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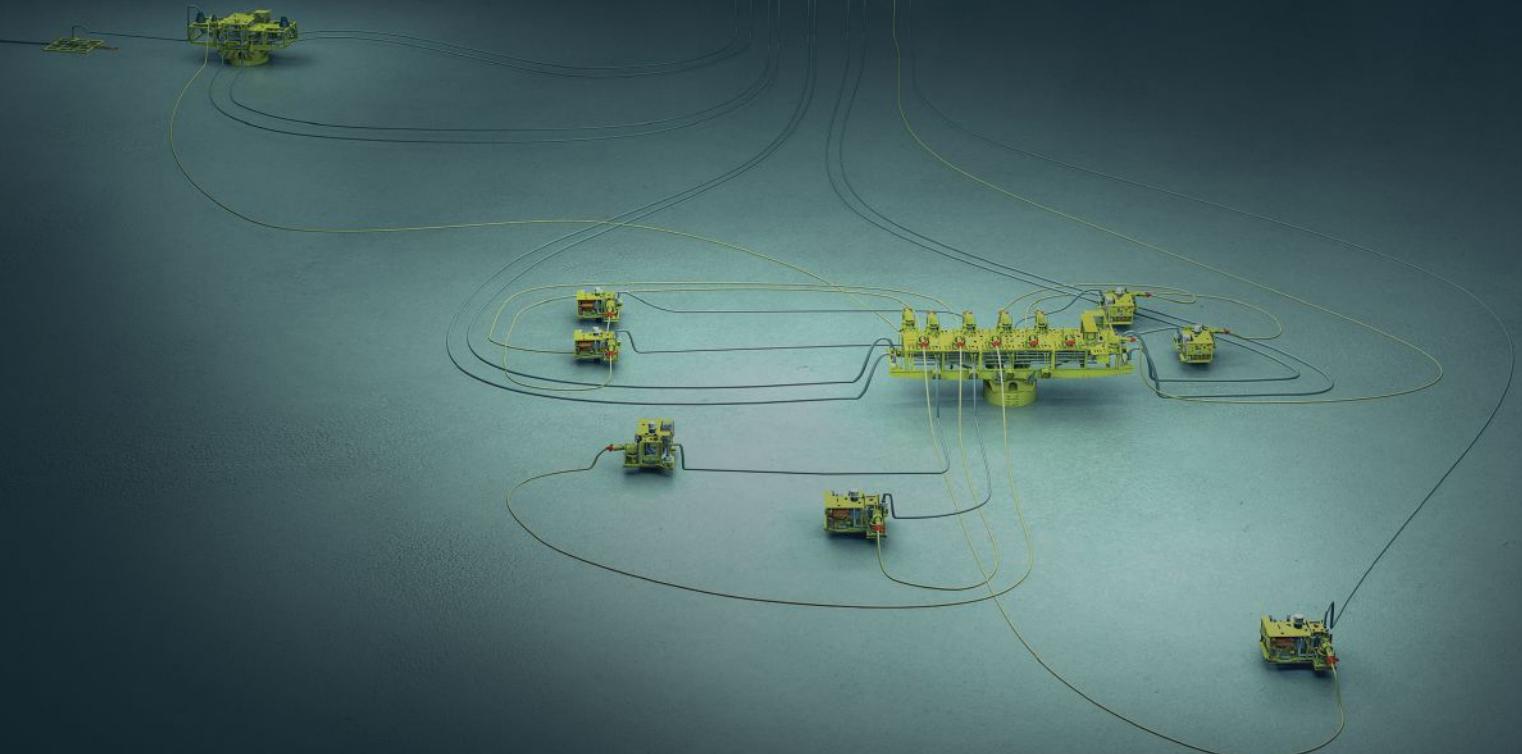
October 2014

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**Common Operating Picture is a Critical
Requirement for Today's Offshore
Communications Systems**

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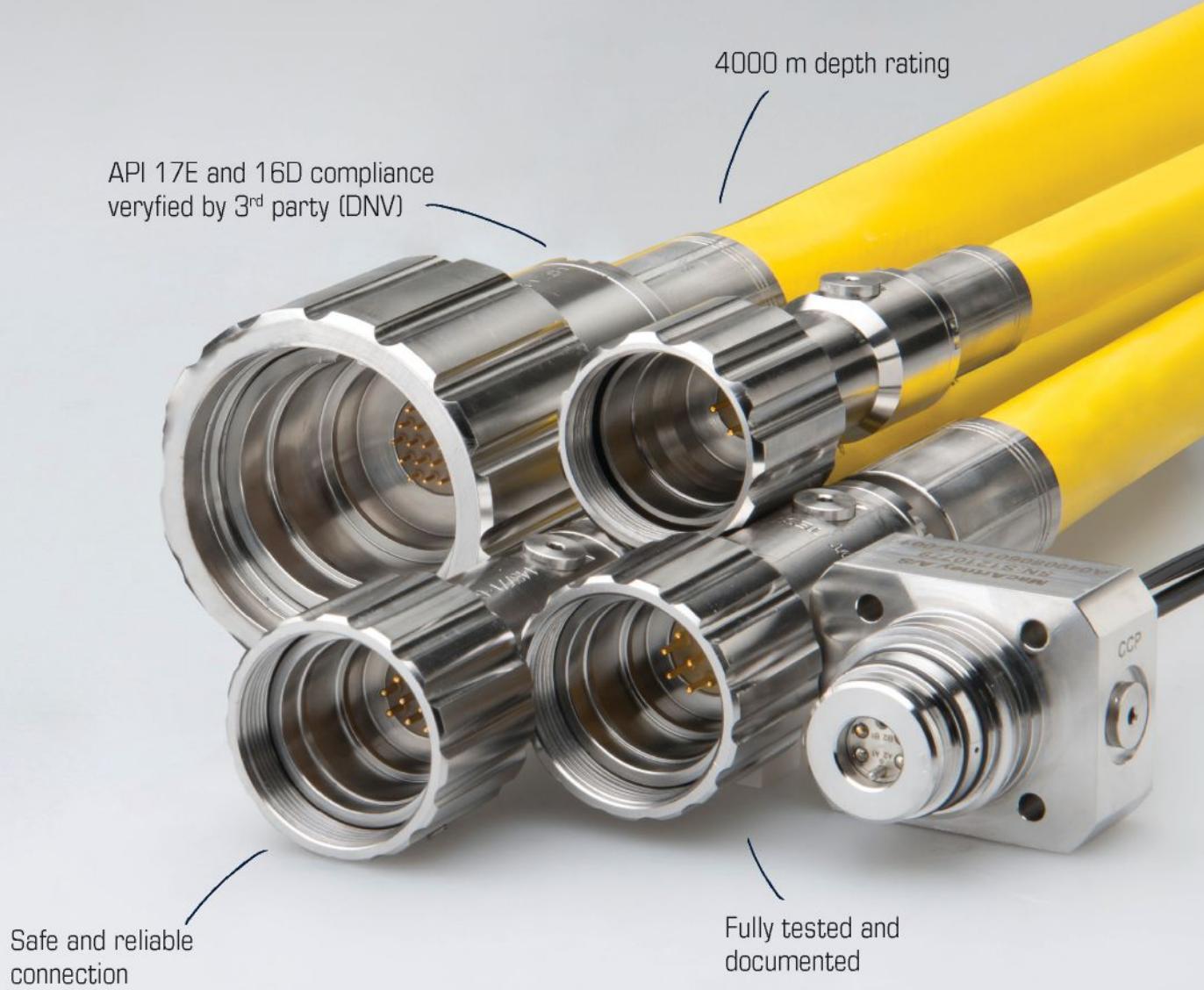
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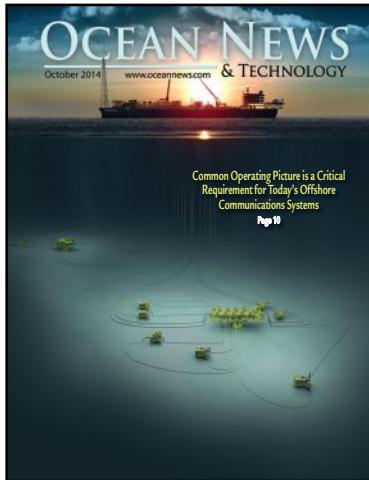
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Subsea technologies hold the key for future field developments in deeper waters, complex reservoirs and longer step-outs. Photo credit: © 2014 Aker Solutions

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EDITORIAL



By Ray Tyson

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Ladd Borne

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Suzanne Short

ART DIRECTOR
Suzanne Short

COPY EDITOR
Robyn Schuricht

CIRCULATION
Samantha Burn
subscriptions@ocean-news.com

ADVERTISING SALES

S.R. V.P./SALES & MARKETING
MJ McDuffee
Tel: +1 (772) 617 6836
Fax: +1 (772) 221 7715
mj@tscpublishing.com

NORTH AMERICAN AD SALES:
Lisa Chilik
Tel: +1 (574) 261 4215
Fax: +1 (574) 255 1006
Lchilik@tscpublishing.com

INTERNATIONAL AD SALES:
Zinat Hassan
Tel/Fax: +44 (0) 845 6522 483
Mobile: +44 (0) 781 1200 483
zhassan@tscpublishing.com

Mimi Shipman
Mob: +44 (0) 777 6017 564
Ph: +44 (0) 193 5508 698
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Industry's big push for more drilling acreage offshore U.S.

A routine call for public comments on the next 5-year offshore leasing plan has provided industry with a rare opportunity to convince the decision-makers to expand the federal program beyond the measly 13% of the U.S. offshore region currently open to drilling.

Influential industry groups like the American Petroleum Institute (API) have been after politicians, spanning numerous election cycles, to allow companies more access to federal waters through leasing. These efforts have largely failed.

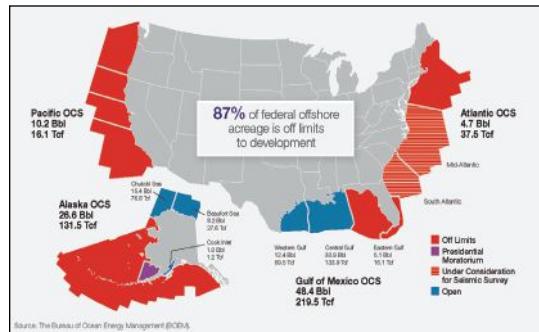
But the stars are aligned this time around. Backed by reputable opinion polls reflecting overwhelming support for more offshore exploration and development, industry advocates now have the public's backing as they do battle against the environmental community as well as President Obama's so-called "all of the above" energy policy, which on the oil and gas side has thus far produced nothing but declining production on federal acreage, offshore and onshore.

As reported in the lead story of this month's Offshore Industry section, a coalition of 11 industry groups asserted in comments to the U.S. Interior Department that no area should be ruled out when considering what offshore drilling sites should be included in the proposed 2017-2022 leasing program.

They also pointed out that offshore drillers have made great safety improvements since the 2010 Deepwater Horizon disaster, though it's worth noting that the oil and gas industry's safety record prior to the incident was stellar.

"American voters, including majorities of Republicans, Democrats and Independents, support offshore drilling and increasing U.S. oil and natural gas production," API said in a statement. "However, most voters do not think the federal government does enough to encourage the development of oil and natural gas resources in the U.S."

Many others have joined the call for expanding offshore drilling, including some 30 organizations and elected officials across the Gulf-coast state of Louisiana. "It is important to consider all areas of the OCS to strengthen our country's energy security, meet our nation's energy demands, and provide a much-needed boost to our nation's economy," wrote Chris John, president of the Louisiana Mid-Continent Oil and Gas Association, and Offshore Committee Director Lori LeBlanc.



Under the current 5-year program, Interior's Bureau of Ocean Energy Management (BOEM) now allows drilling only in the western two-thirds of the Gulf of Mexico, Alaska's Cook Inlet and a few locations off California's shore. The agency has not banned drilling in the Arctic Ocean, though BOEM is holding off on permits while it considers new rules for operations there. In terms of leasing, industry's lifeblood, this means the East Coast, West Coast and eastern Gulf of Mexico are closed in the Lower 48 alone.

So what's at stake here—should roughly 87% of the U.S. offshore remain off limits to leasing and therefore drilling?

For one, allowing the industry to purchase, explore and develop leases in closed areas could create nearly half a million jobs and boost the U.S. domestic energy production by 3.9 mmboe per day, according to studies by Wood Mackenzie and Quest Offshore Resources.

But the International Energy Agency (IEA) warned earlier this year that the current boom in U.S. oil production, fed primarily by massive onshore shale deposits, won't last forever.

"If the federal government continues to prohibit oil and gas leasing on 87% of the U.S. Outer Continental Shelf and domestic production plateaus, IEA projects the balance of power in oil markets could shift back to OPEC and increase the price of oil by \$15 per barrel," Andy Radford, API senior policy advisor for offshore, said in an August press briefing on API comments to BOEM.

Sure, offshore exploration is an expensive and highly risky business with no guarantees. But industry has always responded to the challenge, making the necessary investments to look for oil and gas and pursue development in the event of exploratory success. Now it's time for the federal government to do its part.

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Common Operating Picture is a Critical Requirement for Today's Offshore Communications Systems

by **Mark Stevens**, Director, OCEANEERING® Global Data Solutions

Ocean News & Technology | October 2014



Figure 1. COP displays range from small-format screens with a single display type to a wall of screens with multiple, simultaneous displays.

Offshore communications solutions are required for daily operations as well as incident response. Oil spills, in particular, require the ability to access, understand, and communicate many types of information. Effective, coordinated response operations must be based on collaborative situational analysis and operational management as well as comprehensive reporting shared by multiple organizations, each with their own views of the incident. These collaborative capabilities, in turn, require system interoperability in order to provide a common picture of the crisis and associated response activities.

Recognizing these needs, the industry has created reusable best practices for a common operating picture (COP) for incident response that is supported by open standards. The tools for implementing this COP, including functionality for collecting and displaying all relevant live video and data, have been maturing over the years and are now available to provide real-time feedback as well as replay capabilities for detailed analysis and continuous improvement processes. With proper planning and implementation, a COP can be deployed quickly in any region of the globe to provide a comprehensive tactical operational view, whether for incident response or to enhance daily operations.

Lessons Learned

The April 2010 Macondo/Deepwater Horizon incident in the Gulf of Mexico and the earlier Montara oil spill in Australia drew worldwide attention to the need for a standards-based response management COP. In the case of the Deepwater Horizon incident, there were numerous barriers to any sort of synchronized, total domain awareness. These included lack of consensus over what data should be tracked and transmitted, inadequate tools for pushing real-time data throughout the response organization, and a lack of interoperable communications technology.

(AGO), as this platform allows for quick visualization and representation of the field of operations, rapid deployment of the various GIS feature sets, and the ability to transform the core data to OGP standards.

A COP may be implemented for many types of oil spill events, such as those involving on-land release, a coastal terminal or a tanker in transit, or offshore incidents related to platforms, pipelines, or a deepwater well blowout. The COP should accommodate each step of the incident lifecycle, as shown in Figure 2, which requires proper planning at the beginning of any oil spill response. A comprehensive planning process using a standardized template will establish the foundation for response-related information management and data sharing using agreed-upon data standards, field reporting requirements, media formats, and data archiving procedures.

The COP will be used in different ways by different stakeholders in a typical response operation. For instance, the command team will use it to conduct the daily briefings and as a dashboard for reporting and analysis. The planning group will use it to communicate with other response teams for purposes such as in-situ burns, boom deployments, skimming operations, and beach cleanup. The operations team will use the COP to communicate with the field team about activity status, ensuring they all share the same real-time location information about task forces, major vessels, and current and predicted weather data. The COP will also be used by the legal team for long-term litigation support and can be an important tool for public stakeholders as well, including the general public, news agencies, and academic institutions.

The operational and emergency response teams are responsible for selecting and distributing COP information to other parties through a controlled release to sites including offshore platforms, drill ships, remote underwater

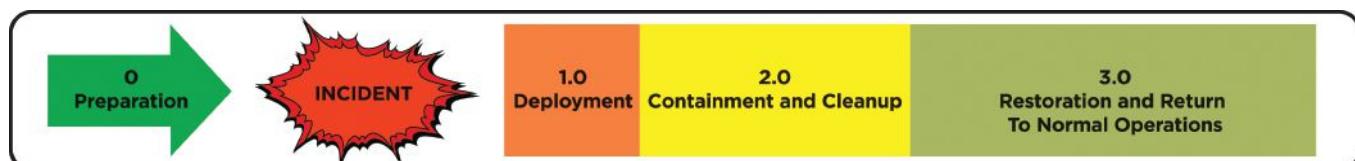


Figure 2. Incident lifecycle (Source: OGP/IPIECA JIP Oil Spill Response Common Operating Picture Architecture: Recommended Practice, August 2014).

To identify learning opportunities following the Deepwater Horizon and Montara incidents, the International Association of Oil and Gas Producers (OGP) formed the Global Industry Response Group (GIRG), which delivered 19 recommendations to pursue, as part of a 3-year Oil Spill Response Joint Industry Project (OSR JIP). Today, a number of these OSR JIP projects are underway, including two related to COP development — one for GIS/mapping of an oil spill response and the second for using GIS technology and geo-information in a response management COP.

According to the OGP, a COP “..is a computing platform based on Geographical Information System (GIS) technology that provides a single source of data and information for situational awareness, coordination, communication and data archival to support emergency management and response personnel and other stakeholders involved in or affected by an incident.” A common solution is to utilize ArcGIS Online

vehicles (i.e., ROVs), docks, support vessels, and onshore field sites. This information is gathered and transmitted via satellite systems or land-based Internet circuits. In order to function effectively, a COP must visually show all of this information within the area of responsibility (AOR) in real or near-real time and provide a dashboard for reporting and analysis.

Establishing the Right Framework

The best approach for deploying a COP is to use a portal-based architecture, which has proven effective in past response activities. Additionally, the integration of interfaces by using a common database back-end allows a more flexible method of displaying all data. The structure of the COP dashboard is also particularly important, as users will rely on it to provide an at-a-glance summary of all COP information. Figure 3 provides one dashboard example.

EDITORIAL FOCUS

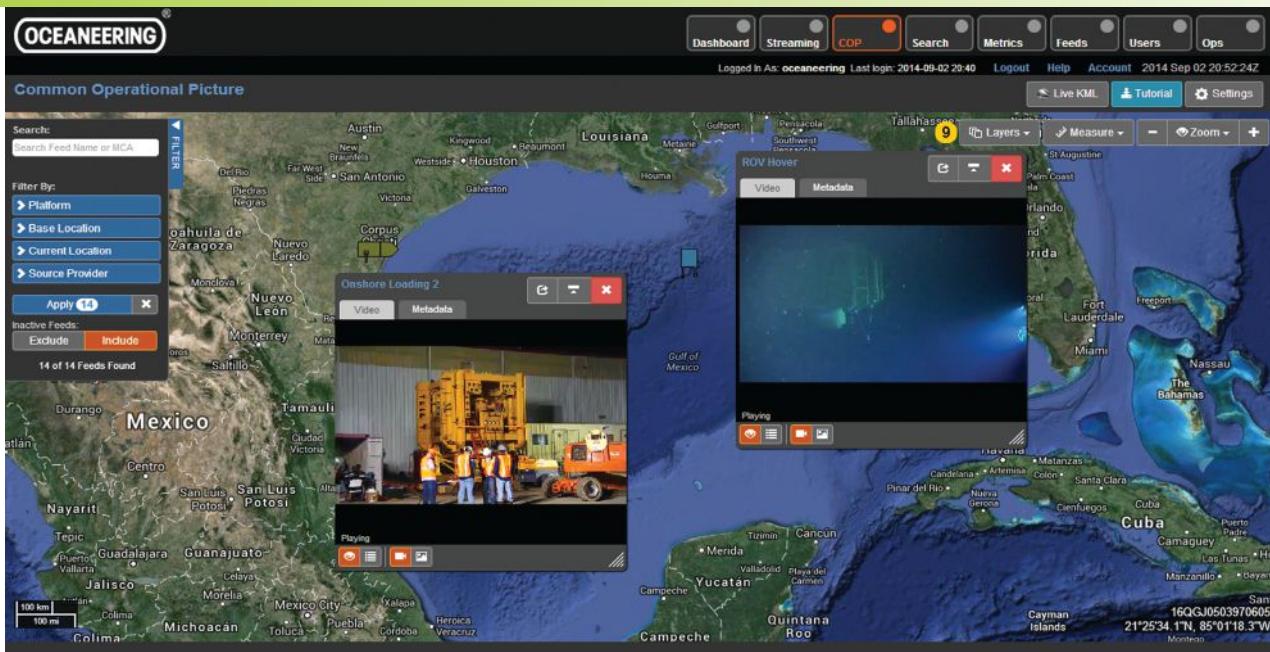


Figure 3. Dashboard includes map of the response site with a number of additional views and data displayed (Source: OCEANEERING).

COP data can include vessel positioning data, weather, sensor feeds, and various audio, video, and other data — all coming from a variety of sources using a variety of formats. Standards make it easier for disparate systems utilized during an incident to consume, analyze, display, and interact with this information. For this reason, the industry has established specifications for key COP elements including web map services, which dynamically produce spatially referenced maps portraying geographic features for retrieval by the user client dashboard, and for servers that are used for geographic features and coverages.

Other information technology tools and systems used by incident command are evolving to include basic COP functionality as well. These tools and systems support processes ranging from procurement to internal and external communications, asset management, invoicing, claims, and reporting. Their integration with the COP helps facilitate data flow and simplify information management processes, so they, too, must be based on open standards.

In the case of proprietary data, it should be integrated into the COP using appropriate levels of data security. The recommended approach is for all providers of any particular data set to make their information available via an open-standard model that can support security requirements and compatibility.

Finally, the COP solution should also meet all regulatory, legal, and other requirements and minimize liability and exposure during an event while also providing ongoing benefits during normal operations.

Video and Other Inputs

For daily operations and incident response, video and telemetry data capture is an increasingly important require-

ment. Video images, in particular, can provide unique real-time and historical awareness of the incident (see Figure 4).

Like other COP data types, video is delivered using web services and encodings that support open standards. The COP user interface and web services provide functions such as viewing controls (play, pause, etc.), video library queries (including search by keyword and tags), and video stream selection. Provisions also should be made for cataloging and handling video data, securely transferring hard drive media from offshore to onshore, professional video editing and annotation, and video archiving. The interface between an Incident Command Center and COP clients should be based on Motion Imagery Standards Board (MISB) specifications, in support of multiple formats.

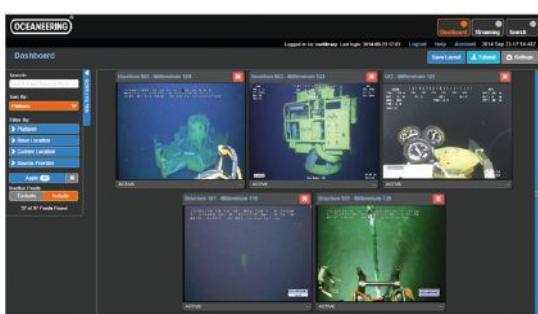


Figure 4. The video portal access can provide various views of the video and telemetry feeds coming in from the remote location.

One other more recent input to consider is social media monitoring, which can inform oil spill response, particularly if the spill is in an area close to people. Attention must be paid to monitoring, filtering, and confirming social media reports as part of including them in the COP.

A coordinated approach to offshore communications has become increasingly important for both daily operations as well as incident response. This has led to the development of industry standards for a

universal COP that can be used for gathering, collating, synthesizing, and disseminating incident information to all appropriate parties involved in an incident. Tools for implementing a COP based on these standards are now available, and their adoption is growing, worldwide, in applications where there is the need to collect, display, and share a wide variety of data — including live video — between multiple stakeholders in demanding onshore and offshore environments.

For more information visit www.oceaneering.com.

OLE JAN DEVELOPS SOFTWARE TO SECURE SAFE OFFSHORE OPERATIONS



No structure is stronger than its weakest part. To avoid disasters in offshore oil and gas field operations, it is essential that the strength analysis is done before the structures are put into operation.

Ole Jan Nekstad, product director at DNV GL, holds a vital part of those analyses. Through DNV GL developed software, he enables the industry to calculate the risk from wind, wave and fatigue impact, something that will determine the safety, lifetime and profitability of the total operation. The software is called

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OCEAN INDUSTRY

High-tech dives on an ancient wreck

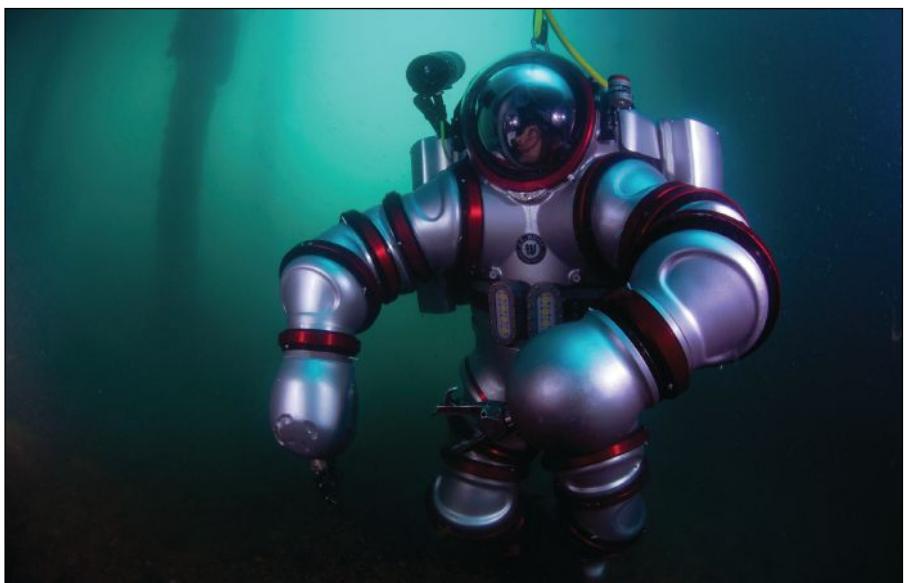


Photo courtesy: Brendan Foley, ©Woods Hole Oceanographic Institution.

When sponge divers first chanced upon the shipwreck off the Greek isle of Antikythera in 1900, they couldn't have known that it would become the richest ancient shipwreck ever discovered. But they soon found that this was no ordinary wreck, as they pulled up jewelry, coins, glassware, and life-size bronze and marble statues now housed in the National Archaeological Museum in Athens. The pièce de résistance was the unique and mysterious Antikythera Mechanism, a complex clockworks device, often called the first known computer, whose gears encoded the movements of the five planets known at the time, phases of the moon, and eclipses.

More than 70 years later, Jacques Cousteau returned to the wreck. His team found hundreds more artifacts, as well as the remains of four people, including a woman. But the Cousteau expedition merely unraveled the mystery a little further. They apparently explored only the galley and stern passenger compartment, leaving the main compartment untouched since 1901.

A multinational team from the Hellenic Ministry of Culture and Sports's Ephorate of Underwater Antiquities (EUA), Woods Hole Oceanographic Institution (WHOI), and the Australian Centre for Marine Robotics will be returning to the wreck site to investigate what else it may still hold. To a Clive Cussler-like setting, they will bring James Bond-like technology: underwater robots to try to map and photograph the site, rebreathing diving gear to stay down longer, and a new robotic Iron Man-like diving apparatus called an Exosuit, which allows divers to stay under water for hours and descend to 1,000 ft. This will be the suit's grand, experimental debut in the world of archaeology.

The team plans to explore sonar targets that could be colossal statues and another wreck nearby that could have been the Antikythera ship's traveling companion. Many hope to find the head of a 7-ft-tall headless statue of Herakles salvaged in 1901, as well as still-missing parts of the Antikythera Mechanism, "which, to my mind, is the most astounding archaeological artifact ever discovered anywhere on any site," said WHOI scientist Brendan Foley, co-director of the expedition with Theotokis Theodoulou and Dimitris Kourkoumelis of the EUA. Foley and colleagues have spent almost a decade experimenting with new marine archaeology technologies and approaches carefully tailored to the temperamental coast where the shipwreck lies.

For more information, visit <http://antikythera.whoi.edu/blog>.

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Teledyne to acquire Bolt Technology Corporation, SeaBotix

Teledyne Technologies Incorporated and Bolt Technology Corporation jointly announced that they have entered into a definitive agreement that provides for the merger of Bolt with a wholly-owned subsidiary of Teledyne. The aggregate value for the transaction is approximately \$171 million, taking into account Bolt's stock options and net cash as of 31 March 2014. Since 1965, Bolt has been a leading supplier of marine seismic energy sources and replacement parts for offshore energy exploration. Bolt also develops and manufactures high-reliability underwater cables and connectors, as well as related electronic controllers, monitoring systems and other auxiliary equipment. Through its SeaBotix business, Bolt is a leading designer and manufacturer of miniature underwater ROVs used in maritime security, search and rescue, aquaculture, and scientific research applications.

Teledyne RESON acquires ATLAS Hydrographic GmbH

Teledyne RESON A/S announce, that its subsidiary, Teledyne RESON GmbH, has acquired assets of ATLAS Hydrographic GmbH and that the business, product lines and a number of employees are now part of the Teledyne Marine Acoustics Imaging group. ATLAS Hydrographic specializes in high-performance deep-water hydrographic survey solutions for the civil market. The product portfolio consists of deep-water multibeam echosounders and parametric sub bottom profilers that going forward are to be sold under the product line name "Teledyne ATLAS Hydrographic."

Acteon acquires UTEC Survey

Acteon has announced the acquisition of UTEC Survey, an independent survey services business with a global footprint. UTEC offers high quality and cost-effective technology solutions in order to gather, process and manage data that supports informed decision-making across the entire life of a subsea field. It generated revenues in excess of \$84 million in 2013. This acquisition further enhances Acteon's ability to serve tier one contractors and oil companies that require comprehensive external support for their assets in terms of data gathering, analysis and interpretation, in order to operate competitively in the integrity and maintenance fields. Acteon will also engage UTEC's geoscience capabilities in developing an extended suite of value-creating subsea services. Complementing the expertise of NCS Survey, another Acteon company specializing in the survey and positioning arena, UTEC will continue to develop its global survey and positioning capabilities across the life-of-field in sectors including construction support, rig moves and all subsea survey applications.

NOAA team reveals forgotten ghost ships off Golden Gate

A team of NOAA researchers confirmed the discovery just outside San Francisco's Golden Gate strait of the 1910 shipwreck SS Selja and an unidentified early steam tugboat wreck tagged the "mystery wreck." The researchers also located the 1863 wreck of the clipper ship Noonday, currently obscured by mud and silt on the ocean floor.



(Photo credit: San Francisco Maritime National Historical Park)

These and other shipwreck investigations mark the first mission of a 2-year project to locate, identify and better understand some of the estimated 300 wrecks in Gulf of the Farallones National Marine Sanctuary, and the adjacent Golden Gate National Recreation Area.

"The waters of the sanctuary and the park are one of the great undersea museums in the nation," said James Delgado, director of Maritime Heritage for the Office of National Marine Sanctuaries. "These wrecks tell the powerful story of the people who helped build California and opened America to the Pacific for nearly two centuries. Finding the remains of these ships links the past to the present."

NOAA's Office of National Marine Sanctuaries and the U.S. National Park Service, which began researching the wrecks in the 1980s, published the first detailed inventory and history of the submerged heritage of the region in 1990.

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

Odyssey Marine Exploration completes current phase of SS Central America recovery

Odyssey Marine Exploration, Inc. has completed the current phase of the recovery operations on the SS Central America shipwreck project. The recovery ship, *Odyssey Explorer*, has returned to Charleston, South Carolina, for necessary repairs and installation of new equipment, which is expected to take approximately 2 to 3 weeks.

In addition to more than 15,500 gold and silver coins, 45 gold bars and hundreds of other gold nuggets, gold dust, jewelry and artifacts recovered from the shipwreck site over the past 5 months, an extensive amount of knowledge has been gained about the formation of the site. Significant sections of ship's structure, associated cultural heritage artifacts and coins were located some distance from the main shipwreck area, requiring excavation over a large area. Sizeable areas remain to be inspected and excavated outside the main shipwreck.

The *Odyssey Explorer* also recently completed a 161,000-sq. m high-resolution video survey of the shipwreck and surrounding seabed. The extensive time involved conducting this planned site survey, as well as days of unworkable weather due to Hurricane Cristobal, resulted in a smaller than average inventory of items recovered during the past month. Operational reports and inventories of items recovered from the SS Central America that have been filed with the court are available at www.shipwreck.net/ssca.php.

After the repair and equipment installation is completed, *Odyssey* plans to conduct sea trials with the new Teledyne-Reson Dual SeaBat 7125 deep-tow system recently acquired to advance the company's deep 20th-century commodity shipwreck search and mineral exploration operations. The company then plans to deploy the *Odyssey Explorer* to one or more shipwreck projects off the coast of the southeastern U.S., which may include additional operations at the Central America site, or pending final permitting, to a shipwreck project in a different operating area.

One of the ill-fated 1846 Franklin Expedition ships discovered

One of the most famous ships lost has been located in the Arctic according to an announcement by Canadian Prime Minister Stephen Harper.

"I am delighted to announce that this year's Victoria Strait Expedition has solved one of Canada's greatest mysteries, with the discovery of one of the two ships belonging to the Franklin Expedition lost in 1846."

"Although we do not know yet whether the discovery is Her Majesty's Ship (HMS) Erebus or HMS Terror, we do have enough information to confirm its authenticity. This find was confirmed on 7 September 2014, using a remotely operated underwater vehicle recently acquired by Parks Canada."



(Photo credit: Parks Canada)

"This is truly a historic moment for Canada. Franklin's ships are an important part of Canadian history given that his expeditions, which took place nearly 200 years ago, laid the foundations of Canada's Arctic sovereignty."

The Parks Canada Underwater Archaeology Team used a Klein 3000 towed side scan sonar, an Iver3 AUV, and a Saab Seaeye Falcon, all from the custom built 10-m aluminum survey vessel *Investigator*.

For more information, visit www.pc.gc.ca.

Deadline for 2015 Women Divers Hall of Fame scholarships and training grants: 28 November

Each year, the Women Divers Hall of Fame™ (WDHOF) awards numerous scholarships and training grants that provide financial and educational support to individuals of all ages, particularly those who are preparing for professional careers that involve diving.

Scholarships are offered in conservation, marine biology, underwater archaeology, journalism, graphic arts, or photography. They are intended to support tuition and fees, independent research, and/or an internship program at an accredited university. Scholarships are paid directly to the recipient. Training grants provide funding for scuba training and, for some awards, scuba equipment. Funds are paid directly to the training facility and/or the equipment vendor upon WDHOF's receipt of an invoice; they are NOT paid directly to the grantee.

You may only apply for one scholarship/grant per year. Applicants MUST complete the online application form. Please read the scholarship/grant descriptions and application instructions carefully. All scholarships/grants require the applicant to submit a biography/resume/curriculum vitae, an essay, and two letters of recommendation.

Information on all scholarships/grants and the online application can be found at www.wdhof.org/scholarships/scholarships.shtml.

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U.S. Department of Transportation announces \$10.8M for rehabilitation of Charleston's Wando Welch Terminal
U.S. Transportation Secretary Anthony Foxx announced a \$10.8 million TIGER (Transportation Investment Generating Economic Recovery) grant for the rehabilitation of the Wando Welch Terminal project, one of 72 transportation projects in 46 states and the District of Columbia that will receive a total of approximately \$600 million from the Department of Transportation's discretionary grant program. Maritime Administrator Paul 'Chip' Jaenichen visited the Port of Charleston to tour the project site and meet with port officials. As the U.S. economy continues to expand, increasingly larger ships that exceed the design capacity of the facility will call on the Port of Charleston to load and unload cargo. The TIGER funds awarded will be used to provide structural repairs and upgrades to the wharf in order to berth the new generation of larger vessels. The Wando Welch Terminal project will also increase the density of the wharf, making the pier structurally sound enough to store increased cargo volumes. Ultimately, these renovations maximize the usage of this terminal which handles 60% of the Port's exports.

MARAD releases LNG bunkering study

The Maritime Administration (MARAD) released a comprehensive study examining the options for liquefied natural gas (LNG) bunkering and the necessary infrastructure, safety, regulatory, and training factors of each in supplying LNG to ships as a propulsion fuel in the maritime sector. Bunkering is the transfer of LNG from a supply station to a receiving vessel for the sole purpose of use as propulsion fuel. The study examines the pros and cons of four bunkering options (truck-to-ship transfer, shore facility-to-ship transfer, ship-to-ship transfer, and transfer of portable tanks) based on factors such as the number and type of vessels to be served, local availability of LNG, port size, congestion and level of activity. The study also makes recommendations to regulators, port operators, vessel operators and LNG infrastructure owners on ways to address the challenges associated with widespread use of LNG as a marine propulsion fuel and provides information to help them decide which method may be most appropriate for their needs. The study is available on the MARAD website at www.marad.dot.gov.

CEVA opens European Center of Logistics Excellence

CEVA Logistics, a leading global supply chain management company, announced the opening of its first Center of Logistics Excellence in Europe. Situated in Ashby de la Zouch, United Kingdom, the opening marks CEVA's third Center following the launch of Centers in Jacksonville and Singapore. The Centers demonstrate 'real world' logistics innovation through supply chain optimization and enhanced visibility, integrated services and technology solutions to power supply chain efficiency. The European Center of Logistics Excellence will provide insights into CEVA's unique offerings and solutions for customers with business in Europe. CEVA plans to use this latest Center to build a strong knowledge center in Europe, develop supply chain talents, offer best-in-class technologies and supply chain solutions to further strengthen its presence in the region. CEVA also intends to educate and inspire the next generation of logisticians from across Europe by using the Center to introduce the scale and breadth of the logistics spectrum, as well as promoting its range of apprenticeships, internships and graduate management programs.

European Shipping Week 2015 date is announced

The week of March 2-6, 2015 has been chosen as the date for the inaugural European Shipping Week when shipping industry leaders from Europe and around the world will descend on Brussels to meet and network with top legislators from the European Commission, European Parliament and the Council of Ministers. The week-long series of high level events will bring together the major players in the shipping industry with the primary aim of promoting the strengths and significance of European and global shipping to these important regulatory bodies in Brussels. The European Commission, through DG MOVE, has endorsed European Shipping Week and formal patronage is already being sought from the European Parliament and the Council of Ministers.

Second of three Fugro offshore coastal survey vessels delivered



Fugro has taken delivery of the second of the three Fugro Offshore Coastal Survey Vessels (FOCSVs) being built by Damen. The Fugro Pioneer is a compact, survey ship capable of undertaking a wide range of survey, monitoring and inspection operations.

The vessel is designed for a variety of survey and inspections duties including light geotechnical work, environmental baseline surveys, monitoring and inspection, and moon pool deployments. Diesel electric propulsion delivers excellent economy at all speeds.

Fugro Pioneer is the second of three survey vessels ordered by Fugro for delivery in 2014. Each will be operating in a different part of the world and so they have been adapted for the individual environments in which they will work. The operating company is a specialist in the acquisition of the full spectrum of survey data and so the vessels have been tailored to be adaptable for a wide range of tasks.

Fugro Pioneer is the second vessel to be built directly by Damen for Fugro. However, the two groups have worked together on a number of refits in recent years and in the process have built a relationship based on trust and mutual understanding.

For more information, visit www.damen.com.

ABS selected to class the world's first very large ethane carrier

ABS has been chosen to class the world's first contracted series of very large ethane carriers (VLECs).

The class contract for the ships, which will be built in Korea by Samsung Heavy Industries (SHI) for an Asian shipowner, represents another gas ship milestone for ABS.

The contract is for six 87,000 cu. m VLECs and available options. The ships will be built at SHI's main shipyard in Geoje, Korea. ABS, which currently has the largest share of the global orderbook for LNG vessels being built to its class, has built a large team of qualified gas surveyors at shipyards across Korea.

"We are delighted to have received the class contract for the

world's first large ethane carriers," says ABS vice president of global gas solutions Patrick Janssens.

ABS is a pioneer in the safe transport and handling of gas, classing the world's first LNG carrier and responding to the evolving technology demands of the largest and most modern units currently in service. ABS has extensive technical experience with the full scope of gas-related assets, ranging from LNG bunker barges to FLNG units and was recently awarded the classification of the first compressed natural gas (CNG) carriers. In May, ABS announced its first classification contract for a floating LNG facility from PETRONAS, Malaysia's national oil company.

The VLEC award marks 1 year since ABS unveiled its Global Gas Solutions team, a multidisciplinary group of gas specialists formed to respond to the rapidly escalating number of gas-related projects, including LNG and LPG transportation, and the growing use of LNG and LPG as fuel for the commercial fleet.

For more information, visit www.eagle.org.

Caterpillar selected by Transnet National Ports Authority to power harbor tugs

Caterpillar Marine is pleased to announce MaK™ 8 M 25 C propulsion engines have been selected by Transnet National Ports Authority to power eight identical 70-ton bollard-pull tugs on order at a South African shipyard. The tugs will be 31 m in length with a beam of 12.5 m and will each be powered by 2x MaK 8 M 25 C engines with a total output of approximately 5332 kW. The MaK engines will be delivered between 2015 and 2018.

MaK engines offer customers a wide range of technical innovations, including excellent load response capabilities, better fuel consumption as well as long intervals between overhauls. The reduced number of components on the engine and the simplicity of the design enable easier overhauls. A proven performer in the commercial marine industry, MaK engines are the chosen power solutions for vessel owners in need of rugged, reliable power.

For more information, visit www.catpropulsion.com.

Kongsberg Maritime to provide turnkey offshore simulator delivery for new ocean rig training center

Ocean Rig UDW Inc., a major international offshore drilling contractor, has chosen Kongsberg Maritime to supply an extensive offshore and navigation simulator package for a brand new training center. With a sophisticated integrated simulator suite, enabling specific operations and vessel team training, Ocean Rig's new facility is shaping up to become one of the world's most advanced offshore training centers.

Ocean Rig owns and operates two ultra-deepwater semisubmersible drilling rigs and nine ultra-deepwater drillships (including three newbuilds for delivery 2014-2016). All of these vessels operate with key technology from Kongsberg, including dynamic positioning, thruster control, integrated control and automation, safety/fire & gas and riser management systems. Four of the drillships have integrated navigation solutions from Kongsberg.

The new training centre comprises two full mission bridge simulators. The K-Sim Offshore simulator is to be

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EXHIBITING AT EURONAVAL 2014
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- OCTOBER 27TH - 31ST
- NOVEMBER 4TH - 6TH
- NOVEMBER 24TH - 26TH
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- BOOTH #56
- BOOTH #16

equipped like a drillship based on Ocean Rig's Samsung 96k/Enhanced Saipem 10000 design. In addition, it will be integrated with K-Sim engine room simulator model DE66 drillship and K-Pos Dynamic positioning system including DP3 backup operation and riser management. The other full mission simulator is designed as a DNV Class A navigation bridge.

Two separate classrooms will also feature K-Sim ECDIS trainers, K-Pos DP Class C and K-Chief 700 crew trainers for drillship. The K-Sim engine simulator will feature DE-66 drillship and MC 90V models. It will be used in a desktop configuration and on Kongsberg Maritime's advanced, touchscreen BigView interactive mimic system. All simulators can provide task specific training, or operate as part of an integrated system to provide full vessel training.

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

New code of safety for ships using gases or low flashpoint fuels agreed in draft form by IMO

The draft International Code of Safety for Ships using Gases or other Low flashpoint Fuels (IGF Code), along with proposed amendments to make the Code mandatory under SOLAS, were agreed by the inaugural session of the Sub-Committee on Carriage of Cargoes and Containers (CCC 1).

The basic philosophy of the IGF Code is to provide mandatory provisions for the arrangement, installation, control and monitoring of machinery, equipment and systems using low flashpoint fuels, such as liquefied natural gas (LNG), to minimize the risk to the ship, its crew and the environment, having regard to the nature of the fuels involved.

The Code addresses all areas that need special consideration for the usage of low flashpoint fuels, based on a goal-based approach, with goals and functional requirements specified for each section forming the basis for the design, construction and operation of ships using this type of fuel.

It was agreed that the new IGF Code should apply to new ships and to existing ships converting from the use of conventional oil fuel to the use of gases or other low-flashpoint fuels, on or after the date of entry into force of the Code. The IGF Code would not apply to cargo ships of less than 500 gross tonnage, but the provisions of the IGF Code could be applied to such ships on a voluntary basis, based on national legislation.



The Bit Viking was the world's first vessel to have its main machinery converted to burn LNG as fuel (Image Copyright: Tarbit Shipping).

The draft SOLAS amendments, along with the draft IGF Code, will be submitted to the parent body, the Maritime Safety Committee, at its 94th session (MSC 94, 17 to 21 November 2014), for approval with a view to subsequent adoption. The draft amendments include a new Part G in SOLAS chapter II-1 (Construction – Subdivision and stability, machinery and electrical installations) related to ships using low-flashpoint fuels, requiring such ships to comply with the IGF Code; and related amendments to SOLAS chapter II-2 (Fire protection, fire detection and fire extinction), covering to the use of fuel with a low flashpoint. Further draft amendments would update the form of safety certificates, to include reference to the new Part G.

For more information, visit www.imo.org.

VSTEP delivers FMB simulator to Danaos Corporation

Danaos Corporation purchased a NAUTIS DNV Class A FMB Simulator and Instructor Station for training of its fleet members. The simulator will be delivered and installed by VSTEP at Danaos Shipping Co Ltd. headquarters in Piraeus, Greece.

The simulator purchased by Danaos Corporation included a NAUTIS DNV Class A FMB simulator with 240° horizontal field of view and an instructor station. It will be used to train navigation and maneuvering with the container vessels of the Danaos fleet. For this purpose, new container vessels were developed and added to the simulator in addition to the existing container vessels in the simulator ship library.

Danaos Corporation is a leading international owner of containerships, chartering vessels to many of the world's largest liner companies. With a fleet of 54 containerships, Danaos is among the largest containership charter owners in the world based on total TEU capacity. Danaos is one of the largest U.S.-listed containership companies based on fleet size. Danaos is today domiciled in the Republic of the

Marshall Islands, with operations conducted out of Greece.

VSTEP will deliver the Class A simulator at Danaos HQ in Piraeus in Q3 2014 and will provide simulator operator training for selected Danaos staff.

For more information, visit www.vstepsimulation.com.

Kongsberg Maritime integrated vessel control systems for well intervention vessels

Kongsberg Maritime will deliver integrated vessel control systems for two new Siem Offshore-owned, Helix Energy Solutions Group, Inc.-chartered Well Intervention Vessels (WIVs) being built at German shipyard Flensburger Schiffbau-Gesellschaft (FSG). Both vessels are due for delivery in 2016, and will provide well-intervention services offshore Brazil for Petrobras, for an initial period of 4 years with options to extend.

Based on the Salt 307WIV design, the new WIVs (FSG 765 and 766) will have a length of 158 m, a beam of 31 m and max. service speed of 17 kts. The vessels are compliant to MODU code and well-intervention 2 notation, and will provide accommodation for 150 persons.

The Kongsberg Maritime scope of supply for these two advanced new buildings covers all key navigation, positioning and automation technology, chosen to ensure safe and efficient vessel operation: K-Master (forward and aft bridge), K-Pos DP-32 with K-Pos DP-12 as back-up DP, cJoy DP joystick system, Dual HiPAP 501 with HAIN reference, HMS 100 helideck monitoring system, K-Thrust thruster control, K-Chief 700 including power management system, K-Safe fire & gas and emergency shut down system, K-Bridge navigation bridge and EA 400 hydrographic echo sounder.

Siem Offshore Inc., headquartered in Kristiansand, Norway, is an international owner and operator of offshore support vessels and provides services to the offshore oil and gas market and the offshore renewable market. Helix Energy Solutions Group is an established leader in rig-less offshore well intervention, providing fast, flexible and high-quality well management services. FSG is the world leader in RoRo ship building, with a global market share of 30% and has in recent years established a strong position in the high-tech offshore vessel market.

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

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Squeezing More Bandwidth into Smaller Space for HD Video and Data-hungry Submersible Applications

By: Marla Isenstein, SeaView Systems Marketing Manager

Challenges

For many towed remotely operated vehicles (ROVs), towed sleds, and general submersible ROV applications, the value and often the success or failure of the vehicle's deployment are based largely on the quality of the data that can be measured and sent back to the operator or logging system on the surface.

For plenty of applications, the bottleneck is the multiplexer that gets this critical data from the cameras and sensors on the ROV into the umbilical's fiber data stream.

For a typical deployment, an ROV might be limited to three standard definition cameras with some serial data. Ethernet, a data transmission protocol that is becoming ubiquitous especially with multibeam sonars, requires a second card.

In many instances, deployments of off-the-shelf as well as custom-designed ROVs were bumping up against communications electronics limitations that could be as demanding as the rigors of deepwater.

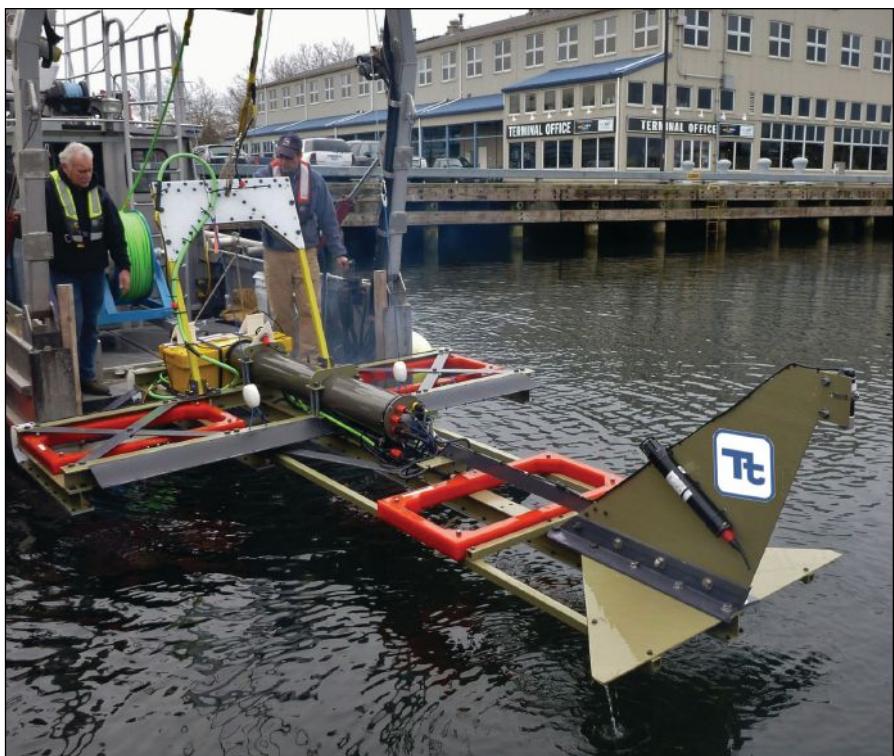
Solutions

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A new suite of multiplexers and data converters from SeaView Systems, the SVS-509 OmniData Multiplexer, breaks through this bottleneck to give ROVs an unprecedented level of flexibility in terms of bandwidth for a given space while increasing the options for the sort of sensors that can be attached to the smallest of ROVs to workclass machines, even offering an upgrade path for equipment that predates modern-day bandwidth demands.

What the SeaView multiplexer provides is a handy set of video, serial, and Ethernet ports and timing triggers—all on one card that enables flexible sensor deployment on many platforms. In the case of very high demand applications, SeaView's standard multiplexer can be optically linked with their gigabit Ethernet converter board and a dual-channel HD-SDI board in order to transmit all these data on one single mode fiber. The combination of all three cards constitutes the SVS-509. The package enables plug-and-play integration for many currently available subsea devices, all in a very compact package.

The SeaView SVS-509, based on the industry standard PC-104 form factor, can be deployed as a direct replacement or upgrade in the numerous existing ROV systems that use the same form factor, opening up a range of improved sensor capabilities for existing ROV hardware.

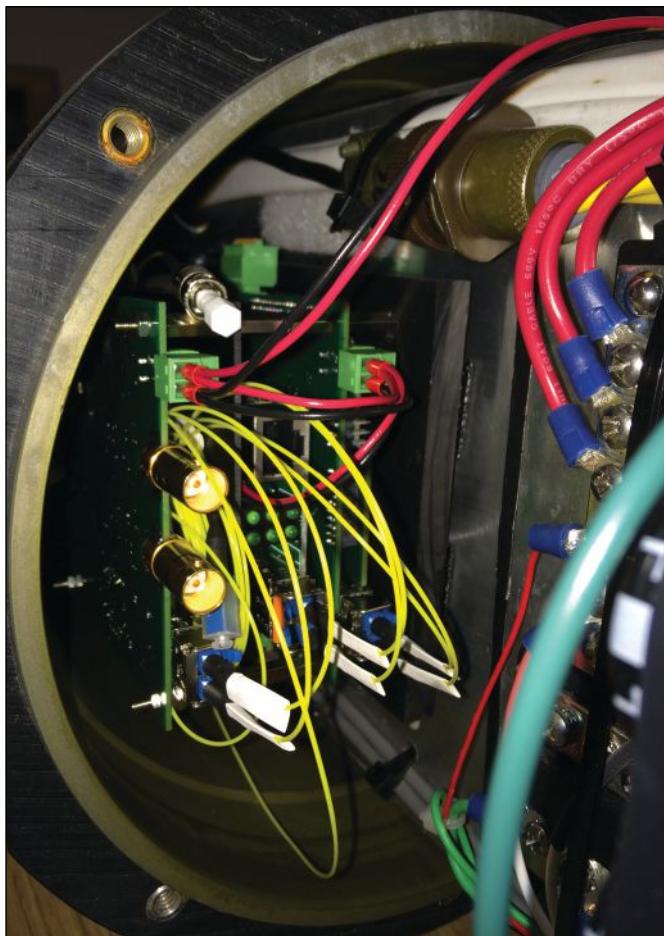


Tetra Tech's TEMA tow rig is small and lightweight for easy deployment from a vessel of opportunity, yet packs a big data punch thanks to the SeaView multiplexer.

"We didn't set out to design a fresh card stack," said Matthew Cook, head of SeaView. "But there just wasn't anything out there that addressed the requirements of some of our deployments. We needed a multiplexer that would enable us to hang two HD cameras, multibeam sonars, tooling cameras, and a Christmas tree load of other sensors, and fit it all into a small pressure cylinder."

Rather than building up a single-purpose solution, they decided to build the Swiss army knife of multiplexers. "Once we'd designed to address the bandwidth issue, it was simply a matter of deciding which ports would be the most useful for the broadest range of applications," said Cook. "And, with the proliferation of multibeam sonars and other high bandwidth devices such as HD cameras, we saw that this flexibility would be extremely helpful going forward." To that end, they also included onboard RS485-232 conversion, which saved the pain of needing extra hardware for that conversion.

In the course of drafting the design, SeaView saw that the PC-104 form factor would make this the obvious choice for upgrading a veritable boatload of existing equipment that could take advantage of either the higher-definition video or additional sensor possibilities the multiplexer enabled.



The Seaview multiplexer board stack fits neatly into the tight confines of Tetra Tech's TEMA bottle housing.

The result, the SeaView Systems SVS-509 OmniData Multiplexer consists of a suite of three optical video and data transmission cards built to the PC-104 form factor with a flexible set of ports: a video and data multiplexer (with multiple SD video channels, RS-485, RS-232 and high speed triggers), a gigabit Ethernet to fiber converter, and an HDI-SDI fiber converter.

"Not every application requires HD and all the extra sensors," said Cook, "but once you've had the luxury of that kind of data, it's hard to imagine trying to get along without it."

Application

An early customer for the product was Tetra Tech, a leading underwater survey company. Their Survey and Mapping Group has deployed the SeaView stack as part of their Towed Electromagnetic Array (TEMA), a tow sled that performs undersea surveys primarily for the detection and mapping of unexploded ordnance. Tetra Tech exploited the improved bandwidth and diverse sensor possibilities, enabling the TEMA sled to readily support a wide range of additional activities, including:

- Cable and pipeline route surveys;
- Pipeline/cable location and O&M monitoring;
- Search, salvage, and debris surveys; and
- Archaeological/cultural surveys.

The design restraints of Tetra Tech's TEMA sled required it to be small enough to be rapidly transported and deployed from a vessel of opportunity while still able to provide a comprehensive suite of sensors, lights, and cameras. The specification demand for very high bandwidth data transfer in a small package presented Tetra Tech with a challenging underwater engineering problem—and SeaView's multiplexer was a perfect fit.

A World of Possibilities

"An ROV or tow sled is essentially a taxi taking sensors and tools to the worksite. If you're going to the expense to put a vehicle into the water, you want to capture as much data of the best quality you can," said Cook. By making it less expensive than the previous generation multiplexer, SeaView has made it a win-win, where you get more for less."

"It's a really great time to be involved in ROV technologies," Cook continued. "The number of different applications for the transmission of subsea data never ceases to amaze me and is growing every day. It's really satisfying to see our products expand these capabilities and address our customers' most demanding requirements."

"The ability to multiplex up live HD video, still DSLR images, as well as all the data from our altimeters, temperature sensors, and electromagnetic systems—all up one single-mode fiber cable—made the SeaView multiplexer the only choice for us," said Richard Funk, senior geophysicist for Tetra Tech and designer of the TEMA vehicle.

For more information, visit www.seaviewsystems.com or www.tetratech.com.

CSA and Seiche combine forces for marine mammal monitoring training 9-13 October 2014

CSA Ocean Sciences Inc. (CSA) and Seiche Measurements are offering a 5-day protected species observer (PSO) and passive acoustic monitoring (PAM) course for individuals seeking professional certification and training for visual and acoustic monitoring of protected species. The course offered by the Seiche/CSA team adheres to current Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement (BOEM/BSEE) mitigation requirements and standards. For more details, please contact Sarah Hancock at s.hancock@seiche.com.

IUCN-Med and GFMC FAO renew commitment for a sustainable use of marine resources

The IUCN Centre for Mediterranean Cooperation (IUCN-Med) signed a new agreement with the General Fisheries Commission for the Mediterranean (GFMC-FAO) on 19 May during the 38th session of the Commission to tighten cooperation on the sustainable use of marine resources. The memorandum of understanding (MoU) aims to respond to newly emerging challenges affecting the conservation of the Mediterranean Sea and its ecosystems and the sustainable use of marine living resources. It provides a framework of cooperation and understanding to facilitate collaboration on key issues, namely:

- The promotion of ecosystem-based approaches for the conservation of the marine environment and ecosystems and the sustainable use of living marine resources;
- Mitigation of the impact of fisheries and aquaculture activities on marine habitats and species;
- Identification, protection and management of marine areas of particular importance in the Mediterranean;
- Integrated maritime policy; and
- Legal, institutional and policy-related cooperation.

To achieve these objectives, the two organizations will share their experience and expertise through the organization of joint missions, common training activities and information sessions to be prearranged by the parties for the implementation and monitoring of activities carried out under this new MoU.

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Ocean News & Technology

Coral growth rate plummets in 30-year comparison

A team of researchers working on a Carnegie expedition in Australia's Great Barrier Reef has documented that coral growth rates have plummeted 40% since the mid-1970s. The scientists suggest that ocean acidification may be playing an important role in this perilous slowdown. In a quest for historical context on the peril facing coral reefs, the team compared current measurements of the growth rate of a section of Australia's Great Barrier Reef with similar measurements taken more than 30 years ago. Their work is published in *Geochimica et Cosmochimica Acta*. Coral reefs are havens for biodiversity and crucial for the economies of many coastal communities. But they are very sensitive to changes in ocean chemistry resulting from human activity. Since the beginning of the Industrial Revolution about one-third of the carbon dioxide, CO₂, which has been released into the atmosphere from fossil fuel combustion and land use change has been absorbed by the oceans, where it damages coral reefs. Coral reefs use a mineral called aragonite to make their skeletons, a process called calcification. It is a naturally occurring form of calcium carbonate, CaCO₃. When carbon dioxide from the atmosphere is absorbed by the ocean, it forms carbonic acid, H₂CO₃, which makes the ocean more acidic and decreases its pH. This makes it more difficult for many marine organisms to grow their shells and skeletons, and threatens coral around the globe. Recent studies have shown a reduction in individual coral growth in the Great Barrier Reef, southern Thailand, and the central Red Sea of between 13% and 24% over the last few decades. But well-characterized observations of carbonate chemistry trends weren't made at those sites, so it isn't possible to draw a direct line of causality between the acidification of the ocean and a decline in coral skeleton building. In order to establish a cause-and-effect relationship between acidification and decreased calcification, a team led by Carnegie's Ken Caldeira and including Carnegie's Jacob Silverman (the lead author) and Kenneth Schneider, formerly of Carnegie, compared measurements of the rate of calcification in one segment of Australia's Great Barrier Reef called Bird Island that were taken in between 1975 and 1979 to those made at the neighboring Lizard Island in 2008 and 2009.

Warming ocean temperatures could increase expansion of invasive, native species



Warming water temperatures due to climate change could expand the range of many native species of tropical fish, including the invasive and poisonous lionfish, according to a study of 40 species along rocky and artificial reefs off North Carolina by researchers from NOAA and the University of North Carolina-Wilmington.

The findings, reported for the first time, were published in the September issue of *Marine Ecology Progress Series*.

"The results will allow us to better understand how the fish communities might shift under different climate change scenarios and provide the type of environmental data to inform future decisions relating to the management and siting of protected areas," said Paula Whitfield, a research ecologist at NOAA's National Centers for Coastal Ocean Science (NCCOS) and lead author of the study.

The North Carolina reefs lie within the temperate-tropical transition zone, where historically, both temperate and tropical species live, at their respective range limits. However, water temperatures in the zone are becoming more tropical, making it an important place to detect climate changes and its impacts.

The researchers first made these discoveries during an ecological study of the marine communities on the North Carolina reefs. Findings from this earlier study showed similar shifts of climate change induced shifts in algal populations.

Researchers combined year-round bottom water temperature data with 2006-2010 fish community surveys in water depths from 15 to 150 ft off the coast of North Carolina. The study revealed that the fish community was primarily tropical in the deeper areas surveyed, from 122 to 150 ft, with a winter mean temperature of 21°C (69.8°F). However, many of these native tropical fishes, usually abundant in shallow, somewhat cooler reefs, tended to remain in the deeper, warmer water, suggesting that temperature is a main factor in controlling their distribution.

"Globally, fish communities are becoming more tropical as a result of warming temperatures, as fish move to follow their optimal temperature range," said Whitfield. "Along the North Carolina coast, warming water temperatures may allow the expansion of tropical fish species, such as lionfish, into areas that were previously uninhabitable due to cold winter temperatures. The temperature thresholds collected in this study will allow us to detect and to estimate fish community changes related to water temperature."

Since their first sighting off the Florida east coast in the late 1980s, lionfish have spread throughout the western North Atlantic including the Gulf of Mexico and Caribbean. They are considered a major threat to Atlantic reefs by reducing reef fish recruitment and biomass, and have been implicated in cascading impacts such as decreased coral cover on coral reefs. To date, cold winter bottom temperatures are the only factor found to control their distribution on a large scale.

For more information, visit www.noaa.gov.

Natural methane seepage on U.S. Atlantic Ocean margin widespread

Natural methane leakage from the seafloor is far more widespread on the U.S. Atlantic margin than previously thought, according to a study by researchers from Mississippi State University, the U.S. Geological Survey, and other institutions.

Methane plumes identified in the water column between Cape Hatteras, North Carolina and Georges Bank, Massachusetts, are emanating from at least 570 seafloor cold seeps on the outer continental shelf and the continental slope. Taken together, these areas, which lie between the coastline and the deep ocean, constitute the continental margin. Prior to this study, only three seep areas had been identified beyond the edge of the continental shelf, which occurs at approximately 180 m (590 ft)

water depth between Florida and Maine on the U.S. Atlantic seafloor.

Cold seeps are areas where gases and fluids leak into the overlying water from the sediments. They are designated as cold to distinguish them from hydrothermal vents, which are sites where new oceanic crust is being formed and hot fluids are being emitted at the seafloor. Cold seeps can occur in a much broader range of environments than hydrothermal vents.

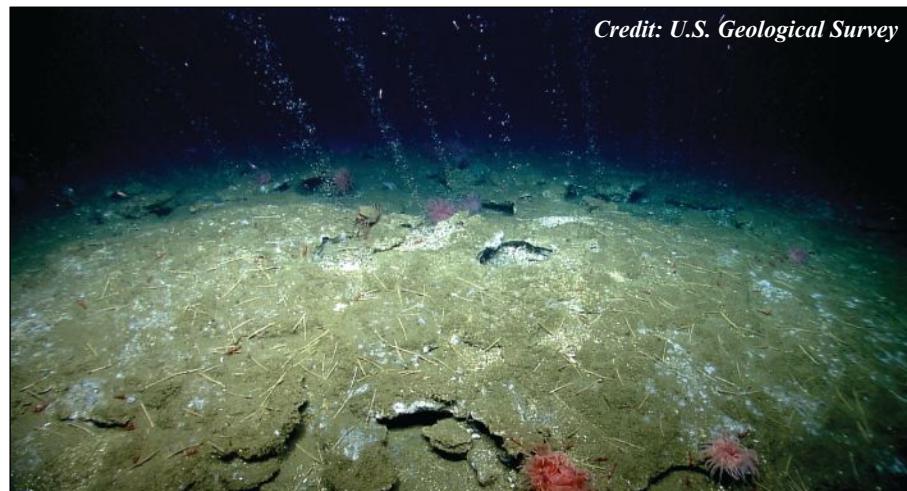
"Widespread seepage had not been expected on the Atlantic margin. It is not near a plate tectonic boundary like the U.S. Pacific coast, nor associated with a petroleum basin like the northern Gulf of Mexico," said Adam Skarke, the study's lead author and a professor at Mississippi State University.

The gas being emitted by the seeps has not yet been sampled, but researchers believe that most of the leaking methane is produced by microbial processes in shallow sediments. This interpretation is based primarily on the locations of the seeps and knowledge of the underlying geology. Microbial methane is not the type found in deep-seated reservoirs and often tapped as a natural gas resource.

Most seeps described in the new study are too deep for the methane to directly reach the atmosphere, but the methane that remains in the water column can be oxidized to carbon dioxide. This, in turn, increases the acidity of ocean waters and reduces oxygen levels.

"This study continues the tradition of advancing U.S. marine science research through partnerships between federal agencies and the involvement of academic researchers," said John Haines, coordinator of the USGS Coastal and Marine Geology Program. "NOAA's Ocean Exploration program acquired state-of-the-art data at the scale of the entire margin, while academic and USGS scientists teamed to interpret these data in the context of a research problem of global significance."

For more information, visit www.msstate.edu.



Credit: U.S. Geological Survey

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NOAA lists 20 coral species as threatened under the Endangered Species Act

NOAA announced it will afford Endangered Species Act protections to 20 coral species. All 20 species will be listed as threatened, none as endangered. Fifteen of the newly listed species occur in the Indo-Pacific and five in the Caribbean.

The announcement is a significant change from the proposed rule in November 2012. Since that time, many new scientific papers on climate change and coral habitat, distribution and abundance were published so that NOAA was able to consider and incorporate new information into the final decision. NOAA also considered extensive public comments as part of the final rule making.

The new information provided after the proposed rule was published strengthened the body of species-specific information available to NOAA for its final determination. The new information also improved the agency's understanding of coral habitat diversity, abundance, distribution and species-specific exposure to threats and their relative vulnerability or resilience.

For more information, visit www.noaa.gov.

Scientists apply biomedical technique to reveal changes within the body of the ocean

For decades, medical researchers have sought new methods to diagnose how different types of cells and systems in the body are functioning. Now scientists have adapted an emerging biomedical technique to study the vast body of the ocean.

In a study published 5 September in the journal *Science*, a research team led by the Woods Hole Oceanographic Institution (WHOI) demonstrated that they can identify and measure proteins in the ocean, revealing how single-celled marine organisms and ocean ecosystems are operating.

"Proteins are the molecules that catalyze the biochemical reactions happening in the organisms," said WHOI biogeochemist Mak Saito, the study's lead author. "So instead of just measuring what species are where in the ocean, now we can effectively look inside those organisms and see what biochemical reactions they are performing in the face of various ocean conditions. It's a potentially powerful tool we can use to reveal the inner biochemical workings of organisms within ocean ecosystems



Photo credit: Brian Dimento, University of Connecticut.

and to start diagnosing how the oceans are responding to pollution, climate change, and other shifts."

The emerging biomedical technique of measuring proteins – a field called proteomics – builds upon the more familiar field of genomics, which has allowed scientists to detect and identify genes in cells. The new study is an initial demonstration that proteomic techniques can be applied to marine environments not only to identify the presence of proteins, but for the first time, to precisely count their numbers.

For their study, funded by the Gordon and Betty Moore Foundation and the National Science Foundation, the scientists collected water samples during a research cruise in October 2011 along a 2,500-mi stretch in the Pacific Ocean, from Hawaii to Samoa. The transect cut across regions with widely different concentrations of nutrients, from areas rich in iron to the north to areas near the equator that are rich in phosphorus and nitrogen but devoid of iron.

For more information, visit www.whoi.edu.

Southern ocean's role in climate regulation

The Southern Ocean that encircles Antarctica lends a considerable hand in keeping Earth's temperature hospitable by soaking up half of the human-made carbon in the atmosphere and a majority of the planet's excess heat. Yet, the inner workings — and global importance — of this ocean that accounts for 30% of the world's ocean area remains relatively unknown to scientists, as observations remain hindered by dangerous seas.

Scripps Institution of Oceanography at UC San Diego is one of 10 partner institutions led by Princeton University who seek to make the Southern Ocean better known scientifically and publicly through a \$21 million program. The endeavor will create a biogeochemical and physical portrait of the ocean using hundreds of robotic floats deployed around Antarctica and an expanded computational capacity. The Southern

Ocean Carbon and Climate Observations and Modeling program, or SOCCOM, is a 6-year initiative funded by the National Science Foundation's Division of Polar Programs, with additional support from the National Oceanic and Atmospheric Administration (NOAA) and NASA.

"The scarcity of observations in the Southern Ocean and inadequacy of earlier models, combined with its importance to the Earth's carbon and climate systems, means there is tremendous potential for groundbreaking research in this region," said SOCCOM Director Jorge Sarmiento, Princeton's George J. Magee professor of geoscience and geological engineering and director of the Program in Atmospheric and Oceanic Sciences.

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

Study links negative biological impacts to oil-exposed killifish

Scientists from Louisiana State University, University of California-Davis, and Clemson University studying Deepwater Horizon impacts on killifish from oiled Louisiana estuaries found that adult fish exhibited genetic responses that indicate physical and reproductive impairment over 1 year post spill.

These results were published in an article titled, Multi-tissue molecular, genomic, and developmental effects of the Deepwater Horizon oil spill on resident Gulf killifish (*Fundulus grandis*) in the April 2013 edition of *Environmental Science & Technology*.

Researchers collected killifish—a non-migratory, estuarine-dependent prey species—between May 2010 and August 2011 from oiled areas in Louisiana and from non-oiled areas in coastal Mississippi and Alabama. This time period coincided with peak killifish spawning. They also collected sediment from oiled and non-oiled sites in Louisiana between 2010 and 2011.

The team measured a contaminant-specific protein, CYP1A, in killifish and results showed that they were exposed to the toxic components of oil, and that the gill was a sensitive target of such exposure. In comparing gene responses between gill and liver tissue, there was a more dramatic response in the gill, which may be reflective of this organ's direct contact with the contaminated external environment.

For more information, visit www.gulfresearchinitiative.org.

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Energy Department offers conditional commitment to Cape Wind

The Department of Energy announced the first step toward issuing a \$150 million loan guarantee to support the construction of the Cape Wind offshore wind project with a conditional commitment to Cape Wind Associates, LLC. If constructed, the project would be the first commercial-scale offshore wind facility in the U.S., with a capacity of more than 360 MW of clean energy off the coast of Cape Cod, Massachusetts. The proposed Cape Wind project would use 3.6-MW offshore wind turbines that would provide a majority of the electricity needed for Cape Cod, Nantucket and Martha's Vineyard, and would create approximately 400 construction jobs and 50 operations jobs. The conditional commitment is an important step towards issuing a \$150 million loan guarantee to support construction of the project. The Department will continue to monitor the project's development and work to reach final agreement before closing the loan guarantee. Under the proposed financing structure for the Cape Wind project, the Department would be part of a group of public and private lenders. This co-lending arrangement will help build private sector experience with offshore wind projects in the U.S. while reducing taxpayer exposure. Currently, the Department's Loan Programs Office (LPO) supports a large, diverse portfolio of more than \$30 billion in loans, loan guarantees, and commitments, supporting more than 30 closed and committed projects. The projects that LPO has supported include one of the world's largest wind farms, several of the world's largest solar generation and thermal energy storage systems, and more than a dozen new or retooled auto manufacturing plants across the country.

BOEM announces milestone for wind energy development offshore North Carolina

The Bureau of Ocean Energy Management (BOEM) has defined three Wind Energy Areas offshore North Carolina, which total approximately 307,590 acres, for potential commercial wind energy development. The Wind Energy Areas announced include the Kitty Hawk Wind Energy Areas (about 122,405 acres), the Wilmington West Wind Energy Areas (about 51,595 acres), and the Wilmington East Wind Energy Areas (about 133,590 acres). Consistent with the Interior Department's "Smart from the Start" strategy for offshore wind, each of the three Wind Energy Areas has been designed to make available areas that are attractive for commercial offshore wind development, while also protecting important viewsheds, sensitive habitats and resources and minimizing space use conflicts with activities such as military operations, shipping and fishing. For example, BOEM worked closely with the United States Coast Guard to ensure that development in the identified areas would not pose significant risks to navigational safety. BOEM also worked with the National Park Service to address concerns regarding potential visual impacts to the Cape Hatteras National Seashore and the Bodie Island Lighthouse. As a result, BOEM refined the areas originally considered for commercial wind energy development during the process of defining the Wind Energy Areas. Before any leases are offered for competitive auction, BOEM will complete an Environmental Assessment to determine potential impacts associated with issuing leases and approving site assessment activities in the Wind Energy Areas, in accordance with the National Environmental Policy Act. BOEM is only considering the issuance of leases and approval of site assessment plans at this time. If leases are issued, any proposal for a commercial wind energy facility will require a construction and operations plan and a site-specific environmental analysis. In December 2012, BOEM published in the Federal Register a Call for Information and Nominations and a Notice of Intent to Prepare an Environmental Assessment. BOEM considered all comments received in response to the Call and Notice of Intent and worked closely with federal, state and local government agencies and stakeholders to avoid existing high use and sensitive resource areas while identifying areas suitable for offshore wind development.

Atlantis signs £7.5 M contract to expand tidal energy project in Scotland



Atlantis, owner of the world's largest planned tidal stream energy project, MeyGen, has been awarded a £7.5 million 2 year contract with the UK's Energy Technologies Institute (ETI) to deliver a multi-turbine foundation structure that will support a further two turbines at the Atlantis-owned MeyGen tidal stream array in the Pentland Firth, Scotland.

The agreement with ETI marks the start of Phase 2 of the ETI Tidal Energy Converter Project (TEC Phase 2). TEC Phase 2 will see two Atlantis-owned 1.5 MW commercial tidal energy turbines installed on an innovative foundation structure designed and built as part of the ETI-funded project. The Project was negotiated separately to, and comes hot on the heels of, the Company's recently funded 6-MW tidal turbine array at the MeyGen site. It will increase the number of turbines at the site from four to six and the rated capacity of the tidal array from 6 MW to 9 MW, enough to power 4,500 local homes.

The ETI originally commissioned the first phase of the Tidal Energy Converter Project ("TEC Phase 1") in May 2012, following a competitive tender that was won by a consortium led by Atlantis. TEC Phase 1 adopted a total system lifetime cost of energy methodology to identify, develop and prove tidal energy system technologies capable of significantly reducing cost of energy and of being deployed at array scale. As a result, the ETI has developed a patent-pending innovative and cost effective turbine foundation design that will be deployed during TEC Phase 2.

The second phase of the project, TEC Phase 2 awarded to Atlantis, will run over three stages, commencing with detailed design, fabrication and installation of the innovative turbine foundation structure and associated technologies. Atlantis will be responsible for turbine supply and electrical connection to the local grid.

Tim Cornelius, Atlantis CEO, said: "We are delighted that the ETI has selected Atlantis to continue to develop its marine project portfolio. Phase 2 of the Tidal Energy Converter project will see Atlantis expand its turbine array at the MeyGen site at Scotland and the scale of commercial marine energy generation in the UK. The ETI funded technologies to be designed and built as part of this Project have the potential to substantially reduce the cost of energy of installed commer-

cial turbines – improving the economics of tidal energy as part of the UK's energy mix."

Jonathan Wills, director, programme delivery at the ETI added: "Results from the first phase of the project have provided a number of innovations across array system architectures and their operation and the potential impact in the cost of energy produced. In Phase 2 we intend to demonstrate the most impactful of the innovations at a real site. The project should further enhance industry and investor confidence in tidal energy and help to unlock its potential as a serious contributor to future energy systems."

For more information, visit www.atlantisresourcesltd.com.

UK first two-bladed offshore wind turbine site selected

The Crown Estate, which manages the United Kingdom's coastal waters, announced that it has entered into an Agreement for Lease with Forthwind Limited, a subsidiary of 2-B Energy, for the UK's first offshore demonstration of two-bladed turbines on the seabed at Methil in Scotland, consisting of two full-scale units.

Two-bladed designs at this scale are a major innovation for the offshore wind industry and the deployment offshore of these 6-MW turbines at Methil will be the first in the world of their kind. 2-B Energy has received grant support from the Department of Energy and Climate Change (DECC) and investment by the Scottish Investment Bank to develop a full-scale onshore prototype in the Netherlands ahead of the two offshore machines planned for Methil, which are anticipated for deployment in 2016 subject to planning consent.

In addition to two-bladed turbine design, 2-B Energy are seeking to further reduce costs by integrating wind turbine technology with innovations in grid and access systems, the installation process and a new operational strategy.

This project will add to our current portfolio of test and demonstration activity in which Scotland is taking a leading role, including Samsung's 7-MW prototype turbine off the coast of Methil and our existing agreement with Statoil for the UK's first floating wind farm off the coast of Peterhead, Aberdeenshire.

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

Launch of joint Canada-UK research call in tidal energy technologies

The Offshore Energy Research Association of Nova Scotia (OERA) and Technology Strategy Board (TSB) of the United Kingdom are jointly investing approximately \$1.4 million CAD (approximately £755,000) in collaborative R&D projects to support the acceleration of the tidal energy sector in both jurisdictions. This competition stems from a Memorandum of Understanding (MoU) signed in February 2014 by the Nova Scotia Department of Energy, the OERA and the United Kingdom's TSB. It commits the two organizations to work together in areas of mutual interest.

The research competition aims to develop enhanced sensing technologies for in-stream tidal energy applications. This will lead to better data, improved data analysis, and collection methods. It will also allow us to advance research faster to address technical challenges and opportunities together and to build a common direction for the economic opportunities associated with tidal energy.

Through this competition, it is expected that new knowledge and skills will be generated. This means the tidal industry

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Proposals must be collaborative and business-led, including at least one business from Canada and one from the United Kingdom. OERA and the TSB expect to fund industrial research projects, in which a business partner will generally attract up to 50% public funding for their project costs (60% for small to medium enterprises). OERA and the TSB expect total project costs to be in the region of \$500,000 CAD (approximately £275,000), though not to the exclusion of projects of other sizes. This is a two-stage competition that opens for applicants on October 6, 2014. The deadline for expressions of interest is at noon AST or 4 p.m. GMT on November 28, 2014.

For more information, visit www.oera.ca.

Siemens receives order for turbines for Sandbank

Vattenfall has awarded Siemens Energy an order for 72 Model SWT-4.0-130 wind turbines for its new Sandbank offshore wind farm. The pro-

ject is being erected 90 km west of the island of Sylt in water depths between 25 m and 37 m within the exclusive economic zone off the German North Sea coast. A pioneering service plan for the project will

generate synergy from its close vicinity to DanTysk offshore wind farm, utilizing joint operations to drive down the maintenance costs of both projects. Vattenfall has contracted Siemens to perform maintenance services on the Sandbank installations for an initial period of 5 years.

The 72 offshore wind turbines of the type SWT-4.0-130 for Sandbank offshore wind power plant will be rated at 4 MW each.

Service operations will center on a Service Operation Vessel (SOV) specifically designed for these deployments. Following project commissioning, this



specialized ship fitted with living accommodations for technicians and a workshop equipped with spare parts on board will take up position between the two wind farms. A helicopter will provide additional deployment readiness to enable crew to be ferried between land, the SOV and the wind turbines, irrespective of weather and sea conditions. DanTysk wind farm, already in an advanced stage of construction and likewise equipped with Siemens wind turbines of the G4 product platform, lies only 20 km away. The permanent deployment readiness of the SOV and its use to both wind farms will enable

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particularly efficient operation owing to the short journey distances and high availability of both wind farms.

The wind turbines themselves will also contribute significantly to increasing efficiency and lowering costs at the Sandbank project. Siemens' Model SWT-4.0-130 wind turbines ordered for the project represent the latest generation of the Siemens G4 platform wind turbines. They combine the proven technology of the most-built offshore wind turbine series—over 900 units worldwide rated at 3.6 MW are in operation—with a significantly enhanced power output of 4 MW at comparable maintenance costs. What is more, the unit's rotor—measuring 130 m in diameter—delivers optimum energy yield even at low and moderate wind speeds. The advanced rotor blades also contribute to efficiency: The 63-m long aeroelastic blades are designed to be flexible under high wind loads, and can therefore be manufactured with up to 20% reduced mass compared to conventional rotor blades. Hence, once commissioned at the end of 2016,

Sandbank will count among the most modern offshore wind farms anywhere in the world. Construction is scheduled to commence in summer 2015.

Wind power and the associated service activities are part of Siemens' Environmental Portfolio. Around 43% of the company's revenues are generated by green products and solutions. That makes Siemens one of the world's leading providers of eco-friendly technology.

For more information, visit www.siemens.com.

Block Island wind farm now fully permitted

Deepwater Wind received the final federal approval needed to build the Block Island Wind Farm—a project that remains on-track to be the nation's first offshore wind farm. The project's lead federal permitting agency, the U.S. Army Corps of Engineers (USACE), has granted its approval of the Block Island Wind Farm. With USACE's permit, the Block Island Wind Farm has now been completely reviewed, and approved, by

11 state and federal agencies.

Deepwater Wind has begun the initial stages of construction on the 30-MW Block Island Wind Farm, which will be located about 3 mi off the coast of Block Island, Rhode Island. Earlier this year, Deepwater Wind selected Alstom as its Block Island Wind Farm turbine supplier and long-term maintenance and service provider. Deepwater Wind received delivery of its 15 wind turbine blades from Alstom in Denmark.

The U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) is reviewing Deepwater Wind's application for a right-of-way in federal waters for the Block Island Transmission System, the transmission cable associated with the Block Island Wind Farm. Deepwater Wind anticipates receiving BOEM's approval in the coming weeks. Offshore construction is expected to begin next summer, with the wind farm in service in 2016.

For more information, visit www.dwwind.com.

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Appellate Court finds in favor of Fishermen's Energy

On the heels of executing its \$47 million agreement with the U.S. Department of Energy (DOE), Fishermen's Energy scored a big win in its 3-year fight to gain approval from the New Jersey Board of Public Utilities (BPU) to build a demonstration scale offshore wind project off the shore of Atlantic City. The Superior Court of New Jersey, Appellate Division, ruled in favor of Fishermen's on a motion filed to require the BPU to reconsider Fishermen's Energy Atlantic City offshore wind project. In April the BPU denied the project approval, claiming that the alleged energy price of \$263 per MWH was too high. Fishermen's had not proposed such a price.

The Appellate Court decision requires that the BPU reconsider the application in light of the \$47 million DOE grant. The decision also requires the BPU to acknowledge that the Fishermen's Energy proposed price is \$199.17/MWH, not the \$263/MWH price used by the Commission.

Significantly, BPU consultants Boston Pacific have already acknowledged that when evaluated at the proposed price of \$199.17, the project meets the net benefits test established by statute, "With documented economic benefits and a lower OREC price, even if FACW's claimed benefits for tourism, environmental impacts, merit order effect, and lessons learned are excluded, the Project provides net benefits of \$33.4 million (net present value); The Project then meets the requirement to demonstrate net benefits to the State as required under the Act."

For more information, visit www.fishermensenergy.com.

Hexicon raises 11.4MSEK to secure development of first reference plant

Swedish offshore wind energy developer Hexicon has attracted 11.4 MSEK (1.24 MEUR) in the form of a rights issue to existing owners. Hexicon develops floating platforms for offshore wind energy.

Hexicon, which recently announced

an agreement with steel maker giant SSAB to develop offshore wind power platforms at deep waters, wants to accelerate the implementation of the new strategy and demonstrate its innovation by building their first reference power plant in the Baltic Sea.

"This new capital will enable us to intensify our design work and the formation of a Swedish consortium that will build our first platform," said Henrik Baltscheffsky, CEO of Hexicon.

Hexicon's innovative and patented floating platforms are fitted with several wind turbines. The platform turns automatically into the wind while harnessing excellent conditions far offshore for the generation of renewable energy. The Hexicon platform is based on scale of economy and profitable energy production. The technology enables efficient wind park configuration in locations where winds are stronger and more stable, and where the visual and environmental impact is minimal.

For more information, visit www.hexicon.eu.

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U.S. Navy announces next generation fathometer selection
Knudsen Systems Inc. (KSI), has been awarded an \$8.1 M contract by the Naval Undersea Warfare Center (NUWC), Division Keyport, to supply the "next generation fathometer" for the U.S. Navy. KSI distributes sonar products produced by the Canadian manufacturer, Knudsen Engineering Ltd. to U.S. domestic customers, in particular U.S. federal & state agencies. Under the IDIQ contract, deliverables will include 320N Navigation Echosounders, EchoSim sonar simulators, and remote displays. The 320N Echosounder was initially designed as a drop-in COTS replacement for the aging UQN-4 fathometer to meet retrofit requirements of several U.S. and foreign Navy surface ship classes. However, the 320N has also recently been chosen for several new ship builds including the Zumwalt class destroyers, and new Arleigh Burke class guided missile destroyer. KSI also provides high performance digital products that are designed for marine applications and address a wide range of applications including oceanographic research, ship navigation, subbottom profiling, hydrographic survey, and dredging. Knudsen products have been used by research institutions, port authorities, navies, and hydrographic agencies as well as civil engineering, dredging, and survey companies worldwide for over 30 years.

Navy christens submarine John Warner

Pre-Commissioning Unit (PCU) John Warner (SSN 785), the first of the Virginia-class attack submarines to be homeported in Naval Station Norfolk, was christened at Newport News Shipbuilding, Newport News, Virginia, on September 6. John Warner is the 12th Virginia-class submarine to be built. It is named after John Warner, the five-term U.S. Senator from Virginia who also served as Secretary of the Navy from 1972 to 1974. His wife Jeanne is the ship's sponsor. Virginia-class submarines are built to dominate the world's littoral and deep waters while conducting anti-submarine warfare; anti-surface ship warfare; strike warfare; special operation forces support; intelligence, surveillance, and reconnaissance; irregular warfare; and mine warfare missions. Stealth and speed are standard in submarines, but this next generation of attack submarines offers an improved level of capabilities to maintain the nation's undersea supremacy well into the 21st century. The Virginia-class submarines are poised to meet the Navy's multi-mission requirements from open ocean anti-submarine warfare to intelligence, surveillance and reconnaissance to projecting power ashore with Special Operation Forces and Tomahawk cruise missiles in the prevention or preparation of regional crises. John Warner will fall in with the 64 ships, 187 aircraft, 18 aircraft squadrons, and 326 tenant commands that are homeported or headquartered in Norfolk.

Raytheon awarded \$59M for MK54 mod kits

Raytheon Integrated Defense Systems, Portsmouth, Rhode Island, is being awarded a \$59,159,691 modification to a previously awarded contract (N00024-11-C-6410) to exercise an option for the production of MK54 Mod 0 Lightweight Torpedo (LWT) Kits, and related engineering and repair services for upgrade of U.S. Navy LWT. Although the MK54 Mod 0 LWT is primarily intended as an anti-submarine torpedo for littoral scenarios, its basic capabilities includes operation in both shallow and deep water acoustic environmental conditions, and exceeds MK46 anti-submarine warfare capabilities in deep-water scenarios. This modification involves purchases for the U.S. Navy and the governments of India, Turkey and Australia under the Foreign Military Sales program.

Phoenix awarded \$14M for SRDRS

Phoenix International Holdings Inc., Largo, Maryland, is being awarded a \$14,840,283, cost-plus-fixed-fee contract for Submarine Rescue Diving and Recompression System (SRDRS) operation and maintenance services. The contractor will provide appropriate and sufficient personnel and services necessary to mobilize and operate the submarine rescue systems that support the response requirements. The contractor is responsible to ensure the rescue systems are maintained in a high state of readiness to support a rapid worldwide deployment on a 24-hours-a-day/seven-days-a-week basis. This contract includes options which, if exercised, would bring the cumulative value of this contract to \$80,998,107. Work will be performed in San Diego, California, and is expected to be completed by August 2015.

USS Theodore Roosevelt conducts combined manned, unmanned operations



The Navy's unmanned X-47B returned to carrier operations aboard USS Theodore Roosevelt (CVN 71) August 17 and completed a series of tests, operating safely and seamlessly with manned aircraft.

Building on lessons learned from its first test period aboard TR in November 2013, the X-47B team is now focused on perfecting deck operations and performing maneuvers with manned aircraft in the flight pattern.

The first series of manned/unmanned operations began when the ship launched an F/A-18 and an X-47B. After an 8-minute flight, the X-47B executed an arrested landing, folded its wings and taxied out of the landing area. The deck-based operator used newly developed deck handling control to manually move the aircraft out of the way of other aircraft, allowing the F/A-18 to touch down close behind the X-47B's recovery.

This cooperative launch and recovery sequence will be repeated multiple times over the course of the planned test periods. The X-47B performed multiple arrested landings, catapults, flight deck taxiing and deck refueling operations.

"For this test period, we really focused on integration with manned aircraft," said Lt. Cmdr Brian Hall, X-47B flight test director. "We re-engineered the tailhook retract actuator and updated operating software to expedite wingfold during taxi, both of which reduce time in the landing area post-recovery. Our goal was to minimize the time in the landing area and improve the flow with manned aircraft in the landing pattern."

"The X-47B's air vehicle performance, testing efficiency and safety technologies and procedures developed and tested throughout the program's execution have paved the way for the Navy's future carrier-based unmanned system capability," said Rear Adm. Mat Winter, who oversees the Program Executive Office for Unmanned Aviation and Strike Weapons.

The X-47B will remain aboard CVN 71 for the duration of the underway period. It will perform additional cooperative deck and flight operations with F/A-18s and complete night deck handling and flying quality evaluations.

The Navy will continue X-47B flight operations over the next year to refine the concept of operations to demonstrate the integration of unmanned carrier-based aircraft within the carrier environment and mature technologies for the future Unmanned Carrier Launched Airborne Surveillance and Strike system.

NATO ships take part in multi-national exercise in Black Sea

Three NATO ships took part in the multinational "Sea Breeze 2014" military exercise, which started on 8 September 2014 in the Black Sea. The deployment is a demonstration of NATO's commitment to strengthen its ability to work with partner navies.

The event will test maritime interdiction operations, communications, search and rescue, force protection and navigation. The United States and Ukraine are organizing this annual exercise which ran from 8-10 September. This year's participants include Ukraine, Georgia, Romania, Turkey, and the United States. NATO is represented by the Canadian frigate HMCS Toronto, the Spanish frigate ESPS Almirante Juan de Borbon and the Romanian frigate ROS Regele Ferdinand. The three ships are currently tasked to the Alliance's Standing NATO Maritime Group Two – (SNMG2). The group is part of NATO's four Standing Maritime Forces.

In response to Russia's actions in Ukraine, NATO has reinforced collective defense measures by increasing its air patrols over the Baltic countries and increased naval patrols in the Baltic Sea and the eastern Mediterranean. The NATO Summit in Wales on 4-5 September agreed to form a new high readiness force and to further step up exercises to enhance the collective defense of Allies.

For more information, visit www.nato.int.

Stealth corvette commissioned into Indian Navy

Breaking new grounds in the making of warships in the country, India commissioned the first indigenously built stealth Anti-Submarine Warfare Corvette, INS Kamorta, on August 23. The Defence Minister Shri Arun Jaitley who commissioned the warship, described the development as, "The coming of age of our ship building industry."

The commissioning of INS Kamorta has added a new dimension to the ASW capability of the Indian Navy and in particular, the Eastern Fleet. The multifarious missions that can be undertaken by the ship truly reflect the enhanced multi-dimensional capability of the Indian Navy.

INS Kamorta is first of the four ASW Stealth Corvettes designed by the Navy's in-house organization, the



Directorate of Naval Design (DND), under Project 28, with an indigenous component of about 90%. Measuring 110 m in length, 14 m in breadth and displacing 3500 tons, the ship can achieve speed of 25 kts. The ship is fitted with anti-submarine rockets and torpedoes, medium and close-in weapon systems and indigenous surveillance radar Revathi. The ship is also capable of carrying an integral ASW helicopter.

Enhanced stealth features have been achieved by 'X' form of hull, full beam superstructure, inclined ship sides and use of infrared signature suppression system for cooling the engine and generator exhausts. The ship has a combination of diesel and diesel' propulsion system with two diesel engines along with one gear box on each shaft. The common raft-mounted gear box and diesel engines give the vessel very low radiated underwater noise. This is well complemented with an efficient propeller which has high cavitation inception speed. The design also incorporates active shaft grounding system and multi zone Impressed Current cathodic protection for suppression of extremely low frequency electromagnetic signature. The very low under water acoustic signature makes it a "silent killer on the prowl."

INS Kamorta has a multitude of systems such as total atmospheric control, integrated platform management, integrated bridge, battle damage control and personnel locator system. This provides a contemporary and process oriented System of Systems for optimal functioning of the warship.

With her state-of-the-art weapons and sensors, INS Kamorta is well equipped to fight in nuclear, biological and chemical warfare conditions. The ship, in essence, showcases the nation's warship design capability and industrial prowess.

The ship has a complement of about 15 officers and 180 sailors. The accommodation and living spaces have been designed with special emphasis on ergonomics and habitability.

For more information, visit www.indiannavy.nic.in.

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First Block III Virginia Class submarine delivered

The Navy accepted delivery of PCU North Dakota (SSN 784), the 11th ship of the Virginia Class, on August 29, 2 days prior to its contract delivery date.

North Dakota is the first of eight Virginia Class Block III ships. Approximately 20% of North Dakota was redesigned as part of the Virginia cost reduction work done to lower acquisition cost and increase operational flexibility. The changes include a ship's bow redesign, replacing 12 individual launch tubes with two large-diameter Virginia Payload Tubes, each capable of launching six Tomahawk cruise missiles.

Only 6 days ago North Dakota successfully completed Alpha, Bravo, and Board of Inspection and Survey (INSURV) trials, which evaluate the submarine's seaworthiness and operational capabilities. During the trials, the crew took the submarine to test depth, conducted an emergency surfacing, and tested the submarine's propulsion plant.

The Navy postponed North Dakota's original May commissioning date because of quality issues with vendor-



assembled and delivered components that required an unplanned dry-docking to correct. Additional design certification work was also required on the submarine's redesigned bow.

North Dakota will spend the next 2 months preparing for its October 25 commissioning in Groton, Connecticut.

For more information, visit www.navy.mil.

Regional navies ready to play at Kakadu 2014

Planning is nearly complete for the Royal Australian Navy's biggest warfare exercise, Kakadu 2014, which will play out off the coast of Darwin from 25 August to 12 September.

Around 1,200 people, eight warships and 26 Navy and Air Force aircraft from throughout the Asia Pacific and Indian Ocean regions will attend the premier naval exercise.

Personnel from Bangladesh,

Cambodia, China, Japan, Malaysia, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Thailand, Timor Leste and Vanuatu will also have key roles, either working in one of the two Kakadu Task Groups or as part of the "observer-at-sea" program.

Cultural highlights for the coalition participants will include a visit to the Darwin Military Museum and a local wildlife park, a huge inter-nation sports day, ship tours and special opening and closing ceremonies.

Showcasing the Royal Australian Navy will be HMA Ships Sydney, Stuart, Newcastle and Arunta along with S-70-B2 Seahawk, Bell 429 and MRH-90 Taipan helicopters.

The Royal Australian Air Force will be proudly represented by four 127 Hawks, four F/A 18 Super Hornets, one E-7A Wedgetail, one AP-3C Orion aircraft, one LR35 Learjet and four GAT36 Learjets.

KAKADU is a biennial exercise, now in its 23rd iteration.

For more information, visit www.navy.gov.au.

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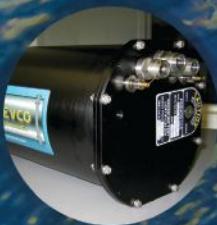
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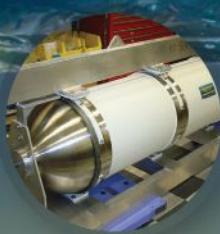


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OFFSHORE INDUSTRY

Go big on offshore drilling, industry groups tell Obama administration

The oil and gas industry and its allies are pushing the Obama administration to consider offshore drilling everywhere it can grant permits, including the east and west coasts of Alaska.

Offshore producers believe safety precautions have improved dramatically since the 2010 Deepwater Horizon oil spill, and argue no areas should be ruled out as the Interior Department considers offshore drilling sites through 2022.

"Decisions on areas to include in the 2017-2022 leasing program will have impacts well into the future," a coalition of 11 industry groups wrote in comments filed to Interior. "Therefore, we believe that BOEM (Bureau of Ocean Energy Management) should fully consider all areas for inclusion in the program and keep as many areas as feasible in the draft proposed program."

The coalition, which includes the American Petroleum Institute, America's Natural Gas Alliance and the U.S. Oil & Gas Association, said drillers have made great strides since the 2010 disaster at BP's Macondo well.

"Immediately after the Macondo incident, the U.S. oil and natural gas industry launched a comprehensive review of offshore safety measures and operations to identify potential improvements in spill prevention, intervention, and response capabilities," they said.

Interior's BOEM, created in the wake of the Deepwater disaster, now allows drilling only in the western two-thirds of the Gulf of Mexico, Alaska's Cook Inlet and a few spots off California's shore. The agency has not banned drilling in the Arctic Ocean, though BOEM is holding off on permits while it considers new rules for operations there.

Surging U.S. oil production sends ripples through crude oil market

Surging U.S. oil production is sending ripples through the crude oil market—in prices, trade flows and the downstream—the International Energy Agency's (IEA) a top oil official recently said on Platts Energy Week.

U.S. production is expected to reach 8.5 mmbbl per day this year and 9.3 mmbbl per day in 2015, almost double 2008's output of 5 mmbbl per day, said Antoine Halff, the head of the IEA's oil

industry and markets division.

"On prices, the surge in production has really offset the production (loss) we've experienced in places like Libya, Iran, and so on," he said. "So that's why prices have not risen more than they have. They've been fairly stable, remarkably stable, given all the turmoil in the Middle East and elsewhere."

Crude oil that had been imported into the U.S. can now be imported by other countries, Halff said.

Antoine Halff "There's been a tremendous remapping of the oil trade flows, if you like," he said. "And now Asia is supposed to really become the magnet for global crude traded internationally. That's a big change. China is now importing more crude than the U.S., for instance."

Wood Mackenzie: Norway sitting on large undeveloped resources

Wood Mackenzie says Norway has 10 Bboe of discovered natural resources that have yet to be developed. It believes more than 60% could be commercialized, potentially adding \$106 billion to the country's oil and gas industry revenues.

The resources are spread across 206 discoveries, ranging in size from less than 1 mmboe to the 2.4-Bboe Johan Sverdrup field. Half are in the North Sea with the remainder divided between the Norwegian Sea and the Barents Sea.

"We consider 4.8 Bboe likely to be economic, with 1.6 Bboe potentially economic, and the remaining 3.6 Bboe not commercial..." said James Webb, Northwest Europe upstream analyst for Wood Mackenzie.

However, the industry will need to address certain issues to maximize value from these projects, he cautioned. Low reserves, lack of infrastructure, and/or complex geology are just some examples of the technical obstacles faced.

Webb added, "Over the last 5 years the average size of new (Norwegian) discoveries has been greater than the average undeveloped field and therefore new fields have been prioritized. In keeping with the capital discipline theme, complex developments...are also being delayed in favor of more straightforward projects."

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DNV GL launches industry program to improve sea spray icing models

Sea spray icing is one of the major challenges when operating in Arctic conditions. So DNV GL is launching an industry collaboration that will develop a simulation model that bridges functional winterization requirements and real physical conditions for drilling rigs, production platforms and vessels. Moreover, experts from both the maritime and oil and gas industries are invited to join the new joint-industry project (JIP) named RigSpray.

"We aim to ensure that the design of icing-mitigation measures delivers both safety and cost benefits," said Per Olav Moslet, DNV GL Arctic technology program director.

Today, the operational capabilities of conventional vessels and offshore structures do not meet the requirements for operating in harsh Arctic conditions. The trend towards increased



activity in the Arctic and especially the ice-free areas means that the issue of sea spray icing needs to be addressed.

"Sea spray icing poses a threat on multiple levels, from blocking the operation of essential components to jeopardizing stability and integrity and thus leading to an increased risk of capsizing," Moslet added. "We aim to ensure that the design of icing-mitigation measures delivers both safety and cost benefits."

The present model still lacks an accurate representation of sea spray, which is a significant parameter for ice formation, DNV GL said, adding that the first step is to develop a software tool to further understand sea spray icing using mathematical modeling and measurements. "We certainly need to fill this gap with more experimental and modeling studies," said Olga Shipilova, RigSpray project manager.

OFFSHORE INDUSTRY HEADLINES

Research & Development • Environmental Assessment • Discovery

Most majors keep investments in lower risk countries, report says

Major oil and gas companies have continued to base the majority of their production in low-risk countries, with a handful of exceptions, according to a new analysis.

The report, by international energy analyst Evaluate Energy, combined various measures of risk published by groups such as Fitch, Institutional Investor and the Organization for Economic Co-operation and Development into one figure. The group then weighed those figures with a company's oil and gas production in both 2000 and 2013 to roughly determine a risk profile for a few major companies.

The results placed most companies in a relatively low-risk range. ExxonMobil Corp., Devon Energy Corp., Anadarko Petroleum Corp., and ConocoPhillips Co. were among the least risky companies, the report concluded.

ExxonMobil has about 86% of its oil and gas production in what rating agencies consider less risky OECD countries, according to the analysis.

The companies that had more production in riskier areas were led by Italy's Eni S.p.A. Eni has added risk since 2000 by expanding production in politically tumultuous nations including Libya, Algeria, Angola, and Nigeria while the company's lower-risk production in Europe has declined, according to the report.

France's Total S.A.'s holdings were deemed the second-riskiest by Evaluate Energy's measure. The company has also seen declining European production and has moved to replenish holdings with more risky African investments, according to the analysis.

Also notable on the list were BP and Apache Corp., both of which Evaluate Energy deemed slightly riskier in 2013 than in 2000, though they remain on the list of companies deemed less risky.

BP's risk has increased as it has boosted production in Azerbaijan and Trinidad and Tobago, and Apache's risk profile increased due to increased production in Egypt, according to the analysis.

Western Gulf of Mexico lease sale attracts \$110M in apparent high bids

Western Gulf of Mexico Lease Sale 238 drew 93 bids from 14 companies over 81 blocks covering 433,823 acres, totaling \$109,951,644 in apparent high bids, reported the U.S. Bureau of Ocean Energy Management (BOEM), which held the event on August 20 in New Orleans, Louisiana.

Most bids came from BP Exploration & Production Inc., which was the apparent high bidder on 27 of 32 bids it sub-

mitted, totaling \$22,837,729.

Although the total bids were more than the 61 received in last year's Western Gulf lease sale, the total value in apparent high bids was just modestly higher than last year's \$102,351,712 received from 12 companies.

Notably, 24 bids were received for the 167 blocks offered on or partially within 3 statute miles of the maritime and continental shelf boundary with Mexico. Leases for the blocks are subject to the terms of the U.S.-Mexico Transboundary Hydrocarbon Reservoirs Agreement.

Lease Sale 238 made available 21.6 million acres for oil and gas exploration and development offshore Texas, encom-



passing 4,026 blocks that lie 9 to 250 mi from the coast in 16 to 10,975 ft of water. BOEM estimates the sale could result in the production of 116 to 200 mmbbl of oil and 538 to 938 bcf of natural gas.

Following BP was Australia's BHP Billiton Petroleum Inc. with 14 bids comprising \$21,887,500. ConocoPhillips placed 10 bids comprising \$23,423,000, including the highest single bid of \$16,788,800 on Alaminos Canyon Block 431.

Chevron Corp. submitted just five bids but tallied the highest sum of high bids, totaling \$25,796,605. Bids it submitted on Alaminos Canyon blocks 215, 258, and 216 represented three of the five single highest bids at \$8,539,321, \$7,439,321, and \$5,739,321, respectively.

Royal Dutch Shell unit Shell Offshore Inc. was the apparent high bidder at \$1.75 million on Alaminos Canyon Block 902, the only block on which the company bid, beating out Stone Energy Corp.'s \$1.06 million bid. BOEM noted that each bid will go through a strict evaluation process within the agency to ensure the public receives fair market value before a lease is awarded. Sale 238 is the sixth offshore sale under the Administration's Outer Continental Shelf Oil and Gas Leasing Program for 2012-17.

"Today's sale is a typical western Gulf sale, and while it included some healthy bidding, it was not expected to fetch the eye popping bids that typically accompany a central Gulf sale," said Randall Luthi, president of the National Ocean Industries Association (NOIA).

Feds boosting oil spill liability limits to keep up with inflation

The Coast Guard has moved to boost the liability limits capping how much companies must pay for oil spills that foul U.S. waters. The administrative move, which would mean a 15.6% increase in the cap for onshore facilities, to \$404.6 million, is designed to ensure that the liability limits keep up with inflation.

The Oil Pollution Act that established companies' liability for oil spills and set the legal framework for cleaning up the accidents also authorized the federal government to adjust the limits as frequently as every 3 years.

The liability caps in the law place a ceiling on the amount companies must pay in economic damages in cases of accidental spills — those where there is no finding of gross negligence, willful misconduct or other violations. Regardless of the liability caps on economic damages, companies must pay the entire cost of cleaning up spills.

The adjustment comes after a series of spills offshore and pipeline accidents onshore, including the Deepwater Horizon disaster in 2010, the collision of vessels in the Houston Ship Channel this past March and the Enbridge Pipeline spill into the Kalamazoo River in 2010.

The proposed limits would apply for spills from deepwater ports, offshore vessels and onshore facilities. Historically, most vessel-related spills have stayed within the existing liability limits. According to Coast Guard data, 62 vessel incidents exceeded the cap from 1991 through 2012 — an average of about three per year.

U.S. boosts 2015 daily oil forecast as shale powers push to 10 mmbbl

The U.S. government recently jacked up its forecast for oil production next year by 250,000 bbl per day as the boom in shale oil drilling continues to confound expectations of slower growth.

The U.S. Energy Information Administration now expects domestic output to rise to 9.53 mmbbl per day, growing by around 1 mmbbl per day for a third consecutive year, according to its latest monthly short-term energy outlook. EIA had predicted output growth would slow in 2015 to 800,000 bbl per day.

The U.S. shale boom has allowed producers to unlock thousands of barrels of reserves, putting the United States on course to become the largest producer of oil globally, which would dramatically reduce its dependence on imports. The EIA also raised forecasts for 2014 U.S. output to 8.53 mmbbl per day from the previous estimate of 8.46 mmbbl per day.

Ruling on Gulf spill could mean billions more in penalties for BP

BP plc acted with gross negligence in setting off the biggest offshore oil spill in U.S. history, a federal judge ruled, handing down a long-awaited decision that may force the energy company to pay billions of dollars more for the 2010 Gulf of Mexico disaster. BP said in a statement that it strongly disagrees with the ruling and will appeal to a higher court.

"The law is clear that proving gross negligence is a very high bar that was not met in this case. BP believes that an impartial view of the record does not support the erroneous conclusion reached by the District Court," the company said.

U.S. District Judge Carl Barbier held a trial without a jury over who was at fault for the catastrophe, which killed 11 people and spewed oil for almost 3 months into waters that touch the shores of five states.

"BP has long maintained that it was merely negligent," said David Uhlmann, former head of the Justice Department's environmental crimes division. He said Barbier "soundly rejected" BP's arguments that others were equally responsible, holding "that its employees took risks that led to the largest environmental disaster in U.S. history."

The case also included Transocean Ltd. and Halliburton Co., though the judge didn't find them as responsible for the spill as BP. Barbier wrote in his decision in New Orleans federal court that BP was "reckless," while Transocean and Halliburton were negligent. He apportioned fault at 67% for BP, 30% for Transocean and 3% for Halliburton.

The court is yet to give its ruling on the number of barrels spilled and no penalty is finalized at this time. The district court will hold additional proceedings, which are expected to start in January 2015, to consider the application of statutory penalty factors in determining a per-barrel Clean Water Act penalty.

Under the U.S. Clean Water Act, BP is liable to pay \$1,100 per bbl of oil for simple negligence and \$4,300 per bbl for gross negligence.

Halliburton to pay \$1.1B to settle lawsuits over Macondo oil spill

Halliburton Co. has agreed to pay \$1.1 billion to settle a majority of lawsuits brought over its role in the Gulf of Mexico Deepwater Horizon disaster. The agreement is subject to court approval and includes legal fees, the Houston-based company said in a statement.

Halliburton was accused by oil spill victims and BP of doing defective cementing work on the Macondo well

ASCO opens its new \$110M Australian Marine Supply Base



ASCO's supply base to support Australia's growth as an international hub.

International oilfield support services company ASCO has opened its new Marine Supply Base in Darwin, Australia. The official opening was attended by the chief minister of the Northern Territory, the Hon. Adam Giles at a recent ceremony on site.

The \$110 million purpose-built supply base will support Northern Australia's growth as an international hub for the oil and gas industry. Funded by the Northern Territory government, ASCO has managed both the design and construction of the base, and has a 20-year contract with the Territory Government to manage its operations.

ASCO made its first entry into the Australian market in 2010 with the purchase of Darwin company Shorebase, which had an established logistics center at East Arm close to the new supply base. In 2012, ASCO acquired Brisbane-based inventory and asset management specialists Oniqua, and in May this year took a majority stake in Bonnie Rock Transport, one of Australia's leading providers of remote area transport and logistics to the oil and gas industry.

"Australia is an important building block for us as we build our global operations through our four key regions—Europe, Americas, Middle East and Africa and Australasia," ASCO Group chief executive Derek Smith said. "ASCO can now support its customers through the entire supply chain cycle, and we are well placed to service the future expansion of this industry over the coming years."

According to the Australian Bureau of Resources and Energy Economics (BREE), investment in LNG gas and oil projects continues to be the main driver of resources and energy investment in Australia. BREE states that 14 LNG, gas and oil projects at the committed stage have a combined value of \$197 billion, or 86% of committed investment in the Australian resources sector. Publicly announced petroleum projects have a combined capital expenditure of \$28 to \$30 billion.

"This is a tremendously exciting time for us. Already a number of international oil and gas companies including ConocoPhillips, Eni, INPEX and Shell will be supporting their operations from Darwin and the supply base will be a critical link in their supply chain operations," ASCO chief executive in Australia Matt Thomas said.

before the April 2010 Gulf of Mexico spill. Halliburton blamed the incident on decisions by BP, which owned the well.

The settlement come as the judge overseeing oil-spill cases weighed fault for the disaster. An agreement now averts the company's risk of a more costly judgment for some spill victims and removes much of the uncertainty that has plagued Halliburton for the past 4 years as investors waited to see the payout tally.

However, the agreement doesn't resolve certain state lawsuits that have been filed against Halliburton. The accident sparked hundreds of lawsuits against BP, Halliburton and Vernier, Switzerland-based Transocean Ltd., the rig's owner. Transocean settled some claims for \$1.4 billion last year, while BP thus far has paid more than \$28 billion and faces potentially billions more, and recently was found to be grossly negligent.

Kongsberg to support Statoil's Johan Castberg project
 Kongsberg Oil & Gas Technologies has secured a contract to carry out an extended concept study and pre-front end engineering design (FEED) for Statoil's Johan Castberg project in the Barents Sea. The project will include the development of the Skrugard, Havis and Drivis oil fields in production license 532, around 230 km northwest of North Cape, with water depths ranging between 360 m and 405 m. The contract continues the concept design work Kongsberg completed in June. Under the extension, Kongsberg will deliver integrated engineering services required for the conceptual design and pre-FEED design of the in-field flowline systems and riser system. The work is expected to be completed in June 2015.

2H to engineer risers for Total's Kaombo Block 32 project

Heerema Marine Contractors has named 2H Offshore to engineer the hybrid risers for Total's Kaombo Block 32 project offshore Angola. HMC and Technip are the EPCI and pre-commissioning for SURF contract holders. 2H will handle detailed engineering of the 18 single top tensioner risers (STTRs) for Kaombo, and is responsible for the engineering of the buoyancy tank, upper riser assembly, and lower riser assembly packages together with global analysis and systems engineering of the risers. Kaombo, in water depths from 4,674 ft to 6,314 ft, will include the Gindungo, Gengibre, Canela, Louro, Mostarda west, and Caril fields tied back to two turret-moored FPSOs. The selected concept consists of a number of production loops with one insulated production riser and one non-insulated service riser per field. Water injection risers will also be required.

Aker Solutions awards DNV GL global frame agreement

Aker Solutions has awarded DNV GL a global frame agreement to pave the way for better technology collaboration, more efficient project execution and considerable cost savings. The frame agreement covers the following Aker Solutions business segments: subsea, umbilicals, engineering and maintenance, and modifications and operations (MMO). The agreement will cover services and cooperation in all the important oil and gas regions (Norway, UK, United States, Brazil and Malaysia) and can be extended to other countries and regions as required. The agreement provides mechanisms for specific joint activities, such as cooperation in front-end engineering and design (FEED) phases and integrated engineering teams. A web-portal will also be set up to allow for exchange of technical and commercial information.

Statoil awards completions framework contract to Omega

Norway's Statoil has awarded a completions framework contract to UK-based Omega Completion Technology. Under the terms of the contract, Omega will deliver its remotely activated completion technology (ReACT) to all of Statoil's 35 assets in the Norwegian continental shelf. Omega supplied the initial ReACT completion solution to Statoil a decade ago and has provided completion equipment for over 30 wells. The initial contract period is for about 2 years with an option to expand for a further 6 years. Omega said the ReACT signaling method offers a means to remotely activate downhole completion equipment without the requirement for costly and complex intervention operations. The technology provides both primary and back-up remote actuation functionality with a mechanical contingency option. Omega Completion Technology general manager Fredrik Harestad said: "This is a great milestone for Omega in Norway and very well timed, as confirmation was received on the first anniversary of the business operations in Norway."

Apache turns up largest discovery in decades off Western Australia coast

U.S. oil producer Apache Corp. has made the largest discovery in 20 years off the coast of Western Australia, the company said, adding that the Canning Basin may hold as many as 300 mmbbl of oil, according to six samples from a well about 110 mi north of Port Hedland.

"The oil and reservoir quality we have seen point to a commercial discovery," said Thomas E. Voytovich, Apache executive vice president and chief operating officer for its international business.

"If these results are borne out by further appraisal drilling, Phoenix South may represent a new oil province for Australia."

The Phoenix South-1 well, situated in 435 ft of water, is located in permit WA-435-P. Apache has a 40% interest and operatorship of WA-435-P and the adjacent permit WA-437-P, while co-venturers

Carnarvon Petroleum, Finder Exploration and JX Nippon each hold a 20% stake. Apache also has exercised its option to acquire 40% interest and operatorship of two additional adjacent permits (WA-436-P and WA-438-P) for a total position of more than 5 million acres.

"This is the most significant new oil play in the North West Shelf since the Enfield discovery opened up the Exmouth Basin almost 20 years ago," Carnarvon Managing Director Adrian Cook said. "The implications on the rest of our acreage are still being assessed, but the potential is extraordinary."

Wireline and formation pressure tools have confirmed at least four discrete oil columns ranging in thickness between 151 ft in the Triassic Lower Keraudren formation, within an overall, sand-rich section between 13,648 ft and 14,763 ft below sea level. Six light oil samples have been recovered from three intervals to date.

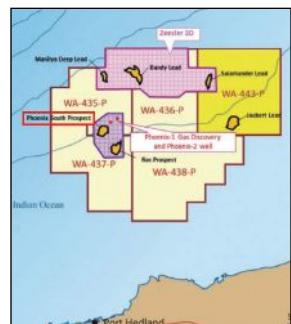
The new discovery may give a much needed boost to Australian oil production. According to British Petroleum (BP), oil production in Australia fell by 17% last year due to depleted reserves.

Apache will have to complete more appraisal drilling to determine the amount of oil that can be recovered. Evaluation of the formation penetrated in the Phoenix South-1 is under way, and final calculation of hydrocarbon pay will depend on additional analysis. Apache and its partners plan to release the information by the end of 2014.

After the discovery, Apache committed to drilling a second well in a neighboring permit. It will target a larger prospect named "Roc." Apache believes that it could also contain lots of oil. The drilling is scheduled to take place in 2015.



Atwood Eagle drills Phoenix South-1.



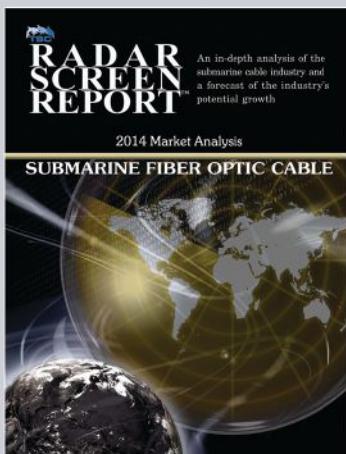
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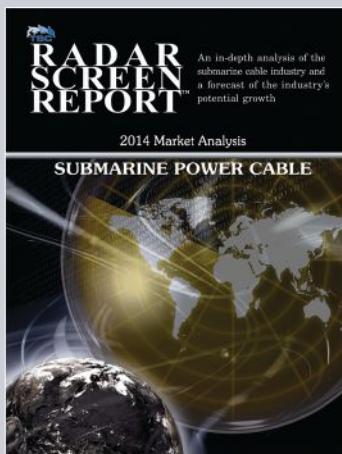
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World's largest turret sets sail.

Shell's 4,300-ton Prelude turret sails from Dubai to South Korea

The largest piece of the turret for Shell's Prelude floating liquefied natural gas facility has set sail from Dubai for the Samsung Heavy Industries shipyard in Geoje, South Korea, where the FLNG is under construction. The 4,300-ton piece was loaded on an ocean-going barge, the Korea Express.

The turret was designed by SBM Offshore in Monaco and built in Dubai by Dubai DryDocks World. At almost 100 m high, it is the largest turret in the world. It is part of a mooring system and will run through the front of the facility and connect to giant chains that will keep it moored securely over the Prelude gas field, Shell said in a statement.

Once complete, Prelude FLNG will operate in a remote basin about 200 km off Australia's northwest coast. It will produce about 3.6 mm tons of LNG a year, which will be pumped directly into ships for delivery around the world.

Bumi Armada to supply FPSO for Eni's offshore Angola project

Bumi Armada has secured a contract to supply a floating production, storage and offloading (FPSO) vessel for Eni's East Hub project at Block 15/06 offshore Angola. Bumi will provide the floater under a 12-year charter, operations and maintenance contract worth about \$3 billion. It has a further aggregate contract value of \$900 million if Eni Angola exercises all the extension options.

Bumi Armada will utilize a very large crude carrier (VLCC) class tanker for the FPSO conversion. The FPSO, which is

expected to start operations in the fourth quarter of 2016, will be equipped to store 1.8 mmbbl of oil, with the capacity to handle 80,000 bbl per day of oil production.

"The contract for the Block 15/06 field marks Bumi Armada's largest FPSO contract to date, in both contract value as well as the VLCC vessel, which we will be using for the conversion, and clearly marks our entrance into the top tier of global FPSO players," Bumi Armada chief executive Hassan Basma said.

The FPSO is expected to be delivered on time and on budget in the fourth quarter of 2016, the company said.

WJM introduces modular offshore drilling rig design called 'MORF'

William Jacob Management Inc. (WJM) has introduced a new modular offshore drilling rig design that it says reduces deployment costs and improves speed-to-market for upstream operations. The Modular Offshore Rig Facility (MORF) is a copyrighted design for a 3,000-horse power modular drilling facility. It is the first of its kind in size and configuration; it is also a first for use in the Gulf of Mexico, WJM said.

Developed for a national oil company with a major presence in the Gulf of Mexico, the design was driven by the client's demand for improved cost performance across its offshore operations.

"Our team of design engineers deliberately downsized the individual modules so they could function like a set of interlocking building blocks and be lifted in-place by 'leapfrog' cranes," said Trevor Smith, WJM's vice president of drilling facilities engineering. "This solution enables the modular rig to be configured for drilling and integrated production below, while providing significant cost savings in deployment."

The rig has two main modules: the drilling equipment set (DES) and the drilling support module (DSM).

The DES has the capacity to access 15 wells arranged in a 3 by 5 matrix and is capable of drilling wells up to 25,000 ft. The DSM is equipped with a pair of rig cranes that streamline installation. The modules can be delivered using the client's service fleet, and then assembled using a combination of crane systems.

The blocks containing the cranes are

installed using the temporary leapfrog crane package. Once the rig cranes are operational, the installation is then completed using the rig's own cranes. This strategy eliminates the need to contract a lift barge, the company said.

Keppel delivers fourth jack-up rig Dukhan to GDI of Qatar

Keppel FELS Ltd. has delivered its fourth jack-up rig, Dukhan, to Gulf Drilling International Ltd. (GDI) of Qatar 9 days ahead of schedule. Dukhan is a high-specification rig built to Keppel's proprietary KFELS B Class design. Keppel FELS has previously delivered three similar jack-up rigs to GDI-Al Khor, Al Zubarah, and Les-hat.



Kukhan is a KFELS B Class design.

Customized for GDI with features that enable it to work anywhere in Qatar, Dukhan will be chartered to Qatar Petroleum for 5 years. The KFELS B Class is equipped with larger spud cans for reduced bearing pressure, which expands its operational coverage, especially in seabeds where soft soil is predominant.

The rig includes a 15,000-psi choke system for well control and can drill wells through 30,000 ft with a cantilever that can skid out 75 ft from the edge of the hull to drill wells. It also features an offline stand building and 7,500-psi mud pumps.

Besides the four jack-up rigs Keppel has built for GDI, N-KOM, its joint venture shipyard with Qatar Gas Transport Co., is constructing a self-propelled and self-elevating liftboat customized for GDI. N-KOM has also been awarded a 6-year repair and maintenance contract for GDI's fleet of jack-up rigs operating in the Middle East.



New MORF rig design.

Honghua Group gets \$320M rig contract from Orion

Honghua Offshore Oil & Gas Equipment (Jiangsu) Co., Ltd., an indirect wholly-owned subsidiary of Honghua Group Ltd., has entered into a Letter of Award with Orion Engineering and Management Ltd. to construct one European-designed semi-submersible drilling rig. It is subsequent to a shipbuilding agreement worth over \$200 million with UDIN Engineering Co., Ltd., a Korean offshore engineering company.

According to the terms and provisions of the LOA, Orion plans to purchase the rig for about \$320 million excluding owner-furnished equipment, representing 24.5% of the company's total revenue as of year-end 2013.

According to the LOA, the sales and purchase agreement was expected to be executed within 60 days. At the same time, Orion has the option to purchase an additional three rigs from Honghua Offshore under the same conditions each respectively at an interval of 6-months. The rig and option units under the LOA will be equipped with the company's in-house design and manufacture drilling package.

Meanwhile, Orion will contract a subsidiary of Opus Offshore Ltd. to supervise the construction of the rig according to the latest regulations and highest quality standards in place within the international offshore exploration and production sector, enabling the company to become a world-class supplier in the global offshore drilling market.

Hallin completes COOEC's mooring lines replacement

Hallin Marine has completed the replacement of nine mooring lines for a subsidiary of China Offshore Oil Engineering Co. COOEC Subsea Technology contracted Hallin Marine to offer support for the replacement of nine lines below the HYSY111 floating production, storage and offloading vessel.

Hallin said this is the first time in the oil and gas industry that all FPSO mooring lines have been replaced as one continuous activity. Previously, only one damaged mooring line was replaced at any time, the company added.

The HYSY111 FPSO mooring replacement project consisted of several phases of work beginning with piles installation then laying and pre-tensioning new lower chain segments by COOEC. Hallin then provided subsea services to cut and remove the old mooring lines, followed by laying and hooking up new upper mooring wires.

COOEC completed the engineering analysis and developed the main project procedures in the last phase, offering specialized tools for the subsea mooring line connection. Hallin delivered the DSV Windermere and dive team as well as subsea operational solutions for the mooring.

"Hallin's involvement commenced at an early phase with an operational and engineering presence on the ground in Shenzhen, China," said Phil Chamberlain, Hallin Marine's service delivery director. "COOEC and Hallin teams worked together in developing the optimal technical solution, while ensuring the critical safety elements of undertaking this work on a live platform were addressed."

Second Liwan pipelay under way offshore China

Construction vessels have started work offshore China installing a second deepwater production pipeline from the main Liwan 3-1 field to the Liwan shallow-water central platform. According to partner Husky Energy, the field will be shut-in for 6 to 8 weeks starting in the fourth quarter to facilitate the program. Production will continue to ramp up through the existing Liwan facilities as various onshore power plants complete their commissioning and start-up process.

In Indonesia, Husky said construction is progressing on the shallow-water platform infrastructure for the BD field and the contract award for the FPSO has received final regulatory approval. Tenders are out for the MDA and MBH joint development, and negotiations continue over a gas sales agreement.

In the Jeanne d'Arc basin offshore Newfoundland and Labrador, Husky says drilling has restarted on a Hibernia-formation well that will target a deeper zone beneath the North Amethyst field, with first production planned later this year.

Solan Field storage tank off-loaded at Lerwick Harbour

Lerwick Harbour has again demonstrated its deepwater capacity and capabilities, this time by simultaneously accommodating two giant support vessels and the successful offloading of a 10,000-ton subsea oil storage tank, destined for west of the Shetland Islands.

The sheltered port's facilities and proximity to the Solan Field, being developed by Premier Oil 90 km into the Atlantic, meant it was perfectly



Solan Tank offloading at Lerwick Harbour in the Shetlands.

placed for final preparation of the tank ahead of installation.

The tank was delivered to the port on July 26 from the construction yard in Dubai by Cosco (Chinese Ocean Shipping) Heavy Lift's transport vessel, Xiang Yun Kou.

One of the largest float-on/float-off vessels in the world, her displacement of 47,285 tons made the Xiang Yun Kou the biggest displacement tonnage ship to berth alongside at Lerwick, although not an alongside record-breaker for length and gross tonnage.

The port was also used by Heerema's semi-submersible crane vessel (SSCV), Thialf, which spent a day and a half mobilizing before heading for Solan on July 31, arriving the next day to await the tank for installation. It was a return visit for the world's largest SSCV at 136,709 gross tons and 202 m in length by 88 m wide. Thialf has visited Lerwick previously, most recently last year.

Seadrill secures commitment for newbuild drillship

Seadrill Ltd., in cooperation with indigenous partner Field Offshore Design Engineering Nigeria Ltd., has secured a contract with Esso Exploration and Production Nigeria Ltd. to use the newbuild ultra-deepwater drillship West Saturn, at the ERHA North Phase 2 project in Nigeria.

The contract is for a firm period of 2 years, plus a 1-year option, and has a total revenue potential for Seadrill and Field Offshore Design Engineering Nigeria Ltd. for the primary contract term of \$497 million, inclusive of mobilization.

The West Saturn is a sixth-generation drillship, currently under construction at Samsung Heavy Industries in Geoje, South Korea, with expected delivery in September.

Winterized rig West Alpha drills first Kara Sea well off Russia

The semi-submersible rig West Alpha has spudded the Universitetskaya-1 well in the Kara Sea for Rosneft-ExxonMobil's joint venture company Karmorneftegaz. This is the northernmost well drilled to date offshore northern Russia, according to Rosneft. The partners hope to prove a new oil province.

The Universitetskaya structure, which covers an area of 745 mi within the East Prinovozemelskiy-1 license, has a potential 1,804 ft tall hydrocarbon trap, the company said, and possible resources of more than 1.3 billion tons of oil equivalent. Rosneft adds that around 30 structures have been identified in three East Prinovozemelskiy areas of the Kara Sea, with a collective resource base of 87 Bbbl or 13 billion tons of oil equivalent.

Water depth at the drilling site is 266 ft, and the designed depth of the vertical well is 7,710 ft from the rotary table.

North Atlantic Drilling, which owns the West Alpha, transported the rig via the Barents and Pechora seas, a journey of more than 1,900 nmi. In preparation for this program the rig was upgraded to improve reliability of its main and supplementary equipment and to safe-



The West Alpha semi-submersible rig.

guard all systems against the effects of low temperatures.

The rig is equipped with a system for monitoring ice conditions, iceberg detection, and tracking of sea ice. It uses infrared cameras, onboard radars, and can analyze satellite and air intelligence data.

To ensure West Alpha operates safely in severe ice conditions, Rosneft and ExxonMobil developed an iceberg collision prevention strategy that includes applying physical action to the ice. If there is a risk that a hummock or floe may damage the rig, support vessels will tow it away to a safe distance.

If, however, physical action proves impossible, the well will be isolated to

ensure no impact on the environment, Rosneft said, and the rig transferred to a safer location. It is equipped with two groups of blowout preventers and an enhanced subsea shut-in device.

Energean aims to invest \$225M in Kavala reserves offshore Greece

Energean Oil & Gas has started a new \$225 million investment program to develop 30 mmbbl of reserves in Kavala, northwest Greece. The company plans to increase output from the Prinos, Prinos North and Epsilon fields to 10,000 bbl per day by 2016.

Under the program, Energean will drill 15 wells and install two new unmanned platforms for the Prinos North and Epsilon fields. They will be tied back to the existing infrastructure the company currently operates.

The wells will be drilled using a Glen Esk drilling rig, which Energean has purchased from KCA Deutag. Drilling is expected to start in early December and the new rig will be re-named Energean Force, the company said.

Prinos, the only proven and producing oil field in Greece, has already produced 115 mmbbl of oil, even though reserves were initially estimated at 60 mmbbl.



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Noble Energy hits at Katmai and Dantzler-2 in deepwater U.S. Gulf

E&P independent Noble Energy said it found oil and gas at two wells—Katmai and Dantzler-2—drilled deep in the Gulf of Mexico.

Its Katmai exploration well discovered 154 net ft of crude oil in two reservoirs in the Miocene play. The discovery well is in 2,100 ft of water and has a total depth of 27,900 ft.

Estimates indicate the well could produce 40 to 100 mmboe, but more exploration and drilling is needed to test the remaining potential, the company said.

Noble operates the Katmai and has a 50% interest. Ridgewood Energy Corp., an energy-focused private equity firm with offices in Houston and New Jersey, holds the remaining 50% stake.

The Dantzler-2 appraisal well found 122 net ft of crude oil in two Miocene reservoirs at a total depth of 18,210 ft in 6,600 ft of water, Noble said, adding that the company's estimated production ranges from 65 to 100 mmboe.

Noble has a 45% interest in the Dantzler, which it operates. Other owners include entities managed by Ridgewood Energy with 35% and W&T Energy VI, an independent oil and gas exploration company, with 20%. The well has been incorporated into the company's plans for the Rio Grande development area.

Meanwhile, Noble said its Bright exploration well in the deepwater Gulf of Mexico reached the targeted Upper and Middle Miocene objectives but did not encounter hydrocarbons. Drilled to a total depth of 13,500 ft on Atwater Valley 362, the well was plugged and abandoned. Full well assessment and the integration of drilling results into the company's geologic models is ongoing to determine forward exploration plans on the recently acquired Atwater Valley acreage.

"While we are disappointed with the results of the Bright well, we remain extremely encouraged by the recent success of our exploration program in the Gulf," said Susan Cunningham, senior vice president, Gulf of Mexico, West Africa, and frontier areas.

BP Exploration & Production Inc. operated the well with 50% working interest and Noble Energy has the remaining 50%.

Jacka unveils first oil reserves for Aje field development off Nigeria

Oil and gas exploration firm Jacka Resources has unveiled the first oil reserves for the Aje field development, offshore Nigeria. Jacka's subsidiary PR Oil & Gas (Nigeria) holds the company's interests in the field, located in OML113, about 24 km offshore western Nigeria. AGR Tracs International has completed

an independent competent persons' report on the field.

Oil reserves for the first phase of the Cenomanian oil development have been assessed as 23.4 mmbbl of proved and probable reserves.

The gross contingent resources total a further 179 mmboe, of which 15.7 mmbbl is allocated to the second phase development. Jacka booked proved and probable net reserves of 1.3 mmbbl at the Aje field and revised the contingent

resources from the second and third developments to 1.5 mmbbl. The total net 2C contingent resources from the Aje Field have been increased to 12.1 mmboe 10.5 mmboe.

Yinka Folawiyo Petroleum operates the field with 25% revenue interest and Folawiyo Aje Services is acting as the technical adviser. Other partners in the field include New AGE, First Hydrocarbons Nigeria, Energy Equity Resources and Panoro Energy.

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Lundin Norway drills new target on Alta prospect in Barents Sea

The Island Innovator has spudded an exploration well for Lundin Norway on the Alta prospect in Barents Sea license PL609. Well 7220/11-1 is roughly 12.4 mi northeast of Lundin's Gotha discovery. The main aim is to prove hydrocarbons in Triassic sandstones and in the Permo-Carboniferous, with potential resources estimated at up to 261 mmboe. Drilling was expected to require around 60 days.

Lundin also planned to drill the Vollgrav exploratory well on PL631 in the northern Norwegian North Sea between the Statfjord and Gullfaks fields,

targeting 57 mmboe. During the fourth quarter the company is lining up more wells in the North Sea on the Utsira High Kopervik prospect in PL625, northwest of the Johan Sverdrup field (163 mmboe) and on Storm in PL555 (89 mmboe). It also plans to drill the Lindarormen well on PL584 in the Norwegian Sea southwest of the Draugen field (194 mmboe).

As for the company's current Norwegian development projects, the semi-submersible Transocean Winner is drilling the second production well on the Bøyla field, 17.4 mi subsea tieback to the Alvheim FPSO. First oil is expected in the first quarter of 2015, peaking at 20 mmboe per day.

The steel jacket is in place at the Edvard Grieg offshore location and laying is under way of the 58.4 mi gas pipeline to connect to the Sage Beryl gas system in the UK sector.

Kvaerner aims for mechanical completion of the topsides toward the end of 2014, followed by commissioning and offshore installation in spring 2015. Apply Leirvik has delivered the living quarters module to the Kvaerner yard in Stord for integration with the other topside equipment.

Russia's Rosneft and Norway's Statoil team up in Barents Sea

Russian oil company Rosneft said it has started an exploration program in the Barents Sea with Norwegian energy company Statoil.

"The start of this exploration operation marks an important milestone in developing the cooperation between Rosneft and Statoil," the Russian company said in a statement.

"The companies plan to implement their experience of exploration and development of hydrocarbon fields in regions with harsh climate."

Rosneft said its subsidiary RN Nordic Oil is working alongside Statoil at the Pingvin license area of the Barents Sea.

Statoil recently received approval from the government to move the Transocean rig, Spitsbergen, to the area. Rosneft said both sides would review the drilling results from the region through the end of the year.

The Norwegian government said explorers would have to wait out a comment period before drilling into any oil-bearing layers of the Pingvin license.

Rosneft is the target of Western economic sanctions imposed in response to Russia's stance on crises in Ukraine.

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Norway to award oil and gas licenses in new offshore areas

Norway will award oil and gas licenses in new offshore areas, including an important Arctic zone bordering Russia, in the first half of 2016, the oil and energy ministry said, in a process that will take longer than recent rounds.

The ministry, which has already asked companies to nominate blocks where they want to drill, expects applications in the second half of 2015, indicating that the process of attributing new licenses will last between 24 and 30 months, longer than the 15-18 months in the previous three rounds between 2008 and 2013.

The world's seventh-largest oil exporter, and the third-largest for gas, started the process of attributing new licenses in January by asking oil firms which areas they would be interested in exploring. Some 40 oil firms expressed interest, including Royal Dutch Shell, ConocoPhillips, Chevron, BP and Statoil, nominating 160 blocks or parts of blocks.

The areas on offer include an offshore zone the size of Switzerland bordering Russia that may contain 1.9 Bboe, mostly of gas, that was opened to oil exploration after Oslo and Moscow resolved in 2010 a four-decade-long border dispute.

The ministry said the need for more surveying in the area makes the current process longer than earlier ones.

Statoil plans to shut down Huldra platform production in North Sea

Norway's Statoil has decided to permanently shut down its Huldra platform in the North Sea following nearly 13 years of production. The company recently carried out operational and maintenance works at Huldra platform, which came on stream in November 2001.

Statoil said the field's pressure declined in recent years and a compressor was needed for gas export and multiphase pumps for liquid export. The platform produced more than 11 mmSCM of gas and 4,000 scm of condensate per day. The platform produced a total of 17.5 Bscm of wet gas with an 80% recovery rate.

Statoil operated the platform without permanent staffing from the Veslefrikk B platform, which is located about 16 km away. In order to reuse the platform, Statoil originally placed the installation up for sale in 2011 but failed to secure a buyer. The company said the project is still actively seeking a solution of reuse.

The Huldra field is located in blocks 30/2 and 30/3. Operated by Statoil, the field lies at a depth of 125 m.

The West Epsilon drilling rig is anticipated to permanently plug Huldra in 2016 while the entire decommissioning will be undertaken between 2019 and 2021. The

field houses six producing wells in two streams, which supply gas to Heimdal via the Huldrapipe, and condensate to Veslefrikk for processing and export through the Sture terminal. The company said Huldra condensate has also been sent to Heimdal.

Statoil owns a 19.87% interest in the field. Other licensees include Petoro (31.95%), Total E&P Norge (24.33%), ConocoPhillips Skandinavia (23.33%), and Talisman Resources (0.49%).



Huldra platform came on stream in 2001.

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Statoil opens Gudrun platform on Norwegian Continental Shelf



Gudrun is Statoil's first platform on the NCS since 2005.

Statoil has opened its first platform on the Norwegian Continental Shelf (NCS) since 2005. The Gudrun platform is the first in a series of new field developments operated by Statoil. It precedes Valemon, which is due for start-up later this year, followed by Gina Krog and Johan Sverdrup on the Utsira High in the North Sea.

The Gudrun platform, which holds an estimated 184 mmboe, is currently producing 30,000 bbl per day. The platform unites new field development with existing pipelines and facilities. Oil and gas from the field are processed on the Sleipner A platform, situated 50 km further south.

The gas is then piped to Europe, while the oil is piped along with the Sleipner condensate to the Kårstø processing complex north of Stavanger for shipment.

"Gudrun is a good example of how we manage to realize projects by combining new field developments with existing infrastructure," Statoil chief executive Helge Lund said. "This is good value creation that helps maintain activity and extends the life of a wide range of offshore fields and facilities."

Statoil said that Gudrun has been put on stream on time and below the estimated cost of the plan for development and operation.

BG pursues two offshore Egypt gas developments

BG Group and its partners have submitted a development plan for the Notus high-pressure/high-temperature and Harmatten Deep gas discoveries in the Egyptian sector of the Mediterranean Sea.

The plan is in accordance with the El Burg offshore concession agreement. BG adds, however, that the release of funds for any further Egyptian development projects, including West Delta Deep Marine (WDDM) Phase 9b, remains contingent on an improvement in the local investment climate. It remains in discussions with Egypt's government.

BG's Egyptian fields produced a total of 57,000 boe per day for the company in the second quarter of 2014, down 14% from the first quarter. This is said to be the a result of deteriorating reservoir performance and the continued high proportion of diversions to Egypt's domestic market, where the company is entitled to a lower share of production.

The first WDDM Phase 9a well has come onstream, however the nine-well development will only temporarily offset underlying E&P production declines, the company said.

KrisEnergy finalizes development concept for Wassana

KrisEnergy Ltd. has finalized a development concept for the Wassana project in block G10/48, offshore Thailand, and submitted the production area application to Thai authorities.

Once submitted, the company secured the Key Gibraltar jack-up rig for 6 months to drill up to 15 development wells in Wassana, and a minimum of six exploration wells in the G10/48 and G6/48 licenses.

KrisEnergy also contracted a mobile offshore production unit to serve as the oil processing facility for the field, with first oil expected in the second half of 2015. Production is anticipated to peak at 10,000 bbl per day.

More South Pars phases near start-up in Persian Gulf

Phase 16 of the South Pars gas field development is undergoing a start-up safety review, according to Iranian news service Shana. Ali-Akbar Shabaniour, managing director of Pars Oil and Gas Co., said hook-up operations were 90% complete, and that the Phase 16 platform should start exporting sour gas to shore during November.

The new Phase 15 platform is expected to start up 1 month later, he added. Phases 15 and 16 are expected to deliver at least 1 bcf per day of gas during the winter.

Phase 18's new Platform A should produce 500 mmcf per day within the next 2 months, according to project manager Hassan Boveiri. National Iranian Drilling Co. finished drilling on Phase 18 in February, and also drilled the wells for Phase 17. For the two phases, 22 wells were drilled.

BP approves new gas project offshore Trinidad

BP Trinidad and Tobago has sanctioned the offshore Juniper gas project. Development calls for a normally unmanned platform with subsea infrastructure, a first for BP offshore Trinidad and Tobago. Fabrication is expected to start in the fall.

The Juniper complex will receive gas from the Corallita and Lantana 50 mi off the southeast coast of Trinidad in water depths of 360 ft. BP plans five subsea wells with a production capacity of around 590 mmcf per day.

Gas will be sent to the Mahogany B hub via a new 6.2 mi flowline. Drilling is to start in 2015 followed by first gas in 2017.

Vaalco says Etame jacket in place offshore Gabon

Vaalco Energy expects installation of two more production platforms to proceed as planned later this year on the Etame Marin block offshore Gabon. One will be added at the Etame field, and the second platform will be installed between the Southeast Etame and North Tchibala fields.

The first platform jacket arrived in Gabon in July and has been positioned on the seabed over the Etame field. The second jacket, now in Gabon, was expected to head out to the field for installation in August. During September, the deck sections were to arrive in country.

Transocean's jack-up Constellation II was expected to begin development drilling from both platforms during the fourth quarter. In late August, the owner-operator of the leased Etame FPSO was to implement a 6-day shutdown to upgrade the gas detection and fire systems. Production was to be shut-in for this program.

Offshore Angola, Vaalco and its partner purchased seismic data earlier this year over the outboard segment of block 5. They expect to complete processing in early 2015, with a view to identify postsalt and presalt prospects.

Proposed rule would establish first standards for U.S. Arctic waters

The Obama administration has introduced a rule that would impose the first minimum standards for oil and gas activity in U.S. Arctic waters. Regulators have signaled that the rule will largely codify steps taken voluntarily, including a possible requirement for a containment system in case of a runaway well. Shell built a specialized, first-of-its-kind containment system for the company's Arctic operations 2 years ago.

If a requirement for similar equipment or containment capability is written into new Arctic mandates, other oil companies that hold oil and gas leases in the region, including ConocoPhillips and Statoil, might have to procure such a device before they could begin drilling.

Other possible mandates include requirements for redundant emergency equipment to control blowouts and close well holes in emergencies. The proposal also could force companies to have a drilling rig ready to bore a relief well during an emergency close by. Offshore operators also could be forced to harden their fleet of vessels, ensuring they are Polar Class ships capable of working in icy conditions.

Shell files revised Arctic offshore drilling plan

Royal Dutch Shell has filed a revised Arctic offshore drilling plan with federal regulators but says the company hasn't decided whether to return to waters off the coast of northwest Alaska in 2015.

The revised exploration plan submitted to the Bureau of Ocean Energy Management (BOEM) in Anchorage calls for two drilling vessels to operate simultaneously in the Chukchi Sea rather than one in the Chukchi and one in the Beaufort Sea off Alaska's north coast.

The presence of two vessels is required so one can drill a relief well in the event of damage from a blowout. Shell Gulf of Mexico Inc.'s revised plan calls for the return of the Noble Discoverer, which performed top hole work at the company's Burger prospect in 2012. The second drilling vessel planned for the Chukchi is the Polar Pioneer, owned by Transocean Ltd., according to Shell.

In 2012, Shell drilled pilot holes and dug mudline cellars in the Chukchi and Beaufort seas. The company was not allowed to drill into oil-bearing deposits because required response equipment was not on hand. The company experienced problems in the challenging Arctic conditions, culminating with the drill vessel Kulluk running aground off an island near Kodiak as it was being towed across the Gulf of Alaska in stormy weather. Shell chose not to drill during the short open water drilling season in 2013 or 2014.



Noble Discoverer may return to Alaska.

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Airpac Bukom making significant investment in new compressors

Air and steam equipment rental specialist Airpac Bukom Oilfield Services is making a significant investment in new containerized 1,000 scfm Zone II air compressors, meeting the latest DNV 2.7-2 specification, which is increasingly demanded by the industry to improve safety and reliability.

These purpose-built Zone II compressors are intended to support global operations. With a capacity of 1,000 scfm at 150 psig (10.3 bar), they deliver more air to enable higher rates of productivity, meeting time-critical demands of offshore fabric maintenance and well test programs, the company said.

These newly designed DNV 2.7-2 containers have a small footprint with in-built access ladders and stacking ability to ensure economy of critical space. With new Cummings M11 3GP engine management, the compressors have greatly reduced emissions and maintenance time.

The new equipment will meet the requirements to support new technologies used within well test operations and other segments within the oil and gas industry. These complement the existing



range of 750, 900 and 1,000 scfm Zone II compressors available from Airpac Bukom facilities worldwide. In addition to the new 1,000scfm Zone II compressors, further investment is also being focused on additional Zone II products, manufactured in accordance with new DNV 2.7-2 specification.

"This is a milestone event for Airpac Bukom and the oil and gas industry as these new 1,000 scfm Zone II compressors are the first on the market that meet the new DNV 2.7-2 specification," said Ian Gravill, Airpac Bukom's sales and marketing director. "They have been

designed and built in the UK to the highest standards and will be used primarily to support offshore well testing and rig fabric maintenance activities."

Fugro: Instrumentation assists riser-wellhead fatigue studies

Fugro has delivered a motion dataset from the BOP stack and lower riser of two deepwater wells in the Barents Sea. During drilling, the client required recording of motion and strain of the wellhead, BOP, and riser to quantify fatigue damage to the wellhead.

Fugro deployed its Wellhead and Riser Instrumentation Service (WARIS), comprising a specialist engineering team and six modular, self-contained DeepData pods.

The latter form the core of a data acquisition system using accelerometers and angular rate sensors to determine motions and rotation at specified locations. Fugro applied a set of clamp-on subsea strain gauges. The modular logging system, operating in water depths of up to 4,593 ft, collected and analyzed data from sensors at various wellhead locations. An ROV was used for data recovery and battery replacement.

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Brazil's Petrobras to install DADAS MetOcean software on offshore rigs

Petrobras is planning to install the DADAS MetOcean software on all Petrobras rigs and FPSOs in Brazil.

Automasjon og Data (A+D) is a Norway-based company specializing in instrumentation and software for collection of meteorological and oceanographic data. A+D is one of the leading companies for building and installing environmental monitoring systems for offshore platforms with several hundred systems in operation on offshore rigs worldwide.

The DADAS software will enable Petrobras to connect to all its rigs online to collect meteorological and oceanographic data. This is specially important for areas with extreme weather conditions.

All MetOcean data from the Brazilian continental shelf is collected into one common onshore database for current and future use. Such data are used for many different applications, including design calculations for new developments,

operational use and statistical use. Current development plans in Brazil indicate up to 200 operational units in the country until 2020.

The contract with Petrobras is the result of more than

3 years of development and testing, where the standard DADAS software has been further developed and adapted to Petrobras' specifications. This will continue in the coming years with further software development work, training seminars and other additional work.

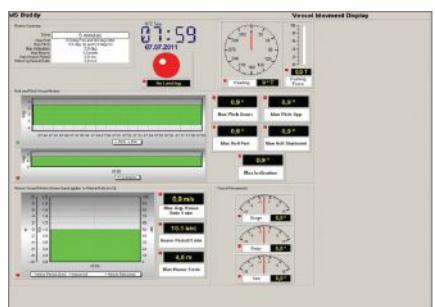
Statoil and DNV GL partner on subsea technology interface

Statoil has partnered with DNV GL to develop an international industry standard for subsea process technology. The joint industry project (JIP), which will be headed by DNV GL, intends to maximize the profitability of larger projects with subsea processing technology.

The standardization of the tie-in technology and module sizes will allow for better technology combination and adaptation. Statoil said subsea pumps have been used in several oil fields, and the initial subsea compression systems will be deployed this year to increase gas production from the Åsgard and Gullfaks fields. The project, which will launch in the first-quarter of 2015, will establish open standards, giving suppliers the option to use standardized technology.

"The industry needs to lower costs to enable more subsea developments and increase the use of subsea processing technology," Statoil executive vice president in technology, projects and drilling said. "It is important not only for Statoil, but for the industry in general, that competition is maintained in the development of the process technology itself, and the input, which is made to the modules. By standardizing the tie-ins and the module sizes, it will be possible to make use of the best technology for each individual function, independent of supplier."

Subsea development costs have increased by 250% in the past 12 years.



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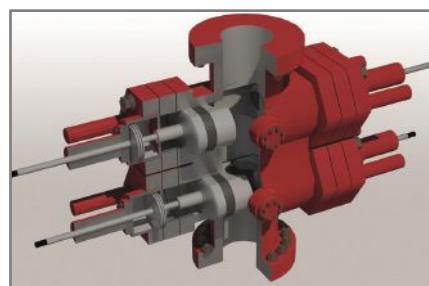
Online well control course to be offered free-of-charge by IWCF

Oilenium™ Ltd., a Petrofac Training Services (PTS) company that provides eLearning training services to the oil and gas industry, has been retained by the International Well Control Forum (IWCF) to produce a new eLearning course to explain the life cycle of a well, with primary emphasis on well control.

The IWCF, which sets international training standards for well control, commissioned Oilenium to create the user-friendly course that will offer an engaging and informative overview of this topic.

The course is being designed to raise awareness of well control among those working in the global oil and gas industry, and those considering a career in the sector. IWCF plans to make it available free-of-charge on its website as part of this drive.

The online offering is the latest initiative in IWCF's ongoing campaign to increase understanding of what triggers a well control incident, the impact and how such incidents can be prevented. It is based on specific recommendations made by the International Association of Oil & Gas Producers (OGP) in the wake of the



Macondo tragedy in the U.S. Gulf.

"Given that the course will be made available worldwide by IWCF at no cost and will play a key role in helping IWCF to improve safety globally, it must provide a highly compelling and effective learning experience," said Kevin Keable, managing director of Oilenium.

"It demonstrates the confidence that they have in us to produce a course that will not only educate participants about the life cycle, but drive home the importance of proper well control and how critical it is, not only to the well-being of oil and gas workers, but to all life in the surrounding environment."

Utilizing colorful 3D animation technology, voice-overs and striking visual images, the fully interactive course will open with an explanation as to how reser-

voirs are formed, which leads to an overview of the well life cycle, from drilling to interventions. It also sheds light on potential hazards, methods of prevention and how kicks and blowouts are addressed by drawing upon actual incidents, such as Macondo and others. Upon completion of the course, the user will have a solid knowledge of the well life cycle, and basic well control.

The new Well Control eLearning course is scheduled for completion in the fourth quarter of this year.

Wood Group Intetech develops new software platform for wells

Wood Group Intetech has built a new software platform to analyze global well component reliability information. The cloud-based tool, dubbed iQRA, is designed to enable operators to make better decisions on well and oilfield component selection. iQRA, which is based on the ISO-14224 standard, will allow users to benchmark their reliability figures against a global dataset and derive safety critical element failure statistics and mean-time-to-failure data. The tool will assist developers in deciding whether to retain wells on a production-injection regime or plug and abandon them.

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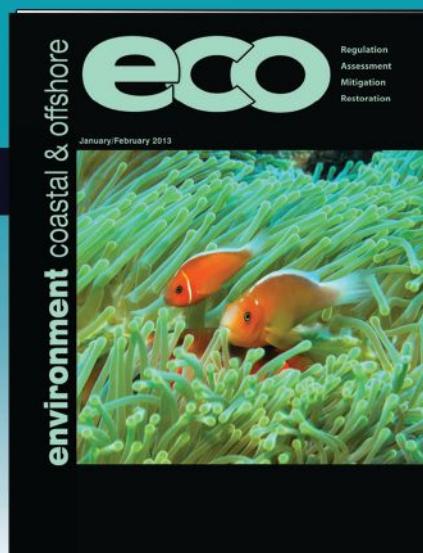
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Lisa Chilik • +1 574.261.4215 • Lchilik@tscpublishing.com
Zinat Hassan • +44 (0) 845 6522 483 • zhassan@tscpublishing.com
Mimi Shipman • +44 (0) 1777 601 7564 • mshipman@tscpublishing.com

EDITORIAL CONTACT:
Greg Leatherman
772-617-6795
editor@eco-tsc.com

CORPORATE CONTACT:
MJ McDuffee
772-617-6836
mj@tscpublishing.com



Marketing & Information Resources

INDUSTRY DEALS

Shell, Alaska natives form Arctic Inupiat Offshore joint venture

Arctic Slope Regional Corp. (ASRC), six North Slope village corporations and Shell Gulf of Mexico have unveiled a new joint venture, dubbed Arctic Inupiat Offshore (AIO). The members of the AIO include ASRC, Ukpigak Inupiat, Tikigaq, Olgoonik, Kaktovik Inupiat, Atqasuk and Nunamuit.

Under the deal, AIO has the option to buy a stake in Shell's acreage and activities on its Chukchi Sea leases. The option agreement gives AIO the opportunity to assume an overriding royalty interest in Shell's leases.

AIO will also have the option to participate in project activities by purchasing a working stake at the time Shell takes the decision to start development and production. ASRC president and chief executive officer Rex Rock will also serve as the president for AIO.

"I applaud Shell's partnership with the Alaska native corporations that will provide a greater voice and opportunity for the people in the region and a seat at the development table," Alaska Governor Sean Parnell said.

"This establishes a very positive precedent in Alaska's Outer Continental Shelf, showing strategic partnership among North Slope communities and Shell, both of which understand the importance of developing Alaska's offshore oil and gas resources."

Shell Alaska vice president Pete Slaiby said: "A regional alliance with so many respected Alaska native corporations provides Shell the opportunity to collaborate with savvy and experienced North Slope business partners going forward. It also underscores our commitment to provide opportunities for North Slope communities to directly benefit from Shell's activities offshore Alaska."

Schlumberger, OneSubsea, Helix, to form well intervention alliance

OneSubsea, Helix Energy Solutions Group, and Schlumberger have signed a letter of intent to form an alliance to develop subsea well intervention systems.

When the final terms are agreed, the alliance will focus on expansion of applications enabled by subsea well access technology and specific solutions for deep and ultra-deepwater and high-pressure operations.

Helix brings a fleet of intervention vessels, OneSubsea provides well control technology as well as manufacture and supply of subsea well intervention equipment and services, and Schlumberger brings conveyance systems and in-well technology for subsea applications.

"From well construction through production enhancement to decommissioning, this is an opportunity for our companies to work with our clients in realizing significant value creation through a fully integrated and collaborative team effort," said Owen Kratz, chairman, president, and chief executive officer of Helix.



Illustration of a well intervention vessel.

"This unique alliance will drive optimization in the complete subsea well intervention value chain," said Jack Moore, Cameron chairman, president, and chief executive officer. "Together, we will develop leading technology to reduce operational risk, increase efficiency, improve recovery, and lower the overall cost of subsea well intervention operations for our clients."

OneSubsea is a Cameron and Schlumberger company.

"We are determined to drive further integration of our leading technology portfolio, backed by improved reliability and greater efficiency, to create a step-change in performance throughout the E&P value chain," said Paal Kibsgaard, Schlumberger's chief executive officer.

Brightoil completes \$1.046B acquisition of Bohai Bay assets

Brightoil Petroleum Ltd. has closed on its acquisition of interest in two oil producing blocks in Bohai Bay from Anadarko China Holdings 2 Co. Ltd., a wholly owned subsidiary of Anadarko Petroleum Corp., for \$1.046 billion.

Brightoil now holds 40.09% interest in the 124-sq. km contract area 04/36 and 29.18% interest in the 88-sq. km unit area 05/36. CNOOC China Ltd. operates both blocks.

Combining the assets with the company's Dinal and Tuzi natural gas field, Brightoil's interest in 2P storage is expected to total 86 mmboe. When all three areas come online, net production will total 25,000 boe per day. Annual net production will total 9 mmboe.

Sit Kwong Lam, Brightoil chairman, said the deal "marks the successful transformation of the group in its

aim to become a resource-based energy enterprise" with aspirations to develop "into an international integrated oil and gas conglomerate."

Chevron sale paves way for first offshore Cambodia oil project

KrisEnergy (Asia) has agreed to acquire the entire issued share capital of Chevron Overseas Petroleum (Cambodia) for \$65 million.

The Chevron subsidiary has a 30% operating interest in offshore block A, where the company discovered the Apsara oilfield during the previous decade. In 2010 it submitted a production permit application (PPA) that was updated in 2012.

Cambodia has no oil or gas production and the Apsara PPA is the first to be evaluated by the Ministry of Mines and Energy, the petroleum regulator that succeeds CNPA.

The contract area covers 1,818 sq. mi over the Khmer basin in the Gulf of Thailand, in water depths ranging from 164 to 262 ft. KrisEnergy already has an indirect interest to the block, and this will rise to 52.5% post-transaction, with the Cambodia National Petroleum Authority (CNPA) backing in with a 5% stake.

Phase 1 will include 24 development wells from a single platform with oil processed and then stored in an offshore vessel prior to export, a similar arrangement to other fields in the Gulf of Thailand. Production from the initial single platform is expected to peak at around 10,000 bbl per day of oil.

Alimak Hek acquires offshore business from Heis-Tek in Norway

Alimak Hek Group has acquired Heis-Tek's offshore business in Norway. The acquisition enables Alimak Hek to further expand its product and service offering of vertical access solutions to the oil and gas industry.

The acquisition encompasses the traction elevator company's sites in Onarheim (new equipment sales) and Bergen (service) with a total of 38 employees. Alimak Hek announced on May 13 that it had agreed to acquire the business. Both parties have agreed not to disclose financial details of the transaction.

"This acquisition will allow us to become a more complete provider of vertical access solutions to our customers in the oil and gas industry, which is one of our prioritized sectors. Heis-Tek has a long history of serving these customers and is a very good fit with Alimak Hek. The acquired expertise and market strength will provide new growth opportunities," the company said.

Industry's first standard for certifying subsea equipment and components to drive efficiency

The subsea industry is challenged by the high cost levels, complexity and low predictability of quality control requirements throughout the supply chain. DNV GL aims to help address these issues through the launch of a new "Standard for certification of subsea equipment and components." The goal of the certification scheme is to help increase quality control and efficiency, in addition to facilitating projects being delivered as scheduled by shortening lead times. Major efficiency issues in the subsea sector are the highly variable requirements by operators from field to field and that quality assurance processes are customized on a project-specific basis, which greatly affects cost levels. The DNV GL standard aims to help the interpretation of existing API and ISO standards and the certificate will provide operators with confidence that fabrication quality is being controlled and assured throughout the industry's complex and distributed value chain. DNV GL also has a number of Joint Industry Projects under way to standardize and streamline efficiency issues in the subsea industry. A recent cooperation project related to subsea documentation seeks to present a minimum unified set of documentation requirements for all major subsea components. Another project addresses common specifications for steel forgings.

Hydro-Lek manipulators used ROV for Italian Navy

Hydro-Lek has delivered two 5-function manipulators to Italian ROV manufacturer, Ageotec, for the Italian Navy for submarine research and rescue. The manipulators are fitted onto a Pegaso ROV system that also includes a motorized winch, silenced diesel power generator as well as a USBL and sonar system. Ageotec were selected by COMSUBIN (the Italian Navy's diver unit) to provide an open frame ROV system for visual and instrumentation research, objects recovery and underwater rescue. The system accomplished its first mission in April and is now fully operational. "This Pegaso system was tailored to our customer's specification and we are delighted with its successful operation. We have fitted Hydro-Lek manipulators on many of our Pegaso ROVs on the basis of their performance and reliability," said Giuseppe Di Stefano, MD for Ageotec Srl. With a lift capacity of 40 kg, the Hydro-Lek HLK-HD5 is a rugged work class 5-function arm and incorporates a continuous jaw rotate assembly and three hydraulic cylinders. Constructed from 316 stainless steel, HE30 aluminium and high density polyethylene, the HLK-HD5 is designed for the smaller ROV for heavy duty underwater tasks.

IKM Subsea is awarded long term ROV contract by Eni Indonesia

IKM Subsea has been awarded a contract by Eni Indonesia to provide ROV services onboard the Drill Rig Scarabeo 7, operating in Indonesia for drilling various Exploration and Completion wells. The contract value including options is in the region of 16 million USD (100 million NOK) and duration term is firm for 2.5 years. Equipment for the contract will be mobilized from IKM Subsea HQ in Norway, whereas the contract will be run from IKM Subsea Singapore, through its affiliate; IKM Subsea Indonesia. IKM Subsea would be providing the in-house built Merlin WR200 workclass ROV and the Sub Atlantic Mohican observation ROV together with all necessary toolings and personnel onboard the rig to support the operations.

Offshore Survey 2015 calls for papers

Offshore Survey, which takes place from 15-16 April 2015 alongside Ocean Business at the National Oceanography Centre in Southampton UK, announces a call for papers. Offshore Survey provides a unique mix of global technology and business from all corners of the industry. With this in mind, it offers the perfect platform to share cutting edge information with an international audience, and the committee welcomes submissions suitable for sessions on subsea positioning, advanced survey techniques, survey operations, data processing and visualisation, and industry and professional issues. All papers will be evaluated by a technical committee of experts from industry and academia. Abstracts can be submitted online at: www.offshoresurvey.co.uk before 3 November 2014.

Fugro completes two key tasks on Gwynt Y Môr



Fugro successfully completed the trenching and burial of inter-array cables for CT Offshore and provided unexploded ordnance (UXO) survey support at the Gwynt y Môr offshore wind farm.

Central to the success of the cabling operation was Fugro's custom-built Q1400 trenching system, which can perform both jet trenching and mechanical chain cutting of soils. In total 37 cables were trenched into very hard seabed with a mixture of soils and hard clays interspersed with boulders and cobbles, gravels and sand. Despite these demanding conditions the Q1400 was successful in burying all the cables.

Gwynt y Môr is the second wind farm project where the Q1400 trenching system has been used when soils have been beyond the capabilities of standard jet trenching systems. This follows on from a busy 2013 with completion of four successful oil and gas trenching projects—one off the West Coast of Ireland and three in the North Sea.

One of the two Fugro-owned Q1400 trenching systems is fully integrated into the subsea support vessel Fugro Saltire, allowing both jet and mechanical chain cutting trenching to be carried out from a single vessel and providing the flexibility to entrench a wide range of seabed terrain from silty/sandy soils to hard clays and boulder fields.

Fugro also mobilized specialized vessels to conduct unexploded ordnance (UXO) surveys, after three UXOs were found on the seabed of the site in February 2014, prompting a requirement to survey the wind farm and export cable route.

As experts in geophysical and UXO surveys, Fugro utilizes vessels that tow multiple magnetometer and gradiometer sensors, enabling the detection of ferrous objects on or below the seabed. As many of the monopoles at Gwynt y Môr were already installed, the site posed a challenge for magnetic work, requiring Fugro to implement special techniques in order to survey close to the steel monopoles.

Fugro's processing geophysicists worked offshore and onshore to process the magnetic data with the results providing confidence to continue with subsea construction in a safe offshore environment.

For more information, visit www.fugrorenewables.com.

Divex secures contract for new saturation diving system

Divex, a subsidiary of James Fisher and Sons plc and a world leader in commercial and defense diving products, has been contracted by Singapore shipyard Keppel Singmarine (KSM) for the engineering design, supply and installation of a 300 m depth, 18 man twin bell / twin hyperbaric lifeboat saturation diving system to be classed by DNV.

The diving systems, which will include an air/nitrox surface diving capability, are to be installed upon a new build vessel for BP Exploration Shah Deniz II Project in the Caspian Sea. The vessel which is to be 155 m long with a beam of 32 m, is being purpose built for the construction phase of the project.

The vessel will be constructed in KSM's Singapore yard in two longitudinal halves of 16 m beam each. These will then be transported into the Caspian Sea through the canal linking to the Black Sea. The vessel will be completed in the Baku Shipyard for delivery in 2017.

The dive system is to comprise two side mate diving bells mated to individual Transfer Under Pressure chambers. The divers are housed in five saturation chambers. The diving bells will be deployed using the Divex pioneered triple winch guide wireless system, which eliminates the traditional clump weight. Divex standard products include Gasmizer, Gaspure and Helipure gas recovery systems and the Kinergetic range of environmental conditioning and life support systems. Manufacture will be distributed around various Divex global facilities including Aberdeen and Glasgow, Scotland, South Africa and Australia.

For more information, visit www.divexglobal.com.

Forum Energy Technologies awarded contract for eight ROVs

Forum Energy Technologies, Inc. announced that it has received an order from Vard Holdings Limited (VARD) to supply eight Perry XLX 150HP work-class ROV systems. The ROVs are to be mobilized on four new-build pipeline supply vessels (PLSV) for the joint venture formed by DOF Subsea and Technip that was awarded four contracts by Petroáleo Brasileiro S.A. (Petrobras) for operations in Brazilian waters. The ROVs will be delivered throughout 2015.

Two of the PLSVs will have a 300-ton laying tension capacity and will be fabricated in Brazil with a high national content. The other two PLSVs are designed to achieve a 650-ton laying tension capacity, thus enabling the installation of large diameter flexible pipes in ultra-deepwater environments, such as the Brazilian pre-salt. These vessels have ground breaking capabilities for vessels of this type and size, requiring ROV services for pipe-laying at

depths down to 3,000 m. The Perry XLX systems comply with the Petrobras' requirements for accuracy and precision.

VARD will be in charge of the design and construction of the four PLSVs. The two 650-ton vessels will be constructed at Vard Søviknes, Norway, while the two 300-ton vessels will be constructed at Vard Promar, Recife in Brazil.

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

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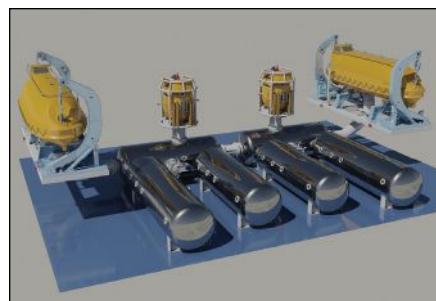
Unique Hydra secures DSCV contract from Ultra Deep Solutions

Unique Hydra, a division of Unique Maritime Group (UMG), is delighted to announce that it has been selected by Ultra Deep Solutions (UDS) to design, build and integrate the dive system for a multipurpose Diving Support Construction Vessel (DSCV).

The new DSCV is equipped with a 300HD 18-man twin bell Saturation Diving System. The dive system incorporates the latest mechanical and electrical design requirements. The feature rich diving system offers a first in the drive towards reducing the complexity of shipyard integration and installation time frames.

UDS has combined the high tech factor, practicality and high safety standards to design and build this DP3 18-man twin bell diving support construction vessel. It is designed to operate up to 4,000 m water depth, in collaboration with Marin Teknikk Norway, the world's renowned global ship designer of such highly-spec vessels.

The vessel is modeled on the proprietary "Red Class 6027" MT design DSCV and is a DP3, 142-m state-of-



the-art multipurpose subsea DSCV.

UDS specializes in the design, construction and operations of World-Class Ultra Deep Diving Heavy Construction Vessel to the offshore industry. Its onshore and offshore expertise provides top-class quality offshore-related services/knowledge with excellent high standards.

For more information, visit www.uniquegroup.com.

National Oceanographic Centre glider fleet to integrate SeeByte's SeeTrack Professional V4

SeeByte, the global leader in creating smart software for unmanned maritime systems, is pleased to announce collaboration with the National

Oceanography Centre (NOC). The agreement will see SeeByte develop tools to help pilot a fleet of gliders.

As a result of UK Robot and Autonomous Systems funding, the Marine Autonomous and Robotic Systems (MARS) group in NOC has recently acquired a large fleet of gliders. These gliders are manufactured by two different companies, Teledyne and Kongsberg, and each has a separate interface and processing tools. The separate interfaces increase both operator training requirements and operational complexity.

Additions to the SeeTrack Professional software suite will allow NOC to use a common interface for all the gliders. Operators will be able to improve planning and monitoring procedures. By combining all the mission plans and monitoring in a single work station, NOC will be able to manage larger fleets of gliders without putting additional strain on the operators. Data from these missions will be consolidated on a shared database, allowing data to be easily analyzed.

For more information, visit www.seebyte.com.

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2 Flexlink™ articulated umbilical buoyancy

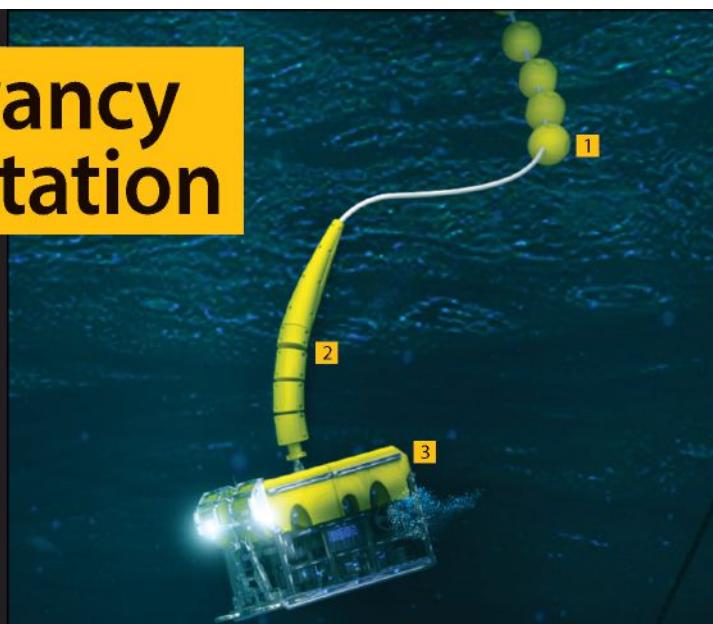
Designed to ensure umbilical lines remain out of the ROV work zone, Flexlink is installed onto lines of 25-75mm with uplifts of 6-12kg in operating depths to 6000msw.

3 ROV buoyancy

Offering a full in-house service Balmoral Offshore Engineering designs and creates intricate ROV/AUV buoyancy profiles with virtually no size limitation. Balmoral's unique composite and pure foam systems are designed to operate at depths of 1000-10,000msw.

The company's refurbished ROV plant incorporates an end-to-end process that includes temperature controlled curing facilities and a state-of-the-art buoyancy block boring and milling plant.

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Oceanica orders two Falcons

Oceanica, the long established Brazilian subsea engineering company, has ordered two Saab Seaeye Falcon ROVs for its expanding operations with Petrobras.

The Falcon's respected reputation in Brazil was a decider for Oceanica, says head of ROV operations, Manoel Teixeira Lopes Filho.



Both ROVs will be deployed in general inspection work in shallow water and the company is currently building two Shallow Dive Support Vessels, with a third planned for engineering projects.

Oceanica was founded in 1978 and is now a key subsea engineering company for Brazil's oil industry with long experience in the installation and maintenance of underwater structures.

The company's range of operations will benefit from the easily manhandled Falcon, which although small, has five powerful thrusters for precise maneuverability and holding the ROV steady in strong cross-currents.

Distributed intelligence is key to the Falcon's success with each device on the vehicle having its own individually controlled microprocessor.

The concept allows systems to be easily added or changed with plug-and-go simplicity that connects multiple modules together through a single RS485 network.

The intelligent, module-focused concept also generates automatic diagnostics on power-up to ensure that each device is fully interfaced and working correctly, greatly simplifying maintenance.

For more information, visit www.seaeye.com.

SMD release advanced ROV training simulator

SMD is delighted to announce the release of the new advanced ROV Training Simulator. SMD's R&D department have been working together with technology partner TreeC to develop a new dynamic and intuitive simulator that addresses current training mar-

ket needs and requirements, with a particular focus on operator/pilot training and mission planning and rehearsals.

The new simulator has been developed to provide easy and intuitive human machine interface via the ROV console control desk, and covers not only work class ROVs, but also future trenching and subsea mining vehicles.

SMD has developed an IMCA Class A simulator platform that incorporates one of the most advanced physics engines on the market. The new simulator produces dynamic content creation, and interaction of equipment in the virtual environment. The system also offers higher simulation efficiency and uses imagery based on realistic subsea working environments for better visualization.

SMD's future-proof approach, protects customer investment with a platform which runs on the latest PC hardware and along with software and benefits from future upgrade paths.

The simulator's enhanced tailor-made mission planning and rehearsal capabilities mean the likes of survey tasks and IRM activities can be performed "dry" and safe.

Further evolution of the SMD Simulator includes tether break management and component identifier among many others. The platform is capable of incorporating multiple and various facets of the subsea environment and can simulate, package and deliver the data based on what the customer requires. This one true platform enables the customer to switch from the real world to the virtual world, and back.

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

Triton to market manned sub to the oil and gas industry

Triton Submarines announced that it will begin marketing its Triton 5500/2 (5500 ft rated/2 passenger) submersible to the oil and gas industry. During the late 70s and throughout the 80s manned submersibles all but disappeared from the oil and gas industry in favor of the ROV. Patrick Lahey, Triton's president, witnessed the transition firsthand. "I was a manned submersible pilot in the North Sea and I watched ROVs gradually replace manned submersibles. It makes sense in many ways but there is an inescapable logic in an oil & gas operation adding the capability of having a manned presence under the surface."

Triton is offering its deepest diving acrylic pressure hull equipped manned submersible, the Triton 5500/2 in a cus-

tom configuration for subsea pipeline inspection, tracking and leak detection. "In most cases, an ROV is still the logical choice but in some circumstances, you can't replace the value of a manned presence in any environment. The deep ocean is no exception and the Triton 5500/2 is an economical and practical solution for oil and gas companies who see the benefit of a manned presence", says Marc Deppe, Triton's VP of sales and marketing. The Triton 5500/2 is the world's deepest diving (5500 ft/1676 m rated) transparent hulled submersible. The 5500/2's extended mission time of 12 hrs combined with its versatility make it an ideal platform for a wide variety of deep ocean tasks.

For more information, visit www.tritonsubs.com.



New ultra-portable mini-ROV from Planet Ocean

Planet Ocean is pleased to announce that they have been appointed as UK and Ireland distributors for the Canadian Deep Trekker range of remotely operated vehicles.

The innovative design of DTG2 is like no other ROV on the market. Powered by on-board rechargeable batteries negating the need for a bulky surface power supply, Deep Trekker offers many advantages over the typical top side powered ROVs. The on-board batteries mean a smaller diameter tether and thus lower drag and eliminates power loss down the tether. A smart charger simply plugs into the back of the ROV with a 6-8 hr operating life from a single charge. The Deep Trekker range is designed to be ultra-portable at under 9 kgs, ships in a single box and is exceptionally simple to deploy and operate. Users can have eyes in the water in 30 seconds.

The HD camera feed streams live video to the integrated LCD screen on the controller and can be plugged to a digital video recorder or TV-monitor if required.

For more information, visit www.planet-ocean.co.uk.

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Orange Business Services wins contract from BW Offshore
BW Offshore, a leading global provider of floating production services to the oil and gas industry, has signed a 5-year, \$12 million contract with Orange Business Services for an end-to-end satellite communication solution for its fleet of highly-specialized oil and gas production vessels. With a fleet of 14 owned Floating Production, Storage and Offloading (FPSO) vessels and one Floating Storage and Offtake (FSO) vessel, BW Offshore is the world's second largest contractor of floating production services. Orange Business Services is providing Maritime VSAT—a fully managed end-to-end satellite-based communication solution—that fully integrates BW Offshore's 14 vessels and two land-based locations into the Orange MPLS network. This solution offers BW Offshore personnel access to the exact same business applications, communication and entertainment services at sea as on land, no matter where the vessel is located. In addition, BW Offshore has agreed to invest in Session Internet Protocol (SIP) trunking—the use of voice over IP to facilitate the connection of a private branch exchange (PBX) to the Internet—to enable the implementation of unified communications for its 2,000 employees regardless of their location. From an administration point of view, the solution is in many ways pioneering. For years, BW Offshore had multiple VSAT providers with different contracts, quality of service and SLAs. The communication solution from Orange Business Services connects the floating and land-based personnel seamlessly in an end-to-end network with the same high performance, quality of service and security.

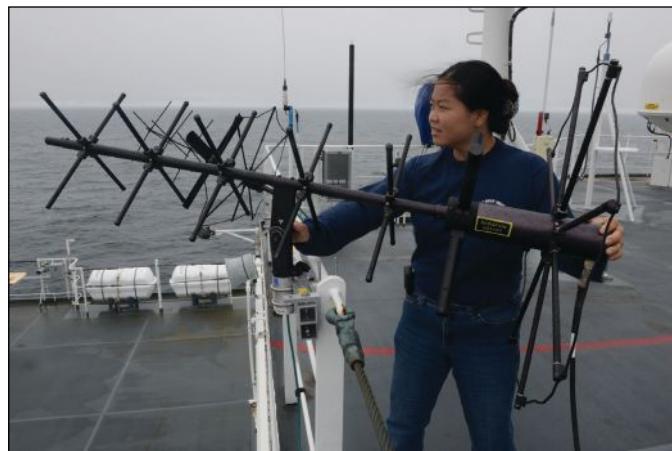
Northrop Grumman wins U.S. Navy CANES contract

The U.S. Navy has selected Northrop Grumman Corporation as one of five contractors for the Consolidated Afloat Networks and Enterprise Services (CANES) full deployment production contract to upgrade cybersecurity, command and control, communications and intelligence (C4I) systems across the fleet. The indefinite delivery, indefinite quantity multiple award contract has a potential value of \$2.5 billion over 8 years. The CANES program eliminates many legacy, standalone networks and provides a common computing environment for dozens of C4I applications. This strengthens the network infrastructure, improves security, reduces existing hardware footprint and decreases total ownership costs. The CANES effort enhances operational effectiveness and quality of life for deployed sailors. Northrop Grumman uses the Modular Open Systems Approach-Competitive TM process for its CANES solution to achieve the lifecycle benefits of open-systems architecture and commercial off-the-shelf components and software. The strategic business and engineering process ensures vendor-neutral, enduring solutions that improve interoperability and lower the total cost of ownership. The Navy selected Northrop Grumman for the design and development and limited deployment phase of CANES in early 2012.

RigNet renews contract with a major global offshore drilling contractor

RigNet, Inc. has signed a renewal contract to serve a major global offshore drilling contractor, on an ultra-deepwater semi-submersible drilling rig operating in the Barents Sea. RigNet has successfully upgraded the VSAT bandwidth for the rig to 8 Mbps full duplex for operations in the Barents Sea close to 74° north latitude. RigNet has demonstrated the capability to provide cost efficient, high quality VSAT solutions with high uptime in the Barents Sea for several years. A high-performance and secure network is a high priority for the oil and gas community, ensuring effective and reliable communications, both offshore and onshore, and access to business-critical IT applications. Through this contract, RigNet is delivering a fully-managed end-to-end IP network solution using VSAT technology for last-mile connectivity. RigNet's fully managed network solutions ensure that the rig derives greater value from network services through increased standardization and innovation. The solution includes VoIP, enterprise data and Internet access services supported by 24/7 network monitoring and support from RigNet's Network Operations Center and, if required, local field technician support, with backhaul to the company's offices via MPLS connection.

MUOS tested on Coast Guard cutter during Arctic Shield 2014



From studying the effects of solar activity to improve radio transmissions to enhancing the capabilities of Automated Identification Systems, the importance of having a reliable communications infrastructure in the Arctic has not been lost on researchers traveling aboard the Coast Guard Cutter Healy as part of Arctic Shield 2014. The ability to quickly send and receive a clear message to prevent or respond to a maritime emergency is vital to the safety of crews transiting the Arctic.

The Mobile User Objective System (MUOS) is the U.S. Navy's next generation narrowband military satellite communications system that will replace the legacy Ultra High Frequency Follow-On (UHF-FO) communications system before that system reaches its end of service life. Engineers from Lockheed Martin Space Systems, the creators of MUOS, are aboard the Healy to test the system's capabilities in the Arctic for the Department of Defense.

"A single MUOS satellite will provide four times the capacity of the entire legacy UFO constellation of eight satellites," said Dr. Amy Sun, narrowband advanced program lead for Lockheed Martin traveling aboard the Healy. "The MUOS constellation is designed to provide smartphone-like communications to mobile forces at rates 10 times faster than the legacy system."

MUOS delivers secure voice and data transmissions to mobile users using an advanced waveform similar to commercial cellphone technology. The MUOS waveform leverages the widely used commercial Wideband Code Division Multiple Access cellphone technology and allows different radios to communicate with the greater MUOS system as well as other network users. Unlike the UFO satellite constellation, the MUOS system allows routing to and from any radio terminal in the system regardless of which satellites are in view.

"This means users could traverse the globe using one radio, without needing to switch out because of different coverage areas," Sun explained. "This goes far in increasing the value that MUOS provides mobile users, not just in traditional theaters of operation, but those at the furthest extents of the planet."

Sponsored by NORAD/NORTHCOM, tests aboard the Healy will begin at latitude 65° north and travel as far north as possible. Another team situated at 82.5° north in Canada will provide Sun and her colleagues an opportunity to evaluate MUOS at the edge of its coverage and gain experience as the satellite rises and falls from view.

MARITIME COMMUNICATIONS

The additional coverage provided by MUOS comes at a time when a need for dependable Arctic communications is growing. If successful, the system could provide the Coast Guard and its partners with one more valuable tool for providing safety and security to those under their watch.

For more information, visit www.dvidshub.net.

ITC Global selected by Harkand for its fleet of offshore vessels

ITC Global has been awarded a 3 year contract from Harkand, a global provider of offshore support vessels and subsea services to the oil & gas industry. The new satellite network provides high-performance broadband connectivity for mission critical voice, video and data applications on vessels operating in the Gulf of Mexico, the North Sea, Africa and Asia Pacific. ITC Global built a private end-to-end satellite-based network, tailored to the unique applications of Harkand, which include real-time video support for undersea ROVs, as well as crew communications.



The satellite network provides connectivity to several Harkand vessels, including the Swordfish, Viking Poseidon, and

Spearfish. These vessels perform a wide variety of missions including acting as bases for advanced ROVs, high specification surveys, providing manned saturation diving capabilities, and installation and repair of jumpers, umbilicals and other deep-sea infrastructure.

Harkand is known for its expertise in complex subsea operations and using class-leading technology to deliver superior results. The Spearfish, for example, is part of a record-breaking project, setting the deepest riser-less well intervention system at a water depth of 2,058 m. And the Viking Poseidon is currently working on the Hess Tubular Bells field performing an installation and field commissioning project in 1,300 m+ water depth. Harkand is focused on setting new standards for operational efficiency with their multi-purpose support vessels, and the new satellite network provides enhanced communications capability that supports that objective.

For more information, visit www.itcglobal.com.

Qnective to build maritime communications network in Oman

Through its local partner Al-Madakhel Investment LLC, Qnective Middle East has been tasked with the design, construction and operation of a new maritime communications network. A close strategic partner, Frequentis, will be responsible for implementing the technical infrastructure. For the Swiss-based Qnective and its Middle Eastern subsidiary as well as its partner, Frequentis, a communications project of this scale is a significant milestone in the companies' growth.

The Sultanate of Oman will be furnished with a state-of-the-art maritime communications network along its coastal shore. Built upon the global maritime distress and safety system (GMDSS) standard, local authorities will obtain additional important data regarding the identity, the freight and itinerary of all the vessels in the waters surrounding Oman.

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Surrounded by the Arabian Sea and the Gulf of Oman, the Sultanate is at a strategically important and highly sensitive geopolitical location. There are roughly 15,000 active fishing boats generating a significant amount of domestic traffic. They will benefit directly from the new network, together with the constant import/export traffic through the Strait of Hormuz. This first class network is consistent with the new world class port facilities in Oman.

The First Class A-License for the building and operation of the GMDSS system was awarded to Qnective's partner company Al-Madakhel for the next 15 years, and Qnective will be the sole operator throughout this period. The Swiss parent company Qnective is a specialist in the design and operation of secure communications networks and is developing its own software made in Switzerland. Clients like government organizations, militaries and companies are already using Qnective's encrypted software in order to exchange voice and data over mobile networks without having to worry that malicious third parties may be trying to intercept them.

For more information, visit www.qnective.com.

DARPA releases RFI for networked maritime operations

The Defense Advanced Research Project Agency (DARPA) Strategic Technology Office (STO) released a Request for Information (RFI) focusing on novel technologies that could be applied to networked maritime operations.

DARPA STO said in the RFI that it is considering the development of architectures, infrastructure and technology components to support affordable, adaptive and persistent maritime operations in contested environments. The goal is to maintain and enhance U.S. maritime superiority using distributed and disaggregated systems as force multipliers for scarce capital assets, or that may provide unique stand-alone capability. The system-of-systems architecture is designed to provide the capability to rapidly adapt to new threats or new missions without the long development cycles typical of current systems. The ability to rapidly and cost-effectively adapt to new missions and new threats is central to successful operations in an era of globally proliferated technology. Capacity enhancement through affordability and networked synergies will ensure the ability of the United States to maintain superiority in contested environments.

DARPA/STO released the RFI because it is interested in information that can be used to assess the viability and timeliness of this type of network maritime operation, especially novel system-of-systems architectures that provide an alternative realization of networked operations at sea.

DARPA/STO intends to use the results of this RFI to inform a decision of whether to pursue networked maritime operations in support of DARPA/STO goals and objectives.

For more information, visit www.darpa.mil.

Rome Research Corporation awarded U.S. Navy contract

PAR Technology Corporation announced that its subsidiary, Rome Research Corporation (RRC), was awarded a 5-year (1 base plus 4 options) firm-fixed-price contract with a potential total value of \$23.5 million. The U.S. Navy contract provides support to operate and maintain the Navy Satellite Communications Facility (NAVSAT-COMMFAC) Northwest, located in Chesapeake Virginia and a component activity of the Naval Computer and Telecommunications Area Master Station Atlantic (NCTAMS LANT) Norfolk, Virginia. This contract represents continuing work for the Company.

NAVSATCOMMFC Northwest is a premier information gateway supporting the Defense Information Systems Agency (DISA) Global Information Grid (GIG), and is one of seven Department of Defense Teleport facilities worldwide providing both satellite and terrestrial connectivity for voice, video, and data to ships, submarines, aircraft and ground forces operating worldwide in support of Naval and Joint Forces Missions. RRC, a leading provider of O&M Teleport services to the DoD, has operated the Northwest site since 2001.

Under the contract, RRC will provide 24/7/365 operation and maintenance of 27 satellite terminals operating in both the military and civilian satellite communication frequency bands. Specific program support includes the Defense Satellite Communications System (DSCS), Teleport Program Office (TPO), Mobile User Objective System (MUOS) and other voice, data and video programs. Specific frequency bands supported include the commercial C and Ku, military UHF, X, Ka and EHF spectrums.

For more information, visit www.pargovernment.com.

Globalstar releases world's smallest satellite data hotspot

Marine customers will benefit from the ease of use and the ability to affordably use data from beyond cellular with Globalstar, Inc.'s newest data solution, the Globalstar 9600™. With the 9600, Globalstar customers can now use a convenient app to seamlessly pair their existing satellite phone and smartphone to send and receive email over the world's most modern satellite network. This affordable data hotspot is ideal for remote workforces to communicate via email, send status reports, download local weather and send pictures.

With an MSRP of \$149.99, the 9600 is designed to work with the following Globalstar products: GSP-1700 and GSP 1600 mobile satellite phones, as well as the GSP-2900 fixed phone system. Up to eight users with Wi-Fi enabled devices can remain connected to the router. To maximize efficiency, their devices can then seamlessly access the Globalstar network to send and receive email and make updates to social media.

For more information, visit www.globalstar.com.

MTN grows customer base

MTN Communications has expanded its communications and content business through maritime operators in Europe. As a result, the company has increased its Southampton, UK office staff and space. The MTN Southampton office is one of seven around the world and houses sales, project management, technical and logistics professionals.

MTN attributes growth in Europe to its ongoing transformation of communications on the world's waterways to make it more akin to a land-like experience. Recent contract wins include the following brands that look to MTN for these innovative services for passengers, offshore employees and crew:

- Fred.Olsen Cruise Lines – an extension of a four-year relationship with this U.K.-based operator including enhanced onboard crew voice and connectivity options, as well as MTN Worldwide TV (MTN TV).

- P&O Ferries – Europe's leading and largest ferry company has selected MTN as its provider for onboard communications for its fleet. This new partnership will serve 11 vessels transporting approximately eight million passengers annually.

- Silversea Cruises – a substantial increase in broadband connectivity for this Italian-owned cruise operator includes satellite and Wi-Fi infrastruc-

ture upgrades, and broader entertainment, data and voice services.

- Technip – an expansion of communications services to vessels in its fleet globally, this leader in project management, engineering and construction for the energy industry is doubling its number of MTN-serviced vessels.

- TUI Cruises – an extension to MTN's existing relationship with this German-based joint venture with Royal Caribbean and TUI AG to provide communications and content onboard its two new builds.

MTN brings a history of pioneering several industry firsts, including an inaugural live video broadcast at sea for the U.S. Government, the first Internet café on a cruise ship and an unmatched live, worldwide maritime television service. In addition, MTN launched the industry's first hybrid satellite and terrestrial maritime broadband communications network as part of an ecosystem of advanced computing and caching solutions.

For more information, visit www.mtnsat.com.

New cruise ship offers latest in Internet access

Tech-savvy modern travelers will be wowed by Royal Caribbean International's newest ship, Quantum of the Seas, which incorporates unprecedented levels of technology to amp up the vacation experience.

"Cruise vacations have a romantic past – but they also have a lively, adventurous, state-of-the-art future," said Richard D. Fain, chairman and CEO, Royal Caribbean Cruises Ltd. "We were determined to take the best advances in modern technology, turn them into shipboard WOWs, and take the frustration out of the vacation. This ship's combination of ease and flexibility would make a yoga instructor proud."

Boatloads of bandwidth keep guests connected; easy-to-use systems expand guest choices and simplify schedules; and RFID technology speeds the boarding process and allows guests to keep track of their luggage every step of the way.

Quantum of the Seas will operate with unprecedented bandwidth using satellites launched by tech partner O3b Networks. With speeds that match fast broadband connections onshore, guests can be online 24/7, no matter what personal device they bring onboard. Guests can watch streaming video, check email, share images on social media and enjoy face-to-face video conversations – even in the middle of the ocean.

"Even when they are getting away from it all on vacation, people want to be

able to connect," said Lisa Lutoff-Perlo, Executive Vice President, Operations, Royal Caribbean International. "Our satellite network will make things possible at sea that could never have been done before, and will make all the difference in the way guests share their Royal Caribbean experience."

In addition, Quantum's connectivity makes it possible for one of the SeaPods in SeaPlex to become a live global video gaming suite where guests can enjoy Xbox Live and compete with other gamers worldwide.

For more information, visit www.royalcaribbean.com.

KVH offers unprecedented World Cup coverage

KVH Industries, Inc., achieved a maritime first by delivering the entire World Cup Final to more than 1,000 seafarers via the IP-MobileCast content delivery service while the match was still in progress. The coverage of the final match followed a month in which video highlights of all World Cup matches were delivered via multicasting technology as part of KVH's IP-MobileCastSPORTSlink service.

The coverage provided a morale boost for crewmembers worldwide, many of whom are keen football fans. The crew members of the BW Prince, for example, a tanker transiting the Atlantic Ocean at the time of the football series last month, gathered daily to watch the international sports event.

On the Iver Experience, a chemical tanker managed by Vroon, Captain Ernst Spier conveyed the entire crew's gratitude for making "the impossible possible by providing this excellent service for watching highlights of the soccer matches of the world championship while sailing in the middle of the Pacific Ocean. It is really a huge step forward in feeling more connected to your family and friends at home and a true and new sensation of not feeling alone and disconnected from the rest of the world while sailing on the far side of the world."

For the World Cup Final, KVH engineers and technicians on two continents guided the transmission of the game, which was multicast to onboard media servers, where it was available for viewing during the match. "This was an incredible engineering achievement, with 4 GB of game data multicast to vessels around the world including far out to sea, with no issues in the transmission. Mariners have never had this kind of coverage on their vessels," said Martin Kits van Heyningen, KVH's chief executive officer.

The World Cup coverage was a special event from the IP-MobileCastSPORTSlink channel, which provides sports coverage from around the world and is available by subscription as part of the IP-MobileCast news and entertainment content offerings for mariners. KVH launched the IP-MobileCast content delivery service in May; the service offers a wide range of commercially licensed content in addition to SPORTSlink, including: NEWSlink, which provides digital print and TV news daily from around the world; MOVIElink and TVlink, which provide new-release Hollywood and international movies and television programs; and MUSIClink, which provides a variety of music channels onboard.

In addition to the multicasting delivery of the entire World Cup Final and highlights of all World Cup matches, KVH also provided mariners worldwide with thorough coverage of the entire series via NEWSlink's "World Cup 2014" news bulletins, which were emailed daily to vessels subscribing to the NEWSlink digital newspaper service for mariners. "Our World Cup English-language Special Edition was produced every day for 32 consecutive days and broke all records in terms of numbers of subscribers," said Kate Hart, KVH Media Group's editor in chief. "A special team of editors stayed up until after midnight every day to cover the event and ensure the special edition was in vessels' inboxes promptly."

KVH's IP-MobileCast content delivery service is available to all vessels using KVH's mini-VSAT Broadband service, which provides satellite Internet and phone services to commercial ships, government vessels, and pleasure yachts around the world. A leading global consulting firm recently reported that KVH's mini-VSAT Broadband service is the market share leader in maritime VSAT. The mini-VSAT Broadband network uses a combination of 19 Ku-band transponders and 3 C-band beams to provide total global coverage. KVH's line of antenna systems designed exclusively for mini-VSAT Broadband service includes: the TracPhone V11-IP, a 1.1 meter diameter, dual-mode C/Ku-band antenna for global VSAT connectivity; the TracPhone V7-IP, a 60 cm diameter enterprise-grade antenna for Ku-band service worldwide; and the TracPhone V3-IP, a 37 cm diameter Ku-band antenna that is the world's most compact maritime VSAT antenna.

For more information, visit www.kvh.com.

Global consortium to build SEA-US, connecting Indonesia, the Philippines, and the U.S.

A consortium of seven global telecommunications companies agreed to cooperate in the construction and operation of a new submarine cable system that directly connects Southeast Asia and the United States with NEC Corporation as the system supplier. The Southeast Asia-United States "SEA-US" consortium consists of PT. Telekomunikasi Indonesia International (Telin), Globe Telecom, RAM Telecom International (RTI), Hawaiian Telcom, Teleguam Holdings (GTA), GTI Corporation (a member of the Globe Telecom group of companies), and Telkom USA. The SEA-US submarine cable system links the five areas and territories of Manado (Indonesia), Davao (Philippines), Piti (Guam), Oahu (Hawaii, United States) and Los Angeles (California, United States). The system will be approximately 15,000 km in length, avoiding earthquake prone areas in East Asia, and thereby helping to ensure stable connectivity. When completed in the fourth quarter of 2016 at an approximate cost of US \$250 million, the cable system will provide an additional 20 Tb/s capacity, connecting Indonesia and the Philippines to the U.S. with state-of-the-art 100 G technology. This capacity will cater to the exponential growth of bandwidth demand between both continents.

Hibernia, SubCom commence Hibernia Express

TE SubCom announced the commencement of the new Hibernia Express submarine cable system. The 4,600 km cable will provide the lowest-latency fiber-optic path between New York and London, connecting Halifax, Nova Scotia, and Brean, UK, with terrestrial fiber to extend connectivity to the major metro areas. Hibernia Express will initially launch with 100 Gbps transmission capacity using TE SubCom's C100 SLTE platform. It will be a 6-fiber-pair submarine cable, with a portion of the fibers optimized for lowest latency and a portion optimized for 100x100 Gbps design capacity. The total cross-sectional design capacity of the cable will be over 53 Tbps. "Having a unique, low latency route combined with increased capacity allows Hibernia Express to offer unmatched services to transatlantic connectivity customers," said Bjarni Thorvardarson of Hibernia Networks. "As a pillar of the submarine cable industry, we are confident that TE SubCom will deliver a highly advanced cable system and world-class implementation. We're thrilled to have reached this critical point in the deployment of Hibernia Express."

Prysmian awarded contract for Cyclades project

Prysmian Group has been awarded a new contract worth approximately 95 million euro by IPTO (Independent Power Transmission Operator), the transmission system operator of the Greek electricity system, for the interconnection between the island of Syros (one of the Greek Cyclades Islands) and the mainland power transmission system in Lavrion, Greece. The project involves the design, supply and installation of a turn-key High Voltage Alternating Current (HVAC) cable system designed to transmit a power of 200 MVA and consisting of 150 KV extruded cables and associated fiber optic cable system along a total route of more than 110 km (108 km submarine and 2 km land) for the interconnection between the two landfalls that will enable integration of Syros into the Greek network system and future expansion to the other Cyclades Islands (Paros, Mykonos, Tinos). The submarine cables for the Lavrion-Syros link will be manufactured in the Arco Felice plant (Naples), the Group's center of technological and manufacturing excellence. Production of both submarine and land cables will be during 2015. Cable installation and protection will be completed within 22 months in 2016. Prysmian has a long-standing track record in the development of submarine interconnection milestone projects in the entire Mediterranean region, such as Italy-Greece, Sardinia-Italian Peninsula (SA.PE.I.), two interconnections between Spain and Morocco, two projects in the Balearic Islands (Spanish Mainland to Majorca and Ibiza to Majorca) and the Dardanelles in Turkey. The Group is also a founding member of the industrial partnership Medgrid, launched to study the feasibility of a high-voltage direct current interconnection project to transmit electricity from solar or wind power plants to load centers on either rim of the Mediterranean.

Cable relocation will deliver broadband speeds to Isles of Scilly



One of the most ambitious projects ever undertaken in the UK to bring superfast broadband to a remote community reached an important milestone in July when a major month-long operation began to divert a submarine fiber optic cable between the UK and Spain to the Isles of Scilly in a pioneering scheme to give the islanders much faster fiber broadband.

The 939-km cable between Porthcurno, Cornwall, and Santander, Spain, formerly known as Rioja, has remained unused on the seabed of the Atlantic Ocean since it was taken out of service in 2006 after 11 years of handling high-speed international communications.

The 12,184 ton cable ship Resolute cut the cable at two points in the Atlantic—about 100 km and 15 km off Lands End—and diverted a section to the Isles of Scilly. The cable was pulled ashore on the Porthcressa Beach on the main island, St Mary's. It is expected that the islanders will be able to order high-speed fiber broadband before the end of the year.

The pioneering project is part of the £132 million Superfast Cornwall initiative between the European Regional Development Fund, BT and Cornwall Council, which plans to make fiber broadband available to 95% of homes and premises on Cornwall and the Isles of Scilly by the end of 2014. The private and public sector partnership has already built a network serving 90% of Cornish premises.

Until now, the 2,200 residents of the Isles of Scilly—located 28 mi off the South West tip of Cornwall—have relied upon a broadband service provided by a radio link between Lands End and the islands. People on all five of Scilly's inhabited islands, famous for their remote Atlantic location and as an Area of Outstanding Natural Beauty and Site of Special Scientific Interest (SSSI), are expected to benefit from the latest investment.

BT described an amusing anecdote about the first attempt to run a cable from the UK mainland to the Isles of Scilly, which took place in 1869 when entrepreneurs attempted to take advantage of government plans for the Post Office to take over telegraph companies. The proposed financial arrangements were very favorable to the telegraph companies and some entrepreneurs established companies in a bid to cash in. The cable ship went off course and found itself 5 mi south of the Isles of Scilly with the cable fully extended. The cable was deliberately cut and, unknown to Scilly islanders, the cable ship steamed triumphantly into Scilly towing just a small section of the cable. Tests were then allegedly faked to make it

appear as if the cable was working correctly. The following year another cable was laid to Scilly—and this one did provide a working service.

For more information, visit www.bt.com.

Nexans awarded Carbon Trust funding for inter-array cables

Nexans is honored to be part of the Carbon Trust's Offshore Wind Accelerator (OWA) program in the UK. Within this program Nexans aims to expand the development of its new 66 kV 3-core submarine inter-array cables and accelerate their time to market. The funding allocated to Nexans, worth around €165,000, came after a competitive bidding process and will be used by the group to further develop the cable offer for commercial use in offshore wind farms by the end of 2015.

Nexans already supplies export and 33 kV inter-array cables to offshore wind developers. Preceding the industry transition towards larger offshore wind farms and more high-power turbines, Nexans has already started to develop 66 kV copper conductor inter-array cables and associated 66 kV connectors. It will complete the qualification program within a few months. As part of the agreement with the OWA, Nexans will also qualify its 66 kV dry design aluminum conductor inter-array cables in order to accelerate the commercialization of the full range of 66kV inter-array cables systems. This is part of the Group's R&D efforts to meet and anticipate customer demand for wind farm components.

The OWA was formed by the Carbon Trust with the aim of reducing the costs associated with offshore wind energy, particularly in light of the UK government's commitment to significantly increase offshore wind capacity. It has previously identified high power turbines and consequently 66 kV inter-array cables as an area where significant cost savings can be made and awarded the funding accordingly.

The higher voltage 66 kV cables allow for greater power capacity with a smaller cross section and lower current, as compared to 33 kV cables that have traditionally been used. They also offer cost savings through lower life-cycle costs and optimized intra-array cable layout.

The cables are currently being tested in Nexans' Hannover plant with results expected to be released early 2015 and products ready for commercialization later in the year.

For more information, visit www.nexans.com.

ABB announces HVDC breakthrough

ABB has announced a breakthrough in cable technology. It has successfully developed and tested a 525-kV extruded high-voltage direct current (HVDC) cable system to make renewable energy installations more efficient and cost-effective.

This latest innovation will more than double the power capacity to about 2,600 MW from 1,000 MW. It will also expand

the cable's reach to distances of 1,500 km, up from less than 1,000 km, while keeping transmission losses under 5%.

The new cable offers a 64 % increase over 320 kV, currently the highest voltage deployed for this type of technology. The 525-kV cable system can be deployed in subsea and underground applications, making it ideal for efficient power delivery through densely populated or environmentally sensitive areas or

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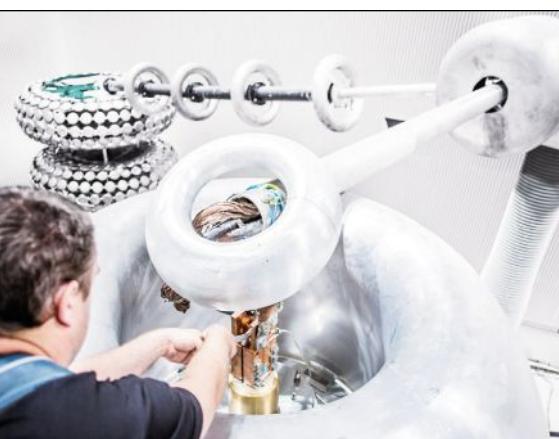
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Network development from business plan to commissioning

at Depth

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coastal and open-sea applications.

By enabling more power over greater distances with reduced losses, ABB's new 525-kV cable technology offers solutions for countries and utilities seeking to enable their electricity transmission systems to integrate more renewable energy being generated by distant solar and wind installations. A single pair of 525-kV extruded HVDC cables could for example transmit enough power from giant offshore wind farms to supply two million households.

The new technology offers savings in capital and operational expenses. It also supports the development of DC grids where ABB removed a key technology hurdle with the development of the hybrid HVDC breaker.

The innovative cable system consists of cables utilizing a new DC cross-linked polyethylene (XLPE) insulation material developed with Borealis, a recognized industry leader, as well as termination and joints manufactured by ABB.

HVDC cable links are essential components of future sustainable energy systems that will need to transmit vast amounts of electricity over long distances, often across or between countries. ABB is a global leader in high-voltage cable systems with a worldwide installed base across applications including city center infeeds, oil and gas platform power supplies, subsea interconnections and the integration of renewables. ABB has commissioned more than 25 DC cable connections and almost 100 AC cable links around the world.

For more information, visit www.abb.com.

JDR wins Dudgeon inter-array contract

JDR has won a new contract with VBMS for the Statoil/Statkraft Dudgeon offshore wind farm. Dudgeon, off the UK's Norfolk coast will utilize over 95 km of JDR's copper core inter-array cable and a range of cable accessories. The design and manufacture will take place at JDR's UK bases in Cambridgeshire and Hartlepool.

The Dudgeon offshore wind farm is located 32 km off the UK coast in North Norfolk at water depths of between 18 and 25 m. With 67 x 6 MW wind turbines, the farm is expected to create enough electricity to power more than 410,000 homes each year. JDR's inter-array cables will collect and transmit the generated power, prior to its export to mainland UK. Construction is expected to start in 2015.

The Dudgeon inter-array cables will be designed by JDR's in-house engineering team and manufactured at JDR's Hartlepool facility. The facility is alongside a deepwater dock that is ideally positioned for manufacture and loading out for European wind farm projects. The

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project will utilize two JDR designed inter-array cables; a 185 sq. mm copper conductor cable, and a 500 sq. mm copper conductor cable. Both cables will be supplied in two continuous lengths, be XLPE insulated and type tested to IEC 60502-2 and CIGRE standards.

To complete the package, JDR will supply a range of accessories including pulling grips, hang-offs, connectors, fiber optic patch panels, cable cleats, three-month abandonment kits and sub-sea repair joints.

For more information, visit www.jdrglobal.com.

PLDT, PCCW Global reach agreement on AAE-1

Philippine Long Distance Telephone Company (PLDT) has reached an agreement with PCCW Global on the Asia-Africa-Europe 1 (AAE-1) submarine fiber optic cable system, a 25,000-km network that will connect Asia, Middle East, East Africa, and Europe using 100 Gbps technology with a minimum capacity use of 10 Gbps.

The submarine cable system—which will be completed in 2016—will connect the Philippines to 17 countries: France, Greece, Egypt, Saudi Arabia, Qatar, UAE, Oman, Yemen, Djibouti, Pakistan, India, Cambodia, Thailand, Singapore, Malaysia, Vietnam, and Hong Kong.

PLDT said that the new cable system will further increase PLDT's international bandwidth capacity and raise the resiliency of its overseas links as it enhances the quality of data and internet connections for its customers.

A highly resilient international network survives man-made and natural disasters, such as undersea earthquakes, which, in some instances, cause the “isolation” of countries from the rest of the world.

PLDT has been investing in international submarine cables in the Asia-Pacific region, establishing direct connections to the U.S. mainland and covering a majority of its total international capacity. The investment in AAE-1 forms part of PLDT's capex for 2014 estimated at between P30 billion and P32 billion.

Once completed, AAE-1 will be part of PLDT's global network of 15 international cable systems, bringing its total international capacity nearly 2 Tbps.

For more information, visit www.pldt.com.

Alcatel-Lucent completes SAT-3/WASC/SAFE upgrade

SAT-3/WASC/SAFE Parties and Alcatel-Lucent have completed the fourth upgrade of the SAT-3/WASC undersea cable system, which went live during the first half of 2014. This latest upgrade has doubled the current system capacity, further positioning SAT-3/WASC as a leading submarine cable facility on the Sub-Saharan African coastline.

Operating at 40 Gbps and with full in-system protection, the system offers one of the lowest latency routes from Africa to Europe with connectivity between Europe, the West Coast of Africa, and Southern Africa with landings in South Africa, Angola, Gabon, Cameroon, Nigeria, Benin, Ghana, Cote d'Ivoire, Senegal, Spain and Portugal. The SAT-3/WASC cable system was upgraded from 420 Gbps to 920 Gbps in the northern segments, north of Ghana, and from 340 Gbps to 800 Gbps in the southern segments. Overall, this fourth upgrade enables a seven-fold increase in SAT-3/WASC's original design capacity through the use of Alcatel-Lucent's advanced coherent technology.

Furthermore, SAFE provides the shortest route and therefore lowest latency between Southern Africa and Asia with connectivity via South Africa, Mauritius, Reunion, India and Malaysia. With 16 landing points spread between Europe, Africa and Asia, the SAT-3/WASC/SAFE cables provide access to global markets and footprint, offering to customers seamless and diverse connectivity to the rest of the world.

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

ABB to provide grid connection for tidal energy project

ABB has been awarded a contract by Atlantis Resources Limited to provide the onshore grid connection for Phase I of the MeyGen tidal stream project in Scotland's Pentland Firth.

The MeyGen tidal stream project is at the forefront of world marine energy development and will harvest the tidal resources of one of the most energetic maritime sites in Europe, the strait connecting the Atlantic Ocean to the North Sea between the Orkney Islands and the Scottish mainland. (see pg 28).



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ABB is responsible for the onshore power conversion and grid connection systems to feed the electricity safely and reliably into the local distribution grid. ABB's project scope includes design, engineering, supply and commissioning of the power conversion, switchgear and transformer solution as well as associated civil engineering and cabling works. Major product supplies include transformers, medium voltage switchgear and power converters.

Studies including those by engineers from the University of Edinburgh and University of Oxford indicate the Pentland Firth's tidal stream has vast energy potential, with ocean currents estimated at 5 m/s, among the fastest in the British Isles.

The initial phase of the MeyGen development has the potential to generate up to 86 MW of electricity, enough power for around 42,000 homes, potentially catering to the needs of almost 40% of households in the Scottish Highlands.

Within the next 10 years, MeyGen intends to deploy up to 398 MW of offshore tidal stream turbines in the Pentland Firth to supply clean and

renewable electricity to the UK National Grid.

For more information, visit www.abb.com.

TIME dotCom Berhad invests in transpacific cable expansion

TIME dotcom Berhad has invested in its second transpacific submarine cable system that will connect Asia and North America in support of its global expansion initiatives.

Its investment in the FASTER cable system is the Group's second submarine cable project in partnership with Google and other investors, and builds on the strength and success of its previous investment in the Unity Cable System.

"When we first invested in Unity in February 2008, I didn't think we'd so quickly be in the position where the demand would so steeply outstrip supply," said TIME's chief executive officer, Afzal Abdul Rahim.

FASTER is also expected to extend the Group's intra-Asia capacity when the Asia Pacific Gateway (APG) cable system, in which it owns a stake, is completed. The APG will link the high-growth ASEAN region to Japan and

beyond, to the United States.

TIME's participation in the FASTER cable system comes just 4 months after it announced that it had joined a consortium to construct and maintain the Asia-Africa-Europe-1 (AAE-1) submarine cable system, a high-capacity cable system linking Asia and Europe via the Middle East.

Together with five well-established global service providers, TIME, through its wholly owned Global Transit 2 Limited (GT2L) subsidiary, will construct and maintain FASTER, an approximately 9,000 km-long cable system linking Japan and North America.

FASTER will feature an initial design capacity of 60 Tbps and the Group's investment will see it secure one dedicated fiber pair capable of carrying 10 Tbps of capacity with the current 100 Gbps technology.

TIME is joined by China Mobiles International, China Telecom Global, Google, KDDI and SingTel as partners in FASTER. The FASTER cable system is targeted for completion in the second quarter of 2016.

For more information, visit www.time.com.my.

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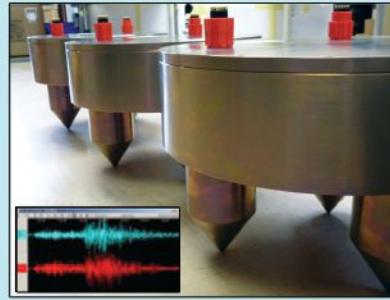


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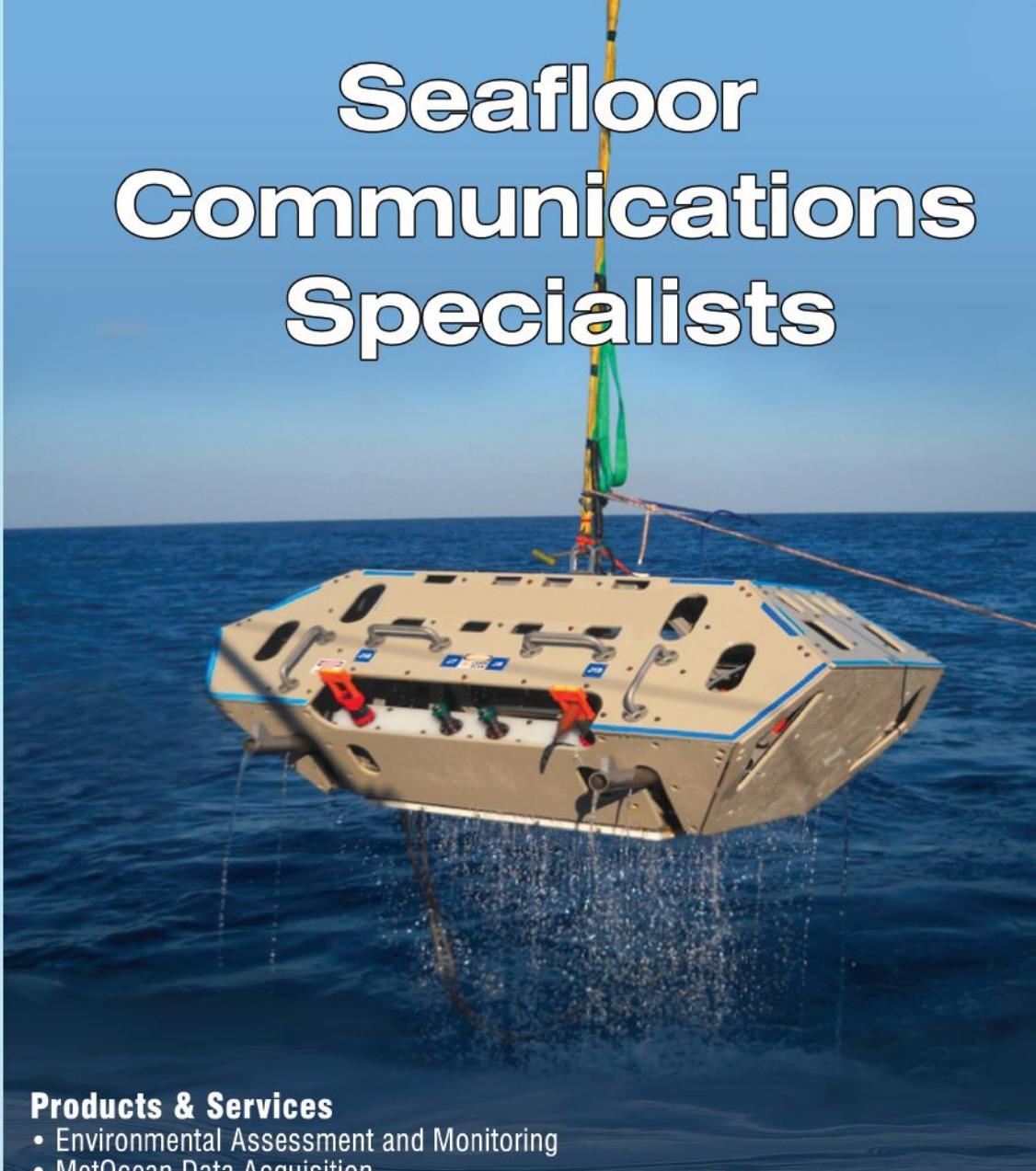
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CSnet offers end-to-end solutions providing global users a pre-engineered, expandable, portable system that can be deployed and redeployed anywhere – in water depths up to 3,000 meters. Meeting the needs for a wide range of spatial, power or bandwidth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

Offshore Communications Backbone

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



Tekmar selected as Dudgeon CPS supplier

Tekmar Energy has been awarded a multi-million pound project with Statoil and Statkraft on the Dudgeon Offshore Wind Farm for the supply of its patented technology TekLink®.

As part of the cable contract, VSMC will be procuring the TekLink® Mechanical Latch Cable Protection System that will be installed for the protection of the subsea power cables into the J-tubeless monopole foundations. Additionally, Tekmar's bespoke polyurethane bellmouths will be used on the offshore substation foundation, protecting the interface of platform and export cables.

This marks some significant milestones for Tekmar as this is the 15th project to be working closely with installation contractor VSMC following the recent joint success both parties have experienced in Germany on Meerwind and on-going installation with Butendiek. This also marks the 30th offshore wind project Tekmar Energy has been awarded and follows the recent announcements of Cape Wind in the USA and Luchterduinen in the Netherlands.

The project supports Tekmar with its ongoing expansion and investment plans such as the new 75,000 sq. ft production unit in Newton Aycliffe, North East of England.

The Dudgeon Offshore Wind Farm will be located in water that is between 18 to 25 m deep on a 35 sq. km site located 32 km off the coast of the seaside town of Cromer in North Norfolk.

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

JDR wins contract for Nordsee One

JDR has signed a contract with Siem Offshore Contractors GmbH for the Nordsee One offshore wind farm as currently being developed by RWE Innogy GmbH and forming part of Germany's largest offshore wind farm cluster. JDR will provide over 70 km of aluminum core inter-array cable, cable accessories and post-delivery offshore services. The Nordsee One Offshore Wind Farm will be located some 40 km north of the German Juist island and will be set in a water depth of up to 34 m.

The Nordsee One Offshore Wind Farm will have 54 wind turbines. The

project will utilize two JDR designed inter-array cables: a 240 sq. mm aluminum conductor cable and an 800 sq. mm aluminum conductor cable. Both cables will be XLPE insulated and type tested to IEC 60502-2 and CIGRE standards. The cables will be designed by JDR's in-house engineering team and manufactured at JDR's Hartlepool facility. This specialist facility is alongside a deepwater dock, ideally positioned for load-outs for European offshore wind farm projects.

Alongside the inter-array cables, JDR will supply a range of accessories including cable pulling grips and hang-offs, cable cleats, power core termination connectors and fiber optic splice boxes. To complete the project, JDR's Global Services will provide field service teams to install the hang-off as well as to route, terminate and test each inter-array cable. JDR's experience in offshore wind field support is backed by a knowledge base of JDR work commissioning subsea power cables for oil and gas projects.

For more information, visit www.jdrglobal.com.

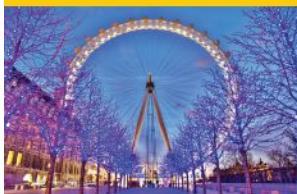
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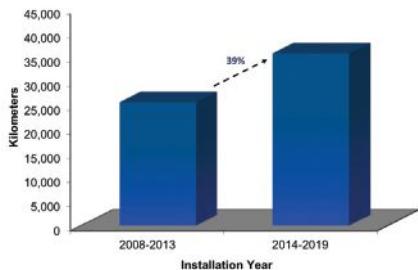
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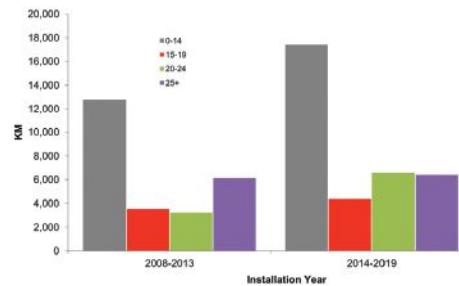
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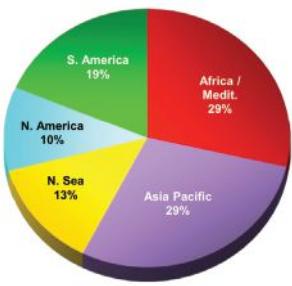
Worldwide Pipeline Demand Growth
2008 – 2013 vs. 2014 – 2019



Worldwide Pipeline Demand Growth
2008 – 2013 vs. 2014 – 2019

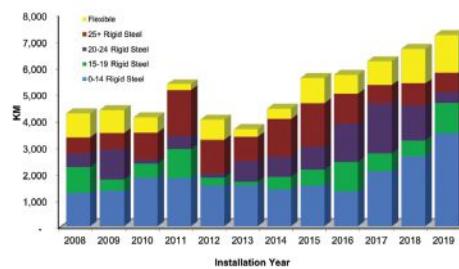


Worldwide Pipeline Demand by Region
2014 – 2019 Installations (35,760 km)

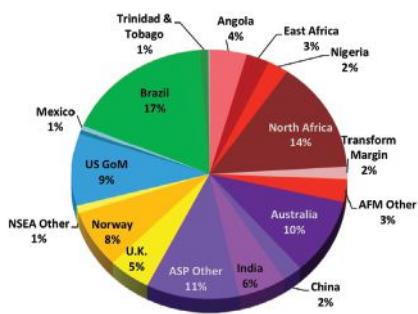


Worldwide Pipeline Demand
2008 – 2019

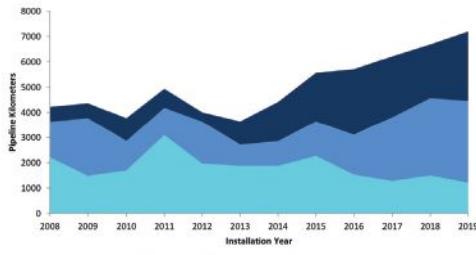
World pipeline demand will continue its growth trend into the foreseeable future buoyed by the development of large projects such as those in the Breton Pre-Salt and investments in export infrastructure in select regions such as Australia, Norway and the Gulf of Mexico. 2014 installations see a significant increase in the 25+ category with the planned installation of large exports for projects such as Wheatstone, Ichthys and the South Stream Pipeline.



Worldwide Pipeline Demand
2014 – 2019 by Province (35,760 km)



Global Project Water Depth Installation Analysis
2008 – 2019e



Note: Water Depth According to Stated Water Depth at the Project Level. See Slide 79 for Further Explanation

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Monthly Stock Figures & Composite Index

Industry Company Name	Symbol	Close(Mid) September	Close(Mid) August	Change	Change %	High	Low
52 week							
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	67.75	67.05	0.70	1.0%	75.64	48.37
Cameron Intl. Corp.	CAM	71.19	72.49	-1.30	-1.8%	74.89	52.50
Drill-Quip, Inc.	DRQ	92.73	99.85	-7.12	-7.1%	121.07	92.25
Halliburton Company	HAL	66.76	68.23	-1.47	-2.2%	74.33	47.46
Tenaris SA	TS	46.90	42.82	4.08	9.5%	49.87	40.63
Newpark Resources, Inc.	NR	12.80	12.49	0.31	2.5%	13.64	10.43
Schlumberger Ltd.	SLB	104.70	105.34	-0.64	-0.6%	118.76	84.91
Superior Energy Services, Inc.	SPN	34.25	34.08	0.17	0.5%	37.05	22.85
Weatherford International, Inc.	WFT	22.59	21.27	1.32	6.2%	24.88	13.07
Deep Down, Inc.	DPDW	1.47	1.60	(0.13)	-8.1%	2.70	1.42
FMC Technologies	FTI	56.12	59.83	(3.71)	-6.2%	63.92	47.58
Total Diversified, Production, Support and Equipment.....		577.26	585.05	-7.79	-1.3%	656.75	461.47
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	22.35	23.16	-0.81	-3.5%	37.56	21.52
Mitcham Industries, Inc.	MIND	11.35	13.47	-2.12	-15.7%	17.87	10.20
Compagnie Gnrale de Gophysique-Veritas	CGV	10.21	9.03	1.18	4.50%	25.78	8.38
Total Geophysical / Reservoir Management.....		43.91	45.66	-1.75	-3.8%	81.21	40.10
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	44.12	48.51	-4.39	-9.0%	58.46	43.01
Diamond Offshore Drilling, Inc.	DO	38.42	43.92	-5.50	-12.5%	65.62	38.38
ENSCO International, Inc.	ESV	45.25	48.25	-3.00	-6.2%	62.25	45.23
Nabors Industries, Inc.	NBR	24.40	25.90	-1.50	-5.8%	30.24	15.32
Noble Drilling Corp.	NE	26.94	26.94	0.00	0.0%	35.54	25.06
Parker Drilling Company	PKD	5.62	6.26	-0.64	-10.2%	8.67	5.60
Rowan Companies, Inc.	RDC	27.59	29.13	-1.54	-5.3%	38.38	27.57
Transocean Offshore, Inc.	RIG	35.08	38.73	-3.65	-9.4%	55.74	34.91
Total Offshore Drilling.....		247.42	267.64	-20.22	-7.6%	354.90	235.08
Offshore Contractors, Services, and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	25.52	25.56	-0.04	-0.2%	28.00	19.44
Gulf Island Fabrication	GIFI	19.8	19.5	0.30	1.5%	26.82	18.06
McDermott International, Inc.	MDR	6.44	7.48	-1.04	-13.9%	9.36	6.26
Oceaneering International	OII	65.61	67.28	-1.67	-2.5%	87.64	64.82
Subsea 7 SA	SUBCY.PK	14.52	16.91	-2.39	-14.1%	22.32	14.22
Technip ADS	TKPPY.PK	21.33	23.04	-1.71	-7.4%	31.32	21.08
Tetra Technologies, Inc.	TTI	11.68	11.27	0.41	3.6%	13.43	9.25
Cal Dive International, Inc.	DVR	0.91	0.78	0.13	16.7%	2.10	0.68
Total Offshore Contractors, Service, and Support.....		165.81	171.82	-6.01	-3.5%	220.99	153.81
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	78.50	80.80	-2.30	-2.8%	99.00	75.25
Gulfmark Offshore, Inc.	GLF	36.61	39.76	-3.15	-7.9%	53.89	36.44
Bristow Group	BRS	71.05	70.49	0.56	0.8%	85.70	64.10
PHI, Inc.	PHII	42.85	38.38	4.47	11.6%	52.98	33.50
Tidewater, Inc.	TDW	46.08	49.40	-3.32	-6.7%	63.22	45.51
Trico Marine Services, Inc.	TRMAQ.PK	13.42	12.75	0.67	5.3%	10.39	13.73
Hornbeck Offshore	HOS	39.44	43.18	-3.74	-8.7%	59.93	37.44
Total Offshore Transportation and Boat		327.95	334.76	-6.81	-2.0%	425.11	305.97

Monthly Stock Figures & Composite Index

Industry	Close(Mid) September	Close(Mid) August	Change August	Change % Aug	High 52 week	Low
Diversified, Production Support & Equipment Companies						
Total Diversified, Production, Support and Equipment	577.26	585.05	-7.79	-1.3%	656.75	461.47
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Total Offshore Transportation and Boat	327.95	334.76	-6.81	-2.0%	425.11	305.97
Total Offshore Source Index	1,362.35	1,404.93	-42.58	-3.0%	1,738.96	1,196.43

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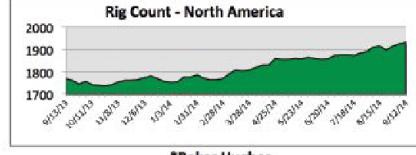
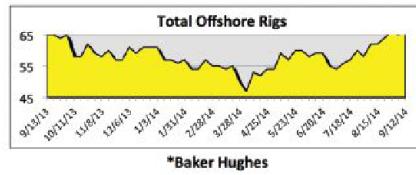
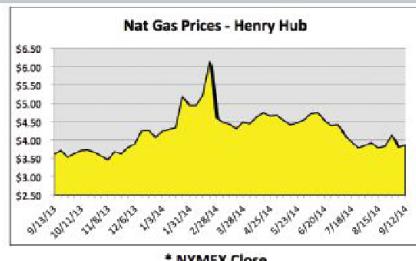
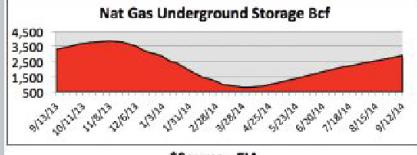
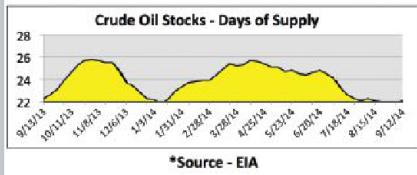
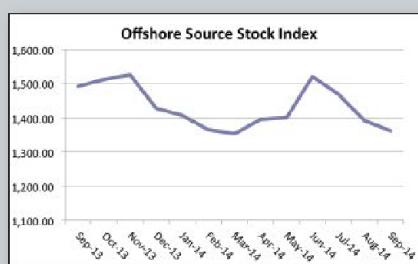
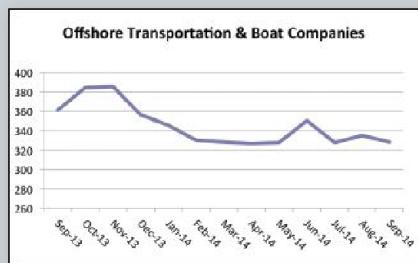
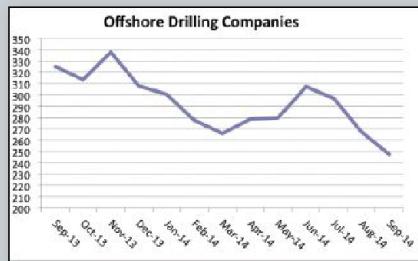
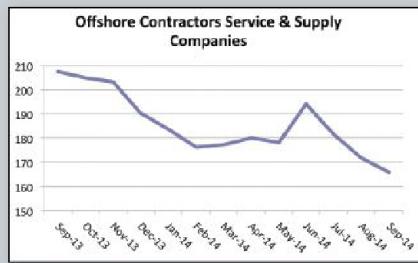
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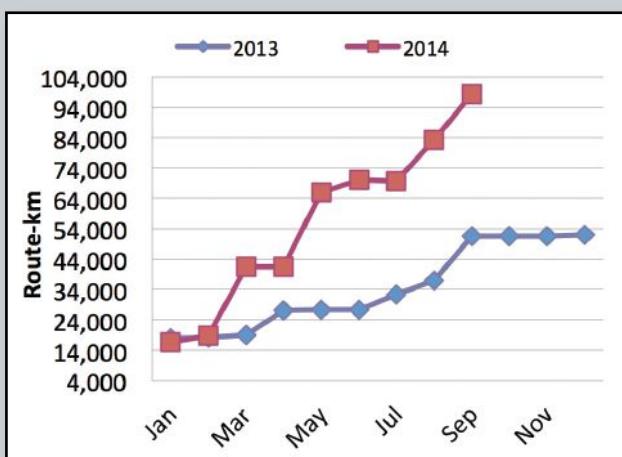
Monitoring the Pulse of the U.S. Offshore Oil & Gas Industry



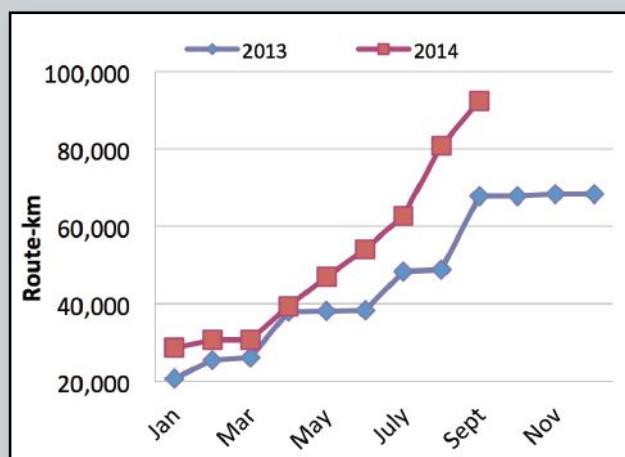
Positive trend, at least 3 weeks
Changing trend, less than 3 weeks
Negative trend, at least 3 weeks

Subsea Telecom & Power Cable Data

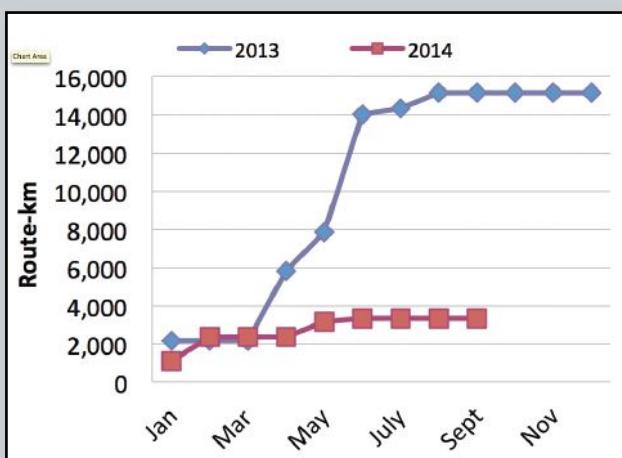
FO Cable Awards by Month



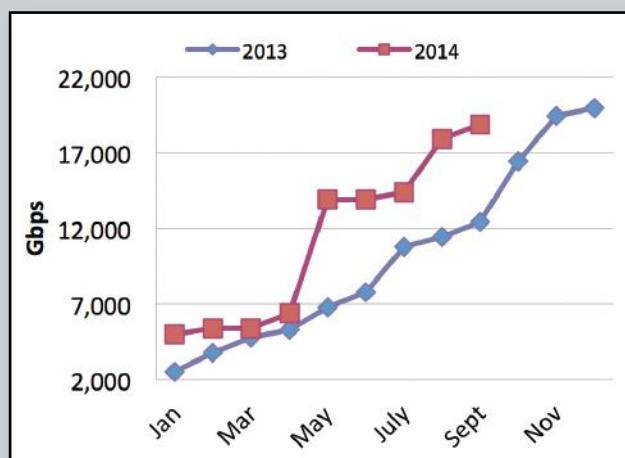
FO Cable Announcements



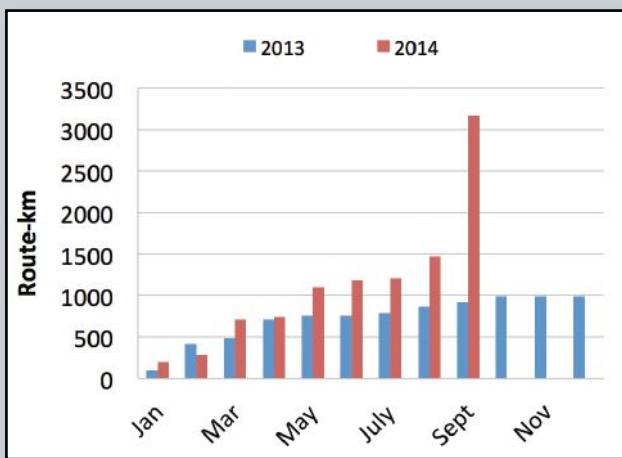
Submarine FO Cables Entering Service in Route-km



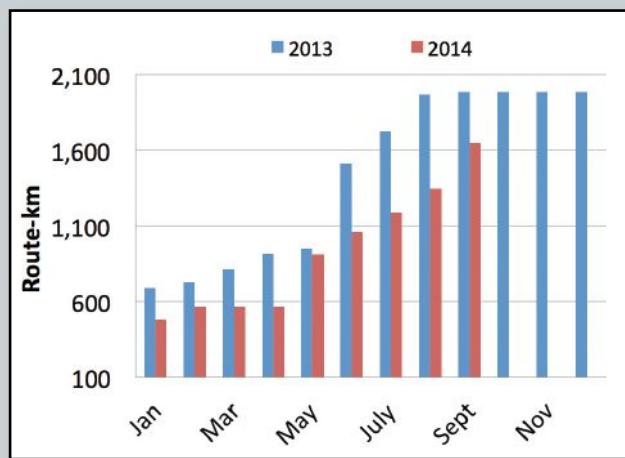
Upgrades of Existing Cable Systems in Gbps



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	9,560
Anadarko Petroleum Corp.	LL	5	G23450	CAL-DIVE Q-4000	Atlas-atlas nw	8,807
Anadarko Petroleum Corp.	DC	621	G23529	HARKAND SPEARFISH	Spiderman	8,087
Shell Offshore Inc.	AC	857	G17561	H&P 205	Great White	7,824
Shell Offshore Inc.	DC	398	G25854	NOBLE GLOBETROTTER	Vicksburg/Gettysburg	7,579
ExxonMobil Corp.	WR	584	G20351	MAERSK VIKING	Julia	7,138
Anadarko Petroleum Corp.	KC	875	G21447	NOBLE BOB DOUGLAS	Lucius	6,840
Chevron USA Inc.	KC	785	G25806	PACIFIC SHARAV		6,827
Anadarko Petroleum Corp.	KC	875	G21447	ENSCO 8500	Lucius	6,817
Noble Energy, Inc.	MC	782	G33757	ATWOOD ADVANTAGE	Caterpillar	6,569
Murphy Exploration & Production Co.	DC	178	G25850	T.O. DISCOVERER DEEP SEAS		6,560
Chevron USA, Inc.	KC	829	G25814	T.O. DISCOVERER CLEAR LEADER	Buckskin	6,428
BHP Billiton Petroleum (GOM) Inc.	AT	618	G08035	T.O. DEEPWATER INVICTUS	Neptune at 574	6,266
Repsol E&P USA Inc.	KC	642	G33335	ENSCO DS-5		6,124
Anadarko Petroleum Corp.	WR	52	G25232	DIAMOND OCEAN BLACKHAWK	Shenandoah	5,874
BP Exploration & Production, Inc.	MC	775	G09866	SEADRILL WEST CAPRICORN	Thunder Horse North	5,673
Eni US Operating Co. Inc.	MC	772	G16647	COIL TUBING UNIT (N.O. #2)	Triton (mc)	5,639
Eni US Operating Co. Inc.	MC	772	G16647	T.O. DEEPWATER PATHFINDER	Triton (mc)	5,639
Anadarko Petroleum Corp.	GC	903	G24197	ENSCO 8506	Heidelberg	5,274
Shell Offshore, Inc.	MC	687	G05863	ATWOOD CONDOR	Mensa	5,150
BP Exploration & Production, Inc.	GC	825	G09981	ENSCO DS-3	Mad Dog Phase 2	4,950
BP Exploration & Production, Inc.	KC	93	G25780	ENSCO DS-4	Gila	4,860
Hess Corp.	MC	726	G24101	STENA FORTH	Tubular Bells	4,570
Shell Offshore, Inc.	MC	812	G34461	NOBLE DANNY ADKINS		4,471
Freeport-McMoRan Oil & Gas LLC	GC	733	G35004	T.O. DEEPWATER CHAMPION		4,463
BP Exploration & Production Inc.	GC	782	G15610	MAD DOG SPAR RIG	Mad Dog Phase 2	4,428
BP Exploration & Production Inc.	GC	782	G15610	PRIDE MAD DIG SPAR RIG	Mad Dog Phase 2	4,427
BP Exploration & Production Inc.	GC	627	G25174	SEADRILL WEST SIRIUS		4,416
Freeport-McMoRan Oil & Gas LLC	GC	645	G18423	HOLSTEIN SPAR RIG	Holstein	4,344
BHP Billiton Petroleum (GOM) Inc.	GC	653	G20084	GSF C.R. LUIGS	Shenzi development	4,238
Shell Offshore, Inc.	MC	943	G34467	STENA ICEMAX	Oasis	4,213
Chevron USA, Inc.	GC	596	G16759	T.O. DISCOVERER INSPIRATION	Tahiti North	4,023
Chevron USA, Inc.	KC	10	G27698	T.O. DISCOVERER INDIA		3,965
Freeport-McMoRan Oil & Gas LLC	GC	643	G35001	NOBLE SAM CROFT		3,885
LLOG Exploration Offshore, LLC	MC	79	G27259	SEADRILL SEVEN LOUISIANA	Humphrey	3,861
Shell Offshore, Inc.	MC	809	G09873	NOBLE DON TAYLOR	Princess	3,853
Shell Offshore, Inc.	MC	809	G12166	H&P 204	Princess	3,800
Anadarko Petroleum Corp.	EB	602	G14205	HELIX 534	Nansen	3,645
Anadarko Petroleum Corp.	EB	602	G14205	WIRELINE UNIT (L.J. #2)	Nansen	3,645
Shell Offshore, Inc.	GC	248	G15565	T.O. DEEPWATER NAUTILUS	Glider	3,233
Shell Offshore, Inc.	VK	956	G06893	NABORS 202	Ram-Powell	3,214
Shell Offshore, Inc.	GC	158	G07995	H&P 202	Brutus	2,985
Shell Offshore Inc.	MC	807	G07963	H&P 201	Mars (Ursa/Princess)	2,945
Statoil Gulf of Mexico LLC	MC	718	G34456	MAERSK DEVELOPER	Juno	2,918
Shell Offshore Inc.	GB	427	G07493	NOBLE JIM THOMPSON	Cardamom	2,719
Chevron USA, Inc.	GC	205	G05911	NABORS 85 (MAYRONNE 162)	Genesis	2,590
Anadarko Petroleum Corp.	VK	869	G13065	WIRELINE UNIT (N.O. #2)	Nile	2,423
Noble Energy Inc.	GC	40	G34536	ENSCO 8501		2,079
Energy Resource Technology GoM, Inc.	GC	237	G15563	ENSCO 8502	Phoenix	1,940
Marubeni Oil & Gas (USA) Inc.	GC	155	G16698	NOBLE DRILLER	Manatee	1,939
SandRidge Energy Offshore, LLC	GC	65	G34539	H&P 206	Bullwinkle	1,353
SandRidge Offshore, LLC	EB	165	G06280	WIRELINE UNIT (L.J. DIST)	East Breaks 164	863
Ankor Energy LLC	MC	21	G22850	NABORS MODS 200		668
SandRidge Offshore, LLC	EB	110	G02650	NABORS S.D. IV	Tequila	660

Deepwater prospects with drilling and workover activity: 54

Current Deepwater Activity as of Monday, 8 September 2014

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,478	35,667	2,438
201 to 400	109	1,120	20
401 to 800	230	879	10
801 to 1,000	356	583	9
1,000 & above	3,327	1,961	26

Rig Activity Report 12 September 2014

Location	Week of 8/8	+/-	Week Ago	+/-	Year Ago
Land	1852	+5	1847	+170	1682
Inland Waters	13	0	13	-8	21
Offshore	66	+1	65	+1	65
U.S. Total	1931	+6	1925	+163	1768
Gulf of Mexico	62	0	62	-1	63
Canada	405	-9	414	+25	380
N. America	2336	-3	2339	+188	2148

Activity by Water Depth Information current as of Monday, 8 September 2014

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

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

Kongsberg Maritime launches new compact, portable acoustic positioning system

Kongsberg Maritime has expanded its extensive acoustic positioning product portfolio, which includes the established HIPAP system, with the launch of μ PAP, a new compact and portable acoustic positioning system for operation from a surface vessel to track ROVs, tow fish, divers and any other subsea target at depths to 4,000 m.

μ PAP operates in SSBL mode (LBL is also possible) where it measures the distance and direction to subsea transponders and computes a 3D position in local coordinates or in geographical coordinates. It offers high accuracy but is smaller, more compact and easier to install on a vessel or other surface unit than larger acoustic positioning systems. The size, weight and ease of installation makes μ PAP a more flexible solution ideal for a diverse range of applications including, aquaculture, seabed survey, seabed cleaning, marine research, diving operations, underwater construction, ROV operations, shallow water seismic, shallow water inspection, ocean renewable energy and salt to freshwater production.

μ PAP introduces a series of advanced new transducers that feature more elements than any of its competitors in the portable and low-cost market. It's established that more ele-



ments provide better acoustic redundancy, mathematical redundancy and improvement of the signal to noise level, so μ PAP's sophisticated transducers can provide more accurate and reliable position data down to 4,000 m range. A built-in motion sensor in the μ PAP transducer compensates for vessel roll and pitch movements. To meet various demands from the market, the μ PAP transducer is available in several versions featuring different built-in motion sensors and physical size.

μ PAP benefits from the Cymbal acoustic protocol providing wide-band spread spectrum acoustic positioning and data communication, though other acoustic protocols can be utilized. The system can also be used as a two-way modem to transfer data between a surface user computer and one or many underwater units. The μ PAP system Operator Station and user-interface runs on a standard Laptop PC and features the Windows[©]-based Acoustic Positioning Operating System (APOS). A built-in comprehensive and informative Online Help user guide is standard and describes a wide range of functions for acoustic positioning and data communication.

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

Seatrionics adds Teledyne RD Instruments products to its portfolio

Seatrionics, an Acteon company and leader in marine electronic equipment sales and rentals, has partnered with Teledyne RD Instruments Inc. to sell its marine measurement and navigation products. Customers in the Middle East and South America will benefit from a sales representation and distribution agreement signed in August.

Harry Maxfield, vice president sales and marketing, Teledyne RD Instruments, said, "We have a strong, long-standing relationship with Seatrionics, who have a great deal of experience with our products and applications. We have always been impressed by Seatrionics' knowledge and professionalism, and we hope this enhanced working relationship will enable us to build upon Seatrionics' presence and reputation in regions that can be challenging for us to address due to time zone differences."

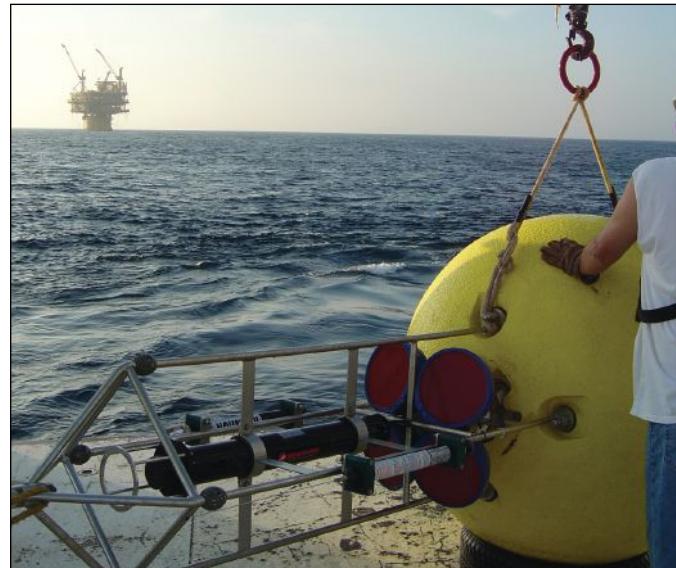
Seatrionics will sell Teledyne RD Instruments' Acoustic Doppler Current Profilers (ADCPs) exclusively in Saudi Arabia, UAE, Qatar, Oman and Bahrain and represent the company for Doppler Velocity Logs (DVLs) non-exclusively in Qatar, Saudi Arabia, Oman and Bahrain. Seatrionics do Brasil Ltda will sell DVLs in Brazil on the same, non-exclusive basis.

Adil Ali, international product sales manager at Seatrionics, said, "Seatrionics is a long-established user of Teledyne RD Instruments' equipment and has multiple Acoustic Doppler Current Profilers and Doppler Velocity Logs in its equipment rental pool. This means that we can easily transfer our in-house technical expertise to our clients."

"This partnership will enable our existing and potential clients to gain a higher level of pre-purchase technical advice and post-sale support in the regions this agreement covers."

The latest agreement reinforces Seatrionics' position as a global force in the sale and support of Teledyne products. The company already represents Teledyne BlueView globally, offering its 2D and 3D multibeam imaging sonar equipment.

For more information, visit www.seatrionics-group.com.



OSIL multi-corers in CSA Ocean Sciences Gulf of Mexico study

CSA Ocean Sciences Inc. has purchased two Mega Multiple Corers from UK-based Ocean Scientific International Ltd (OSIL) for use in a month-long deep-water sampling effort to assess sediment chemistry and infaunal communities in the Gulf of Mexico.

The OSIL Multiple Corer enjoys a privileged position as the primary corer for environmental impact assessment worldwide, owing to its ability to collect up to 12 simultaneous high-quality undisturbed sediment samples, including the sediment/water interface and overlying supernatant water. The 600-mm long core tube collects approximately 450 mm of sediment (0.35 L) and 150 mm of water (0.12 L). The OSIL Multi Corer design has recently been updated to a lead-free version, with features that make the corer easier to clean, and an improved core tube insertion/removal system, which improves usability and handling of both the corer and subsequent samples on deck.

This is achieved through the use of a unique hydrostatic damping system, which slows the penetration rate down to approximately 1 cm/s and removes the typical bow wave observed in other coring systems. In addition, these corers benefit from detachable core holders, enabling the core tubes or the whole corer tube assembly to be removed from the main body of the corer enabling a succession of samples to be taken during any one mission.

The core tubes are sealed top and bottom, allowing rapid retrieval of the corer without jeopardizing the integrity of the samples.

OSIL's range of corers are used worldwide by companies such as IAEA, Petrobras, Altima, NOC, BP, Duke University USA, Fugro, Ocean Lab, University of Qatar, Sure Group, HydroAcoustics , NIO India and The University of Aberdeen for sampling in applications related to environmental impact assessment, geochemical analysis, interstitial waters and biological survey.

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

A brand-new family of miniature inertial sensors

After many years of success and thousands of sensors in the field, the IG-500 Series is being replaced by a brand-new generation: the Ellipse Series. This new series of miniature inertial systems benefits from a new design, new sensors, new capabilities, and new algorithms. "We have selected state-of-the-art MEMS sensors, especially very low noise gyroscopes that greatly enhance Ellipse performance. We integrated cutting-edge GNSS receiver while keeping a small size," declares Alexis Guinamard, CTO of SBG Systems.

With the Ellipse Series, SBG Systems sets up new standard for miniature inertial systems. "Being the only one on the market to design both high-end and entry-level sensors, we are able to upgrade miniature sensors capabilities by injecting some advanced and proven filtering and features inspired from high end inertial navigation systems," adds the CTO. Additionally to higher accuracy, we added for the



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same budget an improved FIR and rejection filtering, robust IP68 enclosure, high output rate, RTK corrections, automatic alignment, etc.

Weighting from 45 grams, Ellipse sensors are incredibly flexible. The Ellipse-A model provides 3D orientation and heave. For navigation, you can connect your own GPS with the Ellipse-E, or use the internal one by choosing the Ellipse-N model. The amazing Ellipse-D completes this state-of-the-art miniature sensor family. This model is a little larger than the rest of the series because it integrates a Survey-grade L1/L2 GNSS receiver with two antennas for unmatched heading and position accuracy.

Ellipse sensors are the only miniature inertial systems to provide Heave that automatically adjusts to the wave frequency. With very low noise gyroscopes, an internal GNSS receiver coupled with DGPS corrections, and an IP68 enclosure, Ellipse Series is definitely the best miniature inertial sensor for motion monitoring, wave measurement, and stabilization and orientation of onboard equipment (camera, antennas, etc.).

For more information, visit www.sbg-systems.com.

Sonardyne acoustic releases deliver perfect reliability for Scandinavian water monitoring

Luode Consulting, a Finnish-based environmental monitoring company, has chosen acoustic release transponders supplied by Sonardyne International Ltd. to support its water and ice quality research in Scandinavia. Using its Sonardyne Lightweight Release Transponders (LRTs) to deploy and recover specialist recording instruments, Luode Consulting has now completed over 350 studies across the region, including under-ice profiling and water cooling monitoring close to nuclear power stations, without a single failure or instrument loss.

During winter, sea ice plays a crucial environmental and economic role for many Scandinavian countries, affecting everything from fishing, walking and skiing, to the ice roads that connect remote communities. Continuous year-round water quality monitoring ensures that the impact from offshore and nuclear energy industry activities upon ice formation, together with naturally occurring phenomena, can be closely observed.

To collect data for its research, Luode Consulting uses instruments such as Acoustic Doppler Current Profilers (ADCPs) moored on the seabed using Sonardyne LRTs. At the end of the study period, the instruments and their valuable data are recovered by transmitting an acoustic signal from the surface to the LRT to activate its release mechanism, thereby allowing all the equipment to float back up to the surface.

Many of the deployments carried out by Luode Consulting last weeks or months, however the LRT's long battery life provides its researchers with the option to deploy instruments for several years if required to do so. In one example for a long-term environmental monitoring study in the Baltic Sea, LRTs were deployed at over 30 locations along the route of a new pipeline, some close to where pipelay barges and support vessels were operating and some during the ice cover season.

For more information, visit www.sonardyne.com.

New addition to the Bowtech lamp family

Bowtech Products Ltd, a global market leader in subsea vision systems, is delighted to announce the arrival of the LED-S-Series lamp, a smaller, 10,000 lumen "baby" version of our 20,000 lumen LED-V-Series underwater floodlight.

The LED-S-Series lamp has been



designed to offer you a smaller, lighter and lower lumen output than our LED-V-Series using the same highly successful technology.

Outputting up to 10,000 lumens with a beam angle of 80° in water (narrower angles are available), the lamp is ideal for illuminating large areas for HD viewing tasks.

Manufactured in corrosion-resistant hard anodized aluminium with an Acrylic window, the lamp is rated to operate at 6,000 m ocean depth.

The LED-S-Series lamp is available as either 100-120 Vac or 130-150 Vdc, with a selection of connectors and connector positions available.

The LED-S-Series lamp is an ideal replacement for obsolete incandescent lamps that can no longer be supplied.

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

TE Connectivity's DEUTSCH Wet-Mate connectors help power world's first subsea gas compression station

Wet-mate connectors enable the supply of power to modular subsea boosting and gas compression systems and interconnect system components like umbilicals, transformers, rotary equipment and variable speed drives on the seafloor. TE's DEUTSCH P18-SW400 range of connectors allows engineers to increase the tieback distance of such systems to a distance of up to 160 km from the host and in water depth up to 3,000 m. This makes recovery of resources in remote locations possible and increases recovery rates of existing brown fields. The robust construction of the connectors, including a 25-year maintenance-free design, negates the need for any retrieval of the connectors, also allowing selective deployment and maintenance of subsea modules. The connectors' unique design reduces the cost of subsea processing while increasing dependability.

TE recently announced that it has completed the acquisition of the SEACON group, a leading provider of underwater connector technology and systems. The SEACON group serves the military marine and subsea sectors for ROVs and AUVs, oil and gas, environmental and oceanographic applications. The group will become part of TE's Industrial Solutions segment and will be integrated into the aerospace, defense and marine business unit.

For more information, visit www.te.com.

Oceaneering International orders six Rowe Technologies deepwater DVLs

Rowe Technologies, Inc. is happy to announce a recent order of six SeaPilot DVLs from Oceaneering International, Inc. Rowe Technologies developed a 4500-m rated titanium SeaPilot DVL for deepwater deployments. The SeaPilot DVL provides a slightly smaller footprint when compared to other products in the market and also provides the industries newest electronics platform.

Rowe Technologies integrated a leak detection sensor into the SeaPilot DVL. The leak sensor will provide ROV pilots real-time information on the status of the structural integrity of the DVL and will allow pilots the opportunity to shutdown the DVL in the case that the structural integrity is compromised—this new features reduces the likelihood for expensive repairs and replacements.

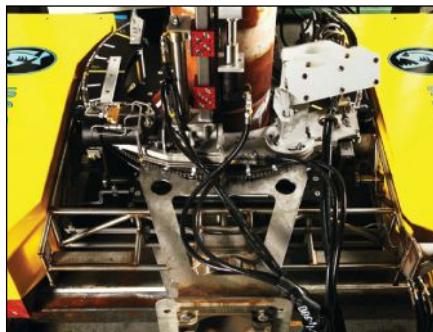
RTI's standard DVL package provides end users a completely capable DVL; there is no need for firmware upgrade. Lastly, RTI has developed a software that is easy to use and program the DVL. Rowe Technologies looks forward to working with Oceaneering in the future.

For more information, visit www.rowetechinc.com.

Seanic Flex Joint Cleaning Tool meets increased demand

Oil and gas operators in the Gulf of Mexico have been keeping Seanic's Flex Joint Cleaning Tool (FJCT) extremely busy over the last year. It was originally designed and developed by Seanic for a major oil company to clean the flexible elastomeric element of excessive marine growth. Removal of the marine growth is necessary to allow for optimal inspection of the molded elastomeric bearing, giving oil & gas operators the ability to establish realistic life-cycle expectations for their in-service SCR flexible joints. The versatile design of the FJCT allows for options to work with various inspection cameras, 3D modeling, lasers, temperature probes, and cleaning tools.

The first FJCT was originally produced in 2007 and as word spread of its capabilities, Seanic negotiated a licensing agreement with the patent holder that allowed for the development of a second unit for Seanic's rental fleet. Since the development of the original concept, the FJCT has been used to inspect over 100 individual flex joints in the Gulf of Mexico. The FJCT is able



to safely clean flex joints with diameters ranging from 4 in. to 24 in. It serves as a stable platform to collect various types of data and imagery that can later be used to analyze the current condition of the flexible elastomeric element. Once the ROV delivers the tool to location, the FJCT is operated by a Seanic technician, the tool is manipulated through the use of a joystick and a tooling computer with graphical user interface. The FJCT has been designed where it can easily be integrated with any number of industry recognized work-class ROVs.

For more information, visit www.seanicusa.com.

MacArtney sells its first LISST to DNV

Det Norske Veritas (DNV) has recently taken delivery of a LISST-Deep laser particle sizer to be applied for oil, gas and mining industry related monitoring. This unique in-situ capable instrument was procured through MacArtney Underwater Technology and marks the first LISST sale by the company in its newly minted role as exclusive representative of Sequoia Scientific's LISST products in Denmark, Norway, Sweden, Finland and Iceland. The LISST-Deep for DNV was delivered as a complete turn-key solution with external battery package and on-site training.

Able to obtain in-situ measurements of particle size, distribution, optical transmission and the optical volume scattering function at depths down to 3,000 m, the LISST-Deep is an industry unique and highly versatile instrument with several scientific and environmental monitoring applications.

The LISST-Deep is best known for its role after the Deepwater Horizon accident.

For more information, visit www.macartney.com.

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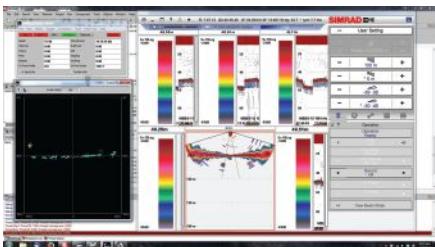
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NOAA selects HYPACK® and HYSWEEP® software

HYPACK, Inc. recently supplied five NOAA fishery survey vessels with the HYPACK® and HYSWEEP® software solution. The vessels, outfitted with the Simrad ME70 scientific multi-beam system on board, is used by NOAA for various missions to support fishery and habitat mapping.



The latest version of HYSWEEP® includes an interface for the ME70, for the data collection, and real time visualization of the sonar. The software suite will provide the operator with all the visualization tools included in the HYPACK® and HYSWEEP® software. In addition, the new Real Time Cloud provides the operator detailed views of the seafloor during the transect. This program will be useful for easier feature detection and categorization, system calibration and verification, and data quality control. Once data is collected, processing will be done through the HYSWEEP® MBMAX64 software. On board the vessel, the scientific crew will be able to analyze the data set shortly after data collection.

The selection of the HYPACK® and HYSWEEP® solution on board the fishery vessels complements the existing NOAA survey fleet that currently operates the HYPACK® and HYSWEEP® software. The standardization minimizes the training needed across the fleet personnel, to operate the system.

For more information, visit www.hypack.com.

ACE Winches launches new technology during period of Norwegian expansion

Following significant Norwegian market growth, ACE Winches, the global deck machinery specialist launched its latest technology - Reel Drive Systems (RDS) as it exhibits at ONS Stavanger. The RDS ranges from 150 Te to 500 Te and will deploy and recover subsea umbilicals, risers and flow lines (SURF), mooring wires and power cables for the global oil and gas sector.

The ACE Winches RDS is Programmable Logic Controlled (PLC) and can be automatically adjusted to accommodate multiple reel sizes up to a 12 m diameter whilst eliminating the requirement for manual handling, optimising the conditions for safe operations.

Before the end of 2014, the firm will provide a 400 Te RDS for a client's pre-lay mooring line installation in Nigeria.

Nishant Nadagouda, head of research and development at ACE Winches, said: "In response to strong global demand for RDS, ACE Winches has invested heavily in its research and development division. Our latest RDS design has enhanced our product range and services to our international client base in the topside and subsea markets."

The modular systems will be located at ACE Winches' new Karmsund quayside facility, enabling clients to benefit from faster mobilisations and the ability to transport the RDS equipment in individual components to assemble onsite.

ACE Winches can mobilise, demobilise and conduct spooling and bollard pull test operations directly from the quayside.

The new 2,000 sq. m facility sits centrally in Karmsund, located conveniently for vessel pass between Bergen and Stavanger.

Norway country manager, Rune Midtun commented: "The recent investment in both products and facilities demonstrates the company's continued commitment to the Norwegian region.

"With our extensive track record as a deck machinery specialist, ACE Winches Norge AS is excellently placed to offer our clients total project solutions across a range of services."

For more information, visit www.ace-winches.co.uk.

Optech provides preview of new technology at OCEANS'14

Visitors to the OCEANS'14 MTS/IEEE conference St. John's, Newfoundland, Canada got a sneak preview of upcoming enhancements to Optech's product line. Staff were on-hand to provide details on how Optech sensors are achieving amazing results and increasing our understanding of the near-shore environment.

Besides new sensor systems, Optech also shared exciting information on the new Project Program for Optech CZMIL, the world's most field-validated airborne bathymetry and water col-



umn characterization system. Although CZMIL is already in use with several large government agencies, it has been out of reach for smaller organizations that could use its seamless topo/bathy mapping, unparalleled turbid water penetration, 80 m clear-water maximum depth, and collection of complex environmental data. Optech is getting ready to revolutionize the industry by making CZMIL and its comprehensive HydroFusion software workflow more widely available.

Visitors also got a preview of an exciting new addition to Optech's marine and topographic mapping product line. Our world-class team of scientists and engineers have been breaking new ground on lidar technology, and their latest work will push the boundaries of what people expect lidar systems can do. Optech will officially reveal these changes at INTERGEO in October, though OCEANS'14 attendees got a sneak peek at the innovations Optech is bringing to the market.

For more information, visit www.optech.com.

Paradigm delivers advanced engineering for everyone with the release of Sysdrill 10

Paradigm® announced the release of Sysdrill® 10, the latest version of its integrated suite of well planning and drilling engineering applications. This major upgrade is integrated with Peloton's WellView®/MasterView® corporate database for drilling and well operations, and includes a new jar placement module based on technology acquired from Cougar Drilling Solutions.

The release, developed in collaboration with Sysdrill customers, offers significant engineering enhancements to the product's existing well planning, torque & drag, hydraulics, casing design, cementing and well control modules. The new jar placement mod-

ule allows calculation of optimal jar locations based upon the jar operating parameters, drilling parameters, and the well trajectory.

The integration with Peloton offers a complete solution for well planning, drilling engineering, daily reporting and data management throughout the well lifecycle. Drilling engineers can send a fully engineered Sysdrill well design to WellView, and during drilling operations, data captured in MasterView can be used in Sysdrill to perform engineering analysis to monitor drilling and prevent NPT events.

"Sysdrill 10 allows drilling engineers to perform advanced engineering analysis with minimum effort, in a single, integrated application, thus saving valuable time," said Robert Innes, director for well planning and drilling. "This is particularly the case through the integration with Peloton, where drilling engineers avoid re-entering data and focus on ensuring the well can be drilled safely and successfully. The incorporation of Cougar's Jar Placement program, which can be licensed by all Paradigm customers, demonstrates that Sysdrill provides a solid platform that can be easily extended to incorporate new engineering algorithms."

"As Cougar continues to expand its business in North America, Middle East and Asia, and has selected Sysdrill as its global standard for well planning and engineering, it was the logical platform for Cougar engineers to deliver accurate jar placement recommendations to our customers," said Andi Rizen, director business development & optimized well delivery, Cougar Drilling Solutions.

For more information, visit www.pdgm.com.

Unique Seaflex offers free trial of pipelaying buoyancy modules

A division of Unique Maritime Group (UMG) which is one of the world's leading integrated turnkey subsea and offshore solutions provider, Unique Seaflex has a new and exciting proposal for those who have yet to benefit from the many technical, operational and commercial benefits of the use of their style of pipeline buoyancy modules on pipelaying projects: "Try Before You Buy (Or Hire)".

The basis of the offer is that Unique Seaflex will supply a mutually-agreed style and quantity of their modules free of charge to new customers for use on an

upcoming project, so that those contractors may assess for themselves the benefits of the Seaflex solution alongside their existing steel or solid plastic units.

Chris Sparrow, global sales manager explains further, "As the market leader in the manufacture, supply and support of inflatable buoyancy modules for pipeline installation projects worldwide, while we already have very many satisfied contractors taking our buoyancy units onto all their projects for which our equipment is suited (which as a general rule of thumb are shore approaches within the air diving range), we are always looking to welcome new customers onboard."

"One thing which we often hear from installation contractors who have not worked with us before is that while they can appreciate the many advantages on paper of our IMCA-compliant bags in terms of ease of transport and handling, speed of rigging, diver safety and the suchlike, they would appreciate the opportunity to get some experience with our equipment before committing to standardizing around it for their future projects. Thanks to our extensive rental pool of such pipeline buoyancy modules in denominations from 1t to 5t capacity, we are able to allow new potential customers to get familiar with our equipment free of cost or risk to them."

When provided with the main project parameters (pipeline size, weight in water, water depths etc), Unique Seaflex are able to draw upon over 20 years' experience of working in this field to make recommendations as to the most suitable buoyancy and rigging solution - and can also assist with the definition of methods. Seaflex technicians are also available to travel worldwide as required to supervise and ensure the most effective and efficient use of their equipment on such projects.

For more information, visit www.uniquegroup.com.



Ocean Signal targets commercial sector

Marine communication and safety specialist Ocean Signal presents its SafeSea® range of GMDSS products plus the world's smallest personal locator beacon at this year's SMM.

Ideal for a range of applications in the commercial sector, the SafeSea V100 GMDSS hand-held radio, the E100 and E100G EPIRBs and S100 SART provide all essential handheld communication devices required in an emergency situation, while the Ocean Signal rescueME PLB1 can be carried easily and unobtrusively by workers on all types of vessels.

Managing director Alan Wrigley said "All our products have applications in the commercial sector and this market remains our focus. In particular, there are significant markets for the PLB1 in fishing fleets, wind farm and other support vessels, staff on passenger vessels, deep sea vessels and cargo vessels. Many more sectors of the commercial area, especially support vessels, are introducing mandates for workers to use PLB-type products, so we are approaching relevant companies and ship-owners to discuss the PLB and all of Ocean Signal's GMDSS products. Our EPIRB meets the needs of various commercial vessels, while all our products apply to a range of boats, including superyachts, fishing vessels and workboats."

"Individual safety has become much more of a priority for commercial operators and there is a lot of emphasis on the safety of individual crew members in the workboat sector. There is therefore huge potential for the use of the rescueME PLB1 across a wide range of areas in the commercial sector. For anyone at sea in any number of circumstances, the PLB1 is a product they would want to have on their person in case of an emergency. It has been developed so that it is very practical to wear or carry on your person, takes up minimal space and is therefore very accessible, plus it is very affordable with a seven-year battery life – all attributes which make the product very appealing in the world-wide maritime market."

For more information, visit www.oceansignal.com.



Sealite Sphere® 6150 (high output)

The iconic Sealite Sphere has evolved, and now delivers 11,000 lumens with a wide beam angle of 85°. Its sleek new 6000 m (anodized aluminum) or 11000 m (titanium) depth rated design provides field-serviceable connector replacement, for quick and easy repair in the field, and all without the need for any specialized tools. A unique 10,000 psi pressure resistant compartment separates the connector and the rest of the light; minimizing the potential for flooding due to connector failure. The Sealite Sphere delivers best in class lumens per water weight, at 33 lumens per gram, while its sapphire crystal port and close cluster LEDs deliver the ultimate in optical performance and durability.

For more information, visit www.deepsea.com.



Tritech's high-resolution survey sonar proves an invaluable tool in search and recovery operations

Yorkshire and the Humber Police areas, through their regional underwater search and marine unit, have been using the Tritech SeaKing Hammerhead system to locate missing persons. The system was recently deployed at Snailsden Reservoir, in the peak district, South Yorkshire, England, UK, where it enabled the team to quickly locate the body of a missing person who was believed drowned. Prior to deployment of the sonar, the area was mapped using Tritech's StarFish 990F, a high-resolution side-scan sonar system, to ensure the safety of divers entering the waterway, ultimately reducing the amount of time they had to be in the water and making the operation safer.

Tritech's SeaKing Hammerhead sonar provides 360° scans of the search area, a geo-referenced plotter display and a built-in compass ensures accurate marking and mapping of the search area.

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

OSIL Supply 1.2m Tern Buoy to Gardline Environmental

UK-based Ocean Scientific International Ltd (OSIL) have recently supplied a 1.2 m Tern Buoy to Gardline Environmental Ltd. for installation in Cyprus.

The 1.2 m Tern Buoy system is extremely robust, with all cables held internally, protected by the rugged enclosed top section, which has been designed to minimise damage from the elements or outside interference. The versatile platform also offers a higher visibility profile, easily seen in high-traffic areas, and boasts a central structure which offers a very high degree of protection for valuable, sensitive, or delicate equipment, whilst maintaining good water flow for e.g. water quality sensors.

The Tern Buoy is designed for extended deployment in harsh coastal environments in deeper water depths, and is suitable for all applications, including scientific studies, water quality monitoring, coastal engineering projects, harbour and coastal monitoring, and maritime traffic control.

The buoy is equipped with a Nortek AWAC, acquiring full profile current speed and direction and wave data in addition to other ancillary parameters including GPS positioning. Data from the AWAC is currently transmitted via GSM, however the buoy has also been equipped with the option to swap comms to Iridium satellite.

OSIL manufacture a variety of data buoys and monitoring systems, as well as a wide range of sampling equipment.

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



Red excitation chlorophyll sensor ideal for environments rich in organic materials

Turner Designs recently developed a chlorophyll sensor that uses a red excitation light source to detect algal fluorescence for estimating algal abundance. This sensor is ideal for environments rich in DOM and blue-green



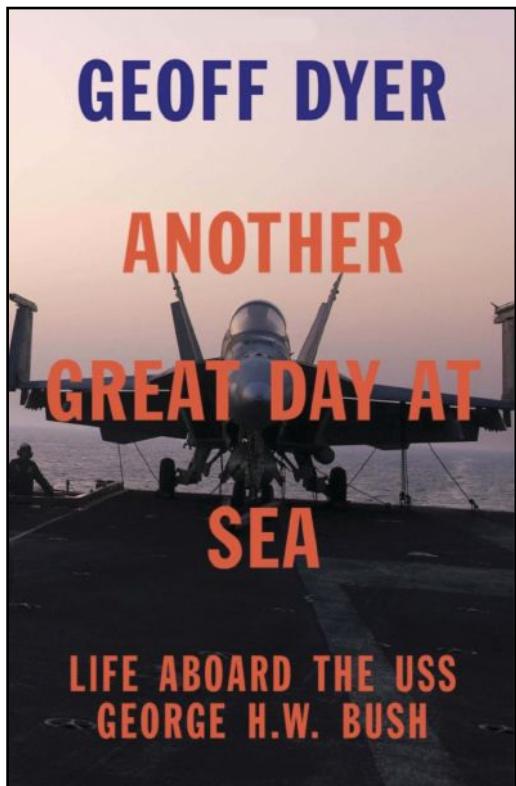
algae. Because DOM doesn't absorb red excitation energy, but algae do, red excitation fluorimetry provides fluorescence detection free from interference errors caused by DOM. Studies done with both blue and red excitation chlorophyll sensors showed at least a 16% overestimation of the actual chlorophyll concentration when using the blue excitation sensor and not applying a correction whereas the red excitation sensor needed no correction.

Another advantage of red excitation for chlorophyll is that it is significantly more sensitive to prokaryotic algae so it can detect much lower concentrations of blue-green algae or cyanobacteria. This new red excitation chlorophyll sensor is available as a single sensor in our Cyclops-7 Submersible Sensor family or as one of three sensors on our C3 submersible fluorometer. Standard optical kits are available for detecting in vivo chlorophyll (blue or red excitation), crude oil, refined fuels, CDOM/FDOM (dissolved organic material), blue/green algae, fluorescein dye, rhodamine dye, PTSa dye, optical brighteners, tryptophan, and turbidity. Fluorometers can also be configured with custom optics for specialized applications per customer request.

Turner Designs provides innovative fluorescence-based solutions for basic research, water quality analysis, pollution control analysis, and industrial applications.

For more information, visit www.turnerdesigns.com.

MEDIA SHOWCASE



Another Great Day at Sea Life Aboard the USS George H.W. Bush

By Geoff Dyer

As a child, Geoff Dyer spent long hours making and blotchily painting model fighter planes. So as an adult, Dyer jumped at the chance of a residency aboard an aircraft carrier. Another Great Day at Sea chronicles Dyer's experiences on the USS George H.W. Bush as he navigates the routines and protocols of "carrier-world," from the elaborate choreography of the flight deck through miles of walkways and hatches to kitchens serving meals for a crew of five thousand to the deafening complexity of catapult and arresting gear. Meeting the Captain, the F-18 pilots and the dentists, experiencing everything from a man-overboard alert to the Steel Beach Party, Dyer guides us through the most AIE (acronym intensive environment) imaginable.

A lanky Englishman (could he really be both the tallest and the oldest person on the ship?) in a deeply American world, with its constant exhortations to improve, to do better, Dyer brilliantly records the daily life on board the ship, revealing it to be a prism for understanding a society where discipline and conformity, dedication and optimism, become forms of self-expression. In the process it becomes clear why Geoff Dyer has been widely praised as one of the most original – and funniest – voices in literature.

Pantheon; ISBN-13: 978-0307911582
Hardcover, 208 pages, May 2014

October 2014

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National Oilwell Varco, Inc. said its executive vice president, general counsel and secretary, **Dwight W. Rettig**, planned to retire effective October 1, and that the company selected **Craig L. Weinstock** as his successor. Weinstock holds a bachelor's degree from the State University of New York and a J.D. from Vanderbilt Law School. Before joining National Oilwell Varco, he practiced law at Locke Lord, LLP in Texas for 29 years counseling corporate boards and independent directors regarding governance, securities and compliance matters. Since joining National Oilwell Varco in October 2013, Weinstock has served as the company's vice president, chief compliance officer and vice president of internal audit. Since joining the company in the early 1990s, Rettig served in the legal department with increasing responsibility, including general counsel of the distribution services group from 1998-1999, vice president and general counsel, corporate secretary and more recently, as executive vice president.

BP appointed **Spencer Dale** as its new group chief economist effective at the end of October. Dale joins BP from the Bank of England where he is currently executive director for financial stability, strategy and risk. He is also a member of the bank's

financial policy committee. In his previous capacity as the bank's chief economist, Dale served for 6 years on the monetary policy committee. Since joining the bank in 1989, his roles included working as private secretary to former Governor Mervyn King and a secondment as a visiting senior adviser in the division of monetary affairs at the board of governors of the Federal Reserve System in the United States. As BP's group chief economist, Dale will be responsible for advising the board and executive team on economic drivers and trends in global energy. He will lead an international team of senior economists whose responsibilities include overseeing the preparation and presentation of the annual BP Statistical Review of World Energy and the BP Energy Outlook.

McDermott International, Inc. appointed **Stuart Spence** executive vice president and chief financial officer following the departure of Perry L. Elders, senior vice president and chief financial officer. Spence, 45, has about 19 years of combined financial and operational management experience with companies in oil-

field products and services and engineering and construction businesses. Immediately prior to joining McDermott, Spence served as vice president of artificial lift for Halliburton Co., where he had overall strategic and operational responsibility for Halliburton's artificial lift product and service line. Previously, he served as senior director of strategy and marketing for Halliburton's completion and production division. Spence joined Halliburton following Halliburton's acquisition of Global Oilfield Services Inc. in November 2011.

Paul Job, engineering manager at independent subsea engineering and training company Jee, was appointed to the 2014 board of directors for the Pigging Products and Services Association (PPSA). Job, who is based in Jee's Aberdeen office, was appointed as the PPSA's associate member director, which will see him working with the board to help develop the PPSA's business strategy and future plans. He will be the first person to officially hold the role, which was formalized earlier this year. The PPSA maintains more than 120 members from 20 countries.



February 16-19, 2015

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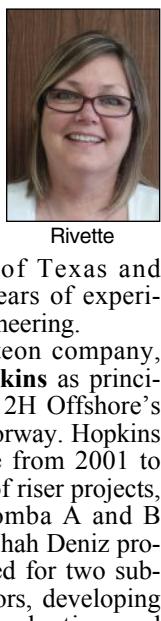
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- Advances in Dispersant Technology
- Public Health and the Deepwater Horizon Oil Spill
- Ecosystem Monitoring Strategies

For more information, please visit: www.gulfmexicconference.org

C & C Technologies Inc. is pleased to announce that **Jill Rivette** has joined the Geotechnical Division in Houston Texas as a senior geotechnical engineer. Rivette is a licensed Professional Engineer in the State of Texas and brings with her many years of experience in geotechnical engineering.



Rivette

2H Offshore, an Acteon company, has appointed **Paul Hopkins** as principal engineer, to develop 2H Offshore's growing client base in Norway. Hopkins worked for 2H Offshore from 2001 to 2006 on a diverse range of riser projects, including Exxon's Kizomba A and B developments and BP's Shah Deniz project. Hopkins then worked for two subsea engineering contractors, developing experience in concept selection and detailed design, with a strong focus on risers, subsea pipelines and structures.

Chesapeake Technology, Inc., (CTI) is proud to welcome **David Finlayson** as chief scientist. Finlayson is an expert in acoustic remote sensing and seafloor mapping technologies and will be working directly with co-founder and CTO, John Gann, to optimize algorithms and develop new apps for broadening SonarWiz use cases. Finlayson earned his Ph.D. from University of Washington and joins CTI with 8 years as a hydrographer for USGS, and 5 years as a sonarman for the U.S. Navy.



Finlayson

Ocean Specialists, Inc. (OSI) announces the addition of **Anne LeBoutillier** as director of global marketing and business development for the firm. She is a business expansion professional with extensive strategic marketing and lead generation expertise and broad experience in subsea cable solutions across both telecommunications and oil & gas industries. LeBoutillier joins OSI following her most recent assignment directing marketing and lead generation initiatives for Global Marine Systems, where she helped the company to establish and improve global recognition for their subsea cable installation capabilities in the oil and gas sector. In the commercial telecom sector, she was previously Asia Pacific director of business development for Tyco Submarine Systems (now TE Subcom) and held management positions in business development, strategic marketing and product management with AT&T Submarine Systems.

Nautronix, is pleased to announce that business development manager, **Thomas McCudden**, has been appointed as the company's global sales manager for NASNet® and will be responsible for developing awareness and worldwide sales of NASNet® positioning technology. Prior to joining Nautronix, he gained a wealth of experience within the oil and gas, telecommunications and finance industries through previous positions at IET, FreeAgent, BT and latterly Coda Octopus.

DeepOcean Group Holding B.V. announces that **Henk van den IJssel** and **Peter van der Hak** have joined the company. Henk will focus as commercial director on international business development and sales and the coordination of commercial activity and Peter will assume the responsibilities of group controller. Henk has more than 25 years of international commercial and business development experience in offshore oil & gas industry with, amongst others, Acergy and Allseas. Peter van der Hak has worked over 13 years with Fugro N.V. spending the last 8 years of that period as their group controller.

Walter Steedman has been elected chairman of the Offshore Survey Division of the International Marine Contractors Association (IMCA). Steedman, who holds a BSc (Hons) degree in Topographic Science from Glasgow University, is chief executive officer of the Veripos group, the specialist provider of satellite positioning services. He is a surveyor by profession and has over 30 years experience in the survey and offshore business in a variety of roles including offshore, project management, commercial, general business management and latterly at executive level.

The Society of Petroleum Engineers (SPE) Aberdeen Section has appointed **Ross Lowdon** as chairman. He takes over from Mr. Anthony Onukwu and will hold the chairmanship until September 2015. Beginning his career as a hydrographic surveyor, Mr. Lowdon has more than 20 years' experience in the oil and gas industry and is currently the head of the surveying domain for Schlumberger Drilling & Measurement, globally. He holds a degree in land economy from The University of Aberdeen and an MSc in Drilling and Well Engineering from Robert Gordon University. Mr. Lowdon has been significantly involved in SPE for 13 years.

Hydroid, a trusted science and technology leader in the field of advanced AUVs, is pleased to announce **Kaitlyn Rhue** as the newest addition to their sales & marketing team. She will take over the duties as marketing manager. She will help to align the company for future growth and expand its presence in the marine robotics market. Part of her focus will be to increase customer communications and feedback to the business facilitating the expansion of products and services to Hydroid customers. Rhue has over 10 years of marketing experience with government, defense and commercial entities. She holds a B.S. in Marketing from the University of Vermont.

OceanGate Inc. announced the start of a collaborative in situ equipment testing program with partner **Teledyne BlueView Inc.** The collaboration will focus on dive opportunities where both the client and vendor work side by side to document the effectiveness of specific technology and fine tune their testing requirements to see product benefits immediately.



Steedman

Blue Water Ventures International, Inc. announced that it has signed a preliminary business services agreement with The Argo Advisory Group, Inc. The Agreement contemplates Argo's funding of BWVI's current search and recovery operations. Such funding would allow BWVI to fully fund its current shallow water projects and expand its operations to include deepwater salvage projects. The agreement is subject to diligence by both parties and the execution of definitive agreements. The agreement contemplates the completion of funding efforts for and by both parties' in order to be successful.

essDOCS announced its expansion to the U.S. with the opening of a regional Americas headquarters office in Hoboken, New Jersey. The U.S. office enhances essDOCS' ability to manage and support its customers across the entire Americas region, while also acting as a sales hub for expansion of the company's cornerstone offering, CargoDocs™.

ABS, a leading global provider of classification services to the marine and offshore industries, announces the opening of a new office in Beijing. This move shows ABS' determination in expanding best-in-class service for the Chinese market. This new office will allow further collaboration with government, industry, academic institutions and research organizations and is part of ABS' continued commitment to serving the growing marine and offshore industries in China.

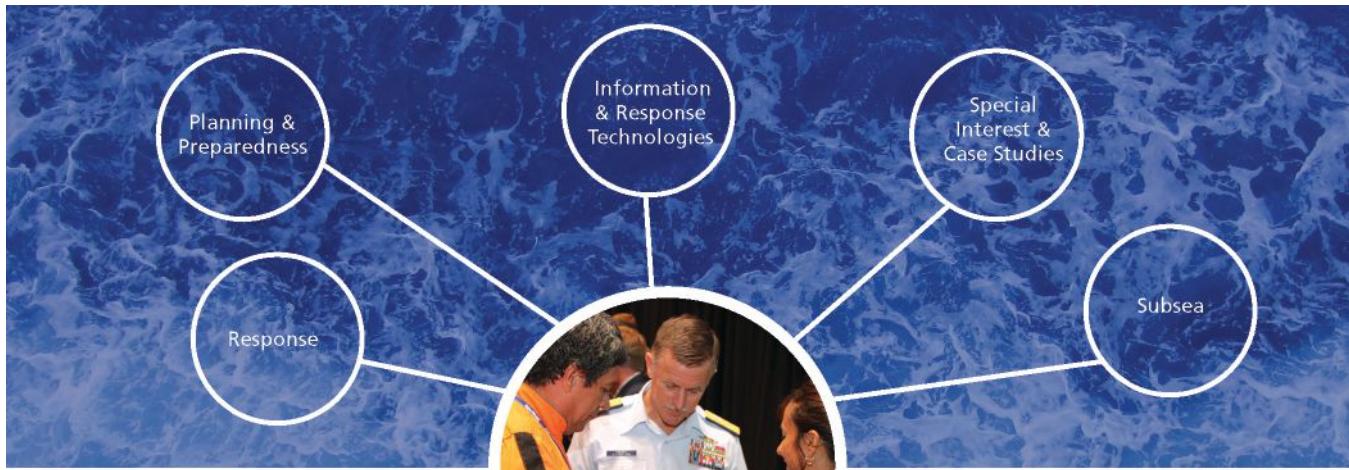
CALENDAR & EVENTS

October 2014

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Ocean News & Technology

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| October 6-9, 2014
Oceanic Engineering Society IEEE AUV
Southampton, UK
www.auv2014.org | October 27-29, 2014
SPE ATCE
Amsterdam, The Netherlands
www.spe.org | November 5-7, 2014
Oil Comm
Houston, TX
www.oilcomm.com |
| October 7-9, 2014
AWEA Offshore Windpower
Atlantic City, NJ
www.awea.org | October 27-31, 2014
Meeting of Acoustical Society of America
Indianapolis, IN
www.acousticalsociety.org | November 17-18, 2014
Offshore Asset Retirement, North Sea
Aberdeen, UK
www.decomworld.com/asset-retirement |
| October 13-15, 2014
WJTA-IMCA Expo
New Orleans, LA
www.wjta.org | October 28-29, 2014
Offshore Energy
Amsterdam, The Netherlands
www.offshore-energy.biz | December 2-4, 2014
Clean Gulf
San Antonio, TX
www.cleangulf.org |
| October 13-17, 2014
Sea Tech Week
Brest, France
www.seatechweek.com/ | October 29, 2014
Offshore Wind Installation & Maintenance
Amsterdam, The Netherlands
www.owimconference.com | December 3-5, 2014
International Workboat
New Orleans, LA
www.workboatshow.com |
| October 14-15, 2014
MTS Dynamic Positioning
Houston, TX
www.dynamic-positioning.com | November 1-5, 2014
Restore America's Estuaries
Washington, D.C.
www.estuaries.org | December 9-11, 2014
Renewable Energy World Conference
Orlando, FL
www.renewableenergyworld-events.com |
| October 14-16, 2014
Deep Offshore Technology International
Aberdeen, Scotland
www.deepoffshoretechnology.com | November 4-6, 2014
Deepwater Operations
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Distribution: GOM Oil Spill & Ecosystem; Subsea EXPO;
Product & Services Focus: Multibeam & Side Scan Sonars; Research & Development Services

FEBRUARY

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

MARCH

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

APRIL

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

MAY

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

JUNE

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

JULY

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

AUGUST

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

SEPTEMBER

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

OCTOBER

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

NOVEMBER

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

DECEMBER

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

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Lisa Chilik

574-261-4215

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International

Zinat Hassan

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zhassan@tscpublishing.com

Mimi Shipman

+44 (0) 777 601 7564

mshipman@tscpublishing.com

Editorial

Ladd Borne

772-285-8308

lborne@tscpublishing.com



OCEAN INDUSTRY DIRECTORY



Directory Sales:

North America:

Lisa Chilik: +1 574-261-4215
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International:

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E-mail: inquiry@nortek.no

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

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iXBlue

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Fax: +33 (0) 1 30 08 88 01
Website: www.ixblue.com



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

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

L-3 Klein Associates, Inc.

11 Klein Drive
Salem, NH 03079
Tel: +1 603 893 6131
Fax: +1 603 893 8807
Email: Klein.Mail@L-3com.com
Web: www.L-3Klein.com
Contact: Deborah Durgin, Supervisor, Marketing & Sales



Klein Associates, Inc.

L-3 Klein is the world's leading sensor technology provider that manufactures and designs high-resolution side scan and multi-beam sonar equipment, and radar-based security and surveillance systems. L-3 Klein has developed a worldwide reputation of excellence in the industry by providing quality products and excellent customer service. Please feel free to check out our product offerings at www.L-3Klein.com.

Marine Sonic Technology, Ltd.

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



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

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

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6032 Railroad Avenue
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Tel: +1 985 385 6789
E-mail: bill.new@newindustries.com
Website: www.newindustries.com
Contact: Bill New



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OCEAN INDUSTRY DIRECTORY

ON&T's Product & Service Directory

SUBSEA TOOLING

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Houston, TX 77064
Tel: +1 713 934 3100
E-mail: info@seanicusa.com
Website: www.seanicusa.com
Contact: Karen North

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

Subsea Americas

3447 Hwy 182
P.O. Box 185
Berwick, LA 70342
Tel: +1 985 714 1767 or 985 518-0055
E-mail: charles@subseaamericas.com
Website: www.subseaamericas.com
Contact: Charles Mayea



Subsea Americas (SSA) is a leading provider of rental ROV tooling equipment on a worldwide basis. SSA is a 24 hr. / 7 days a week service provider of a comprehensive range of standard subsea tooling equipment. From torque tools and flying lead orientation tools to 15k isolated hydraulic intensifiers and wire rope cable cutters - SSA can fully support the client's needs with quality service, and reliable equipment at a most competitive cost.

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Fax: +1 979 865 8859
E-mail: sales@seacon-ap.com
Website: www.seacon-ap.com



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

UNDERWATER VEHICLES/AUVS

Exocetus Development LLC

1444 East 9th Avenue
Anchorage, AK 99501
Tel: 858-864-7775
Fax: 907-569-0268
Contact Ray Mahr
Email: sales@exocetus.com
Website: www.exocetus.com



The Exocetus Coastal Glider, designed for coastal waters where high currents and large variations in water densities occur, has a larger buoyancy engine than legacy gliders, enabling the glider to operate in 2+ knots of current, handling water densities from 7 - 37 ppt, operate for 60 days with a lithium battery and integrate additional sensors.

Hydroid, Inc.

a subsidiary of Kongsberg Maritime
6 Benjamin Nye Circle
Pocasset, MA 02559-4900 USA
Tel: +1 508 563 6565
Fax: +1 508 563 3445
E-mail: glester@hydroid.com
Website: www.hydroid.com
Contact: Graham Lester



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

OceanServer Technology, Inc.

151 Martine Street
Fall River, MA 02723 USA
Tel: +1 508 678 0550
Fax: +1 508 678 0552
E-mail: sales@ocean-server.com
Website: www.iver-auv.com
Contact: Jim Kirk



OceanServer Technology, Inc. is a leading provider of man-portable Autonomous Underwater Vehicles (AUVs) with over 200 AUVs deployed worldwide. The Iver AUV is an affordable, commercial vehicle used for general survey and sub-surface security work, and serves as a research platform for autonomy, behavioral and sensor development studies at universities and navy research facilities.

UNDERWATER VEHICLES/ROVs

Deep Ocean Engineering Inc.

2528 Quince Drive, Suite 111
San Jose, CA 95131 USA
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Fax: +1 408 436 1108
E-mail: sales@deepocean.com
Website: www.deepocean.com
Contact: Bill Charbonneau



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

i-Tech

22330 Merchants Way
Katy, TX 77449
Tel: +1 281 693 9403
E-mail: Katarina.Tehlirian@Subsea7.com
Website: www.interventiontechnology.com
Contact: Katarina Tehlirian



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

Perry

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Tel: +1 713 329 8230
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Forum Energy Technologies' Perry brand supplies deepwater work class ROVs, tooling solutions, burial systems, and control-system-based products to the oil, gas, and telecommunications industries. Providing the most advanced, robust and dependable ROVs and subsea products in the world, Forum's Subsea group has facilities in the US and UK and sales offices and agents around the world.

Schilling Robotics, LLC

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Davis, CA 95618
Tel: +1 530 753 6718
Fax: +1 530 753 8092
Contact: Peter MacInnes
E-mail: peter.macinnes@finci.com
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Schilling Robotics, a business unit of FMC Technologies, is a leading global producer of high-technology subsea systems, including remotely operated vehicles (ROVs), manipulators, and custom-engineered systems for subsea production. We bring nearly 30 years of technological expertise and innovation to the challenges facing customers in the subsea environments. www.fmctechnologies.com

SeaBotix Inc.

2877 Historic Decatur Road, Suite 100
San Diego, CA 92106 USA
Tel: +1 619 450 4000
Fax: +1 619 450 4001
E-mail: Info@SeaBotix.com
Website: www.SeaBotix.com



SeaBotix is a world leading manufacturer of capable underwater MiniROVs that perform a multitude of tasks including maritime security, search and recovery, hull and pipeline inspection, hazardous environment intervention, aquaculture, sensor deployment and oceanographic research. The Little Benthic Vehicle systems have become the benchmark in compact ROVs around the world.

Sub-Atlantic

Woodburn Rd.
Blackburn Business Park
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AB21 0PS, Scotland
Tel: +44 (0) 1224 798660
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VideoRay

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E-mail: sales@videoray.com
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UNDERWATER VIDEO EQUIPMENT

Kongsberg Maritime Ltd.

Campus 1, Aberdeen Innovation Park
Balgownie Road, Bridge of Don
Aberdeen AB22 8GT UK
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Fax: +44 (0)1224 226501
Email: km.camsales.uk@kongsberg.com
Website: www.km.kongsberg.com/cameras
Contact: Mark Esslemont



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ROVSCO, Inc.

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Tel: +1 281 858 6333
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E-mail: sales@rovco.com
Website: www.rovco.com
Contact: Jessica McKenney



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

SIDUS Solutions, LLC

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Tel. +1 619 275 5533
Fax +1 619 275 5544



P.O. Box 925006
Houston, TX 77292
Tel. +1 281 596 7568
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Email: info@sidus-solutions.com
Web: www.sidus-solutions.com

SIDUS Solutions, LLC is a full service manufacturer offering integrated subsea and hazardous area security & surveillance solutions, from conceptual design through engineering to technical & customer support. Our subsea products are currently operational to depths exceeding 6,500m. Worldwide, SIDUS serves the oil, gas, academic, scientific & military industries.

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Hawboldt Industries

220 Windsor Road
Chester, Nova Scotia
Canada B0J 1J0
Tel: 902 275 3591
Fax: 902 275 5014
E-mail: paul.phillips@hawboldt.ca
Website: www.hawboldt.ca
Contact: Paul Phillips



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12251 FM 529
Houston, TX 77041
Tel: +1 713 937 4494
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WINCHES - UNDERWATER

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Tyrebagger Works, Clinterty, Kinellar
Aberdeen AB21 0TT, UK
Tel: +44 (0) 1224 791001
Fax: +44 (0) 1224 791002
E-mail: admin@alloceans.co.uk
Website: www.alloceans.co.uk
Contact: Brian Abel

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