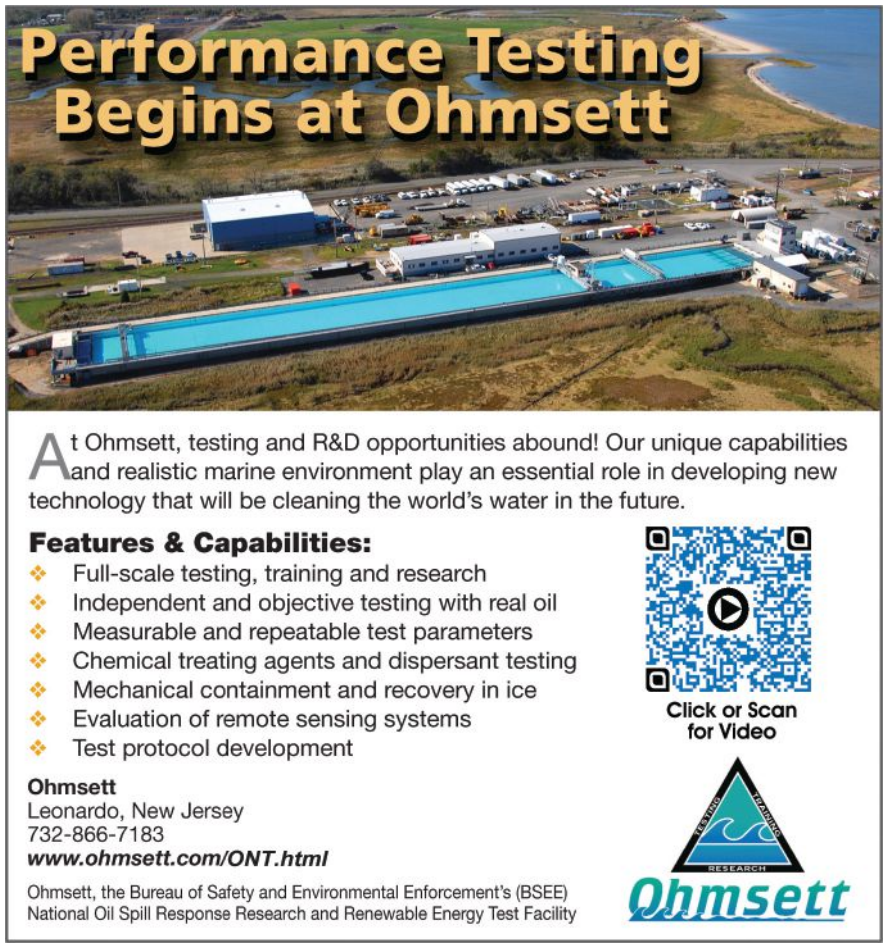
Beyond the connectivity between Africa and Europe, thanks to interconnections with other submarine cables, ACE constitutes another route to the Americas and Asia for Africa. Moreover, ACE is an alternative for network traffic between Europe and Asia going through Africa. The cable also diversifies transmission arteries between Portugal and France.

ACE relies on what is currently the most advanced technology used for submarine cables: wavelength division multiplexing (WDM). With WDM, cable capacity can be increased without additional submarine work. Overall capacity will be boosted to 12.8 Tbps using 100-Gbps technology, which supports high-capacity networks.

The cable's construction amounts to a total investment of around US$700 million for the consortium, with around US$250 million financed by the Group and its subsidiaries. This major investment furthers two of Orange's strategic objectives: to provide widespread access to the internet in the more than 20 African countries where the Group is present and to continue to improve the quality of its network service.

Through the development of its submarine networks, Orange is contributing to the development of a high-quality worldwide network to help service the ever-increasing volumes of data being exchanged.

For more information, visit www.orange.com.



Transpower says Cook Strait cables must be protected

Transpower said that two recent prosecutions over fishing activities in the Cook Strait Cable Protection Zone (CPZ) reinforce the importance of the High Voltage Direct Current (HVDC) Cook Strait Cable.

The CPZ protects vital submarine electricity and telecommunication cable links between the North and South Islands. The cables form part of the HVDC inter-island link that transfers power between the North and the South Islands.

Activities such as fishing and anchoring are prohibited in the CPZ to protect the cables under the Submarine Cables and Pipelines Protection Act 1996. The penalty for breaching the Act can result in fines of up to $250,000, as well as forfeiture of the vessel.

HVDC & power electronics manager Ricky Smith said that protecting the submarine cables of the HVDC inter-island link is critical to ensuring a secure supply of electricity in both the North and South Islands.

The reminder comes following two recent cases where convictions were secured: the first where the master of an inshore trawler negligently conducted a fishing activity inside the CPZ, and the second involving a recreational runabout moored in the CPZ under the belief that this activity would not cause damage. Both prosecutions resulted in significant penalties.

For more information, visit www.transpower.co.nz.

JDR wins Race Bank contract

DONG Energy has awarded a contract to supply subsea power cables for the Race Bank offshore wind farm to JDR Cables. Additionally, both companies have collaborated on a comprehensive frame agreement for offshore wind farm cable and accessory supply.

The Race Bank offshore wind farm, located off the Norfolk coast, was awarded development consent in 2012. It will have a potential capacity of 580 MW and could generate enough electricity to power over 400,000 UK homes a year. The project will span approximately 29 sq. mi and is due to be operational by 2018.

JDR is a leading provider of technology connecting the offshore energy industry. For this contract, JDR will design and manufacture 110 km of 36 kV inter-array cables and provide offshore testing and termination services. The scope of work also includes the supply of accessories, including hang-offs, electrical t-connectors and cable cleats, and the entire system will be manufactured from JDR's facility in Hartlepool, UK.

The frame agreement, signed on JDR's stand at Global Offshore Wind in London last week, states that JDR will manufacture array cables, connectors and hang-offs, and provide termination and testing for a minimum of three offshore wind projects. JDR will work in collaboration with DONG Energy to enhance current designs and develop new technologies and processes to improve the quality and price of subsea power cables through the life of the frame agreement.

For more information, visit www.jdrglobal.com.

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THE PLATFORM CHALLENGE

Andrew Lloyd, Director, Installations at Global Marine Systems Limited describes the process of connecting oil and gas platforms with fiber optic telecommunications cables and how to overcome the specific and sometimes considerable challenges that lie in wait.

Cable Innovator supporting J-tube pull in operations in the North Sea.

Regardless of whether the requirement is platform-to-platform or platform-to-shore connections, installing subsea fiber optic telecommunication cables begins with the same process—a DTS (desktop study) that forms the foundation for the FEED (front end engineering design) study—and we use our in-house engineering teams and GeoCable GIS (geographical information system) software. This intelligent software helps manage and analyze geographically referenced data, giving quick access to over 2 million kilometers of as-laid cable data, along with the locations of pipelines, subsea structures, fishing grounds, and even must-avoid locations such as munitions dumps. It's one of the largest databases of its kind in the world.

Properly executed, the study should detail all the influences on cable route safety and provide sound engineering solutions for the environment encountered. It should also specify the quantity of submarine cable and the plant required to build the system.

The study provides a technical reference for the entire project and throughout the life of the cable system, detailing factors likely to influence all subsequent activities, from survey through installation, and then throughout the system's operations and maintenance lifecycle. It's an extremely meticulous, but essential part of all oil and gas projects and can take around 2 months to execute to provide the necessary level of detail.

Ultimately, the study will recommend a route that does not conflict with existing subsea infrastructure. It will also provide recommendations for cable type, armor type, and any other engineering challenges such as burial requirements and cable crossing points.

With the study complete, the proposed route is then subject to a dedicated marine hydrographic survey. A survey vessel will sail the route to determine the exact nature and topology of the seabed. Here, geophysical survey tools will include echo-sounders, sonar, sub-bottom profilers, and magnetometers that, in combination with geotechnical sampling, provide a comprehensive set of data that is charted and incorporated into the GIS software, updating the route where required.

The survey data are also interpreted and used to perform burial assessments that, when combined with knowledge gained from the DTS study, help determine the best burial tools and cable protection measures for the system. Based on a typical cable length of 30 to 50 km for an oil/gas project, a marine survey can take around 3 months to complete, including all the reporting and charting.

Both during and after the marine survey, we are able to use the data collected to optimize the cable route and create key engineering documents that form the cable installation blueprint. Comprehensive route position lists (RPLs) and straight line diagrams (SLDs) will be generated that detail the position and all aspects of the cable route such as the cable plant (branching units, repeaters, joints, beach manholes), cable lengths, armor types, transitions, slack, water depths, cable and pipeline crossing points, and maritime boundaries.

The drafting of operational procedures will also start answering questions: How will the cable be handled? How will it be deployed over the stern? How will it be buried? How will it be pulled onto and terminated on the platform itself?

Alongside this, a procedure will be drawn up detailing how our vessel will enter the platform's 500-m zone and how people will get on and off the platform, which will all be agreed upon with the platform owners. All of the documents and drawings we produce are presented to the platform owners and end customer for sign-off.

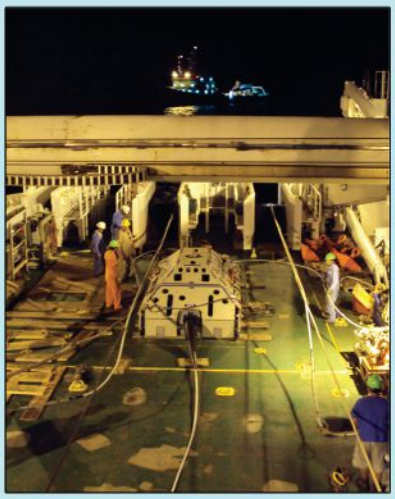
Permitting is another challenge. Our permitting department is responsible for obtaining and assisting with any consents, licenses, permits, or other permissions required. Such permits are subject to an array of regulatory requirements, particular to each country, which can be complicated by international, national, and local legislation.

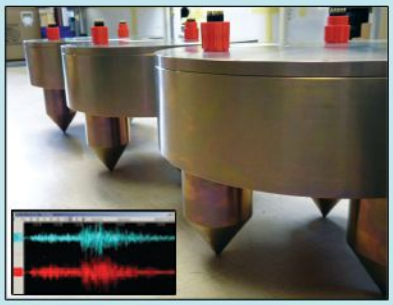
Only when permitting is complete can the installation vessel be mobilized. Here, specialist equipment will be loaded and the cable installation team will join the vessel, first sailing to the port of cable manufacture before heading to the work site.

Firstly, grapnels are pulled along the seabed to ensure the route is clear of debris. It's surprising what can obstruct a route—aside from the usual abandoned rope and netting—we've encountered downed helicopters, sea containers, and even cars that have fallen off transporter vessels.

The cable is then laid, typically to a tolerance of ±1 m, along with any other cable plant such as branching units or CEM (cable end modules)—a CEM allows subsea rather than on-platform cable termination, a trend we are witnessing increasingly. Where possible, we simultaneously lay and bury the cable through a subsea plough to ensure the cable is immediately protected and deploy additional protection at cable or pipeline crossings. If the cable does have to be terminated onto a platform, then the engineering documents produced at the start of the project will be used to ensure the cable can be safely pulled on the platform and routed to the termination location.

A typical project, including cable loading, installation, and reporting will take approximately 60 days, depending on weather delays, which arguably presents one of our biggest challenges, particularly in the North Sea where weather conditions can change very quickly. Once complete, the cable is fully function tested and final reports are prepared for customer sign-off. Job done!





Seafloor Communications Specialists

CSnet International

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Experts in Seafloor Communications Network

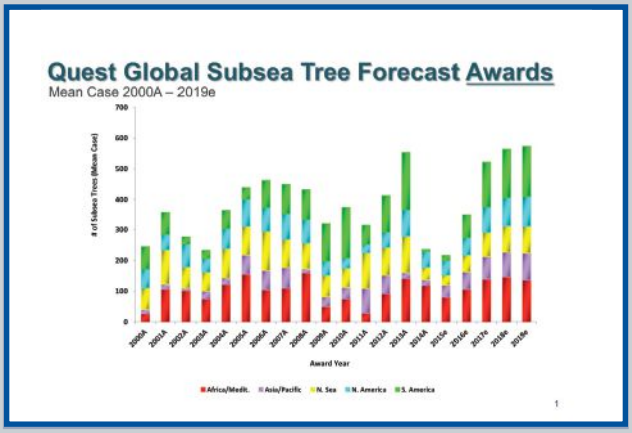
CSnet offers end-to-end solutions providing global users a pre-engineered, expandable, portable system that can be deployed and redeployed anywhere – in water depths up to 3,000 meters. Meeting the needs for a wide range of spatial, power or bandwidth requirements, the Offshore Communications Backbone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

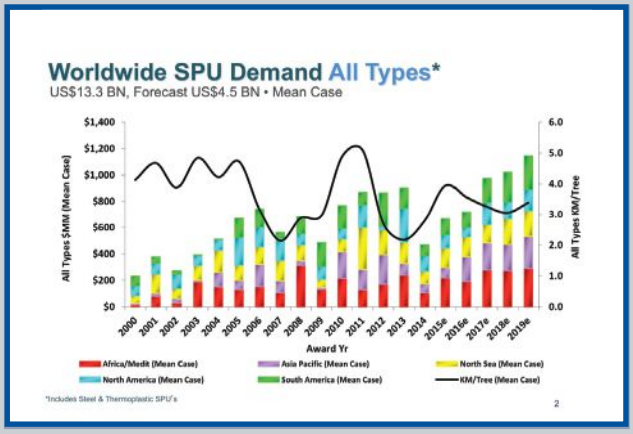
Offshore Communications Backbone

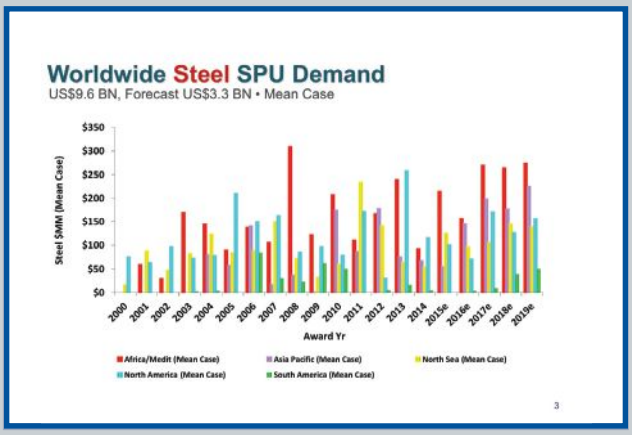
The OCB is a modular seafloor communications network that is directly connected to the Internet. Clients can provide and control their own sensors and data outputs, or CSnet can provide a suite of sensors from the surface to the seafloor with data directly forwarded to the client's onshore facilities.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

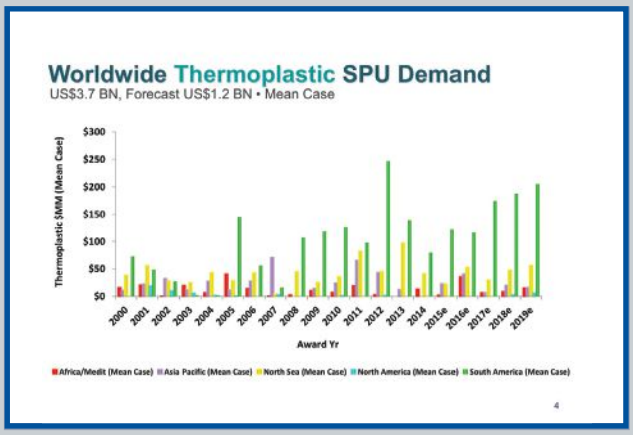
OFFSHORE STATS & DATA

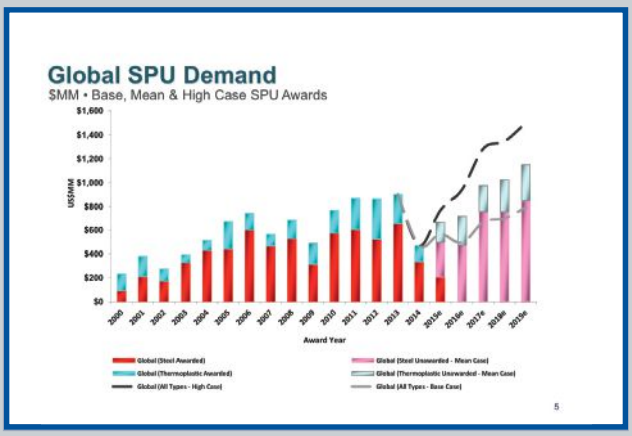
Quest Offshore Activity Report

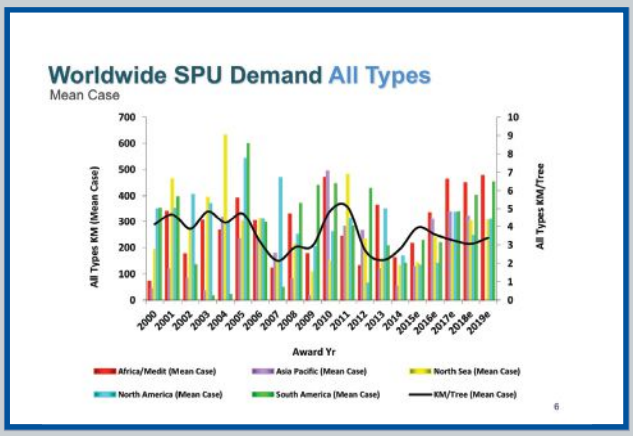












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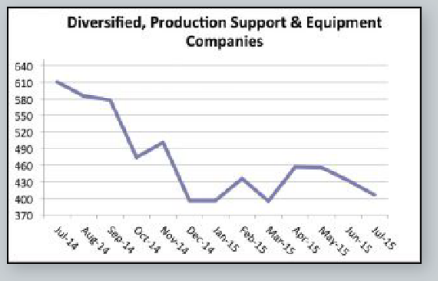
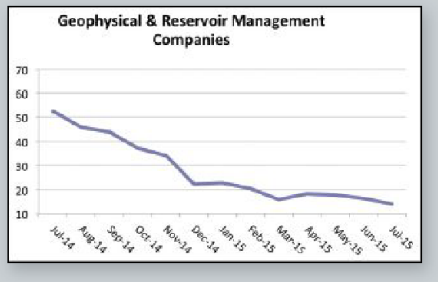
Monthly Stock Figures & Composite Index

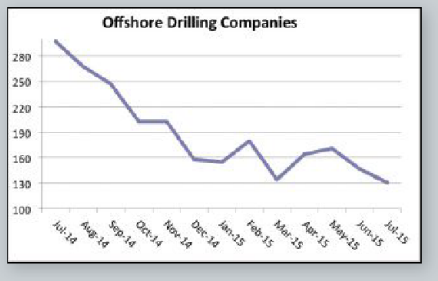
Industry Company Name	Symbol	Close(*Mid*) *July*	Close(*Mid*) *June*	Change	Change %	High	Low 52 week
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	59.50	61.96	-2.46	-4.0%	75.15	47.51
Cameron Intl. Corp.	CAM	50.72	53.55	-2.83	-5.3%	74.89	39.52
Drill-Quip, Inc.	DRQ	67.22	73.36	-6.14	-8.4%	107.23	65.28
Halliburton Company	HAL	41.07	44.05	-2.98	-6.8%	74.33	37.21
Tenaris SA	TS	25.80	27.94	-2.14	-7.7%	47.06	24.35
Newpark Resources, Inc.	NR	7.68	7.67	0.01	0.1%	13.60	7.29
Schlumberger Ltd.	SLB	86.63	87.04	-0.41	-0.5%	115.90	75.60
Superior Energy Services, Inc.	SPN	19.30	20.99	-1.69	-8.1%	37.05	16.70
Weatherford International, Inc.	WFT	11.34	13.20	-1.86	-14.1%	24.88	9.40
Deep Down, Inc.	DPDW	0.60	0.55	0.05	9.1%	1.90	0.49
FMC Technologies	FTI	36.53	42.12	-5.59	-13.3%	63.92	34.85
Total Diversified, Production, Support and Equipment.....		**406.39**	**432.43**	**-26.04**	**-6.0%**	**635.91**	**358.20**
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	4.60	5.25	-0.65	-12.4%	16.50	4.22
Mitcham Industries, Inc.	MIND	4.29	4.58	-0.29	-6.3%	13.82	3.81
Compagnie Gnrale de Gophysique-Veritas	CGV	5.00	6.38	-1.38	-21.6%	11.76	4.80
Total Geophysical / Reservoir Management..……..		**13.89**	**16.21**	**-2.32**	**-14.3%**	**42.08**	**12.83**
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	23.81	27.97	-4.16	-14.9%	51.39	23.52
Diamond Offshore Drilling, Inc.	DO	23.99	26.91	-2.92	-10.9%	50.59	23.74
ENSCO International, Inc.	ESV	20.01	21.85	-1.84	-8.4%	54.95	19.78
Nabors Industries, Inc.	NBR	12.85	14.02	-1.17	-8.3%	29.97	9.91
Noble Drilling Corp.	NE	13.99	15.10	-1.11	-7.4%	29.17	13.15
Parker Drilling Company	PKD	2.98	3.38	-0.40	-11.8%	6.86	2.51
Rowan Companies, Inc.	RDC	18.69	20.51	-1.82	-8.9%	32.15	17.23
Transocean Offshore, Inc.	RIG	14.51	16.66	-2.15	-12.9%	44.49	13.28
Total Offshore Drilling..……..		**130.83**	**146.40**	**-15.57**	**-10.6%**	**299.57**	**123.12**
Offshore Contractors, Services, and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	12.38	13.89	-1.51	-10.9%	28.00	11.97
Gulf Island Fabrication	GIFI	10.53	10.07	0.46	4.6%	23.57	10.00
McDermott International, Inc.	MDR	4.86	5.67	-0.81	-14.3%	8.07	2.10
Oceaneering International	OII	43.06	46.05	-2.99	-6.5%	74.15	43.06
Subsea 7 SA	SUBCY.PK	8.8	10.1	-1.30	-12.9%	17.81	8.17
Technip ADS	TKPPY.PK	13.8	16.3	-2.50	-15.3%	26.30	13.39
Tetra Technologies, Inc.	TTI	6.17	6.24	-0.07	-1.1%	12.11	4.72
Total Offshore Contractors, Service, and Support..……..		**99.60**	**108.32**	**-8.72**	**-8.1%**	**190.01**	**93.41**
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	67.74	71.00	-3.26	-4.6%	83.12	66.59
Gulfmark Offshore, Inc.	GLF	10.18	12.01	-1.83	-15.2%	42.80	10.00
Bristow Group	BRS	50.72	52.72	-2.00	-3.8%	75.08	50.10
PHI, Inc.	PHII	31.89	33.75	-1.86	-5.5%	52.98	27.09
Tidewater, Inc.	TDW	21.97	23.12	-1.15	-5.0%	50.99	18.84
Trico Marine Services, Inc.	TRMAQ.PK	12.81	12.94	-0.13	-1.0%	14.53	11.95
Hornbeck Offshore	HOS	19.33	20.76	-1.43	-6.9%	46.75	17.91
Total Offshore Transportation and Boat ……..		**214.64**	**226.30**	**-11.66**	**-5.2%**	**366.25**	**202.48**

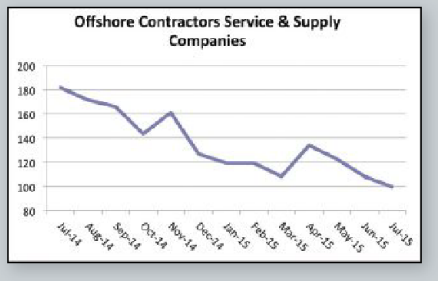
Monthly Stock Figures & Composite Index

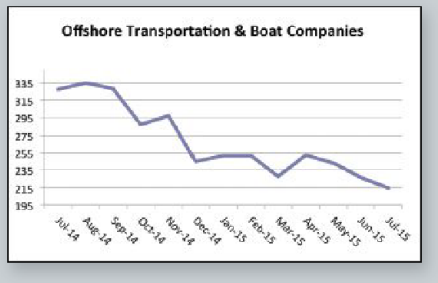
Industry	Close(*Mid*) *July*	Close(*Mid*) *June*	Change	Change %	High 52 week	Low 52 week
Total Diversified, Production, Support and Equipment	406.39	432.43	-26.04	-6.0%	635.91	358.20
Total Geophysical / Reservoir Management	13.89	16.21	-2.32	-14.3%	42.08	12.83
Total Offshore Drilling	130.83	146.40	-15.57	-10.6%	299.57	123.12
Total Offshore Contractors, Service and Support	99.60	108.32	-8.72	-8.1%	190.01	93.41
Total Offshore Transportation and Boat	214.64	226.30	-11.66	-5.2%	366.25	202.48
Total Offshore Source Index	865.35	929.66	-64.31	-6.9%	1,533.82	790.04

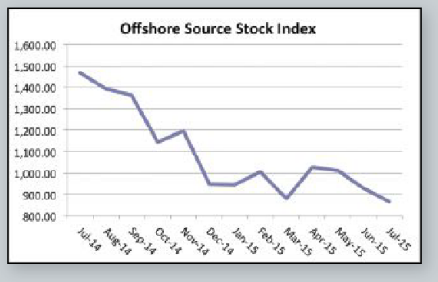












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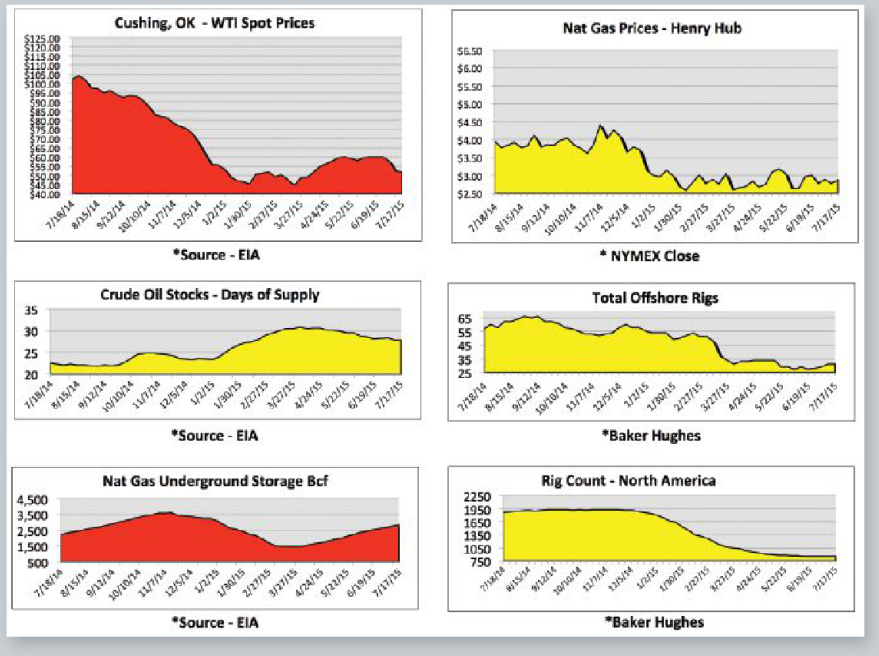
Oil & Gas Industry Trends

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



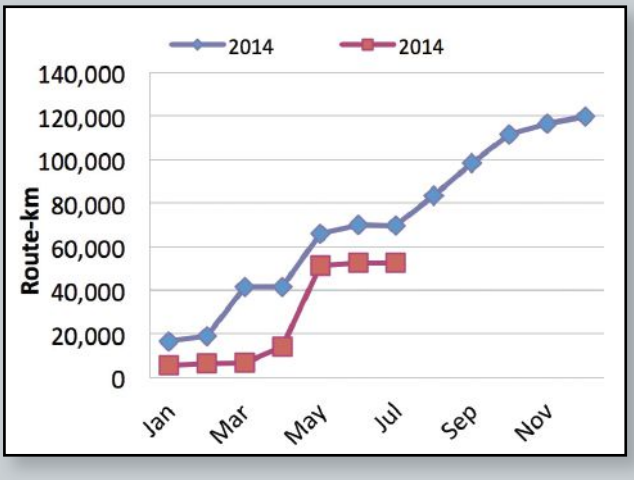
Positive trend, at least 3 weeks

Changing trend, less than 3 weeks

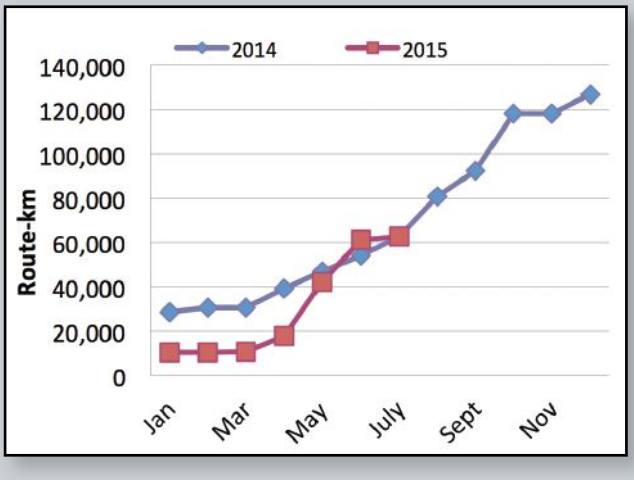
Negative trend, at least 3 weeks

Subsea Telecom & Power Cable Data

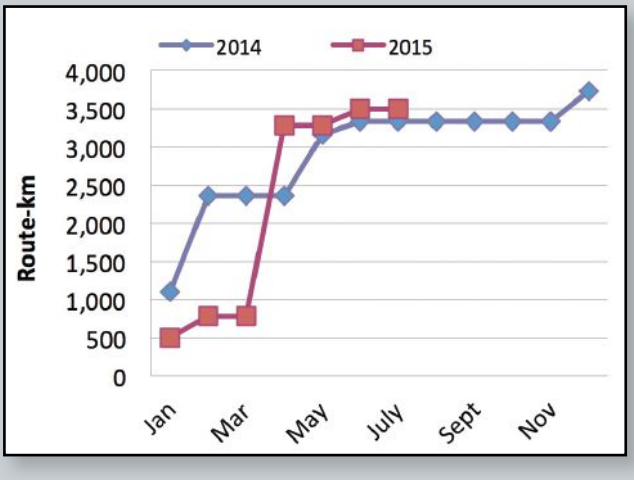
FO Cable Awards by Month



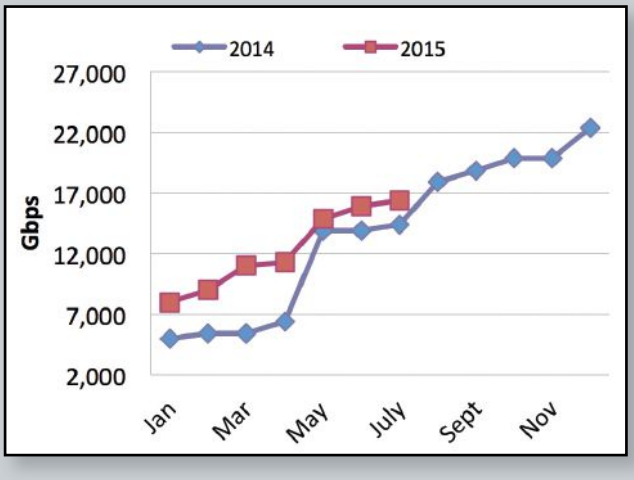
FO Cable Announcements



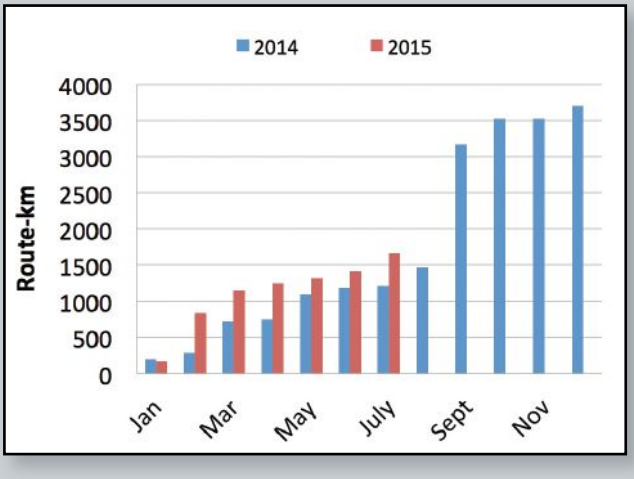
Submarine FO Cables Entering Service in Route-km



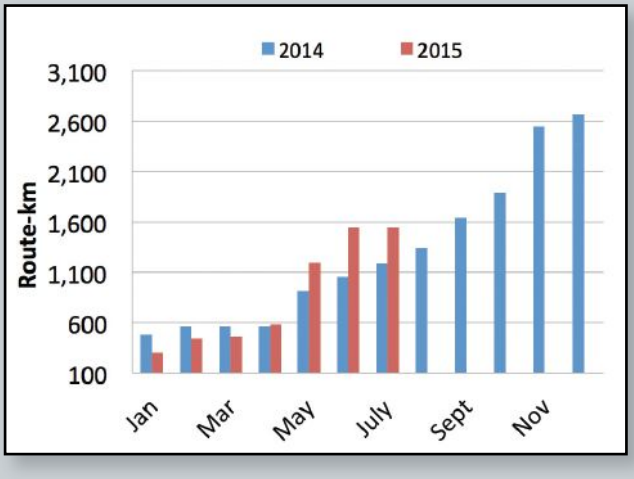
Upgrades of Existing Cable Systems in Gbps



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)
Shell Offshore Inc.	WR	508	G17001	NOBLE JIM DAY	Stones	9,568
Anadarko Petroleum Corp.	AT	349	G18577	DIAMOND OCEAN BLACKHORNET	Jubilee	8,730
Anadarko Petroleum Corp.	DC	620	G23528	ENSCO 8506	Spiderman	8,055
ExxonMobil Corp.	WR	584	G20351	MAERSK VIKING	Julia	7,120
Chevron USA Inc.	WR	758	G17015	T.O. DISCOVERER CLEAR LEADER	Jack	6,968
BP Exploration & Production, Inc.	GC	743	G15607	SEADRILL WEST AURIGA	Atlantis	6,824
Union Oil Co. of California	WR	634	G18745	PACIFIC SHARAV	Saint Malo	6,803
Marathon Oil Co.	WR	225	G32668	MAERSK VALIANT		6,779
Deep Gulf Energy III	MC	521	G34441	NOBLE DANNY ADKINS	Barataria	6,771
LLOG Exploration Offshore, LLC	MC	431	G22877	SEADRILL WEST NEPTUNE	Delta House	6,427
BP Exploration & Production Inc.	MC	778	G14657	THUNDER HORSE PDQ	Thunder Horse North	6,031
Murphy Exploration & Production Co.	MC	692	G34455	DIAMOND OCEAN BLACKRHINO	Thunderridge	5,917
Anadarko Petroleum Corp.	WR	51	G31938	DIAMOND OCEAN BLACKHAWK	Shenandoah	5,857
BP Exploration & Production Inc.	MC	775	G09866	SEADRILL WEST VELA	Thunder Horse North	5,673
Eni U.S. Operating Co. Inc.	MC	772	G16647	ENSCO 8500	Triton	5,639
BP Exploration & Production Inc.	MC	776	G09866	SEADRILL WEST CAPRICORN	Thunder Horse North	5,636
Freeport-McMoRan Oil & Gas LLC	MC	127	G19925	NOBLE TOM MADDEN	Horn Mountain	5,467
Anadarko Petroleum Corp.	GC	859	G24194	ROWAN RESOLUTE	Heildelberg	5,346
Chevron USA Inc.	GC	807	G31752	PACIFIC SANTA ANA	GC 807 (Anchor Well)	5,183
BP Exploration & Production Inc.	GC	825	G09981	ENSCO DS-3	Mad Dog Phase 2	5,176
BP Exploration & Production, Inc.	KC	93	G25780	ENSCO DS-4	Gila	4,860
ExxonMobil Corp.	AC	65	G09249	T.O. DEEPWATER CHAMPION	Diana (South)	4,852
Cobalt International Energy, LP	GB	958	G30876	ROWAN RELIANCE		4,846
Freeport-McMoRan Oil & Gas LLC	MC	126	G18194	ROWAN RELENTLESS	Horn Mountain	4,525
Shell Offshore, Inc.	MC	812	G34460	NOBLE GLOBETROTTER		4,475
BP Exploration & Production Inc.	GC	782	G15610	MAD DOG SPAR RIG	Mad Dog Phase 2	4,428
Hess Corp.	MC	725	G22897	STENA FORTH	Tubular Bells	4,328
Chevron USA Inc.	GC	640	G20082	TRANSOCEAN DEEPWATER ASGA	Tahiti 2	4,292
BHP Billiton Petroleum (GOM) Inc.	GC	609	G16764	T.O. DEEPWATER INVICTUS	Shenzi	4,288
Shell Offshore, Inc.	AT	18	G33863	STENA ICEMAX	Gnome	4,253
Anadarko Petroleum Corp.	GC	561	G16753	NOBLE BOB DOUGLAS	K-2	4,144
Chevron USA Inc.	GC	596	G16759	T.O. DISCOVERER INSPIRATION	Tahiti North	4,023
Freeport-McMoRan Oil & Gas LLC	GC	643	G35001	NOBLE SAM CROFT		3,885
Shell Offshore, Inc.	MC	809	G05868	NOBLE DON TAYLOR	Ursa	3,848
Chevron USA Inc.	GB	978	G26693	T.O. DISCOVERER INDIA		3,836
Shell Offshore, Inc.	MC	935	G07976	CAL-DIVE Q-4000	Europa	3,797
LLOG Exploration Offshore, LLC	MC	895	G33764	SEADRILL SEVAN LOUISIANA		3,682
Anadarko Petroleum Corp.	EB	602	G20725	WIRELINE UNIT (L.J. DIST)	Nansen	3,680
Anadarko Petroleum Corp.	EB	602	G20725	COIL TUBING UNIT (L.J. DIST)	Nansen	3,680
Shell Offshore, Inc.	VK	956	G06893	NABORS 202	Ram-Powell	3,214
Shell Offshore, Inc.	MC	762	G07962	NOBLE BULLY I	Deimos	3,144
Shell Offshore, Inc.	MC	807	G07963	OLYMPUS N88	Mars (Ursa-Princess)	3,037
Shell Offshore, Inc.	GC	158	G07998	WIRELINE UNIT (HOUMA DIST)	Brutus	2,985
LLOG Exploration Offshore, LLC	MC	546	G25098	NOBLE AMOS RUNNER	Longhorn MC 502 546	2,566
Stone Energy Corp.	MC	29	G13997	ENSCO 8503	Cardona	2,121
Shell Offshore, Inc.	GC	116	G05896	ATWOOD CONDOR	Popeye	2,046
Marathon Oil Co.	EW	873	G12136	NABORS SUPER SUNDOWNER XXI	Lobster	773
Ankor Energy LLC	MC	21	G28350	NABORS MODS 200		668
Fieldwood SD Offshore LLC	EB	110	G02650	NONE RIG PA OPERATION (LJ)	Tequila	660
W&T Offshore, Inc.	EW	910	G13079	H&P 203		560

Deepwater prospects with drilling and workover activity: 50

Current Deepwater Activity as of Monday, 6 July 2015

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,359	36,158	2,310
201 to 400	90	1,130	20
401 to 800	193	893	10
801 to 1,000	327	579	9
1,000 & above	3,041	2,042	28

Rig Activity Report 10 July 2015

Location	Week of 07/10	+/-	Week Ago	+/-	Year Ago
Land	827	-1	828	-974	1801
Inland Waters	5	0	5	-13	18
Offshore	31	2	29	-25	56
U.S. Total	863	1	862	-1012	1875
Gulf of Mexico	31	2	29	-24	55
Canada	169	30	139	-146	315
N. America	1032	31	1001	-1158	2190

Activity by Water Depth Information current as of Monday, 6 July 2015

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 and Baker Hughes

Applied Acoustics introduces new 'Blowfish' ODT transponder

A new transponder designed for use by subsea UXO disposal organizations and salvage specialists was introduced at the recent Hydrographic Society's UXO Seminar in Southampton by Applied Acoustics, based in Great Yarmouth, UK. The company that has been manufacturing positioning beacons for more than 25 years has developed this product, named the 1439 'Blowfish' ODT, as a combined positioning transponder and triggering device. It provides the twin functions of confirming a safe distance from a target, and receiving and acting upon a specific acoustic signal. It can be used to trigger a detonator, actuate a hydraulic valve or inflate a lift bag, for example.

The Blowfish ODT transponder can operate in up to 1,000 m of water, can be configured using the 3510 PAM Portable and operate as a ranging and positioning beacon with the Easytrak Nexus USBL system. The small beacon with a battery life of 180 days is less than 320 mm in length, weighs just 850 g but is extremely robust.

In addition to detonator initiation and secure remote actuation, the transponder can also be used for metocean or ocean bottom seismic (OBS) equipment positioning and recovery.

For more information, visit www.appliedacoustics.com.

Dukane Seacom creates first certified 90-day underwater locator beacon

Dukane Seacom (a HEICO Company) has created the first FAA and EASA certified 90-day underwater locator beacon (ULB) that complies with TSO-C121b & TSO-C142a and ETSO-C121b & ETSO-C142a. Dukane Seacom is the world's largest supplier of ULB devices to the commercial and military aviation markets.

The new 90-day operational requirements go into effect on 1 December 2015. In addition to exceeding this longer operational requirement, the DK120/90 also offers a 7-year battery replacement cycle. This longer battery life is 1 year longer than that offered by our existing 30-day ULB's and better aligns with recorder and aircraft maintenance cycles.

These ULBs have been extensively tested to verify compliance to all primary cell lithium battery safety requirements including FAA and EASA approvals. An exchange program is offered for airlines who would like to convert from 30-day beacons to 90-day beacons through Dukane Seacom's distribution partner, Seal Dynamics.

For more information, visit www.heico.com.

Valeport releases new SWiFT SVP

Following a successful showing at Ocean Business, Valeport has now released the latest addition to its portfolio of sound velocity sensors and profilers, the SWiFT SVP.

Positioned as the ultimate handheld profiler, the SWiFT SVP has been designed from the outset with the intention of a seamless workflow, and has integral GPS to geo-locate every profile. This new compact unit features high accuracy sound velocity, pressure, temperature, salinity and density measurement, plus integral GPS, re-chargeable battery and LED status indications for GPS, battery and communications.

Using a simple 'twist and go' switch on the unit, data can be easily and quickly downloaded, reviewed and translated to common SVP formats wirelessly via Bluetooth Smart, which uses the SWiFT APP on iOS devices where data can be instantly shared via FTP, email and cloud services. Valeport's standard DataLogX2 software for PC use will also support the SWiFT SVP.

With a battery endurance of up to a week and easy charging via USB, the SWiFT SVP is intended for coastal, harbor and inland hydrographic survey use, and offers the highest quality sound velocity profiles in a compact, robust and portable package.

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

Cortland gains DNV GL design approval on Selantic® tethers

Cortland Company has gained DNV GL design specification approval for its Selantic® fiber tethers for subsea anchoring / tethering applications.

The first Selantic® tethers were installed more than 20 years ago, and some of these still remain in operation today. Typical applications for Selantic® tethers include long-term anchoring in the seabed to subsea buoy mooring systems (like Mid-Water Arch (MWA) tethering systems); mooring of flexible risers and umbilicals; and subsea buoys and pipelines. Tethers are also deployed for other offshore installations such as wave, wind, or in current energy plants. No other fiber tether solution has achieved this design specification.

Positioning of subsea buoyant structures is demanding due to the harsh and remote undersea location. Material and construction decisions are critical to success when engineering subsea tethers that deliver a design life greater than 20 years in environments battling corrosion, marine growth and particle ingress. In addition, vertical positioning of a subsea buoyant structure for 20 years is very different from horizontal positioning of floating structures like FPSOs.

The DNV GL design specification confirms that Cortland's Selantic® fiber tethers meet the requirements and are certified for subsea anchoring and tethering applications. They can be individually engineered to meet client requirements, including very tight length tolerances with strengths exceeding 3,000 Te. Cortland has also developed a system for ROV-friendly connection / disconnection of their Selantic® tethers, as described in patent WO2013165253A1.

The weight penalty associated with using chain or steel wire rope for anchoring flexible risers and umbilicals makes fiber tether solutions more efficient and cost effective. This is due in part to the reduced buoyancy requirement, as well as improved handling and installation requirements. High performance fibers can be up to seven times as strong, weight for weight, as traditional steel wire rope, and do not corrode.

Aramid fibers used in Cortland's Selantic® tethers have so far been the only available material that has the field-proven performance for this application due to their low creep rate (non-reversible elongation) and long-term fatigue performance. Testing activities on Selantic® tethers retired after 15 years of use have verified this within the given design limits.

Another key performance characteristic of Selantic® tethers includes high visibility outer jackets to enhance the safety level in operations. In addition, the design of the jackets and load bearing core minimizes the long-term effect on performance from particle ingress and marine growth.

For more information, visit www.actuant.com.

FluoroSense™ handheld fluorometer ideal for quick *in-situ* chlorophyll estimates

Turner Designs is very excited to announce FluoroSense–the smallest, easiest to use handheld fluorometer for measuring in vivo chlorophyll. Its simple two-button keypad enables users to quickly power on the instrument and take a reading to estimate chlorophyll in almost any aquatic habitat. There is no

warm-up time required–chlorophyll µg/L estimates are displayed in seconds. The FluoroSense plastic molded enclosure boasts an extremely lightweight, small, waterproof design, while offering a high degree of durability. With a very low power draw, the FluoroSense can take over 10,000 measurements on a single pair of AA batteries. Factory calibrated, the only maintenance required is simply rinsing after use. The FluoroSense can estimate chlorophyll concentrations spanning the linear range from 0 to 199µg/L and resolve down to 1µg/L of chlorophyll. This is the ideal tool for quickly estimating in situ chlorophyll concentrations.

For more information, visit www.turnerdesigns.com.

Cutting edge Simrad EK80 wideband echo sounder launched

Kongsberg Maritime has extended its portfolio of sophisticated scientific hydroacoustic products with the launch of the Simrad EK80, a high precision wideband echo sounder. The EK80 is a quantum leap forward in acoustics for ecosystem monitoring, working on frequencies from 10 to 500 kHz simultaneously.

The Simrad EK80 supersedes the popular Simrad EK60, a system that has sold more than 1,100 units for research vessels worldwide and has become an international standard for fish stock assessment. Developed in close cooperation with leading marine institutes who carried out extensive testing of prototypes during the development period, the EK80 provides an advanced tool for scientists investigating marine and freshwater ecosystems. An upgrade path is available for all vessels fitted with the EK60.

The system exploits wideband echo sounder technology where backscatter levels from a range of frequencies are processed, providing enhanced target information. The wideband frequency sweep (chirp) in combination with advanced signal processing gives exceptionally good signal-to-noise ratio and range resolution. This combination of high resolution and detailed frequency response is set to assist scientists with ecosystem monitoring enabling them to identify species more accurately.

The Simrad EK80 can operate with single and or split beam transducers and provides real-time echo integration and target strength visualization in an unlimited number of layers as well as recording and storage of raw data for replay or analysis. Third party post-processing alternatives for the EK80 RAW data are available for rapid survey analysis and reporting.

The echo sounder system is modular with several combinations of transceivers and transducers available to fit individual research purposes. EK60 is used for fish stock management worldwide and to allow for a smooth transition to the EK80 platform the new EK80 SW can work with both the Simrad General Purpose Transceiver (GPT), as well as the Wide Band Transceiver (WBT)

For more information, visit www.simrad.com.

Morgan Advanced Materials offers Rekofa slip rings for reliable performance in on and offshore wind turbines

Morgan announces the availability of its slips rings for the rotary transmission of power and signals. Sold under its Rekofa brand and with over 50 years' production experience, they feature reliable performance in constantly rotating equipment. Trusted by some of the world's leading wine turbine producers, the products have already been installed in thousands of wind turbines worldwide.

The Rekofa branded slip ring assemblies provide the constantly rotating motors with blade pitch control for power and data signals, helping ensure efficient power generation without damage to the turbines, even in excessively strong winds. As a result, the slip rings are ideally suited for use in both on- and offshore wind turbines.

Rekofa brand slip rings are also well suited for construction and other heavy machinery such as harbor cranes and

excavators, as well as for automated automobile production lines.

With a range of innovative products, Morgan supplies customers in 15 different industries for more than 50 different applications, including turbines, excavators, filling and printing machines for the labeling of food packages or newsprint, and welding equipment for the production of automobiles.

For more information, visit www.morganadvancedmaterials.com.

Underwater Survey Explorer V6.3 new release

Coda Octopus is delighted to announce the latest update to our Underwater Survey Explorer software. The latest release includes several new features including:

- Range and bearing measurements from operator selected points;
- Color map optimisation tool; and
- Minor bug fixes.

A new feature on the Processing tab, enables the operator to instantly measure the range and bearing from the survey vessel or ROV to a target point or to an imported model. The bearing can be represented as either relative or absolute to the vessel or ROV. The change in range/bearing from the vessel to the target point as the vessel moves around the survey area can also be displayed, giving the operator real-time feedback to enable the target point to be maintained within a specified area.

Line measurements can be added that display continuously updating real-time feedback on vessel/ROV range/bearing and perpendicular distance from the line with additional color

coding; red if to port, green to starboard, and yellow on the line.

Multiple measurements can be displayed simultaneously, allowing the operator comprehensive real-time measurements of complex scenes.

The Color Map Optimisation tool is a new button on the View tab that allows the operator to easily create different color palettes for the intensity, range, depth and 2D color controls. The changes to the color palate can be saved as a CMAP file for easy access for future projects.

For more information, visit www.codaoctopus.com.

STR invest in the latest generation of marine navigation systems

Subsea Technology & Rentals Ltd (STR), global specialists in the design, production and rental of advanced subsea technology for the offshore energy industry, have invested in the latest generation of marine navigation systems with the acquisition of two Teledyne TSS Saturn 10 units.

The Saturn fiber optic gyrocompass capitalizes on more than a century's experience in marine navigation. Teledyne TSS' own experienced and innovative engineering team has combined the latest solid state technologies and calibration techniques to offer a user-friendly, highly accurate and cost-effective navigation solution for demanding marine environments.

The Saturn product range has been designed by TSS to provide a range of versatile attitude and heading reference, and inertial navigation systems for both surface and subsea applications. The lightweight, compact and highly reliable units have no moving parts and are maintenance free, making them ideal for all sizes of surface vessel and subsea vehicle.

Applications for the Saturn product range include navigation for fast ferries and yachts; subsea positioning for autonomous underwater and remotely operated vehicles; attitude and heading references for dynamically positioned platforms; full attitude data for hydrographic survey vessels; and much more.

For more information, visit www.str-subsea.com.

Tracerco introduces offshore mobile reservoir tracer analysis laboratories

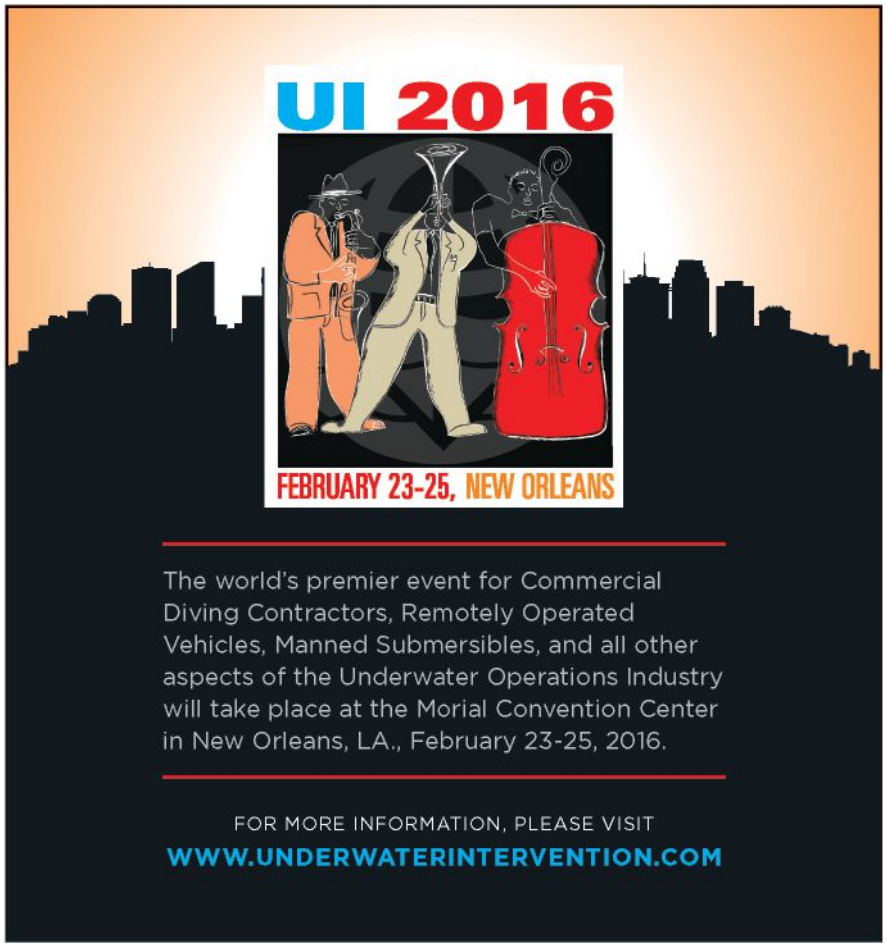
World leading technology company Tracerco, part of FTSE 100 Johnson Matthey Plc, has invested in a number of new mobile reservoir tracer analysis laboratories for use onsite in offshore projects. The laboratories will give customers rapid sample analysis turnaround, producing results almost immediately as opposed to the weeks that it often takes when samples have to be sent offsite for analysis. This allows oil companies to optimize production by reacting quickly to the Tracer Production Log™ (TPL) in Inflow, Frac and Interwell. The development and production designs can be altered to maximize production. It can also help reduce the cost implications of keeping contingency tools on hire such as PLT or coiled tubing equipment.

The mobile tracer laboratories for offshore projects are built to DNV 2.7 Zone 2 standard and are fully pressurized and able to integrate with safety systems on the rigs.

The laboratories contain identical analytical equipment as is used in our shore-based facilities, allowing multiple tracer analysis with no compromise on tracer selectivity and sensitivity. Onsite analysis offshore will provide more immediate insight on real-time fluid flow, allowing the customer to make better informed decisions on strategies such as well changes or well interventions so helping boost productivity.

Tracerco mobile tracer laboratories are supplied on a full turnkey basis and come with a crew of experienced analytical chemists to support the required tracer analytical campaign.

For more information, visit www.tracerco.com.



Qimera, hydrographic processing evolved

QPS has released Qimera, which has re-invented bathymetric data processing. Qimera is the easiest to use yet most advanced bathy processing program. Building on from the renowned multibeam bathymetry engine in QINSy and the leading bathymetry data cleaning program Fledermaus, QPS have created Qimera. Brand new technologies the Dynamic Surface™, Dynamic workflow™ and the Wobble Tool™ are harnessed using all the latest computing technology in guided workflows, making the user experience easier and empowering the user like never before.

Special upgrade pricing is available for existing QPS customers holding licences under annual support, and a limited launch offer is available to everyone.

Qimera™ is a totally new multibeam processing application for production MBES processing. It is also the beginning of the transition of the various QPS applications and modules into new products and modules to provide an efficient mapping workflow.

For more information, visit www.qps.nl.

SevenCs releases new ECDIS Kernel

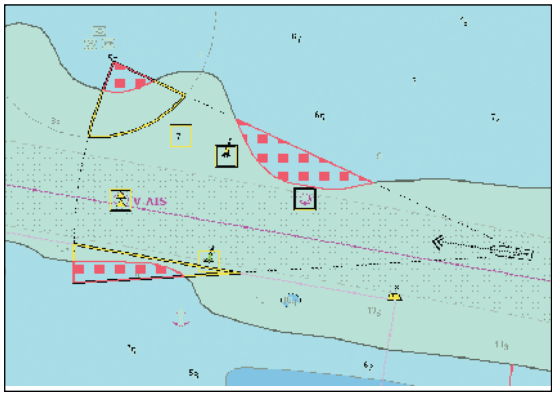
The new version of the SevenCs ECDIS Kernel SDK (Software Development Kit) 5.20 has been designed to meet all future requirements of the latest international standards in order to reduce implementation irregularities and improve the overall usability of chart display systems (IEC 61174 Standard edition 4.0; IHO S-52 Presentation Library edition 4.0; IHO S-64 Test Standard edition 3.0).

Eric Rottman, Kernel SDK product manager, comments: "A major focus of the release version 5.20 has been laid on detection and indication of danger and caution objects. Now it is specified which objects have to be treated as navigational hazards, areas for which special conditions exist and safety contour related objects."

Highlights include:

• Reflects the revised and new definitions for the chart and mariner's settings (i.e., display categories, viewing group layers and so-called display selectors).

• Enables the display of the status of a chart of any past time or time interval



based on the applied chart updates.

• Lists only those objects in a pick report that are displayed according to the chart settings.

A big advantage of the new version is the new test frame. It is included in the delivery and supports all S-64 chart display tests.

Highlight of the new version is certainly the new stand-alone chart handling tool. The so-called ChartHandler allows for handling large amounts of data and sets a benchmark for chart loading and updating in the industry.

For more information, visit www.sevencs.com.

New sound velocity correction for HIPS and SIPS

CARIS™ has introduced a new sound velocity correction algorithm to HIPS and SIPS™ that significantly improves results for many mid and deep-water sonars and benefits some shallow water multi-sector systems as well.

The new algorithm was based on research from the Ocean Mapping Group of the University of New Brunswick, Canada and now accounts for the separation between transmit and receive arrays, when performing ray-tracing. By defining the location of the separate arrays a more robust estimate of the path of each beam to the seafloor and back can be made, taking into account the physical separation between the arrays and the movement of the vessel through the water between transmit and receive.

"Implementing this algorithm is a very important step for CARIS" said Burns Foster, HIPS and SIPS product manager, "With an increase in the use of multi sector sonars, a more sophisticated method of ray-tracing was needed and this excellent research from the Ocean mapping Group was just what we were looking for."

The new algorithm was initially developed to work with Kongsberg sonar data, but has been successfully implemented for some other common beam forming multibeam systems as well. This enhancement is now available for download from the CARIS Online Customer Services website for free for all users of HIPS and SIPS 9.0 with a valid subscription. Please contact Customer Services support@caris.com if you have specific questions about supported systems.

For more information, visit www.caris.com.

C-Nav launches upgraded C-Scape software

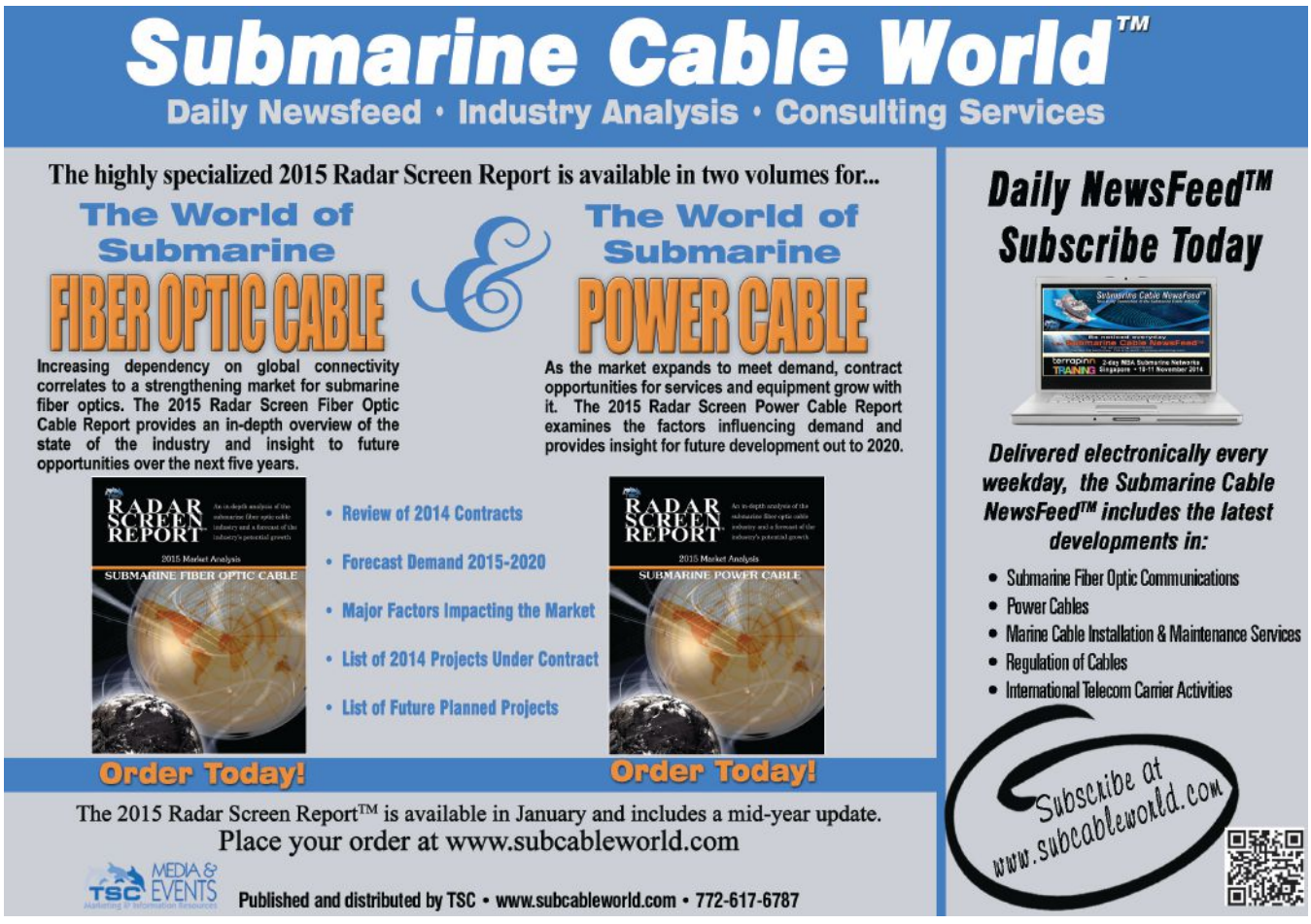
C-Nav®, a division of C & C Technologies, an Oceaneering International Company™ providing dynamic DGNSS precise point positioning systems, has introduced a newly upgraded version of its C-Scape software.

C-Scape provides independent, real-time monitoring of dynamic positioning (DP) systems, while simultaneously providing operations overview of other vessels infield and subsea infrastructures via multilayer AutoCAD files. C-Scape blends multiple sensor inputs for unparalleled position quality assurance/quality control and is suitable for most dynamically positioned vessels, including drilling rigs and ships.

The updated software includes enhanced control functions for all C-Nav receivers, improved AutoCAD support and advanced graphics capabilities. Enhancements, such as the SIMOPS feature, add an additional safety layer to operations, and the graphics display can be used with manual controls in the unlikely event of total failure of the DP system. The software requires minimal installation and operation training; a simulator device is available for crew training.

"Our goal, at C-Nav, is to deliver the most dynamic and accurate positioning hardware and software products available on the market," said Russell Morton, C-Nav systems development manager, C&C Technologies.

For more information, visit www.cnav.com.



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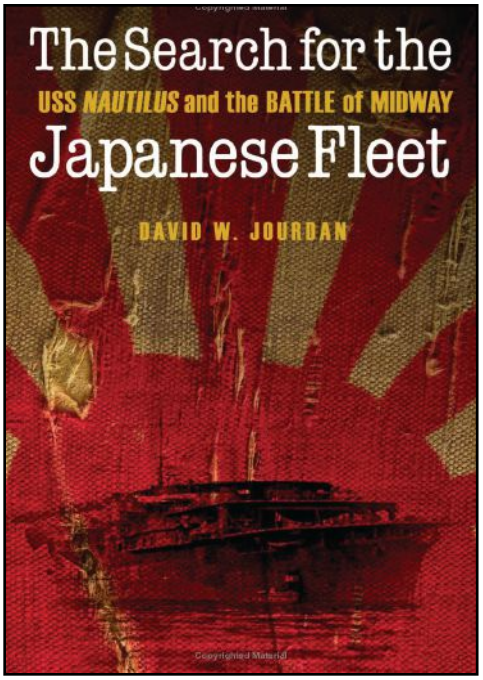

The Search for the Japanese Fleet:
USS Nautilus and the Battle of Midway

by David W. Jourdan

In The Search for the Japanese Fleet, David W. Jourdan, one of the world's experts in undersea exploration, reconstructs the critical role one submarine played in the Battle of Midway, considered to be the turning point of the war in the Pacific. In the direct line of fire during this battle was one of the oldest boats in the navy, USS Nautilus. The actions of Lt. Cdr. William Brockman and his 93-man crew during an 8-hour period rank among the most important submarine contributions to the most decisive engagement in U.S. Navy history.

Fifty-seven years later, Jourdan's team of deep-sea explorers set out to discover the history of the Battle of Midway and find the ships that the Allied fleet sank. Key to the mystery was Nautilus and its underwater exploits. Relying on logs, diaries, chronologies, manuals, sound recordings, and interviews with veterans of the battle, including men who spent most of 4 June 1942, in the submarine conning tower, the story breathes new life into the history of this epic engagement. Woven into the tale of World War II is the modern drama of deep-sea discovery, as explorers deploy new technology 3 mi beneath the ocean surface to uncover history and commemorate fallen heroes.

Potomac Books, ISBN: 978-1612347165
Hardcover, 424 pages, June 2015

Walter Robertson was appointed managing director of NorSea Group (UK) Ltd. while **Mike Munro** becomes the company's first operations director. Robertson has 30 years' experience in the logistics sector. Prior to that, he had a 28 year career with the ASCO Group at managing director level. From 1998 to 2006, he oversaw the establishment and running of the company that was set up as a joint venture to provide environmentally focused waste management solutions to the UK oil and gas industry. As operations director, Munro will be responsible for all operational activity at NorSea's logistics bases at Aberdeen, Montrose, Peterhead and Scrabster harbors in Scotland. Prior to joining NorSea he spent 7 years with Peterson (United Kingdom) Ltd., as divisional operations manager based in Aberdeen, but spent a lot of time developing the company's overseas business in the international market. Having spent 23 years with Total E&P, Munro spent 8 years in the Middle East with Qatar Petroleum before returning to Aberdeen.

London-based SURF contractor Ceona said that the company's executive vice president commercial and business development, **Mark Preece**, was appointed chief executive officer. Preece takes over from current CEO, **Steve Preston**, who after 40 years in the industry has decided to retire from operational management and step down. Preston worked tirelessly to establish Ceona as a key subsea player over the last 3 years, having been a prime mover and overseeing the construction of the company's purpose-built flagship, Ceona Amazon. Ceona is a SURF and heavy subsea construction contractor in the deepwater market, specializing in full-service engineering, pipelay and construction project management and execution, including floater installation.


Preece

Transocean Ltd. named **Mark Mey** executive vice president and chief financial officer. **Esa Ikaheimonen** stepped down from the position. Mey most recently was executive vice president and CFO of Atwood Oceanics. Prior to Atwood, Mey was senior vice president and CFO and a director of Scorpion Offshore Ltd. He also held positions with offshore driller Noble Corp. Mey earned an advanced diploma in accounting and a bachelor of commerce degree from the University of Port Elizabeth, South Africa. He is a chartered accountant and attended the Harvard Business School executive advanced management program.

Strategic Marine named **Rob Osborn** as general manager for fabrication and engineering. Prior to joining Strategic Marine, Osborn held leadership roles in companies including ATCO Australia and Kiewit. Osborn will be based in Strategic Marine's Vietnam base.

Atwood Oceanics Inc. named **Mark W. Smith** senior vice president and CFO of the company. He reports to Rob Saltiel, president and CEO, and is responsible for the company's global financial operations. In May, Smith was appointed as CFO on an interim basis.

FairfieldNodal appointed **Charles W. Davison Jr.** as president and CEO. Davison succeeds **Walter Pharris**, who is retiring after 35 years. Pharris will continue to serve as chairman of the company's board of directors. Davison holds an MBA from the University of Tennessee. He is a certified Six Sigma Black Belt, and has extensive international training and experience in operational excellence and executive management.

Oceaneering International, Inc. announced the appointment of **Steve Barrett** as senior vice president, subsea products, with worldwide responsibility for Oceaneering's Subsea Products segment. Mr. Barrett started his career in the oil and gas industry in 1980. In 1982 he joined FMC Technologies, Inc., where he progressed from design engineer to his most recent role as global subsea services director. Barrett holds a B.S. in mechanical engineering from Texas A&M University and an M.B.A., finance and entrepreneurship, from Rice University.

Seatronics Ltd, an Acteon company, has promoted **Derek Donaldson** from vice president Asia Pacific to vice president global operations. Donaldson enters into a new position within the Seatronics Group management structure, reporting directly to the Seatronics Group managing director, Phil Middleton. Donaldson and Middleton will together support regional vice presidents in managing and developing the global Seatronics business. Donaldson will be based in Singapore and will continue to manage the regional office, whilst maintaining a global presence.


Donaldson

HTL Worldwide is delighted to announce the appointment of **Bastien Wacogne** as regional manager EMEA. Bastien's appointment forms an integral part of HTL's ongoing commitment to offer customers a world class service. As regional manager EMEA, Bastien's main role will be to further establish and support HTL Worldwide's growing international distribution network in Europe, The Middle East and Africa. He brings a wealth of experience and a successful sales track record in the specialist industrial fastener manufacturing industry. He is also multi-lingual being fluent in English, French, German and Portuguese.

2H Offshore, an Acteon company, has appointed **Prahlad Enuganti** as technical manager in its Aberdeen office, to strengthen its management team and drive business growth. Enuganti holds a master's degree in electrical and computer engineering from The University of Texas in Austin, and joined 2H's Houston office in 2006 as an engineer. He worked on subsea structural monitoring projects in the Gulf of Mexico and was responsible for a variety of 2H's offshore riser engineering and integrity assessments. He was also the integrity team lead for BP's Holstein, Horn Mountain, Mad Dog and Thunder Horse assets, working with BP to identify and manage risks for its umbilicals, risers, flowlines and other subsea production equipment.


Enuganti

Crowley Maritime Corporation announced that **Mark Miller** has been promoted to vice president, corporate and marketing communications, within Crowley's corporate services group. Miller directs all aspects of internal and external communications around the world for Crowley and its commercial subsidiaries. He, along with his team, is responsible for the companies' brand development and protection; media relations and crisis communications; and strategic development, execution and oversight of marketing communications, including advertising, website development, internet marketing, social media engagement, content marketing and digital and printed collateral.

WFS Technology Ltd announces **David Ellison**'s promotion to sales director. David has joined the company to further develop their growing portfolio of national and international accounts. He comes with 30 plus years of experience within the subsea part of the oil and gas industry, having spent the last 20 years in commercial, marketing and business development roles where he was instrumental in acquiring and nurturing numerous large corporate accounts.

BMT Group has announced the appointment of **Sir John Hood KNZM** as chairman of BMT Group Ltd. following the retirement of Dr. Neil Cross. Sir John Hood is a non-executive director of BG Group plc and WPP plc, chairman of Urenco Ltd (from which he will retire later this year), Matakina Ltd, and Study Group Ltd; president and chief executive officer of the Robertson Foundation; and chair of the Rhodes Trust and Teach For All. For 5 years he served as Vice-Chancellor of the University of Oxford and, before that, as Vice-Chancellor of the University of Auckland after a successful career at Fletcher Challenge, New Zealand's largest industrial conglomerate.

Xodus Group has promoted **Andrew Sewell** to the role of global subsurface lead to drive forward its global subsurface capabilities. Sewell has more than 24 years' experience working in the oil and gas industry, initially as a geophysicist, and joined Xodus in 2012 as subsurface manager. He previously worked with Senergy (now LR Senergy) as region manager for Europe and Africa. He started his career with Schlumberger after graduating from Cambridge University with an MA in Physics in 1991.

Umbilicals and cables specialist, **Umbilicals International**, part of the Seanamic Group, has invested over $2M in new cable manufacturing lines at its Houston production facility. The two lines will streamline cable production, and marks a significant expansion of the company's dynamic cable manufacturing capability.

Bibby Subsea and **Aqueos Corporation** are pleased to announce the formation of a strategic alliance to jointly provide subsea services. The goal of this strategic alliance is to increase their respective market share and expand their global footprint in targeted offshore oil and gas markets.

St. Andrews Instrumentation has invested in a new headquarters and test center as it advances its global production ambitions. The company–a wholly owned subsidiary of the University of St. Andrews–has taken a lease on two units at Mill Court Industrial Estate in Tayport, Dundee, effectively tripling the size of its premises. The moves comes after 3 years of research and development and around £1 million of investment by the University and the SOI Group.

Unique Group has set in place measures to double its size and global infrastructure by 2019 through capital investment, acquisitions and expansion into key markets. With a current turnover in excess of $100 million, the company has restructured its worldwide organization into five new business units to capitalize on Unique Group's current and future market sectors.

Subsea Technology and Rentals (STR) is pleased to announce a rental partnership agreement with Tritex NDT. An array of Tritex NDT specialist diver and ROV equipment will now be available to hire or purchase through STR's head office in Great Yarmouth.

Furuno has strengthened their training network in China by joining forces with **New Alliance Marine Training Centre** (NAMTC) in Wuhan. NAMTC aims at providing high quality training, which is recognized and accepted by the strictest ship owners and operators. The training center was established by professional seamen, whose ambition was to help Chinese seafarers with improving their competences in order to meet the requirements of the global maritime market.

OTT Hydrometry, the specialist manufacturer of environmental monitoring equipment, has appointed **NVM Ltd** as exclusive distributor for Ireland. Based in Drogheda in Co. Louth, NVM will be responsible for sales and service in Ireland with immediate effect.

CALENDAR & EVENTS

September 8-11, 2015
Offshore Europe O&G
Aberdeen, UK
www.offshore-europe.co.uk

September 28-29, 2015
AWEA Offshore Windpower
Baltimore, MD
www.offshorewindexpo.org

September 28-30, 2015
SPE ATCE
Houston, TX
www.spe.org

October 13-14, 2015
MTS Dynamic Positioning
Houston, TX
www.dynamic-positioning.com

October 13-15, 2015
Deep Offshore Technology
Houston, TX
www.deepoffshoretechnology.com

October 18-23, 2015
SEG Annual Meeting
New Orleans, LA
www.seg.org

October 19-22, 2015
Oceans MTS/IEEE
Washington, DC
www.oceans15mtsieeewashington.org

October 27-29, 2015
LAGCOE
Lafayette, LA
www.lagcoe.com

October 27-29, 2015
OTC Brasil
Rio de Janeiro, Brasil
www.otcbrasil.org

November 1-4, 2015
Geological Society of America
Baltimore, MD
www.geosociety.org

November 2-4, 2015
WJTA-IMCA
New Orleans, LA
www.wjtaimca2015.com

November 4-6, 2015
OilComm
Houston, TX
www.oilcomm.com

November 10-12, 2015
Clean Gulf
New Orleans, LA
www.cleangulf.org

November 17-20, 2015
EWEA 2015
Paris, France
www.ewea.org/annual2015

December 1-3, 2015
International Workboat
New Olreans, LA
www.workboatshow.com

February 23-25, 2016
ICOE
Edinburgh, UK
www.icoe-conference.com

February 23-25, 2016
Underwater Intervention
New Orleans, LA
www.underwaterintervention.com

March 15-17, 2016
Oceanology International
London, UK
www.oceanologyinternational.com

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2 **Describe your job function (circle 1):**
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3. ENG'R/SCIENTIST
4. TECH'N/OPERATOR
5. BUYER
6. SALES
7. OTHER (Specify) _____

3 **Describe your organization (circle 1):**
A. SHIPS, CONSTRUCTION, SALVAGE
B. U/W VEHICLES/COMPONENTS
C. NAVIGATION/POSITIONING
D. RESEARCH & DEVELOPMENT
E. OCEAN INSTRUMENTATION
F. OFFSHORE OIL & GAS
G. COMMUNICATIONS/UTILITIES
H. SCIENCE, ENVIRONMENTAL
I. EDUCATION INSTITUTION/LIBRARY
J. GOVERNMENT MILITARY
K. GOVERNEMENT CIVILIAN
L. MARINE HARDWARE/DECK EQUIP.
M. FISHING INDUSTRY, AQUACULTURE
N. SURVEY, MAPPING, EXPLORATION
O. DIVING EQUIPMENT/SERVICES
P. CONSULTING, DATA SERVICES
Q. MARINE ELECTRICAL/ELECTRONICS
R. COMPUTER SERVICES/SOFTWARE
S. OCEAN RENEWABLES
T. SUBSEA IRM
U. OCEAN OBSERVING
V. SHIPPING/TRANSPORTATION
W. SUBMARINE TELECOM
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Z. OTHER (specify) _____

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Editorial: Forecast: 2015 and Beyond; Underwater Navigation; Manned Submersibles
Distribution: Euromaritime; Naval Future Forces; Deepwater Decommissioning Workshop; GOM Oil Spill & Ecosystem
Product & Services Focus: Multibeam & Side Scan Sonars; Research & Development Services

FEBRUARY
Editorial: Subsea Fiber Optic Networks; Decom & Abandonment
Distribution: IEEE/Current,Waves,Turbulence Measurement Wkshp; NACE Corrosion; Decommissioning and Abandonment Summit; U.S. Hydro
Product & Services Focus: Connectors, Cables & Umbilicals; Diver Detection Systems

MARCH
Editorial: Oceanology & Meteorology; Maritime Security
Distribution: Ocean Business; Offshore Well Intervention Conf. North Sea;
Product & Services Focus: Buoys & Monitoring Instrumentation; Environmental Monitoring/Testing Services

APRIL
Editorial: Offshore Technology; Ocean Mapping & Survey
Distribution: OTC; AUVSI; Oceans '15 MTS/IEEE Genova, Italy
Product & Services Focus: Subsea Tools & Manipulators; Offshore Risk Assessment; Training/Safety

MAY
Editorial: UW Imaging & Processing; Marine Salvage/UW Archeology
Distribution: OMAE – Ocean/Offsh/Arctic Eng; Seawork Intl; UDT; Well Integrity and Lifecycle Digitalization Conference
Product & Services Focus: Magnetometers; Water Dredges & Airlifts; Diving Services

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

JULY
Editorial: Ocean Engineering; Marine Construction; Special Focus Section: Products & Services Case Studies
Distribution: TBA
Product & Services Focus: Navigation, Mapping & Signal Processing; Data Processing Services

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

SEPTEMBER
Editorial: Ocean Observing Systems; Subsea Telecom; Offshore Wind Installation & Maintenance
Distribution: SPE ATCE; AWEA Offshore Windpower; Oceans '15 MTS/IEEE Washington DC; Offshore Well Intervention Conf., GOM
Product & Services Focus: Water Sampling Equipment; Cable Installation Services

OCTOBER
Editorial: Offshore Communications; Subsea Inspection, Monitoring, Repair and Maintenance
Distribution: LAGCOE; OilComm; Clean Gulf; Offshore Asset Retirement Conference
Product & Services Focus: Acoustic Modems, Releases & Transponders; Marine Communications; Survey & Exploration Services

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

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

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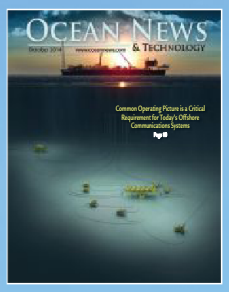

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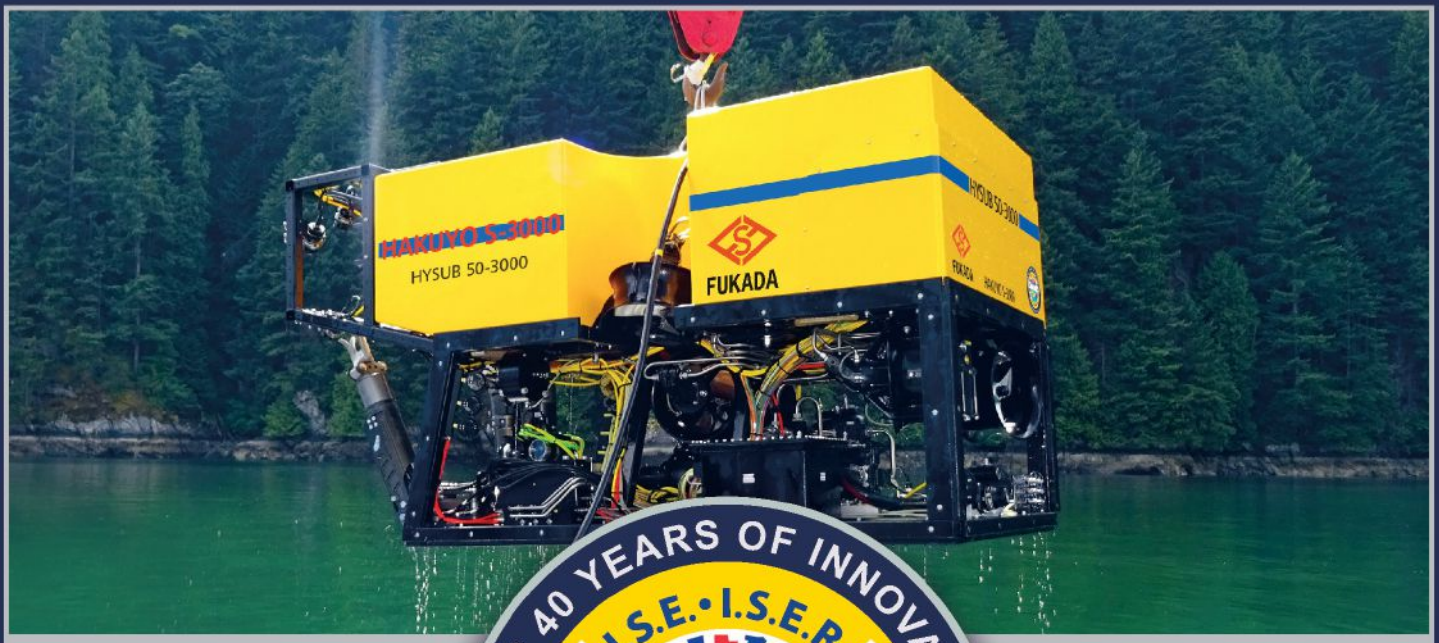

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