

# OCEAN NEWS

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December 2015    [www.oceannews.com](http://www.oceannews.com)

## & TECHNOLOGY



Year in Review

Page 10

Underwater  
Intervention  
Pre-Show Guide

Page 30



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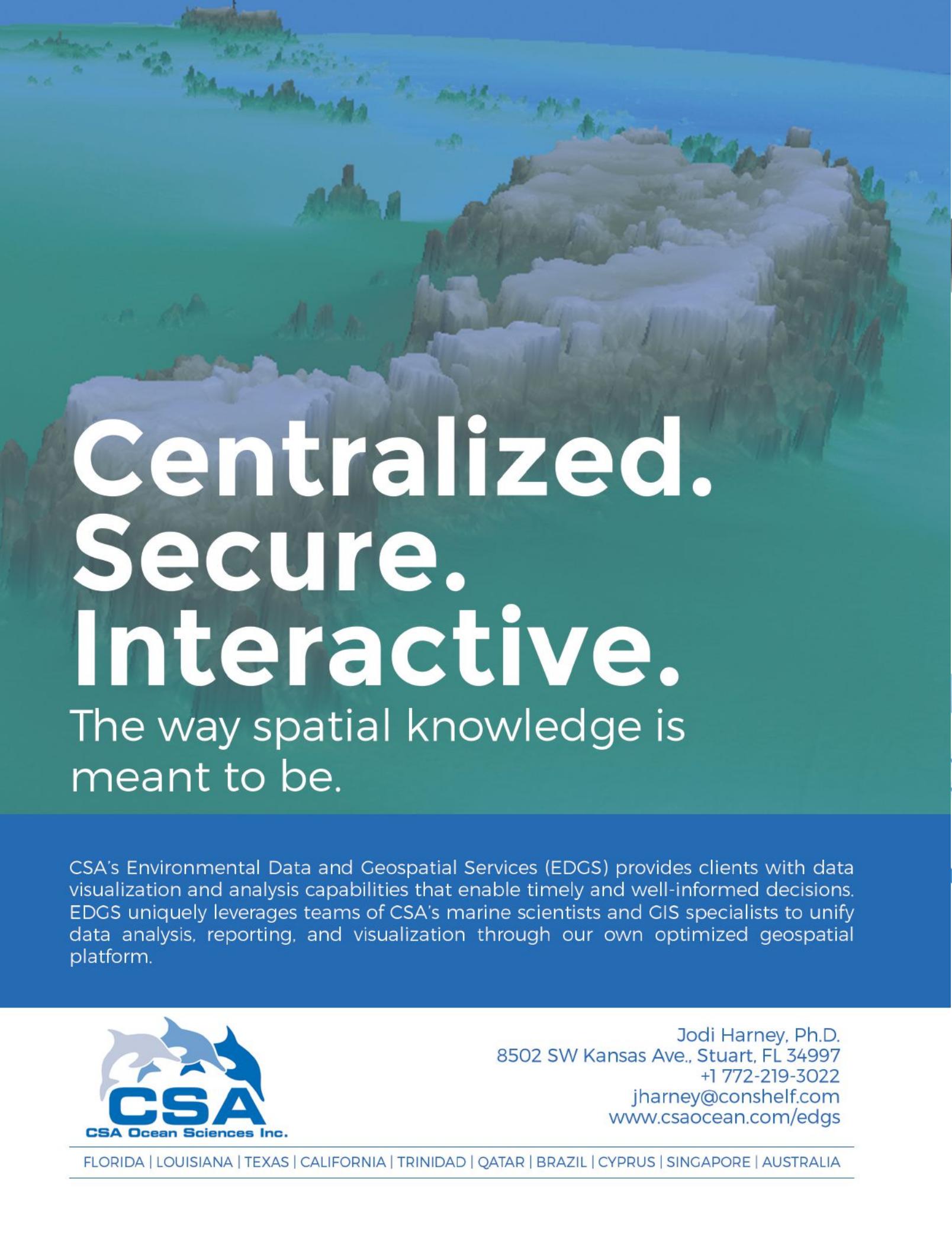
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# in this issue

Ocean News & Technology December 2015

## Ocean Industry



## Offshore Industry



## 2015 Year in Review

Page 10

## Underwater Intervention Pre-Show Guide

Page 30

- |                            |                                |
|----------------------------|--------------------------------|
| 15 Ocean Industry Briefs   | 35 Offshore Industry Headlines |
| 18 Maritime Transportation | 38 Upstream Oil & Gas          |
| 20 Ocean Science           | 48 Underwater Intervention     |
| 24 Ocean Energy            | 52 Maritime Communications     |
| 28 Defense                 | 58 Subsea Cables               |

6

## Departments

- |                             |
|-----------------------------|
| 8 Editorial                 |
| 62 Offshore Stats and Data  |
| 66 Product News             |
| 70 People & Company News    |
| 72 Calendar & Events        |
| 75 Ocean Industry Directory |

## Cover Photo



Photo Courtesy of Fugro Subsea,  
Abu Dhabi

**OCEAN NEWS**  
& TECHNOLOGY

More News, More Technology, More Data

## in the next issue

### Editorial Focus

- Underwater Navigation
- Manned Submersibles

### Product Focus

- Multibeam & Side Scan Sonars
- Research & Development Services



**Technology Systems Corp.**

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# EDITORIAL

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Research Analyst,  
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# Global Offshore Wind – 2015 in Review

It has been a busy year for the offshore wind industry – global capacity installed this year not only doubled that of 2014, but it also now comprises over a third of global installed capacity to date. More turbines have been installed in 2015 than globally in any previous year; additions from Germany and the UK dominated the market, together installing 768 turbines in European waters.

The huge Gwynt y Môr wind farm in the UK, as well as additions from smaller German and UK farms (Borkum Riffgrund, Butendiek, and Humber Gateway for example), make 2015 a record year for this burgeoning renewables industry. A record arriving at a critical time for the renewables industry, considering the fallout from the oil price crash and current availability of cheap energy derived from fossil fuels.

Notably, 2015 has seen the commissioning of several larger-scale wind farms, with 11 of the 18 wind farms to supply energy to the grid this year rated at 200MW or above. This signals the start of a new era for offshore wind – as the scale of offshore wind operations increases, and 80 turbine farms become the norm, it is likely that we will see rapid development throughout the industry over the next few years. Nevertheless, the rapidly changing demands of the offshore wind industry has had its challenges, especially with the sheer volume of projects we have seen installed this year. The supply chain, particularly in Western Europe, will have to adapt fast to meet the needs of even larger future developments, such as the UK Round 3 mega-projects.

Greater possibilities for this growing market have been realised through innovative solutions, and as a result, confidence has grown in offshore wind technology. In the last year, the use of drones and radar technology has been increasingly adopted by the industry. Floating wind has also taken a huge leap forward this year; Statoil recently announced a final investment decision for the world's first floating wind farm, marking a shift-change in attitudes towards floating wind turbines. This development in Europe comes while all eyes are on Asia – awaiting power generation from Japan's Fukushima 7MW turbine, the largest floating turbine installed yet. If both of these landmark

projects prove successful, they will define not only the offshore wind market's strong development over the past 15 years but also its rapidly evolving future prospects. Particularly for Europe, the use of floating turbines would allow smaller countries to capture huge wind resources in deeper water regions such as the North Sea.

Looking back through 2015, we can see signs of future growth. Onshore and offshore construction have begun for wind farms which will contribute significantly to future capacity; for example, Gemini in the Netherlands, Hastings (Rampion) in the UK and Gode 1 & 2 in Germany will contribute a combined 1.5GW of offshore wind capacity within the next five years. Additionally, offshore construction of foundations for Block Island began this year, heralding the entry of the U.S. to the offshore wind market.

Other key projects are nearing construction-end as we move towards 2016. South Korea's first offshore wind farm near Jeju Island should finish construction and become functional in the next year; meanwhile, Taiwan and Brazil are expected to install pilot turbines offshore as a first step to entering the market. DW forecasts fewer additions in 2016 relative to 2015; however, the level of construction and the diversity of locations expected in 2016, bodes for a larger global market in the years to come. Closer to home, 2016 signals the start of construction for some of the Round 3 projects and a move into a new phase of gigawatt-scale projects.

On a more sombre note, the sharp halt to onshore wind subsidy in the UK (announced in June 2015) has introduced some doubts for the industry's offshore contemporaries. While policy remains a major driver for offshore wind, reliant on subsidy and government support, the industry is vulnerable to changing political environments.

In the near future, offshore wind must look to become more self-sustainable through lowering costs and by becoming more competitive in the energy mix. Although it is already set on this course, 2016 will be a crucial year in which the industry must retain investment and momentum during a period of relative economic deterioration.

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# Year in Review

## Baumann becomes SUPSALV director

Captain Gregg Baumann assumed command from Captain Mark Matthews as the director of Ocean Engineering, Supervisor of Salvage and Diving (SUPSALV), Naval Sea Systems Command announced.



Baumann reports to SUPSALV after serving as program manager for the International Fleet Support Program Office. He also served as chief of staff for the Deputy Assistant

Secretary of the Navy for Ship Programs, executive assistant to the Assistant Secretary of the Navy for Research Development and Acquisition and DDG 51 program manager representative. He also completed a SUPSALV tour, serving as the assistant for salvage.

## Abigail Ross Hopper named new director of BOEM

Secretary of the Interior Sally Jewell named Abigail Ross Hopper as the director of the Bureau of Ocean Energy Management (BOEM), which manages the development of the U.S.'s conventional and renewable energy and marine mineral resources on the Outer Continental Shelf.

## Craig McLean named new leader for NOAA Research

NOAA administrator Kathryn Sullivan, Ph.D., announced that Craig McLean, deputy assistant administrator for NOAA's Office of Oceanic and Atmospheric Research (OAR), has been selected to head the office, which is responsible for NOAA's research enterprise, including laboratories and programs across the country.

Prior to this position, McLean served as deputy assistant administrator for OAR's Programs and Administration, as executive officer of the National Ocean Service, and was the founding director of NOAA's Office of Ocean Exploration.



## NOAA establishes new panel to guide ocean exploration

NOAA announced the appointment of 13 members to a new federal Ocean Exploration Advisory Board that will provide guidance to NOAA and the nation on the exploration of our ocean.

The new members represent government agencies, private sector leaders, academic institutions and not-for-profit institutions involved in all areas of ocean exploration, from advanced technology to citizen exploration.

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

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



## NOAA, partners reveal first images of historic San Francisco shipwreck

NOAA and its partners released three-dimensional sonar maps and images of an immigrant steamship lost more than 100 years ago in what many consider the worst maritime disaster in San Francisco history.

On 22 February 1901, in a dense morning fog, the SS City of Rio de Janeiro struck jagged rocks near the present site of the Golden Gate Bridge and sank almost immediately, killing 128 of the 210 passengers and crew aboard the ship.

NOAA's Office of National Marine Sanctuaries Maritime Heritage Program is engaged in a 2-year study to discover and document shipwrecks in the Gulf of the Farallones National Marine Sanctuary and nearby Golden Gate National Recreation Area.

## Team led by Paul G. Allen locates one of the largest battleships ever constructed

A research team led by Paul G. Allen has located the Musashi, one of the world's largest and most technologically advanced battleships. The ship was sunk during World War II and, despite numerous eyewitness accounts, the exact location of the ship was unknown.

Using historical records from four different countries, detailed topographical data and advanced technology aboard his yacht, M/Y Octopus, Mr. Allen and his team discovered the wreckage in the Sibuyan Sea off the Philippines on 2 March 2015.



## WHOI takes delivery of new research vessel Neil Armstrong

Following completion of successful acceptance trials, the nation's newest research vessel, the Neil Armstrong, was officially turned over by the U.S. Navy on 23 September to the Woods Hole Oceanographic Institution (WHOI), which will operate the vessel as part of the national academic fleet.

## Alvin completes depth certification to 4,500 M

WHOI announced that the Human Occupied Vehicle (HOV) Alvin has achieved certification from the U. S. Naval Sea Systems Command (NAVSEA) for operations to its rated depth of 4,500 m (approx. 2.8 mi.).



## U.N. finalizes Polar Shipping Code

The International Maritime Organization—the U.N. agency charged with establishing global shipping standards—adopted the environmental component of the Polar Code, a suite of mandatory measures governing Arctic and Antarctic shipping. The environmental portion of the Polar Code will include some noteworthy elements, such as a ban on the operational discharge of oil and chemicals and enhanced standards associated with disposal of sewage and garbage into polar seas. Moreover, voyage planning provisions to safeguard marine mammals will provide additional conservation protection.

## Final rule on vessel requirements for Notices of Arrival and Departure and AIS

The U.S. Coast Guard announced the publication of the final rule on Vessel Requirements for Notices of Arrival and Departure and Automatic Identification Systems. This final rule amends the applicability of notice of arrival requirements to include additional vessels, sets forth a mandatory method for electronic submission of NOAs and modifies related reporting content, timeframes and procedures. Additionally, the final rule extends applicability of AIS requirements beyond Vessel Traffic Service areas to all U.S. navigable waters and requires that additional commercial vessels install and use AIS.

## Court rules Navy war games violate law protecting whales and dolphins

A federal court announced that the U.S. Navy's training and testing activities off the coast of Southern California and Hawaii illegally harm more than 60 whale, dolphin, seal, and sea lion populations. The U.S. District Court, District of Hawaii, found that the National Marine Fisheries Service—the agency charged with protecting marine mammals—violated multiple requirements of the Marine Mammal Protection Act and the Endangered Species Act when agreeing to the Navy's plan.

## U.S. Navy releases fiscal year 2016 budget proposal

The Department of the Navy released its proposed \$161.0 billion budget for fiscal year 2016. This budget is part of the \$534.3 billion defense budget President Barack Obama submitted to Congress.

## Phoenix upgrades U.S. Navy Deep Drone ROV

Phoenix International Holdings, Inc. recently completed an upgrade of the U.S. Navy's 8,000-ft depth capable ROV Deep Drone. All work was performed under a multi-year contract with the U.S. Navy's Office of Supervisor of Salvage and Diving (SUPSALV). The upgrade included installing a new umbilical, sonar, high-definition camera, LED lighting system, an updated frame, and a new foam pack. In addition, and at the heart of the upgrade, Phoenix installed a completely new Programmable Logic Controller (PLC)-based vehicle control system.



## Interior leases area offshore Massachusetts for wind energy development

BOEM held the nation's fourth competitive lease sale for renewable energy in federal waters offshore Massachusetts for potential wind energy development. The auction consisted of two rounds before determining RES America Developments, Inc. and Offshore MW LLC as the provisional winners of Lease Area OCS-A 0500 (187,523 acres) and OCS-A 0501 (166,886 acres), respectively.

## DONG Energy takes over Massachusetts offshore wind project

DONG Energy has agreed to take over RES Americas Developments Inc.'s more than 1,000-MW newly assigned development project rights off the coast of Massachusetts. At the offshore wind auction held by BOEM, RES secured the rights to develop one of the two leases that were awarded. The lease comprises an area that could potentially accommodate more than 1,000 MW.

## Block Island Wind Farm completes first "steel in the water"

The Block Island Wind Farm reached its "steel in the water" milestone with the installation of the first wind farm foundation component.

Deepwater Wind's offshore foundation installation contractor set the first, 400-ton steel jacket on the seafloor on 26 July, at the wind farm site, roughly three miles off the Block Island, Rhode Island coast.

## ABB wins cable order for one of the world's biggest wind farms

ABB won an order worth around \$130 million from DONG Energy, the Danish integrated energy company, to supply a high-voltage cable system that will bring power from the Walney Extension wind park off the northwest coast of England to more than a million people in the UK. The Walney Extension will provide additional generation potential of 660 MW on top of the existing offshore wind farm's 367 MW.

## Countries, oil companies agree to end routine flaring

Chief executives from major oil companies have joined together with senior government officials from several oil-producing countries to commit, for the first time, to ending the practice of routine gas flaring at oil production sites by 2030 at the latest.

## U.S. displaces Russia as world's top oil and gas producer

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

## U.S. oil reserves rise to their highest levels since 1975

Proved reserves of crude and condensate in the United States rose 9.3% in 2013 as drillers showed they could extract more oil than previously thought from shale formations.

Reserves increased 3.1 Bbbl to 36.5 Bbbl, the Energy Information Administration said in its annual U.S. Crude Oil and Natural Gas Proved Reserves report.

# Year in Review

## BP agrees to settle 2010 Deepwater Horizon oil spill claims

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



## UK introduces tax cuts, allowances to support North Sea oil industry

The supplementary tax charge on UK oil and gas companies will be reduced to 20% from 30% and petroleum revenue tax will also be cut to 35% from 50%, Chancellor of the Exchequer George Osborne commented in the annual budget speech. The government also will provide U.S. \$29.6 million for a seismic surveys program in under-explored areas of the North Sea.

## Blue Ocean Technologies sets subsea intervention record

The Woodlands, Texas-based company said its Interchangeable riserless intervention system (IRIS) intervened on a deepwater production well in the Gulf of Mexico's Desoto Canyon, reaching a record-breaking 8,200 ft (2,499 m).

## Aker Solutions develops capping technology to limit deepwater drilling risks

Aker Solutions has delivered the key subsea component for the system being developed by Marine Well Containment Company to limit environmental risks from oil and gas production in the U.S. Gulf of Mexico, the company said. The Subsea Containment Assembly, or SCA, is designed to contain a well-control incident by connecting and creating

a seal to prevent oil leaks. It can also be used in a cap-and-flow plan to direct fluid to vessels on the surface. The technology works under pressures as high as 15,000 psi.

## Saudi Aramco breaks world cable length record

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

## ABB sets world record in HVDC voltage level

ABB successfully commissioned a high-voltage direct current (HVDC) link between Norway and Denmark to increase availability of renewable hydroelectric and wind power in the region's electricity grid. At 500 kV, the Skagerrak 4 link sets a new record in transmission voltage using Voltage Source Converters (VSC).

## Prysmian to strengthen submarine cable production capabilities

Prysmian Group has announced new investments worth over €40 million to upgrade production capabilities in its cable plants in Pikkala, Finland and in Arco Felice, Italy. The factories are already the Group's centers of excellence for high voltage and submarine cable production. These new investments will enable both plants to be fully equipped to manufacture and test large cross-section 3-core cables up to a voltage of 400 kV.

## MCP to deploy largest 4G offshore network

Statoil has chosen Maritime Communications Partner (MCP) to deploy and operate their high speed 4G-network on the Norwegian Continental Shelf (NCS). Statoil and MCP have signed a 6-year contract with an option to extend for another 4 years. With that MCP will immediately start building the world's largest 4G network at sea.

## Schlumberger to acquire Cameron

Schlumberger Limited and Cameron jointly announced a definitive merger agreement in which the companies will combine in a stock and cash transaction. The agreement was unanimously approved by the boards of directors of both companies.

## SpeedCast appointed as Inmarsat distribution partner

Inmarsat has appointed SpeedCast International Limited as a distribution partner for flagship maritime service FleetBroadband and Fleet One, its new voice and broadband data service for leisure yachts and nearshore fishing boats. As part of the agreement signed, the global network and satellite communications service provider has also been appointed as a Value Added Reseller (VAR) for Fleet Xpress, Inmarsat's high-speed broadband maritime service, delivered over the new Global Xpress (GX) constellation acquired by Inmarsat in January.

## C & C Technologies Inc. acquired by Oceaneering

Oceaneering International, Inc. announced that it has closed the previously announced definitive agreement to acquire C & C Technologies, Inc., a global provider of survey and satellite-based positioning services. Subject to customary post-closing working capital adjustments, the acquisition price of approximately \$230 million was paid in cash.

## Technip offers US\$1.83B in cash for oil services company CGG

Technip SA of France has made a preliminary takeover offer of US\$1.83 billion in cash for smaller French oil field services company CGG SA, a sign of accelerating consolidation in the sector as falling crude prices have crimped spending by large oil producers.

## Teledyne acquires Bowtech

Teledyne Technologies Incorporated announced that it has acquired Bowtech Products Limited (Bowtech) through a U.K.-based subsidiary. Based in Aberdeen, Scotland, Bowtech designs and manufactures harsh underwater environment vision systems. Terms of the transaction were not disclosed. Founded in 1989, Bowtech is a leading supplier of rugged cameras and LED lighting sources deployed in the most extreme environments within the remotely operated vehicle (ROV), defense, oceanographic, nuclear and marine science industries.

## Teledyne Marine Systems welcomes SeaBotix

Teledyne Marine Systems group, leading providers of undersea vehicles

and subsea infrastructure, has announced that SeaBotix, part of the recent Bolt Technology Corporation acquisition by parent company Teledyne Technologies Incorporated, will join the Marine Systems group of companies.

## EMC to acquire MTN

Emerging Markets Communications (EMC) has signed a definitive merger agreement to acquire MTN Communication. The acquisition will benefit the organizations' combined 1,600 vessels and more than 8,000 land-based customer sites in the most hard-to-reach places on all continents and in every ocean.

## exactEarth and Harris Corporation form strategic alliance to provide real-time global maritime tracking

exactEarth Ltd., the leading provider of Satellite Automatic Identification System (AIS) data services, and Harris Corporation, a world leader in space, geospatial and remote sensing solutions, have formed an alliance to provide a new level of AIS data service that will deliver real-time global coverage for maritime vessel tracking.

## Atlantis acquires MCT from Siemens

Atlantis Resources has reached an agreement to acquire the entire issued share capital of the Bristol-based tidal business, Marine Current Turbines Limited (MCT), from Siemens AG in an all share deal. The acquisition is conditional upon certain conditions being satisfied.

## Tocardo acquires IHC Tidal Energy

Tocardo Tidal Turbines, producer of tidal and free-flow water turbines, has acquired IHC Tidal Energy, the tidal energy division of Dutch maritime company Royal IHC.



## Shell to buy BG for about \$70B

Shell has agreed to acquire British oil and gas major BG Group for \$70 billion in a deal that could be the largest merger between energy companies in a decade. It also would create the world's largest independent producer of liquefied natural gas amid a historic downturn in oil and gas prices.

## GE buys Oceaneering's subsea electric actuator product line

GE has agreed to purchase Oceaneering's subsea electric actuator product line, which will be used to improve remote subsea production and processing capabilities.

## ORBCOMM completes acquisition of SkyWave

ORBCOMM Inc. completed the acquisition of SkyWave Mobile Communications, the largest M2M service provider on the Inmarsat global L-band satellite network. Based in Ottawa, Canada, SkyWave adds more than 250,000 subscribers, 400 channel partners, annualized revenues of over \$60 million and adjusted EBITDA of over \$12 million.

## Wärtsilä to acquire L-3 Marine Systems International

Wärtsilä Corporation is set to acquire L-3 Marine Systems International (L-3 MSI) from L-3 Communications Holdings Inc. L-3 MSI is a business sector within L-3's Electronic Systems business segment primarily focused on the commercial ship industry. The transaction is valued at Euro 285 million (enterprise value), subject to customary adjustments including an estimated reduction of Euro 60 million for L-3 MSI employee pension-related liabilities to be assumed by Wärtsilä Corporation.

## Energy Transfer to buy Williams

The Williams Cos. said it will accept an offer from rival Energy Transfer, ending months of negotiation with a deal worth \$32.9 billion. The purchase is the second-largest energy deal announced this year, behind only Royal Dutch Shell's \$70 billion acquisition of natural gas producer BG Group in April, and it's the largest combination announced since oil prices slid from near \$60 per barrel highs earlier this year. Including debt and other fees, Williams' final price tag will climb to \$37.7 billion.

## Lotte Hass dies

Lotte Hass passed away at the age of 86 on 14 January 2015. By being the first woman to dive with autonomous diving equipment, Lotte Hass opened up a formerly male-dominated field for females. Against strong opposition, she first starred as an underwater photo model before moving behind the camera to become an underwater photographer. She was inducted into the Women Divers Hall of Fame and the International Scuba Diving Hall of Fame in 2000. Spectacular film scenes that showed her diving fearlessly with sharks certainly contributed to the big success of her husband Hans Hass' movies in the 1950s.

## Jack W. Fisher passes away

Jack W Fisher, president of JW Fishers Mfg., passed away at home after a brief illness on 20 February 2015. He was 73 years old. The business was started because Mr. Fisher, an avid diver, needed an underwater metal detector to use on a salvage project in the mid 1960s. He discovered there was no such device available. Over the next several years he designed and constructed his own underwater metal detector. JW Fishers Mfg. was formed and Jack began building and selling his detectors to other divers. Over the next 50 years, the company developed into a significant enterprise by designing, manufacturing and marketing the most extensive line of underwater search equipment offered by any single manufacturer.



## Christopher Nicholson passes

Christopher Nicholson, one of the world's leading innovators in underwater robotics technology, passed away suddenly at the age of 62 at his residence in Falmouth, Massachusetts.

Nicholson was founder and president of Deep Sea Systems, International, now Oceaneering International. He was an internationally recognized inventor and developer of underwater robotics and received the National Oceanographic Institute Award from the Academy of Underwater Arts and Sciences in 1992.



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# OCEAN INDUSTRY

## Phoenix International assists U.S. Navy in locating missing cargo ship El Faro



Phoenix International Holdings, Inc. (Phoenix), under the operational direction of the U.S. Navy's Office of the Supervisor of Salvage and Diving (SUPSALV), successfully located the U.S. flagged cargo vessel El Faro using the U.S. Navy's deepwater side scan-sonar search system, Orion. The ship was found in approximately 5,000 m of seawater (msw) in the vicinity of Crooked Island in the Bahamas.

Following the search and location of the missing ship, the Phoenix team launched the U.S. Navy's deepwater Remotely Operated Vehicle (ROV), CURV-21, to verify and visually inspect the wreckage. Over the next several days, Phoenix continued to identify and recover priority items, such as the Voyage Data Recorder (VDR), as directed by the National Transportation Safety Board (NTSB) investigation team.

Phoenix operates the ORION search system, the CURV ROV, and several other U.S. Navy search and recovery assets under its multi-year Undersea Operations contract with SUPSALV. Search operations were conducted from USNS Apache (T-ATF 172), which was mobilized from its homeport in Little Creek, Virginia.

Phoenix, an internationally recognized expert and proven industry leader in the field of undersea search and recovery, provides quick response and turn-key services for the location and recovery of objects from any water depth down to 6,000 msw (20,000 ft of seawater). Phoenix is an employee-owned, ISO 9001-2008 Management System certified marine services contractor providing manned and unmanned underwater solutions and project management services to a diverse set of clients worldwide. Services from our seven regional offices include wet and dry hyperbaric welding, Nondestructive Testing (NDT), subsea engineering services, conventional and atmospheric diving, Autonomous Underwater Vehicles, Remotely Operated Vehicles, and other robotic systems.

For more information, visit [www.phnx-international.com](http://www.phnx-international.com).

## in this section

Ocean Industry Briefs	15
Maritime Transportation	18
Ocean Science	20
Ocean Energy	24
Defense	28

### Registration now open for the 2016 ROV Challenge

Registration is open for middle school team participation in the popular ROV Challenge, sponsored by the Mid Atlantic Robotics IN Education (MARINE) program. This year's program, hosted by the Bermuda Institute of Ocean Sciences (BIOS) with lead donor support from HSBC, will become a regional partner with the Marine Advanced Technology Education Center (MATE), which challenges students to apply physics, math, electronics, and engineering lessons to the marine environment.

Following the success of last year's ROV Challenge, MATE approached BIOS about a partnership that will give Bermudian youth a stronger path to ROV competitions at higher international levels. Bermudian middle school students will compete this year at the Scout and Navigator levels of the MATE course (designated for beginner and mid-level difficulty).

This year's topic is "From the Gulf of Mexico to Jupiter's Moon Europa: ROV Encounters in Inner and Outer Space." During the challenge, students will set vehicles they have built with mentorship from instructors on a variety of missions, such as surveying and retrieving samples from a moon-like surface and collecting a coral sample from the deep sea.

The event will be held at the Bermuda National Sports Center on 30 April 2016.

### Taiwan faces EU sanction on fisheries

Three weeks after Greenpeace Rainbow Warrior busted Taiwanese tuna longliner Shuen De Ching No. 888 fishing illegally in the Pacific, the European Commission has yellow carded Taiwan for failing to fight illegal, unreported and unregulated (IUU) fishing. The yellow carding highlights significant failings in Taiwan fisheries management, especially in the oversight of its distant water fleet.

Taiwan now has 6 months to bring its fisheries management and vessel control policies in line with international law, or it risks a red card blacklisting. A red card would mean an import ban on fisheries products to the EU, the world's largest market for fisheries products. The resulting economic loss from such a ban could be as high as €13 million.

Taiwan exports more than half of its US\$3.38 billion fisheries production, with more than 90% of tuna going to the US, Japan and other countries.

## Robot school opens to help address environmental challenges

The National Oceanography Centre (NOC) is a partner in a new £2.5 million Centre for Doctoral Training in the use of robotic systems for environmental sciences.

The NOC component of the centre will focus on innovative marine robotics and sensors, which can be used to address key scientific challenges such as, climate change, deep-sea exploration, and identification of biodiversity 'hotspots.' The fleet of marine robots based at the NOC has recently developed into one of the most advanced in the world.

This project is being led by the University of Southampton and also involves the British Antarctic Survey, Heriot-Watt University, University of East Anglia, and the Scottish Association for Marine Science. Between all six organizations, this school will teach skills in a range of unmanned systems—which can monitor everything from erupting volcanoes to algal blooms in the ocean.

The centre is called NEXUSS (NEXt generation Unmanned Systems Science) and is funded by the Natural Environment Research Council (NERC) and the Engineering and Physical Sciences Research Council (EPSRC). It will provide training to over 30 science and engineering Ph.D. students, with the first intake due to start in autumn 2016.

For more information, visit [www.noc.ac.uk](http://www.noc.ac.uk).

## U.S. to combat illegal fishing and seafood fraud and promote the sustainable management of international fisheries

President Obama has signed the Illegal, Unreported and Unregulated (IUU) Fishing Enforcement Act, marking another critical step in the administration's efforts to combat IUU fishing and seafood fraud.

The bi-partisan legislation, signed by the President, includes a number of provisions preventing illegally harvested fish from entering the U.S. and supports efforts to achieve sustainable fisheries

around the world. The U.S. will join a global effort to ratify and implement the Port State Measures Agreement (PSMA), which will prevent vessels carrying fish caught illegally from entering U.S. ports and keep illegal product out of U.S. markets.

Implementation of the agreement was the first recommendation of the IUU Action Plan, released in March by the President's Task Force on Combatting IUU and Seafood Fraud, an interagency group co-chaired by the Departments of Commerce and State.

The U.S. now joins 13 other nations that have already ratified the PSMA, which will be legally binding once a total of 25 countries have ratified it.

The U.S. has already implemented most of the measures outlined in the PSMA domestically, and this formal ratification provides additional leverage to encourage ratification and adoption of these measures by other countries so that it will apply to ports around the world.

For more information, visit [www.noaa.gov](http://www.noaa.gov).



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## Closer collaboration between IMCA and ICES

Two recent events have highlighted how the International Marine Contractors Association (IMCA) and the Chartered Institution of Civil Engineering Surveyors (ICES) are working closely to promote the importance of hydrographic and civil engineering surveying in the marine environment and the competency of their respective members.

Under the terms of the 2014 Memorandum of Understanding (MoU), signed by both organizations, offshore survey personnel who have completed competence portfolios based on the IMCA framework can use this as a demonstration of their competence for membership of ICES. Likewise IMCA will promote recognition of the competence of ICES members to its international offshore contractor membership where companies have competence management schemes in place based on the IMCA model.

"Working together to improve levels of competence, a vital step to ensuring there are enough trained and competent people to undertake important projects, was a major factor in the signing of the MoU. Indeed, it provides members of each of our organisations with something of a win:win situation. We are now taking things a step further," explains IMCA's newly appointed Technical Director, Richard Benzie.

"We have recently seen two important milestones in the cementation of the IMCA:ICES relationship. On 2 September, ICES spoke about its professional qualification route for offshore surveyors at the IMCA Competence & Training Seminar in Aberdeen; and in early October an ICES representative addressed IMCA's Offshore Survey Committee in Aberdeen. We are also exploring a number of other areas where there may be opportunities for further fruitful cooperation."

ICES chief executive officer Bill Pryke commented: "I am delighted that both organizations have already acted on our MoU. ICES has tremendous respect for the work IMCA does in promoting standards and competence in the offshore survey industry. By working together to support individuals and contractors, we can ensure all those involved in offshore survey are competent and operate within a professional environment that recognizes and nurtures their skills."

Although the MoU talks primarily about surveyors, as Richard Benzie explains, other roles covered within IMCA's competence frameworks are not excluded. "Typical examples would be those of geophysicists and data processors. Ed Danson, a much respected offshore survey industry figure, a former member of our Offshore Survey Committee and former president of ICES, has mapped IMCA's survey competence frameworks against the requirements for technical membership of ICES and has found a positive level of synergy between each organization's approach to competence assessment."

## Port of Houston Authority on pace for a record year

"Operations continue to perform efficiently and effectively for the benefit of our customers and stakeholders that use the Port of Houston Authority facilities," stated executive director Roger Guenther in his report to the Port Commission of the Port of Houston Authority.

Guenther also shared in his report that the container terminals, which handle the majority of cargo tonnage crossing Port Authority wharves, continue to operate at record levels with loaded container units growing 14% versus this time last year. "The Port Authority is expecting to surpass 2 million TEUs this year for the first time in its history," Guenther announced.

This month, the Bayport Container Terminal recorded the highest number of gate moves ever in a single day for either of the Port Authority container terminals at 4,300 transactions. Customers still experienced excellent service levels including low truck turn times.

In its commitment to provide cost and service advantage through efficiencies to its customers, the Port Commission accepted the staff's recommendation for tariff rates to remain the same in 2016.

## Maersk Line to reduce its network capacity, postpone investments in new capacity



As a response to both the shortterm and longterm market outlook, Maersk Line is accelerating a number of already established cost and efficiency initiatives. Maersk Line will reduce its network capacity and postpone investments in new capacity, while at the same time reducing operating costs by escalating already announced plans to simplify the organization. In light of the lower demand these initiatives will allow Maersk Line to deliver on the ambition to grow at least in line with the market to defend the market leading position.

As a response to the current market outlook, network capacity will be reduced in Q4 2015 and throughout 2016. As already announced, the closure of four services (ME5, AE9, AE3 and TA4) has already been initiated over the last 2 months and plans are in place to further cancel a total of 35 sailings in Q4.

Maersk Line will continue to manage capacity and does not plan to exercise the previously announced options for six 19,630 TEU vessels and two 3,600 TEU feeders and will postpone decision on the optional eight 14,000 TEU vessels.

Over the next 2 years, Maersk Line expects to lower the annual Sales, General & Administration (SG&A) cost run-rate by USD 250 million with an impact of USD 150 million in 2016. SG&A savings will be derived from already initiated transformation projects and the standardization, automation and digitalization of processes.

"We are on a journey to transform Maersk Line. We will make the organization leaner and simpler. We want to improve our customer experience digitally and at the same time work as efficiently as possible," says Søren Skou.

Today, Maersk Line has 23,000 land-based staff globally. The organizational transformation and on-going automation and digitalization will enable Maersk Line to reduce the global organization by at least 4,000 positions by the end of 2017 with the aim of minimizing redundancies through managing natural attrition.

"We are fewer people today than a year ago. We will be fewer next year and the following year. These decisions are not taken lightly, but they are necessary steps to transform our industry," concludes Søren Skou.

For more information, visit [www.maerskline.com](http://www.maerskline.com).

## ABS to class first LNG carriers with KOGAS KC-1 containment system

ABS, a leading provider of classification services to the global marine and offshore industries, has been selected to class two Liquefied Natural Gas Carriers (LNGCs) for SK Shipping, featuring the KC-1 cargo containment system (CCS).

The agreement brings the number of LNGCs to be built to join ABS/KR class for Korea Gas Corporation (KOGAS), the world's largest LNG importer, to five.

"ABS has a long association with South Korea's shipowners and ship-builders and has supported them as they push the development of ships and systems to new levels of innovation and efficiency," says ABS chairman, president and CEO Christopher J. Wiernicki. "The award of these five class contracts confirms our position as a trusted partner to South Korea's leading maritime and shipbuilding companies."

Two 174,000 cu m LNGCs will be built with the KOGAS-developed KC-1 CCS for SK Shipping at the Samsung Heavy Industries yard in South Korea. An additional three 174,000 cu m LNGCs, featuring the No 96-type CCS, two for Korea Line Corporation and one for Hyundai LNG Shipping, will be built at Daewoo Shipbuilding and Marine Engineering.

Upon delivery, the ships will be chartered to KOGAS and will carry shale gas from the United States to South Korea beginning in 2017.

For more information, visit [www.eagle.org](http://www.eagle.org).

## Kongsberg Maritime releases new K-Sim cargo handling simulator

Kongsberg Maritime has released its latest K-Sim Cargo simulator model, SCC-II, based on a Suezmax crude oil carrier with 12 cargo tanks and two slop tanks. Shown for the first time at Kongsberg Maritime's European Simulator User Conference in Gothenburg, the new simulator model enables integrated, real-time exercises based on actual ship specifications and performance data on liquid cargo handling operations.



The model is delivered with a sophisticated new Integrated Automation System (IAS) to replicate Cargo Control Room (CCR) operations. The CCR can be represented by different combinations of interactive mimic panels, operational panels or consoles or desktop stations, allowing it to be laid out according to the specific requirements of any training facility.

The new model contains a closed circuit TV system with three camera angles providing a view from both manifolds and a third camera with view from the jetty to give students a complete training scenario.

The SCC-II model is equipped with an inert gas plant to provide training on cleaning the flue gas and replacing combustible gases in the cargo tanks with low or non-flammable gases. The pump configuration represents a typical crude oil carrier with three cargo pumps, two ballast pumps, three oil/gas separators, a stripping pump and ejector.

Kongsberg Maritime's state-of-the-art load calculator, K-Load, is also integrated in the model. The system uses the various tank levels and corresponding specific gravity and calculates hydrostatic conditions, intact stability, longitudinal strain, tank content and damage stability. It can also produce ullage and loading reports.

The new model, which is certified by DNV GL and exceeds current STCW requirements, is already in use by Buskerud and Vestfold University College in Norway and TMS Cardiff Training Centre in Athens, Greece.

For more information, visit [www.km.kongsberg.com](http://www.km.kongsberg.com).

## Damen RoPax ferry MV Veteran for Canadian lifeline vessel replacement

The Damen 80-m ice class RoPax ferry MV Veteran handover to the Government of Newfoundland and Labrador (GNL) took place in St. John's, Newfoundland, Canada on 23 October 2015. Launched earlier this year by Damen Shipyards Galati in Romania on 27 March 2015, the vessel will start services from Fogo Island and Change Islands before the end of November. MV Veteran was delivered from the shipyard on time and within budget.

Announcing the arrival of the vessel, Premier Paul Davis of the Government of Newfoundland and Labrador stated: "The arrival of the MV Veteran is a proud moment for our province and the residents of Fogo Island and Change Islands."



MV Veteran is the first of a two-vessel contract, with a design stemming from a Canadian-Danish partnership between Fleetway and Knud E. Hansen. Several Canadian companies provided services for these vessels, from electrical equipment to fire-fighting systems. The sister ship, the MV Legionnaire, launched by the same shipyard on 15 July 2015, is scheduled for delivery in the spring of 2016. MV Legionnaire will operate on the short-haul route, the busiest route from Portugal Cove to Bell Island.

For more information, visit [www.damen.com](http://www.damen.com).

## VSTEP and Poseidon team up to bring maritime simulator innovation to the Philippines

VSTEP and Poseidon Asia, Inc. (PAI) have forged a strategic alliance to bring the reputed and highly-acclaimed NAUTIS maritime simulators and training apps to the Philippines.

Through Poseidon Asia, VSTEP has officially made available its NAUTIS maritime simulators to major stakeholders in the Philippine maritime industry including reputable maritime institutions, maritime training centers, and local ship management and crew manning companies.

Given their singular thrust to provide the very best in maritime simulation to their customers, the two international companies have partnered to effectively cater to the Philippine maritime industry, with focus on the maritime education and training sector.

As an official confirmation of this partnership, Poseidon Asia and VSTEP will be showcasing the NAUTIS maritime simulators at the Global Crew Connect event to be held in Manila.

For more information, visit [www.vstepsimulation.com](http://www.vstepsimulation.com).

**HELCOM kick-starts work on underwater noise**

Suppressing harmful underwater noise in the Baltic Sea tops the agenda of the HELCOM Pressure group meeting as the practical work for creating a regional register of impulsive sounds kick-starts. The occurrence of such abrupt sounds, challenging to measure, is planned for national reporting in a jointly agreed manner, and the register contributes to the overall task of minimizing the negative impact of underwater noise on marine life.

Representatives of scientific and policy institutions from the Baltic littoral states took part in the 3-day Pressure group meeting, held in Copenhagen, Denmark, to review and assess the impact of pressures mainly from input of hazardous substances and nutrients, littering of marine environment and dredging activities. The Meeting was chaired by Lars Sonesten from the Swedish University of Agricultural Sciences.

The Meeting follows up on the commitment to set up the impulsive sound register by the end of 2016, along with other noise management measures, as agreed by the HELCOM 2013 Ministerial Meeting. The new HELCOM Experts Network on Underwater Noise is about to start hands-on activities, the topmost goal being a roadmap to building a knowledge base on underwater noise. The Network will prepare the short term Roadmap for 2015-17 and look after its implementation. Moreover, the Meeting will review the ongoing work to prepare a region-wide HELCOM indicator for ambient noise, referring to continuous low frequency anthropogenic sound.

**The U.S. IOOS QARTOD project publishes three manuals for real-time quality control of data**

The U.S. Integrated Ocean Observing System (IOOS) Quality Assurance/Quality Control of Real-Time Oceanographic Data (QARTOD) project recently published three data quality control (QC) manuals that provide guidance to 11 U.S. IOOS Regional Associations as well as other ocean observing entities who collect and provide oceanographic data to a diverse data-user community. These QC manuals establish written, authoritative procedures for the QC of real-time data and meet the requirements set forth in the Integrated Coastal and Ocean Observation System (ICOOS) Act of 2009 (the reauthorization of this legislation is in progress).

To ensure each manual's comprehensiveness, U.S. IOOS was fortunate to receive extensive reviews and input from subject matter experts representing national and international organizations within the ocean-observing community, including sensor manufacturers and academic institutions. U.S. IOOS also actively solicits feedback from operators (those who collect and provide data) who have used the manual as guidance for conducting real-time quality control for directional and nondirectional wave data, dissolved nutrients data, and in-situ current data. This feedback is incorporated as manuals are updated, which is done as technologies expand and resources permit.

The Manual for Real-Time Quality Control of In-Situ Wave Observations Version 2.0 was originally published in June 2013 and contains 21 tests that operators who oversee the collection of data for directional and nondirectional waves can implement to ensure the quality control of their data. The update includes minor adjustments to general content, as well as that particular to waves.

The Manual for Real-Time Quality Control of Dissolved Nutrients Data covers nitrogen, phosphate, and silicate, which are included in the 26 or core variables for which U.S. IOOS is establishing data QC procedures.

The Manual for Real-Time Quality Control of In-Situ Currents Data is one of eight guidance documents for the quality control of real-time data that have been published by U.S. IOOS since 2012 and is one of three that have been updated.

For more information, visit [www.ioos.noaa.gov/qartod](http://www.ioos.noaa.gov/qartod).

**New study provides first field observations of rare Omura's whales**

Cerchio et al. 2015. *Roy Soc Open Sci.* doi:10.1098/rsos.150160

Reproduced from Cerchio et al. (2015).

An international team of biologists has made the first-ever field observations of one of the least known species of whales in the world—Omura's whales—off the coast of Madagascar.

In a paper published 14 October 2015, in the Royal Society Open Science journal, the researchers describe the whales' foraging and vocal behaviors and habitat preferences in the shallow waters of coastal Madagascar.

For many years, these marine mammals were misidentified as Bryde's whales due to their similar appearance—both are small tropical baleen whales with comparable dorsal fins, though Omura's are slightly smaller in size and have unique markings with a lower jaw that is white on the right side and dark on the left.

In 2003, using genetic data from samples obtained from old whaling expeditions and a few strandings in the western tropical Pacific, scientists determined Omura's whales were actually a distinct species. But there had been no confirmed records of sightings in the wild and little else has been known about the elusive species until now.

"Over the years, there have been a small handful of possible sightings of Omura's whales, but nothing that was confirmed," says lead author Salvatore Cerchio, who led the research while at the Wildlife Conservation Society. He is now at the New England Aquarium (NEAQ) and a guest investigator at the Woods Hole Oceanographic Institution (WHOI). "They appear to occur in remote regions and are difficult to find at sea because they are small—they range in length from approximately 33 to 38 ft—and do not put up a prominent blow."

So little is known about Omura's whales that scientists are unsure how many exist or how rare the species is.

Over a 2-year period, the researchers observed 44 groups and were able to collect skin biopsies from 18 adult whales. The samples were then sent to coauthor Alec Lindsay at Northern Michigan University who performed the DNA analysis that confirmed the whales' species.

Additional coauthors of the paper include Melinda Rekdahl of the Wildlife Conservation Society and Boris Andrianantaina, Norbert Andrianarivelo, and Tahina Rasoloarijao of the Institut Halieutique et des Sciences Marines, Université de Toliara, Madagascar.

The work was supported by the International Whaling Commission Small Cetacean Conservation Fund, the U.S. Marine Mammal Commission, and the Prince Albert II Conservation Fund.

For more information, visit [www.whoi.edu](http://www.whoi.edu).

## Research suggests marine invasive species benefit from rising CO<sub>2</sub> levels

Ocean acidification may well be helping invasive species of algae, jellyfish, crabs and shellfish to move to new areas of the planet with damaging consequences, according to the findings of a new report.

Slimy, jelly-like creatures are far more tolerant of rising carbon dioxide levels than those with hard parts like corals, since exposed shells and skeletons simply dissolve away as CO<sub>2</sub> levels rise.

The study, conducted by marine scientists at Plymouth University, has found that a number of notorious 'nuisance' species—such as Japanese kelp (*Undaria pinnatifida*) and stinging jellyfish (*Pelagia noctiluca*)—are resilient to rising CO<sub>2</sub> levels. They show why global warming and changes in seawater chemistry can help the spread of hundreds of damaging marine organisms.

The study, published in Research and Reports in Biodiversity Studies, notes that in the tropics, coral reefs face a host of interconnected problems

(bleaching, corrosion, disease, spreading seaweed, invasive species) that are all caused by rising CO<sub>2</sub> levels.

The study arose from observations at volcanic sites in the Mediterranean, where Professor Hall-Spencer has led expeditions to record what forms of marine life cope well with higher CO<sub>2</sub> levels. They found that invasive species of algae and jellyfish thrive at levels of carbon dioxide predicted to occur this decade. Their extensive review of laboratory experiments reveals stand-out cases such as so called 'Killer algae' (*Caulerpa taxifolia*), which is spreading worldwide, that benefit from higher CO<sub>2</sub> but are so toxic that native herbivores die of starvation rather than eat it.

The report highlights the American slipper limpet, *Crepidula fornicate*, as an example of ocean acidification both helping and hindering a species, with evidence to show it has spread to Europe to become one of the 100 most invasive species, while at the same time, the species' larvae has been placed at greater risk of predation due to reduced shell growth. Similarly, both the Red King Crab, which has invaded

the Barents Sea, and the predatory snail *Urosalpinx cinerea*, which has moved from the northwest Atlantic to the northeast Atlantic and Pacific, impacting upon oyster and scallop aquaculture in the process, have also demonstrated a marked reduction in larval survival and growth.

For more information, visit [www.plymouth.ac.uk](http://www.plymouth.ac.uk).

## New study questions long-held theories of climate variability in the North Atlantic

A University of Miami (UM) Rosenstiel School of Marine and Atmospheric-led study challenges the prevailing wisdom by identifying the atmosphere as the driver of a decades-long climate variation known as the Atlantic Multi-decadal Oscillation (AMO). The findings offer new insight on the causes and predictability of natural climate variations, which are known to cause wide-ranging global weather impacts, including increased rainfall, drought, and greater hurricane frequency in many parts of the Atlantic basin.

For decades, research on climate

December 2015

21

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variations in the Atlantic has focused almost exclusively on the role of ocean circulation as the main driver, specifically the Atlantic Meridional Overturning Circulation, which carries warm water north in the upper layers of the ocean and cold water south in lower layers like a large conveyor belt.

"The idea of the ocean as the driver has been a powerful one," said UM Rosenstiel School Professor Amy Clement, the lead author on the study. We used computer models in a new way to test this idea and find that in fact there is a lot that can be explained without the ocean circulation."

While the overall rise in average temperature of the Atlantic is caused by greenhouse gases, this study examines the fluctuations occurring within this human-related trend. Identifying the main driver of the AMO is critical to help predict the overall warming of the North Atlantic Ocean in coming decades from both natural and man-made climate change. Recent research suggests that an AMO warm phase has been in effect since the mid-1990s, which has caused changes in rainfall in the southeastern U.S. and resulted in twice as many tropical storms becoming hurricanes than during cool phases.

Using multiple climate models from around the world, Clement's research team removed the ocean circulation from the analysis to reveal that variations in the Atlantic climate were generally the same. The AMO results in a horseshoe-shaped pattern of ocean surface temperatures in the North Atlantic Ocean that have been naturally occurring for the last 1,000 years on timescales of 60 to 80 years. This new analysis shows that the pattern of the AMO can be accounted for by atmospheric circulation alone, without any role for the ocean circulation.

The study, titled "The Atlantic Multidecadal Oscillation Without a Role for Ocean Circulation," was published in the 16 October issue of the journal *Science*. The co-authors include Clement, Katinka Bellomo and Lisa N. Murphy from the UM Rosenstiel School; Mark A. Cane of Lamont-Doherty Earth Observatory of Columbia University; and Thorsten Mauritsen, Gaby Rädel and Björn Stevens from Max Planck Institute for Meteorology in Germany. The work was supported by grants from the Department of Energy and the National Oceanographic and Atmospheric Administration.

For more information, visit [www.rsmas.miami.edu](http://www.rsmas.miami.edu).

## Rapidly acidifying waters pose major threat for Southern Ocean

As a result of increasing atmospheric carbon dioxide concentrations, the chemistry of the Southern Ocean is expected to change so fast over the next few decades that tiny creatures at the base of the food web may soon struggle to form their shells. New research by scientists from the University of Hawai'i, Mānoa (UHM) and the University of Alaska, Fairbanks (UAF) finds that for some organisms the onset of such critical conditions will be so abrupt, and the duration of events so long, that adaption may become impossible.

The study, published in the journal *Nature Climate Change*, uses a number of Earth System Models to explore how the uptake of anthropogenic carbon dioxide and the resulting ocean acidification will affect the Southern Ocean over the next century.

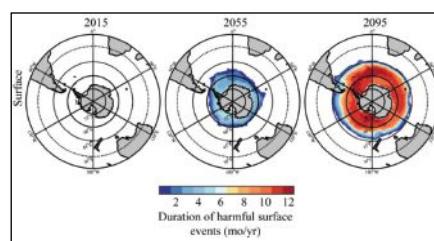
One of the most threatened marine organisms is the pteropod, a tiny sea snail that serves as a staple for plankton, fish, whales, and seabirds.

Not only is the concentration of carbonate ions projected to fall to dangerously low levels due to ocean acidification, but these conditions will become the new norm across large areas of the Southern Ocean.

"Our analysis shows that in large parts of the Southern Ocean, the duration of such undersaturation events will increase abruptly from 1 month to more than 6 months, in less than 20 years upon their onset, and could reach nearly year-long durations by the end of the century," notes co-lead author Tobias Friedrich, climate scientist at IPRC.

"This is a clear warning sign. Given the projected rapid expansion and prolongation of these harmful conditions, it remains very uncertain whether pteropods and other vulnerable marine organisms will be able to adapt," adds Claudine Hauri, lead author of the study and a chemical oceanographer at both the International Arctic Research Center (IARC) at UAF and the International Pacific Research Center (IPRC) at UHM.

For more information, visit [www.manoa.hawaii.edu](http://www.manoa.hawaii.edu).



Credit: Nina Bednarsek, NOAA.

## 100-year-old mystery solved: Adult eel observed for the first time in the Sargasso Sea

After more than a century of speculation, researchers have finally proved that American eels really do migrate to the Sargasso Sea to reproduce. A team supervised by Professor Julian Dodson of Université Laval and Martin Castonguay of Fisheries and Oceans Canada reports having established the migratory route of this species by tracking 28 eels fitted with satellite transmitters. One of these fish reached the northern boundary of the Sargasso Sea, the presumed reproduction site for the species, after a 2,400 km journey.

The discovery puts an end to more than a hundred years of conjecture regarding the migratory route and location of the only American eel reproduction site. "Eel larvae have been observed in the Sargasso Sea since 1904, suggesting that the species reproduced in this area, but no adult eels had ever been observed in this part of the Atlantic Ocean," explained Professor Dodson of the Faculty of Science and Engineering at Université Laval.

Julian Dodson and his team affixed transmitters to 22 eels captured in Nova Scotia and 16 from the St. Lawrence Estuary. In the ensuing weeks, 28 of these transmitters resurfaced in different areas of the Atlantic.

Analysis of the data revealed that all the eels adopted similar migratory paths and patterns. Near the coastline they appear to use the salinity level and temperature to find the high seas. A single eel provided data for the ocean segment of the migration. Its transmitter showed that it turned due south upon reaching the edge of the continental shelf, and headed straight to the Sargasso Sea. In 45 days, this eel captured in the province of Quebec covered 2,400 km. "This points to the existence of a navigation mechanism probably based on magnetic field detection," asserted Professor Dodson.

Julian Dodson remains cautious about drawing premature conclusions from some thirty eels, only one of which travelled the full migratory route. "Our data nonetheless shows that the eels don't follow the coastline the whole way, they can cover the route in just weeks, and they do go to the Sargasso Sea. We knew that millions of American eels migrated to reproduce, but no one had yet observed adults in the open ocean or the Sargasso Sea."

For more information, visit [www2.ulaval.ca](http://www2.ulaval.ca).



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## Beothuk Energy, Talon Energy Services form strategic alliance

Beothuk Energy Inc. announced that it has formed a strategic alliance with Talon Energy Services of St John's, Newfoundland and Labrador (NL). Talon, which has also acquired an interest in Beothuk, will work with Beothuk to develop and construct its offshore wind projects in Atlantic Canada and the United States.

Beothuk's president and CEO, Kirby Mercer stated, "Talon is another key partner as we move towards developing Canada's first offshore wind farm in western NL. Talon has a proven record of first class construction on large-scale industrial projects, while providing maximum local benefits."

Terry King, president of Talon, said, "We see offshore wind as the next emerging energy sector in North America and the opportunity to lead the way right here in NL is exciting. Partnering with Beothuk provides Talon's group of companies and its employees a huge growth potential."

Talon provides energy services and solutions to the oil & gas, resource, heavy industrial, and now the offshore wind sectors. With a single point of contact for personnel, engineering, fabrication, fabric maintenance, construction, commissioning and start-up, and maintenance services, Talon's suite of companies offer the client a full-service solution. Talon is strategically located to service its clients in the oil and gas industry with offices based in St. John's, NL, and Edmonton, Alberta.

Beothuk Energy Inc., headquartered in St. John's, NL, is an international green energy company with a strategic focus on offshore wind power. Beothuk is planning to construct a 180-MW wind farm in St. George's Bay, NL, a gravity-based substructure manufacturing facility at the Port of Corner Brook, NL, and a service and staging facility at Port Harmon, Stephenville, NL. These projects will help make Beothuk a leader in offshore wind development in North America and western NL a center of excellence for green energy. They will also have an immense beneficial socioeconomic effect on the area.

For more information, visit [www.beothukenergy.com](http://www.beothukenergy.com).

24

## 275+ groups to Obama: Keep leading on offshore wind

Offshore wind for the Atlantic Coast is closer to reality than ever before and the Obama administration is largely to thank, said environmentalists, public health advocates, and faith and elected leaders. More than 275 groups and officials joined together on a letter to President Obama and his administration, urging them to continue their leadership in developing wind power off the Atlantic Coast.

"In the race for developing pollution-free energy off our coasts, we are finally at the starting block," said Bronte Payne, clean energy associate with Environment America. "We're counting on continued leadership from the president and his officials to see offshore wind closer and closer to the finish line."

The Obama administration has awarded nine commercial wind leases totaling over 700,000 acres in federal waters up and down the Atlantic coast, with more on the horizon. It recently announced a multi-state project with New York, Maine, Massachusetts, and Rhode Island that will lay important groundwork for developing wind along the northeastern coast.

The year so far has "marked a major milestone in America's pursuit of offshore wind power, with our first project finally under construction off the coast of Rhode Island," said the letter. "We are counting on your leadership to ensure that [the Block Island offshore wind farm] is truly the beginning of a new energy chapter for America."

The letter lauded the Obama administration's Clean Power Plan, noted that, "additional leadership is needed to maintain momentum and ensure that offshore wind power plays a major role in states' plans to reduce pollution and shift to clean energy."

"Climate change is already having profound impacts on wildlife and their habitats," said Catherine Bowes, senior manager for Climate & Energy with National Wildlife Federation, another of the letter's signers. "Responsibly developed offshore wind power can and must play a major role in ensuring a clean and reliable energy future for America, and we call on state leaders to commit to bringing this transformational power source online."

## E.ON's Amrumbank West wind farm fully operational



The construction of Amrumbank West offshore wind farm is completed. All 80 turbines are connected to the network. With its full installed capacity of 288 MW now operational, Amrumbank West can produce enough climate-friendly power to meet the needs of 300,000 households and to displace more than 740,000 metric tons of carbon emissions annually.

Amrumbank West is in the German North Sea about 40 km from Helgoland Island, where the operations and maintenance center for the wind farm is located. E.ON invested €1 billion in the project. Offshore construction began in January 2014, and the first turbine began generating electricity in May 2015. Amrumbank West is wholly owned by E.ON.

"We've commissioned two large offshore wind farms—Amrumbank West and Humber Gateway off the U.K. coast—in just one year," E.ON Management Board member Bernhard Reutersberg said. "Both were completed on time and on budget, which underscores our ability to expand renewables."

E.ON continues to enlarge its offshore portfolio. In May the company announced its decision to move forward with Rampion, a 400-MW project off the south coast of England. Construction will begin in January 2016. E.ON ranks among the world's three leading offshore wind power companies.

For more information, visit [www.eon.com](http://www.eon.com).

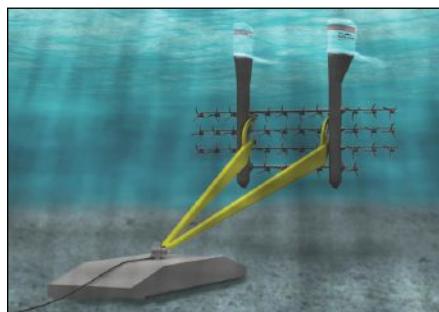
## Private investors commit to BRTP project

Black Rock Tidal Power (BRTP), a Schottel Hydro subsidiary, has set up a project company that will take over its TRITON tidal energy platform once fully commissioned for 15 million Canadian dollars. The private equity investment into the project company amounts to 10.5 million Canadian dollars.

TRITON is a floating platform carrying a number of Schottel Instream Turbines that generate up to 2.5 MW from tidal currents. The device is planned to be installed in autumn 2016 at the BRTP berth at the Fundy Ocean Research Centre for Energy (FORCE) in Canada. FORCE provides an infrastructure to its five berth holders including a substation, grid connection, sea cables and a fully consented site.

Together with the berth at FORCE, BRTP has been awarded the developmental tidal feed-in tariff (FIT) and the respective power purchase agreement (PPA) with Nova Scotia Power. The electricity generated will be fed into the North American power supply system and the SPV will operate the device over the 15 years duration of the FIT.

BRTP and Schottel Hydro have successfully raised 10.5



million Canadian dollars of private equity for the project company. The equity investment will be leveraged by an additional 4.5 million Canadian dollar commercial loan. The private equity includes investments from the shareholders of the Schottel Group, the Singapore-based clean tech investor Envirotek and as lead investor Inerjys Ventures, a Canadian investment company that acts in clean energy.

BRTP will start to market the second 2.5-MW project for which the FIT and PPA are granted. Furthermore, Schottel Hydro and its subsidiaries BRTP and TidalStream have developed a robust global project pipeline.

For more information, visit [www.blackrocktidalpower.com](http://www.blackrocktidalpower.com).

## Siemens revolutionizes grid connection for offshore wind power plants

Siemens has introduced a new solution for connecting offshore wind turbines to the grid. Presented at the National Maritime Conference in Bremerhaven, this direct-current technology enables a cost-efficient and simplified connection of offshore wind power plants far from the coast. The platform housing the transmission technology is much smaller and more compact than before. Until now, these plants have been connected to the grid via large central converter platforms. Siemens is now further developing the transmission technology, enabling a large number of much smaller platforms to be built. With the new solution, a direct-current cable can connect several of these platforms sequentially in a wind farm and then route them to an onshore transformer substation. Overall, this solution costs less and is also more efficient than the approach used with conventional platforms.

The compact design permits encapsulated high-voltage electrical equipment to be used—especially diode recti-

fier units (DRUs), which are installed instead of the usual air-insulated transistor modules. The system is also modular and flexible when it comes to installation. The volume of the platform structures is reduced by four-fifths and the weight is cut by two-thirds. As a result, costs are reduced by more than 30%. At the same time, the new solution enables transmission capacity to be increased by one-third, while transmission losses fall by one-fifth. This is a significant step toward significantly reducing the cost of offshore wind power and making it competitive compared with conventionally generated electricity.

A diode rectifier unit has a transmission capacity of 200 MW. Typically, two DRUs are installed on one platform. Up to three of these new platforms can be connected to each other to create an offshore grid node that replaces collection platforms in the wind farms. This link enables a connection to the mainland of multiple offshore wind farms with a total capacity of up to 1,200 MW. The electricity is transported to a grid infeed point on land via cables. A converter station con-

December 2015

25

Ocean News & Technology

## "Fishers make the **most powerful** and ruggedly constructed underwater metal detectors you can own"

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verts the direct current back into alternating current for subsequent transmission and distribution. The land station will also be built by Siemens using a proven design.

Thanks to high-voltage direct-current (HVDC) transmission technology, the new system's transmission losses, including cable losses, are just 3%. Siemens is a leading supplier of HVDC technology. The use of direct-current instead of alternating-current transmission to connect wind farms to the grid is made cost-effective by the new technology for cable lengths of more than about 80 km.

The new technology is being funded by the German Federal Ministry of Economics and Energy (BMWi) as part of the federal government's 6th energy research program under the supervision of project sponsor Jülich. The research funding provided by the BMWi in the area of power grids is aimed primarily at advancing the grid infrastructure and developing it to accommodate the infeed of a large share of renewable energy.

For more information, visit [www.siemens.com](http://www.siemens.com).

### BlueTEC operation brings successful results

The BlueTEC Texel Tidal partnership announced that the first months of operating the BlueTEC tidal energy platform have been a success. With every tidal flow, the platform supplies electricity into the Dutch national grid. The project partners are now planning the installation of a second, larger turbine.

"Getting the platform from the drawing board to a grid-connected operating reality in just 6 months is amazing," says Allard van Hoeken, head of new energy at Bluewater Energy Services.

Shortly after its launch this summer the platform's new moorings passed their first serious tests with flying colors as two large storms passed over the area.

With the platform up and running smoothly, the project partners are now looking forward to the next step in its development. "We will install the next turbine—a Tocardo T2—before the winter. This will double the platform's capacity," says Mr. Van Hoeken. "A few months after that we will install a second T2 turbine. With two turbines working simultaneously this will double



the capacity once again to reach the 400 to 500 kW mark. This means a proven solution is available on the market. In the meantime we will proceed to even larger units of 2.5 MW each."

The BlueTEC platform serves as a demonstrator model. The platform's ease of maintenance illustrates the advantages of a floating system perfectly: "It has been very easy to solve any issues we came across," informs Mr. Van Hoeken. "We can reach the platform with a small boat, open the watertight door and enter the electronics room, fix and replace something and be back on land an hour later."

For more information, visit [www.bluewater.com](http://www.bluewater.com).

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## EMEC to support development of Chinese test site

The European Marine Energy Centre (EMEC) based in Orkney, Scotland, has strengthened its ties with China having signed a Memorandum of Understanding with organizations based in Qingdao to support the development of a marine energy test site in the area.

Scottish-based EMEC and the University of Edinburgh signed the MoU alongside the Ocean University of China (OUC), Qingdao National Laboratory for Marine Science and Technology (QNLM), and Qingdao Songling Power Environmental Equipment Company (QSPEEC) at the UK-China Energy Dialogue—an annual forum for UK and Chinese government, business and academic leaders to meet and discuss the strategic challenges facing their respective energy sectors.

The MoU states intent to share knowledge and carry out fundamental research to establish a wave energy test site in Qingdao.

For more information, visit [www.emec.org.uk](http://www.emec.org.uk).

## Floating offshore wind has the potential to deliver for the UK

Analysis carried out by the ETI suggests that floating wind technology has the potential to deliver a leveled cost of energy of less than £85/MWh from the mid-2020s, allowing it to compete with the lowest cost forms of low carbon generation.

The UK already has the world's highest offshore wind capacity and in order to reduce costs further, there needs to be access to good quality wind resource, which is close enough to the shore and power users so that transmission costs are minimized and operations and maintenance costs reduced.

Floating offshore wind technology can open up new commercially exploitable sites in deeper water relatively close to the shore that are currently inaccessible due to limitations in the depth to which fixed foundations can be deployed.

The Floating Wind Technology Insight uses evidence from the ETI's Energy System Modelling Environment (ESME) tool, an internationally peer-reviewed national energy system design and planning capability, together with the findings from the ETI's £62-million Offshore Wind Programme.

For more information, visit [www.eti.co.uk](http://www.eti.co.uk).



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### Crowley awarded vessel management contract by Military Sealift Command for ROCON fleet

Crowley Maritime Corp.'s government services group has been awarded a new technical management contract for five U.S. government-owned, Military Sealift Command (MSC) Roll-On/Roll-Off and container ships (ROCON). Under the approximately \$130 million contract, Crowley will provide full turnkey operation and management of the fleet, including crewing and scheduled/unscheduled repair and drydocking services initially for 1 year with four, additional 1-year options. The turnover phase for the ships began on 1 October 2015.

Of these five vessels, two will remain berthed in Jacksonville and three will be homeported in Norfolk—all within the service area of Crowley's local offices. This contract will have a positive economic impact through the creation of several new jobs in both Jacksonville and Norfolk. The ships—USNS 1st LT Harry L. Martin, USNS LCPL Roy M. Wheat, USNS SGT Matej Kocak, USNS PFC Eugene A. Obregon and the USNS MAJ Stephen W. Pless—will be used to transport cargo throughout the world in support of the U.S. military.

"Crowley is proud to have been selected to provide technical management for this government fleet," said Crowley's Paul Varghese, general manager, government services. "This contract is a perfect fit for us and would not be possible without the hard work and determination of our remarkable government team and the tremendous support we received from MSC."

Crowley's government services team combines the technical and professional capabilities of the company's owned and managed fleets, under the direction of a team of tenured professionals, many of whom are mariners, to bring together best-in-class operations, engineering and contracting personnel. The team provides bundled vessel management solutions for the U.S. Maritime Administration, Military Sealift Command, and other agencies; custodial services for vessels seized by U.S. government agencies; naval architecture and marine engineering services; project management and salvage and dive operations; and a host of other services through its 123-year-old parent company, Crowley Maritime. To learn more about the offerings of the government services team, click [here](#).

For more information visit [www.crowley.com](http://www.crowley.com).

### Keel for future USS Paul Ignatius (DDG 117) authenticated

The keel of the future USS Paul Ignatius (DDG 117) was authenticated during a ceremony at the Huntington Ingalls Industries shipyard 20 October 2015.

The ship's keel was authenticated by its namesake, the Honorable Paul Ignatius and Mr. Bill Jones, the Hull Superintendent. Both authenticators etched their initials into the keel plate to symbolically recognize the joining of modular components and the ceremonial beginning of the ship.

"We are very honored that the namesake of DDG 117, The Honorable Paul Ignatius, is able to witness this milestone ceremony," said Capt. Mark Vandroff, DDG 51 class program manager, Program Executive Office (PEO) Ships. "Laying the keel breathes life into a ship and is the first major event in a shipbuilding program."

During World War II, Paul Ignatius served as a commissioned lieutenant in the Navy. Ignatius continued his service as Secretary of the Navy from 1967-1969 and later as Assistant Secretary of Defense for Installations and Logistics during the Lyndon B. Johnson administration. The future USS Paul Ignatius is the 67th ship of the Arleigh Burke (DDG 51) class and the first ship to bear his name.

Paul Ignatius, a Flight IIA ship, is the first ship in the FY2013-FY2017 multi-year procurement contract to start fabrication and is scheduled to deliver in 2018.

Upon joining the Fleet as the 67th DDG 51 class ship, she will serve as an integral player in global maritime security, engaging in air, undersea, surface, strike and ballistic missile defense.

## ONR advances cutting-edge unmanned underwater vehicles at demo



Robotic arms help Explosive Ordnance Disposal (EOD) techs to neutralize underwater mines. Autonomous underwater vehicles map out a ship's hull in blackness beneath the water, and hundreds of personnel from six nations come together in one place to work on autonomous underwater vehicles and mine countermeasures (MCM).

All that and more—including brilliant new images of wooden shipwrecks on a river floor—took place at the Office of Naval Research (ONR)-sponsored Pax River technology demonstrations, which concluded in late September at naval Air Station Patuxent (Pax) River in Maryland.

"This is the cutting edge," said Dr. Walter Jones, executive director at ONR. "These are technologies that will impact the future of naval operations and protect our Sailors and marines."

"The MCM program—with vital contributions from partner commands and our international allies—is making great leaps in developing and fielding autonomous, unmanned systems," said Dr. Jason Stack, program officer and lead for ONR's Mine Warfare program. "MCM and EOD represent some of the dull, dirty and truly dangerous jobs performed every day by our sailors and marines. These emerging technologies will assist these men and women by making their jobs faster and safer."

A total of 40 unmanned, autonomous or remotely operated systems were demonstrated and tested over the 2-week period, including over 30 in the water at one time. Some included:

- Unmanned underwater vehicles from Canada, the UK and the U.S. worked together with an unmanned surface vehicle from the UK to search the ocean and seafloor for mines;
- Robotic arms built using 3D printing were demonstrated for inspecting and neutralizing underwater explosives attached to ship hulls; and
- Advanced sensors capable of finding mines buried under the ocean sediment were demonstrated from a variety of platforms—including one capable of movement in any direction using biologically inspired controls and fins.

In addition to the host command of NAS PAX and ONR, partner commands included Naval Air Warfare Center Aircraft Division and Naval Surface Warfare Center Panama City. Uniformed and civilian partner personnel from the UK, Australia, New Zealand, Canada and Germany were on hand and helped guide much of the efforts.

For more information, visit [www.onr.navy.mil](http://www.onr.navy.mil).

## Bollinger delivers the CGC Joseph Napier

Bollinger Shipyards has delivered the Joseph Napier, the 15th Fast Response Cutter (FRC) to the U.S. Coast Guard. The announcement was made by Bollinger's president & CEO, Ben Bordelon. "We are very pleased to announce the delivery of the latest FRC built by Bollinger Shipyards, the Joseph Napier, to the 7th Coast Guard District in Puerto Rico. We are looking forward to honoring and celebrating the heroic acts of Joseph Napier at the vessel's commissioning."

The 154-ft patrol craft is the 15th vessel in the Coast Guard's Sentinel-class FRC program. To build the FRC, Bollinger used a proven, in-service parent craft design based on the Damen Stan Patrol Boat 4708. It has a flank speed of 28 kts, state-of-the-art command, control, communications and computer technology, and a stern launch system for the vessel's 26-ft cutter boat. The FRC has been described as an operational "game changer" by senior Coast Guard officials.

The Coast Guard took delivery on 20 October 2015 in Key West, Florida, and is scheduled to commission the vessel in Puerto Rico during January 2016.

Each FRC is named for an enlisted Coast Guard hero who distinguished him or herself in the line of duty. This vessel is named after Coast Guard Hero Joseph Napier. Joseph Napier, Keeper of St. Joseph Life-Saving Station 6, showed his true heroism and courage as he risked his life and led his crew into gale-force winds to rescue the men of the wrecked schooner, the D.G. WILLIAMS in October 1877. Napier demonstrated his courage during multiple rescues as a career lifesaver of the Great Lakes.

For more information, visit [www.bollingershipyards.com](http://www.bollingershipyards.com).



## Two halves of Prince of Wales vessel joined together

The second Queen Elizabeth Class (QEC) aircraft carrier, HMS Prince of Wales, passed a significant milestone when the 26,500 ton forward half of the ship was joined to the 12,000 ton superblock that makes up the rear of the vessel.

This feat of precision engineering saw the forward half of the ship moved back 17 m on a specialized hydraulic system in a process called "skidding." This resulted in a perfect joining of the two halves of the ship, with less than a 3 mm tolerance down the center line.

The operation, which is believed to be a UK record in terms of the weight of ship that was skidded, took place in Babcock Rosyth Facilities over 10 hours.

The next stage of the assembly will be to weld the two sections of the ship together, which will then allow all of the pipework and the 3.2 million meters of electrical cable to be connected by the outfitting teams ahead of commissioning.

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

The Queen Elizabeth Class will be the centerpiece of Britain's defense capability for the 21st century. Each 65,000-ton aircraft carrier will provide the armed forces with a 4-acre military operating base that can travel up to 500 mi per day to be deployed anywhere around the world.

For more information, visit [www.royalnavy.mod.uk](http://www.royalnavy.mod.uk).

## Navy divers survey historic WWII in Sunda Strait

U.S. Navy divers, assisted by personnel from the Indonesian Navy (TNI-AL), surveyed the World War II wreck of the cruiser USS Houston (CA 30), from 16 to 24 October.

The 9-day operation was held aboard USNS Safeguard (T-ARS 50) with embarked divers from Explosive Ordnance Disposal Mobile Unit 11, Mobile Diving and Salvage Team Seven (MDS 11-7). The purpose of the diving survey was to assess the current condition of the vessel and document any patterns of unauthorized disturbance of the grave site.

Houston was sunk during the World

War II Battle of Sunda Strait on 28 February 1942. The ship remains sovereign property of the U.S. under customary international law and is a popular dive site.

Divers found no evidence of recent salvaging. The ship's condition remains relatively unchanged since the previous survey operations in 2014. Sailors from Safeguard and Navy divers completed the current phase of survey operations with a wreath-laying ceremony in waters near the wreck of USS Houston.

## LCS Crew 104 moves aboard PCU Milwaukee (LCS 5)

The "Juggernauts" of Littoral Combat Ship (LCS) Crew 104 are one step closer to commissioning the Navy's newest warship, the future USS Milwaukee (LCS 5), after moving on board 18 October.

The crew is currently preparing for the ship's commissioning, scheduled 21 November at Milwaukee Veterans Park. USS Coronado (LCS 4) was commissioned in its namesake city in April 2014, but Milwaukee's commissioning will make her the only LCS to not only be commissioned in her namesake city, but also in the state where she was built and among the people that built her.

Crew 104 spent much of the year in Wisconsin, working to prepare the ship for its future service. During their time in Wisconsin, the San Diego-based crew developed a strong bond with the citizens of Milwaukee.

Unlike previous crews of commissioning littoral combat ships, LCS Crew 104 is already an operationally experienced crew.

Deployed on USS Fort Worth (LCS 3) to Singapore last November, the crew gained significant experience during operations, which included assisting in the search and recovery efforts of AirAsia Flight 8501, which crashed during a storm in the Java Sea.

After returning from deployment aboard Fort Worth in February, the crew underwent rapid refresh training using the latest in shore-based training simulators to prepare them for taking delivery of Milwaukee.

Following the commissioning ceremony, Milwaukee will begin her journey out of the Great Lakes and into the Atlantic Ocean to embark on her expected 25 years or more of service to the nation.

# UNDERWATER INTERVENTION PRE-SHOW GUIDE

## UNDERWATER INTERVENTION 2016

UI 2016

Underwater Intervention is a not-for-profit industry conference and exhibition, jointly owned by the Association of Diving Contractors International and the ROV Committee of the Marine Technology Society. Until the early 1990's, these two non-profit, professional organizations hosted separate conferences – ROV Intervention and the Diving Symposium. The increased common ground between the commercial diving and ROV (remotely operated vehicles) industries created an atmosphere ripe for a merger of the two conferences. In 1993, the first Underwater Intervention was hosted in San Diego, California. Now, 22 years later, Underwater Intervention has grown to encompass more industries in addition to Commercial Diving and Remotely Operated Vehicles. We now include Manned Submersibles, Instruments and Sensors, Sonar and Acoustics, Ocean Engineering, Marine Salvage and Shipwrecks, AUV and UUV Technology.

If you work in any of these industries, or offer goods and services to these industries, this is your conference. We look forward to seeing you in New Orleans.



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30

Ocean News & Technology

### Submissions by Track

#### Advanced Underwater Engineering

New tools for cleaning operations

#### ASV Technology

Brian Anderson

Sea Machines Autonomous Work Boats

The Launch of the "Submaran"

#### AUV Technology

BIOSwimmer UUV

Dynamic Mission Planning for AUVs

Extended Capabilities of EchoRanger

Inspection Class AUV Technology

Iver3-580 EP Remote Helm Functionality

Low-cost AUV for Education and Research

Modular, Open, Low-Cost Micro-UUVs

Seastick

USS INDEPENDENCE SURVEY

#### Commercial Diving

Bell Bounce Diving in the Future

Dive Mission Comparison Panel

Diver's Fitness

Hyperbaric Evacuation Planning

Improved Dive Safety with Diveable Controls

Legal Update 2016

Medical Requirement Changes

New and proper use of tools

Selecting Qualified Diving Contractors

Solid CO<sub>2</sub> Adsorbent

Surface Supplied Diving Systems, ABS Requirements

Underwater Oil Detection and Recovery

Underwater Structural Inspections: Engineer

Updating Canadian Diving Standards

#### Deepwater Field Development

Deepwater Gas Field Development Aspects

Ham or Eggs

#### Import/Export Compliance or How to Avoid Federal Prison

How to Avoid Federal Prison

#### Instruments and Sensors

Data Retrieval Technologies for ROVs and ASVs

Enhancing AUV Operations

#### Manned Submersibles

Alvin Control System

CO<sub>2</sub> Scrubber Qualification Testing

Manned Submersibles Abstract

New type submersible craft

Spherical hull form - Manned Submersibles

Status of Underwater Flight: Part 2

#### Marine Education/Academia

ASCE WFI MANUAL

Exploring Shipwreck Alley

Invent Like A Girl

Open The Oceans

PLOCAN Glider School

Students Under the Sea

Sudents use ROVs for Sturgeon Research

TecXotic ROV Team

#### Observation Class ROVs

Enhancing ROV Operations

Hybrid Design of Bio-Inspired ROV

Low Latency HD Video over Coaxial Cable

Micro ROV's in Power Plants

Mini-ROVs for Munitions Response

Recovering Lost Scientific Landers

Shipwreck Identification

#### Ocean Research and Marine Archaeology Technology

HMS Hood Bell Recovery

NMCM Support for Royal Canadian Navy

#### Subsea Survey

Improve Efficiency with Laser Scanning

Subsea 3D Laser based Survey

#### Work Class ROVs

Connie Sylvester

Technical Innovations to Domed Scanning Sonar

### Special Events

#### Monday Night Networking Event

Early Bird Reception

6 pm - 8 pm

Inside Hall D

Complementary

Light Refreshments, Beer and Wine

#### Tuesday Night Networking Event

Annual Awards Dinner

Hampton Inn and Suites Ballroom

7 pm - 9 pm

Business Attire Requested

Tickets Required - \$85.00 per person

#### Wednesday Night Networking Event

Dinner with Strangers

Sign up to join a group for dinner.

You never know who you may meet across the table or sit next to at dinner! Sign up on the Announcement Board at the SWAG Booth in Registration.

Each person pays his own way.

#### Thursday Morning Hangover Brunch

After a night on the town in the Big Easy, we all need a little pick me up. Whatever condition your condition is in, stop by the International Lounge to rehydrate and refuel.

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**VideoRay**  
underwater video cameras

Booth #229

Booth #800

Booth #729

Booth #231

Booth #503

## General Schedule

Event	Time	Location	Comments
<b>Sunday February 21, 2016</b>			
ADCI Executive Committee Meeting	3 pm - 5 pm	Hampton Inn and Suites	Closed Meeting
Exhibitor Registration and Move in Begins	1 pm - 5 pm	Morial CC Hall D	Open to Exhibitors Only
Sunday Night Mixer	5:30 - 6:30 pm	Location TBA	ticketed event or Sponsor opportunity
<b>Monday February 22, 2016</b>			
Registration Open	7 am - 7 pm	MCC Hall D	
Exhibitor Move In	7:30 am - 5 pm	MCC Hall D	Exhibits must be finished by 5 pm
ADCI Board Meeting	7:30 am - 4 pm	Hampton Inn and Suites	
NHI Underwater Bridge Inspection Course	7:30 am - 4:00 pm	MCC Room	Register Here
SWAG Booth and Genius Bar Open	1 PM - 5 PM	Registration Area	Posters, T-Shirts, News, Message Board, Show App and WiFi Assist
UI Technical Program Committee Meeting	2 pm - 4 pm	MCC Room	Closed Meeting
ADCI Gulf Coast Chapter	4 - 6 pm	MCC Room	
ADCI MidWest Chapter	4 - 6 pm	MCC Room	
ADCI Western Chapter	4 - 6 pm	MCC Room	
ADCI East Coast Chapter	4 - 6 pm	MCC Room	
ADCI Asia Pacific and Malaysian Chapter	4 - 6 pm	MCC Room	
Early Bird Reception	6 - 8 pm	MCC Hall D Registration Area	Closes at 8pm Hosted Event Sponsor Opportunity
<b>Tuesday February 23, 2016</b>			
Registration Opens	7 am - 5 pm	MCC Hall D	
ADCI Engineering Diving Committee	7 am - 9 am	MCC Room	
Speakers Ready Room Open	7:30 am - 4:30 pm	MCC Room	Also Technical Committee Office
NHI Underwater Bridge Inspection Course	7:30 am - 5:30 pm	Register Here	
Technical Sessions	8 am - 5 pm	MCC Meeting Rooms	
SWAG Booth and Genius Bar Open	8:30 A - 5 P	Registration Area	Poster, T-Shirts, News, Message Board, Show App and WiFi Assist
Exhibits Open	9 am - 5 pm	MCC Hall D	
Demonstration Tank Open	9 am - 5 pm	MCC Hall D	Exhibitor/Speaker Demonstrations
ADCI Saturation Diving Committee	9:30 - 11:30 A	MCC Room	
ADCI Latin American and Caribbean Chapter Meeting	4 pm - 6 pm	MCC Room	
ADCI Chilean Chapter Meeting	9:30-11:30 am	MCC Room	
IOPG DOSC Pre-Meeting	1:30 - 3:00 pm	MCC Room	
IMCA DDMC Pre-Meeting	7 pm - 9 pm	Hampton Inn and Suites	Tickets Required Business Attire
<b>Wednesday February 24, 2016</b>			
Registration	8 am - 5 pm	MCC Hall D	
Speakers Ready Room	7:30 am - 4:30 pm	MCC Room	
NHI Underwater Bridge Inspection Course	7:30 am - 5:30 pm	Register Here	
Technical Sessions	8:30 am - 5 pm	MCC Rooms	
SWAG Booth and Genius Bar	8 am - 5 pm	Registration Foyer	Poster, T-Shirts, News, Message Board, Show App and WiFi Assist
American Welding Society Underwater Welding Committee	9 am - 4 pm		
Exhibits Open	9 am - 5 pm	MCC Hall D	
Demonstration Tank Open	9 am - 5 pm	MCC Hall D	Exhibitor / Speaker Demonstrations
GOM Diving Safety Workgroup	9:30 - 11:30 a	MCC Room	Coffee
ADCI Marketing Committee	11:30 pm - 1:00 pm	MCC Room	Closed
ADCI Annual Membership Meeting	5:00 PM	MCC Room	
ADCI BOD Meeting	To Follow	MCC Room	Closed Meeting
Dinner with Stangers	Times Vary	Local Restaurants	See Sign ups at SWAG Booth
<b>Thursday February 25, 2016</b>			
NHI Underwater Bridge Inspection Course	8:00 am - 5:00 pm		Register Here
Registration	8 am - Noon	MCC Hall D	
Speakers Ready Room	8:30 am - 2 pm	MCC Room	
SWAG Booth and Genius Bar	9 am - noon		Poster, T-Shirts, News, Message Board, Show App and WiFi Assist
Thursday Morning Hangover Brunch Hosted by Advisory Board	10 - 11:30 am	MCC Hall D	
International Lounge			
Technical Sessions	9 am - 3 pm	MCC Rooms	
Exhibit Hall Open	9 am - 2 pm	MCC Hall D	
ROV Committee Meeting	9 am - 10:30 am	MCC Room	
Demonstration Tank Open	9 am - 1 pm	MCC Hall D	Exhibitor/Speaker Demonstrations
American Welding Society Underwater Welding Committee	9 am - 4 pm	MCC Room	Open Meeting
IOGP Diving Improvement Workgroup Meeting	10 am -	MCC Room	
Business Networking Event	1 pm - 2 pm	MCC Hall D	Hosted Beer
UI Committee	2 pm - 4 pm	MCC Room	Closed Meeting
Exhibitor Move out	2 pm - 8 pm	MCC Hall D	



Booth #507

**MacArtney**  
UNDERWATER TECHNOLOGY

Booth #500

**OUTLAND**  
TECHNOLOGY

Booth #805

**SHARK**  
**SHARK MARINE**  
TECHNOLOGIES INC.
**TELEDYNE**  
MARINE INTERCONNECT  
SOLUTIONS

Booth #200

# UNDERWATER INTERVENTION PRE-SHOW GUIDE

## Exhibitor List

December 2015

**32**

Ocean News & Technology

Company Name	Booth Number	Company Name	Booth Number
2G Engineering	811	John W Fisk Company	435, 437
2G Robotics - Underwater Laser Scanners	829	Kirby Morgan Dive Systems	102, 100
ADCI	609	Kongsberg	501
AK Industries	422	L-3 Communications Klein Associates	512
Alpha Rentals, LLC	208, 206	Laser Tools Co, Inc.	319
Amron International, Inc.	110	Linden Photonics, Inc.	728
Ansell	802	LinkQuest Inc.	905
Applied Acoustic Engineering Ltd.	510	MacArtney Inc.	500
Aqua Lung America	617	Mactech Offshore	806
Aqua-Air Industries, Inc.	305	Marin TM	233
Aqueos Corporation	619	Marine Magnetics Corporation	321
Armada Systems, Inc.	329	Marine Technology Reporter	221
Avon Protection Systems, Inc.	822	Marine Technology Society	328, 227
AXSUB, Inc.	812	MATE Center	330
Bay-Tech Industries, Inc.	722, 724, 726	Moog Tritech and Focal	300
BIRNS, Inc.	809	Morgan City Rentals	311
Broco, Inc.	901	Northwestern Michigan College - Great Lakes Water Studies Institute	508
Casco Antiguo Latino America	810	Nuvair	217
Cathx Ocean Ltd.	827, 823	Ocean News and Technology	229, 231
CaviDyne, LLC	511	Ocean Reef	317
Commercial Diving Supply	129	Ocean Technology Systems	506
Cortland Company	420	Oceaneering International	800
C-Tecnics	534	Oceanwide Safety at Sea	226
Cygnus Instruments, Inc.	730	Outland Technology	805
David Clark Company Incorporated	327	Penn State Applied Research Lab	302
Deep Ocean Engineering, Inc.	320	Polymer Corporation	113
Deep Trekker Inc.	407, 409	PommeC	923, 925, 915
DeepSea Power and Light	729	Pressure Tech Ltd.	213, 116
Delta Wave Communications, LLC	312	Quikrete	903
Denso North America	401	R2Sonic, LLC	412
Dive 1st Aid	426, 424	Redfish Rentals	535, 537
DiveLab	133	Remote Ocean Systems	313
Divers Supply, Inc.	801	ROVSCO, Inc.	301
Diving Unlimited International	844, 840	SAAB SeaEye	325, 323
EdgeTech	623	Sea Technology Magazine	804
EPIC Divers and Marine	416	Seamor Marine	201
Falmat Cable	400	SeeByte	732
Five Star Products, Inc.	340	Shark Marine	913
Flange Skillets International	828	Simpson Strong-Tie	723
Fugro	633	Sound Metrics Corporation	711
Greensea	701	South Bay Cable	625
Gulf Engine and Equipment, Inc.	715	Southwest Research Institute	335
Heavy Metal Divers	927	Subsalve USA	507
HEMISPHERE GNSS	413	Subsea Technologies, Inc. Booth	411
Historical Diving Society, USA	210	Survey Equipment Services	707, 705
Homeland Security Investigations	106	Teledyne Marine	200
Hy-Lok USA	131	The Pipeline Development Company (PLIDCO)	621
HYPACK, Inc.	318	Trelleborg Offshore Boston, Inc.	306
IHC Hytech B.V.	228	Triton Diving Service, LLC	222
Innerspace Corporation	432	VideoRay LLC	503
International Ocean Systems	111	Wachs Subsea	230
International Special Risks	907	Water Rescue	818
J W Fishers	627	Xeos Technologies Inc.	911
JFD Divex	819		

**LinkQuest Inc.**



**Booth #905**



**Booth #627**



**Booth #320**



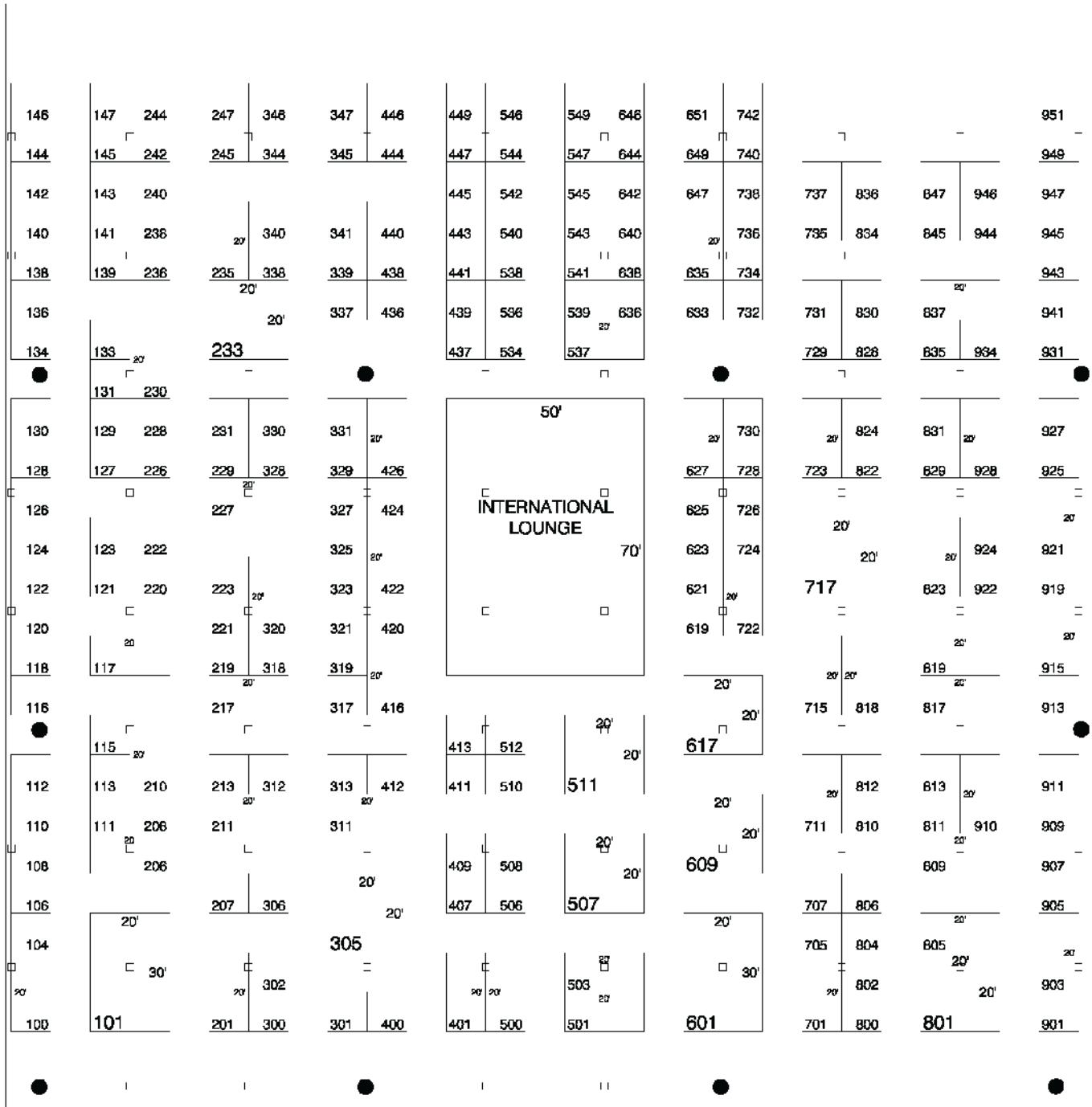
**Booth #623**

# Floor Plan

December 2015

33

Ocean News & Technology



**MAIN  
ENTRANCE**



Booth #625



Booth #400



Booth #701



Booth #301

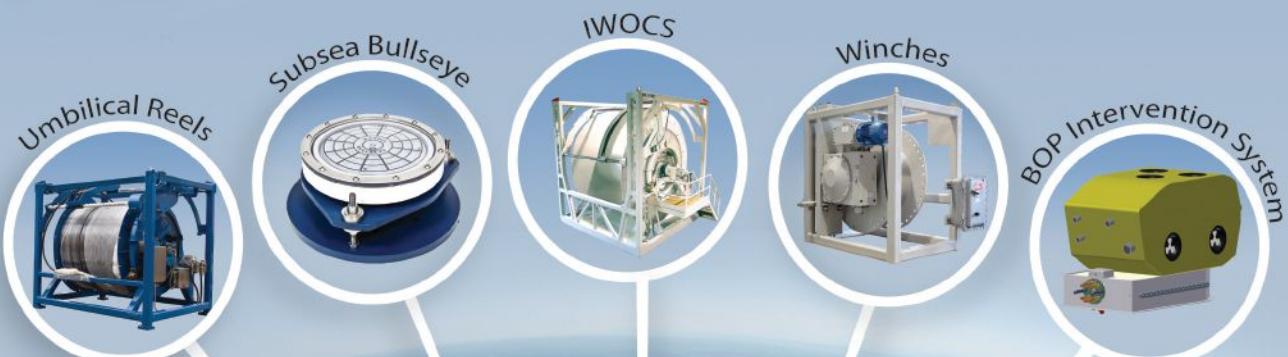


Booth #711

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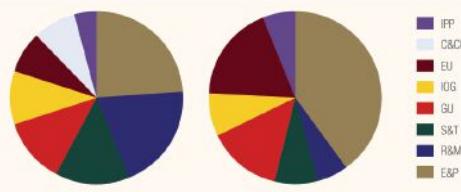
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# OFFSHORE INDUSTRY

TOP 50 FASTEST GROWING BY SECTOR

2014

2015



Source: Platts Top 250

## U.S. shale profits outpacing industry heavyweights: Platts annual survey

The Platts Top 250 Global Energy Company Rankings, which measured 2014 financial performance in a variety of sectors, showed that it was a strong year for U.S. shale players, despite slumping oil prices. Earnings growth even outpaced industry heavyweights.

Although corporate growth rates across the board fell slightly, America's top shale players booked significant gains. They recorded a 3-year compound growth rate of 56%, up from 46.8% in 2013, according to Platts. Eight of the 10 energy firms with the best growth rates were North American shale or tight oil companies.

In the overall rankings, energy companies in the Americas accounted for 45% of the top 250, increasing their footprint at the expense of rivals in Europe and Asia. "There is a whole suite of companies that have been brought along by the shale boom," said Robert Perkins, senior editor of Platts' EMEA Oil News.

While the E&P sector grew the most in 2014, refining and marketing struggled due to sluggish demand that led to overcapacity, thereby hurting profit margins, Platts said, noting that North American refiners got the better of international rivals, benefiting from cheaper crude and natural gas.

## BP sees technology about doubling world energy resources by 2050

The world is no longer at risk of running out of oil or gas for decades ahead with existing technology capable of unlocking so much that global reserves would almost double by 2050 despite booming consumption, oil major BP said.

When taking into account all accessible forms of energy, including nuclear, wind and solar, there are

enough resources to meet 20 times what the world will need over that period, said David Eyton, BP Group head of technology.

"Energy resources are plentiful. Concerns over running out of oil and gas have disappeared," Eyton said at the launch of BP's recent inaugural Technology Outlook.

Oil and gas companies have invested heavily in squeezing the maximum from existing reservoirs by using chemicals, super computers and robotics. The halving of oil prices since last June has further dampened their appetite to explore for new resources, with more than \$200 billion worth of mega projects scrapped in recent months.

By applying these technologies, the global proved fossil fuel resources could increase from 2.9 trillion boe to 4.8 trillion boe by 2050, nearly double the projected 2.5 trillion boe required to meet global demand until 2050, BP said.

With new exploration and technology, the resources could leap to a staggering 7.5 trillion boe, Eyton said. "We are probably nearing the point where potential from addition recovery from discovered reservoir exceeds the potential for exploration."

## FPS spending to increase through 2019, says Douglas-Westwood

Douglas-Westwood's report, "World Floating Production Market Forecast 2015-2019," projects that \$68 billion will be spent on FPS units between 2015 and 2019—an increase of 49% compared to 2010 through 2014.

Despite capital spending growth over the forecast, orders this year have been very weak with only four contract awards so far, the result of the low oil price impacting project sanctioning activity, compounded by recent history of high-cost FPS projects running late and over-budget.

In the near-term, DW said to expect improvement next year. Operators have worked this year to redevelop projects to make them more cost effective and their efforts should see final investment decisions made on a number of projects.

FPSOs will represent by far the largest segment of the market both in terms of numbers (67 installations) and forecast capex (79%) during 2015-2019. FPSSs will account for the second largest segment of capex (9.3%) and TLPs third with 9.2%.

## in this section

Offshore Industry Headlines	35
Upstream Oil & Gas	38
Underwater Intervention	48
Maritime Communications	52
Subsea Cables	58

### U.S. oil and gas industry emerges as an important drone incubator

It's no wonder that because of its broad commercial application, the unmanned aerial vehicle (UAV), or drone, the oil and gas industry is rapidly evolving into an important incubator for both UAV technology and government regulators grappling with associated safety and environmental issues.

The drone, once mainly a tool of the military, now offers all sorts of commercial applications that the industry can use. For example, they allow oil and gas companies to monitor pipelines, roads, storage tanks, buildings, bridges, and power lines, and also provide a role in exploration and response to oil spills.

ConocoPhillips conducted the first drone flight in commercial airspace, off the coast of Alaska in 2013. Although the company shelved its exploration



plans in the Arctic, it surveyed sections of the Chukchi Sea using a drone.

BP received approval from the Federal Aviation Administration (FAA) in 2014 to deploy drones to monitor its pipeline network at Alaska's Prudhoe Bay, the first time the feds gave a green light to the use of drones over land in the United States.

Oregon-based VDOS Global LLC won approval from the FAA in late 2014 to use drones to inspect Shell's flare stacks in the Gulf of Mexico.

Earlier this year, the FAA decided to dramatically loosen federal limits on drone use. There are now hundreds of various companies that have received approval from regulators to operate drones for commercial purposes.

There are even "drone services," which individuals or businesses can contract for the use of a drone without having to actually own one. If someone needs aerial imagery of their farm, business, or neighborhood, there are drone pilots that can do the work them.

# OFFSHORE INDUSTRY HEADLINES

Research & Development • Environmental Assessment • Discovery

## Many oil companies ‘virtually abandoning’ exploration: Analysis

The hunt for new stores of oil and gas has been dramatically curtailed amid a global crude slump, with exploration budgets at the largest oil companies cut in half from their peak levels in 2013, according to a recent analysis. Investment banking firm Tudor, Pickering, Holt & Co. forecasts that spending will fall to \$25 billion next year, down from the \$50 billion these same companies spent just 3 years ago.

Oil companies are spending less in part because service costs have tumbled alongside oil prices, allowing explorers to spend less money to search for new reservoirs. But a vast majority of the spending cuts are related to a pullback in activity, said Tudor, Pickering, Holt & Co. in an analysis released to investors.

“Many (exploration and production) companies are virtually abandoning exploration altogether, especially in the U.S.,” the analysts wrote.

For example, major ConocoPhillips will stop searching for oil and gas in deepwater fields by 2017, and it plans to sell the offshore leases it does not intend to drill, according to a report in the Houston Chronicle. Its exit from deepwater exploration would free up roughly \$800 million in capital, the amount it has budgeted for exploration next year.

Recent auctions for oil and gas leases have attracted little interest, the analysts pointed out, noting that bid value fell 80% in a single year, Tudor, Pickering, Holt & Co. analysts wrote.

## U.S. decision to cancel offshore Arctic lease sales draws API’s ire

The U.S. Department of the Interior said in mid-October that it will cancel the



Erik Milito

two potential Arctic offshore lease sales scheduled under the current 5-year offshore oil and gas leasing program for 2012-2017. The agency cited “current market conditions and low industry interest” as reasons for the move.

But Erik Milito, director of upstream for the American Petroleum Institute (API), primarily blamed the Obama administration for its decision.

“Our industry’s strong interest in developing our country’s vast offshore oil and natural gas resources in Alaska was undermined years ago when the administration began implementing a system of regulatory and permitting unpredictability and uncertainty,” Milito asserted.

The administration’s decision follows Shell’s announcement that it would cease further exploration activity offshore Alaska for the foreseeable future, citing a “disappointing exploration outcome” with its Burger J exploration well.

“In light of Shell’s announcement, the amount of acreage already under lease and current market conditions, it does not make sense to prepare for lease sales in the Arctic in the next year and a half,” U.S. Interior Secretary Sally Jewell said.

Under the current program, Chukchi Sea Lease Sale 237 was scheduled potentially for 2016. Interior’s Bureau of



Ocean Energy Management (BOEM) issued a call for information and nominations in September 2013 to which industry submitted no specific nominations.

Beaufort Sea Lease Sale 242 had been scheduled potentially for first-half 2017. BOEM published a call for information and nominations in July 2014, but only received one nomination, thereby raising concerns about the competitiveness of any such lease sale at this time.

The Bureau of Safety and Environmental Enforcement (BSEE) also separately denied requests from Shell and Statoil for lease suspensions that would have allowed the companies to retain the leases beyond their primary terms of 10 years. The Beaufort lease will expire in 2017, and the Chukchi lease in 2020.

## Oil slide means ‘almost everything for sale as asset deals accelerate

Information provider IHS Inc. says more than \$200 billion worth of oil and natural gas assets are for sale globally as companies come under renewed financial pressure from the prolonged commodity price rout, Bloomberg reported, noting that there were roughly 400 buying opportunities as of September.

“Basically almost everything is for sale,” Bloomberg quoted an IHS representative as saying.

Low prices have slashed profits and, as of the second quarter, about one-sixth of North American major independent crude and gas producers faced debt payments that were more than 20% of their revenue. Companies have announced

\$181.1 billion of oil and gas acquisitions this year, the most in more than a decade, compared with \$167.1 billion the same period in 2014, data compiled by Bloomberg show. Companies with strong balance sheets are seeking buying opportunities, IHS said, citing Perth, Australia-based Woodside Petroleum Ltd.’s \$8 billion offer for explorer Oil Search Ltd. and Suncor Energy Ltd.’s \$3.3 billion bid for Canadian Oil Sands Ltd. Both targets rejected initial offers.

As of August, one out of every eight junk-rated oil companies was in danger of defaulting, according to Moody’s. Next year the U.S. benchmark may trade up to around \$55/bbl, Bloomberg reported, citing the IHS representative who said it would take several years for supply and demand to rebalance, and prices may rise to about \$70/bbl by 2018.

## UK firms missing opportunities by failing to work together: Deloitte

Deloitte’s survey of oil and gas operators and oilfield services companies has found that a lack of effective supply chain collaboration means companies are missing out on maximizing the potential value from the UK Continental Shelf. Some 74% of respondents said collaboration was an integral part of their day-to-day business, but only 27% reported that the majority of their efforts resulted in a successful outcome.

Cost reduction was found to be the main driver for collaboration today, with nearly a third (31%) of company respondents in agreement; 90% said that supply chain collaboration would also play a greater role in their company’s success.

The most critical finding highlighted the discrepancy between what drives successful collaboration, and the actions of leadership and business processes to underpin it. While there was clear recognition of the value of collaboration and what’s needed to make it happen, trust and mutual benefits for example, less than 10% said that leadership regularly emphasized its importance or included it in their business strategy.

Despite this, 20% of respondents still said they actively sought out opportunities to collaborate, which shows that the potential is there if the right leadership and incentives are in place.

This was the first Deloitte oil and gas collaboration survey in the UK and took place during the month of July 2015. The survey, recently released to the media, was supported by industry body Oil and Gas UK. Sixty-one persons participated from a wide range of operators and oilfield services companies. For more information, visit [www.deloitte.co.uk/UKCS-collaboration](http://www.deloitte.co.uk/UKCS-collaboration).

## Collaboration aims to develop enhanced well control training

Lloyd's Register Energy's Training Academy and The Well Academy are collaborating to develop a new enhanced training program for well control certification.

"Training your staff is vital for safe, competitive, and sustainable drilling operations," said Jeroen Bergevoet, Academy training manager and technical knowledge manager for Lloyd's Register Energy.

"Our delegates will be trained to use the very latest technologies and also will be given complete insight into the criticality of human factors in well operations, which can be overlooked when operators are under pressure and time constraints."

Courses will offer delegates an advanced participative experience in well control certification training and well control equipment training, with classroom and case studies complimenting workgroup sessions. Training will be offered with simulators to give delegates "hands-on" scenario training using well control equipment.

"We are dedicated to offering team-based training with advanced well control theory and equipment modules delivered in an interactive manner for both surface and subsea rig operations," said Ivo Nijhuis, director of The Well Academy.

"Using crew resource management concepts, the teams will use simulated sessions to demonstrate their procedural competency in dealing with well control equipment failures."

Courses are designed to reduce expensive travel and accommodation costs. The main cost savings for industry is that the well control certification training and well control equipment training are now delivered in a 1-week program, whereas in the past these were two separate programs. This saves mobilization and accommodation costs and training time of rig crews.

The first course is anticipated to be ready in December 2015.

Lloyd's Register Energy's Training Academy was launched in 2013. It provides a wide portfolio of training opportunities to support, maintain and enhance competencies and skills in various sectors within the drilling industry.

The Well Academy was founded in 2012 by oil and gas industry professionals with a desire to improve well operations performance. It provides the drilling and well services industry with practical training solutions.



Ivo Nijhuis

## Claxton and OIS improve technology to deliver subsea well abandonment campaign

Acteon company Claxton said it improved the technological advantage of its suspended well abandonment tool (SWATTM) by developing an extension module. In turn, this enables Claxton and Acteon sister company Offshore Installation Services Ltd (OIS) to set deeper environmental and intermediate barriers, Claxton added.

SWAT holds the Queen's Award for Innovation in the UK and the Petroleum Institute Platinum Award for Innovation. It is the first tool of its type and is provided by Claxton in co-operation with OIS.

"In combining our proven SWAT tool with the new extension module, we have significantly increased the range of wells that can be abandoned using SWAT," said Neil Watson, Claxton's SWAT product leader. "By providing our customers with more opportunities to opt for this rigless method, we enable them to reduce their well abandonment costs considerably."

The existing tool is deployed from a vessel through the moonpool, eliminating the need for a drilling rig. It is positioned on the wellhead and then used to perform casing perforation, recovery of drilling mud and placement of the required cement barriers in the well.

SWAT utilizes the extension module to enable cement to be positioned even deeper within the well. A wiper plug is positioned before and after the cement column, which ensures that the wellbore is cleaned ahead of the cement. The lower plug forms a base for the column and slurry is uncontaminated when it enters the annulus. The cement is then displaced to the required depth in the well. In OIS's most recent well abandonment campaign, the depth was 2,400 ft below mudline. This added depth capability significantly enhances well decommissioning capacity; previously, the SWAT tool was limited to environmental barriers up to 600 ft below mudline, which limited the wells eligible for abandonment with SWAT.

OIS successfully completed its 18th multi-operator plug and abandonment (P&A) campaign for Centrica Energy and Antrim Energy in the central North Sea, using Claxton's new SWAT extension module. Ten subsea wells in Categories 1, 2.1 and 2.2 were abandoned with the rigless method.

"This project is the largest well decommissioning campaign completed by OIS since Acteon sister company, Claxton, introduced SWAT in 1996," said Valerio Percoco, vice president of business development, OIS.

"The successful completion of this project, with zero environmental or lost-time incidents, reinforces our position as a global leader in the vessel-based P&A market, having safely abandoned 128 wells over the past 19 years."

Furthermore, he said, this multi-operator approach enables operators to share project costs, which, when combined with the rigless approach, provides a cost-effective method for decommissioning non-revenue generating assets.

"Project costs are divided equally between operators on the basis of number of wells brought to the campaign, and lump sum costs such as mobilization and demobilization are shared," he said.

OIS conducted offshore operations from an anchor-handling tug supply vessel (AHTS), which is said to be more cost-effective and fit for purpose than a construction vessel or rig, according to OIS.



Pre-deployment preparation for SWAT the suspended well abandonment tool.



The suspended well abandonment tool during load out.

**Saipem secures over \$661M worth of offshore contracts**  
 Italian firm Saipem has secured two new offshore engineering and construction contracts worth more than USD \$661 million. The first contract was awarded by Saudi Aramco Karan, which involves the engineering, procurement, transportation and installation of offshore structures. The company will perform these installation activities offshore Saudi Arabia. As part of the EPCI contract, Saipem will install observation platform, wellhead production deck module, auxiliary platforms, 20-in. internally cladded flowline and composite power cable. Eni has also awarded an EPCI contract for block 15/06 - East Hub Development Project, located about 350 km northwest of Luanda, Angola. The project involves the development of the Cabaça North and Cabaca South-East discoveries located within the block. Under the contract, Saipem will provide five flexible risers and 20 km of rigid flowlines. In addition, SURF facilities, including umbilical sections, rigid spools, well jumpers and 14 PLETs, would be fabricated in Angola. The project is slated for completion by the end of 2016.

**Pulse gets nod for acoustic mooring line monitoring system**  
 Pulse Structural Monitoring won a contract with National Oilwell Varco (NOV) Arendal in Norway to provide an acoustic mooring line subsea monitoring system to measure mooring line inclination and tension. The contract is for 12 mooring line subsea monitoring sensors and ancillary topsides equipment, which have been enhanced to meet specific client requirements. The equipment will be installed in the North Sea. The Pulse system consists of 12 ROV deployable INTEGRIPod acoustic data loggers on the mooring line's upper section to measure actual inclinations. The MoorASSURE software then regenerates the angles to corresponding tension and horizontal displacement, as well as presence detection of the line. The mooring line sensor array is acoustically linked to an innovative acoustic receiver's arrangement in the hull of the ship. Calculated data is communicated back to the NOV control system and ship control room.

**DeepStar awards GMC steel catenary riser test project**  
 DeepStar has awarded GMC a testing project as part of DeepStar Phase XII-B. The project title is "Testing of High-Strength Mechanically Connected Steel Riser" and its purpose is to demonstrate the strength and fatigue resistance of high-strength mechanically connected and friction welded pipe for use in steel catenary risers. Full-scale testing is to include mechanical testing of friction joints as well as full-scale fatigue testing friction joints and the connector rated for 15,000 psi service. "This project award underscores the urgent requirement in the offshore oil and gas industry to develop cost-effective technical solutions for developing deepwater and ultra-deepwater prospects. Completion of this testing will significantly advance the technology readiness level of GMC's Intelligently Connected Pipe," said Glen Viau, chief operating officer of GMC Ltd.

**Murphy orders subsea hardware for Rotan off Malaysia**  
 Murphy Sabah Oil has contracted Aker Solutions to supply the subsea production system for the deepwater Rotan gas field development offshore Malaysia. The scope includes equipment for four subsea wells, a hub manifold, in-line tees, a connection system, and a production control system. First deliveries are scheduled for the second quarter of 2016. Aker Solutions has worked previously with Murphy on the Kikeh oil and gas project, Malaysia's first deepwater development, and the Siakap North-Petai oil and gas field tieback to Kikeh. Both fields are in block K offshore Borneo, East Malaysia.

## Lukoil strikes potential giant gas field in Black Sea offshore Romania



PJSC Lukoil said its Lira-1X exploratory well in the deep-water Romanian Black Sea discovered a large, potentially extensive gas field. The semi-submersible Transocean Development Driller II drilled the well on the Trident block (EX-30), 105 mi offshore in 2,296 ft water depth. Drilling reached a depth of 8,858 ft before the well was temporarily abandoned for further evaluation of the discovery.

Analysis of drilling data and geophysical exploration suggests Lira-1X delivered a productive interval with an effective gas-saturated thickness of 151 ft. According to the seismic data, the field could extend up to 15 sq mi in size, with potential for more than 1 tcf of gas, although this has to be confirmed by appraisal drilling.

Lukoil added that Lira-1X will reduce the risk for exploration on further substantial prospects nearby and in other parts of the block. Its planned work program for 2016 includes another well on Lira and reprocessing of seismic data

to confirm the size of the discovery and precise assessment of its potential reserves.

Romania's government awarded the company's subsidiary Lukoil Overseas Atash a 72% share of the 388-sq. mi concession in 2011, in partnership with PanAtlantic Petroleum and Societatea Nationale de Gaze Naturale Romgaz.

Earlier this year, Wood Mackenzie suggested recent deepwater developments in the Black Sea, notably ExxonMobil-OMV Petrom's play-opening 2.5-tcf Domino discovery in the Romanian sector, could have a major impact on the region's gas supply dynamics.

Wood Mackenzie claims 630 mmcf of gas per day could be onstream in the early 2020s from Domino, making Romania a net exporter of gas for the first time. The economics of Black Sea deepwater gas developments stack up for investors, the analyst added, even in the current climate.



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*The new Ulstein DX105 design.*

#### New well intervention vessel design offers storage, weight advantages

Herrenknecht Vertical and Ulstein Design & Solutions (UDS) have developed a new well intervention vessel design. The Ulstein DX105, which incorporates the HVG Terra Invader 750 drill tower, is for operations in water depths up to 8,250 ft. UDS said the focus is on cost efficiency in medium and heavy well intervention operations.

The vessel's large, free work deck, with direct access to the moonpool, allows it to carry a large diversity of additional facilities including coiled tubing and wiring equipment; storage of multiple Christmas trees and other subsea items; cementing equipment and storage of extra drill pipes, risers, and casings; and well test equipment.

The drill tower consists of an A-frame structure, said to provide easy access to the drill floor.

"By using an automated horizontal racking system, a light substructure could be realized, which in combination with the weight saving A-frame solution resulted in a lower center of gravity," said Dennis Vollmar of Herrenknecht Vertical. "That improves also the operational envelope of the vessel."

Bram Lambregts, deputy director at UDS, added: "Its higher payloads and mobilization speed compared to semi-submersibles ensure that the Ulstein DX105 is less dependent on nearby infrastructures. This is of great importance for well intervention operations in remote areas and harsh environments, which is further enhanced by applying the proven UlsteinX-BOW to increase the operational window of the vessel."

#### Asian offshore vessels select Synectics for surveillance

Global surveillance business Synectics has secured key contracts to supply integrated surveillance solutions for three oil and gas vessels within the Asia Pacific market. Two LNG carriers and an FLNG facility, which will be

located in the South China Sea, will be protected by Synectics' COEX camera stations and will benefit from Synectics' Synergy command and control platform.

The LNG carriers, built by a leading South Korean shipyard, will use a combination of COEX C3000 and C2000 camera stations (PTZ and fixed) to monitor mooring space, cargo manifolds, deck operations, and vessel-critical infrastructure such as the boiler, motor and compressor rooms. Microphones will also be integrated into a number of camera stations to facilitate process monitoring.

Over 60 COEX camera stations will also be deployed on the non-propelled FLNG vessel designed to produce 1.5 million ton of LNG each year. With an "at sea lifespan" of 20 years, the cameras will be installed on both the hull and topside for monitoring production storage and offloading areas.

Synergy, Synectics' open platform solution that enables alarms and events, security and process control sub-systems, video, and data to be monitored, managed, and recorded from a single unified interface, will be used by both the LNG carriers and FLNG vessel.

#### Shell brings latest phase of Bonga development online offshore Nigeria

Shell Nigeria Exploration and Production Co. Ltd. (SNEPCo) has started production from the deepwater Bonga Phase 3 project. This is an expansion of the Bonga Main development, with a daily peak output anticipated to reach around 50,000 boe.

Production is transported through existing subsea flowlines to the Bonga FPSO, which is designed to produce more than 200,000 bbl per day of oil and 150 mmcf per day of gas.

The Bonga field, which began producing oil and gas in 2005, was Nigeria's first deepwater development in water depths of more than 3,281 ft. To date it has delivered more than 600 mmbbl.

SNEPCo operates as contractor under a production-sharing contract with the Nigerian National Petroleum Co.,



*Shell Nigeria's Bonga FPSO.*

which holds the lease for the surrounding OML 118 concession. Other partners are Esso Exploration & Production Nigeria, Total E&P Nigeria, and Nigerian Agip Exploration.

#### Ultra-deepwater Fugro Scout completes work off Middle East



*The Fugro Scout.*

Fugro Scout, Fugro's new 272-ft ultra-deepwater geotechnical drilling vessel completed its first project in the Middle East. Fugro said the vessel was successfully deployed in the Arabian Sea and the Red Sea, completing several geotechnical and geophysical survey scopes for various clients. The vessel was in transit to The Netherlands to execute a geotechnical survey for an offshore wind-farm in the Dutch sector of the North Sea.

The new vessel is specifically designed to address the varied demands of both the shallow and deepwater survey markets, Fugro said. With a twin tower drilling derrick over a centrally located moonpool, the Fugro Scout supports automated pipe and tool handling equipment to promote safe drill floor operations.

A large soil laboratory provides an open plan working environment for geotechnical operators; other equipment includes both downhole and seabed sampling and testing systems rated for 9,842 ft water depth. The vessel is equipped with a dynamic positioning station holding capability (DP-2) and is built to Comfort Class COMF-V(3) standards, with quarters for up to 60 operational staff.

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## Chevron scores big on Anchor appraisal in U.S. Gulf

Field operator and 55% owner Chevron Corp. has come up big on the appraisal of the Anchor discovery in the deepwater Lower Tertiary Wilcox Trend of the U.S. Gulf of Mexico.

"The positive results of our appraisal work at Anchor indicate a significant discovery of potentially hub-class scale," said Jay Johnson, Chevron's executive vice president, upstream.

The original Anchor discovery well, located in Green Canyon Block 807, about 140 mi off the coast of Louisiana in 5,180 ft of water, was drilled in late 2014 to a depth of 33,750 ft and encountered 690 ft of net oil pay.

Appraisal drilling began in June 2015 and recently found 694 ft of net oil pay, the company said, adding that to date, Chevron has confirmed a hydrocarbon column of at least 1,800

ft in the Lower Tertiary Wilcox reservoirs at Anchor. Complete appraisal of the field will require further delineation wells and technical studies. Anchor co-owners are Cobalt International Energy, L.P. (20%), Samson Offshore Anchor, LLC (12.5%), and Venari Resources LLC (12.5%).

## Shell obtains authorization for drilling off Nova Scotia

Shell Canada has received an operations authorization from the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) to begin drilling at the Shelburne Basin Venture Exploration Drilling Project. The drilling unit used by Shell Canada, Stena IceMAX, was performing preparatory work before commencing drilling operations.

Earlier this year, the company submitted applications to the board to carry out a deepwater drilling program 250 km offshore Nova Scotia. During the initial phase of the program, the company planned to drill two exploratory wells.

Before drilling the first well Cheshire, Shell Canada was required to obtain an approval to drill a well (ADW) from the CNSOPB. For the second well Monterey Jack, the company needed to obtain separate ADW at a later date.

"After an extensive regulatory review process, Shell Canada has demonstrated to the satisfaction of the CNSOPB that it will be taking all reasonable precautions to protect safety and the environment while carrying out the drilling program," said Stuart Pinks, CNSOPB chief executive officer.



*The Stena IceMAX*

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## Woodside to drill up to three wells in the Beagle subbasin off Australia

Woodside Petroleum announced plans to drill up to three wells in the emerging Beagle subbasin to test prospects east of the Angel platform and west of the play-opening Phoenix South-1 discovery as part of its bid to rejuvenate its North West Shelf portfolio.

The three wells will be drilled in license areas WA-472-P and WA-473-P and are located 41 to 124 mi northeast of Dampier, Western Australia. The prospects, Skippy Rock-1 and Buttons Crossing-1, are located in WA-472-P while Big Brooks-1 sits within WA-473-P. All the targets are within 197 to 295 ft of water. However, Woodside will use a semi-submersible drill rig over a jack-up rig, most likely the Atwood Eagle, the company noted.

The two WA-472-P wells are required to be drilled by May 2016 after the company secured a 12-month permit extension, while the well in WA-473-P, originally due by May 2016, has been pushed back into final permit year, Woodside said. The first well scheduled for drilling was expected to be Skippy Rock-1, which is testing a medium-sized target, between 20 to 100 mmbbl.

Interest in the Beagle subbasin has been amplified by the Phoenix South-1 discovery in WA-435-P to north, where Quadrant Energy plans to drill the Roc-1 well before the end of the year, the company noted. Woodside's last attempt at making a discovery in the Rowley subbasin area of the Roebuck basin, Anhalt-1 in WA-462-P, was an expensive deepwater duster.

## Consortium completes drilling three wells in Libra area off Brazil

Petroleo Brasileiro (Petrobras) has reported that the consortium responsible for the Libra area in Santos Basin's pre-salt has concluded drilling of the 3-BRSA-1310-RJS well in the block's central portion in offshore Brazil.

The 352,260 sq. km offshore pre-salt Santos Basin is located in the south Atlantic Ocean, 300 km southeast of São Paulo, Brazil. It has several recent significant oil fields, including Tupi, Jupiter, and Libra.

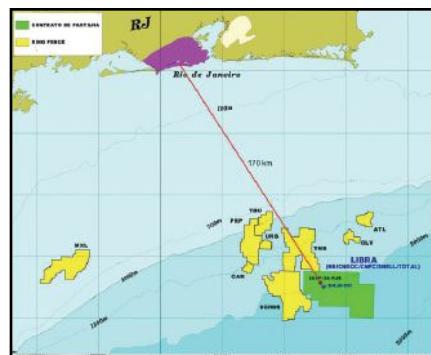
Following completion of drilling, the well discovered hydrocarbons in a low-porosity reservoir and provided vital information for the ongoing appraisal campaign over the area. It is the fourth well drilled in the Libra field.

The consortium comprising Petrobras (operator, with 40%), Shell (20%), Total (20%), CNPC (10%), CNOOC (10%) and PPSA (contract manager), is also

drilling at two other locations.

Coring operations are in progress at the 3-RJS-739A well in the northwest region of the block, which has already detected carbonate reservoirs containing oil. Drilling has started on well 3-RJS-741 located in the north.

In order to conduct extended well tests, the consortium has already contracted a floating production, storage and offloading vessel (FPSO), which has a capacity of 50,000 bbl per day of oil and 4 mmcm of gas a day.

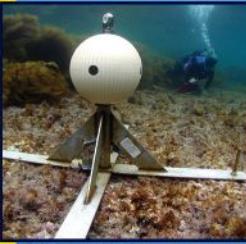


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43

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*Depletion compression platform (DCP) next to the Malampaya shallow water production platform (SWP).*

### **Second platform starts operations on Malampaya offshore the Philippines**

Shell Philippines Exploration and its partners have started gas production from the new depletion compression platform (DCP) serving the Malampaya field. The new platform—the first designed and built in the Philippines—is adjacent to the existing Malampaya shallow water platform, 31 mi offshore Palawan.

Shell said the new facility, and the

two new production wells completed in 2013, will maintain the level of gas production needed to fulfill commitments under existing gas sales agreements.

The facility's self-installing allowed it to be installed without the need for large specialized installation vessels. It was built to float and towed from Subic to the Malampaya offshore location. The inbuilt jacking system was used to jack down the 262-ft legs and lift the platform from the water into its final position. Both Malampaya platforms are designed to withstand typhoons and earthquakes.

### **Foxtrot begins production from second platform off Ivory Coast**

Foxtrot International, which is 33.33% owned by RAK Petroleum, has started production from a second platform on block CI-27 in the offshore Ivory Coast area, southern West Africa. According to RAK Petroleum, the Marlin-B1ST well is flowing an average of 1,100 bbl per day of 26 degree API oil through a 35/64-in. choke at present.

Installed in April as part of a \$1 billion expansion program to bring the Marlin oil and gas field and the Manta gas field on production, the new Marlin platform is expected to double the hydro-

carbons treatment capacity of block CI-27. The platform will also increase the supply and the reliability of gas deliveries. Operational since 1999, the first platform on the block processes gas and liquids from the Foxtrot, as well as Mahi fields. The Marlin-B1ST well was drilled in 100 m of water to a total depth of 2,660 m and encountered 62 m of gross pay in the Cenomanian interval.

### **Chevron launches production from Lianzi offshore Congo and Angola**

Chevron Corp. said subsidiary Chevron Overseas (Congo) Ltd. began oil and gas production from the Lianzi field, located in a unitized offshore zone between the Republic of Congo and the Republic of Angola.

Located 65 mi offshore in roughly 3,000 ft of water, Lianzi is Chevron's first operated asset in the Republic of Congo and the first cross-border oil development project offshore Central Africa. The project is expected to produce an average of 40,000 boe per day.

The field, discovered in 2004, includes a subsea production system and a 27-mi. electrically heated flowline system, the first of its kind at this water depth. Chevron operates the field.

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### **Statoil starts wet gas compression on Gullfaks field in North Sea**

Statoil has increased gas recovery rates from its Gullfaks oil and gas field in the Norwegian sector of the North Sea with partners Petoro and OMV through cost-effective wet gas compression. The company said that the process will increase recovery by 22 mmbce and also extend plateau production by around 2 years from the Gullfaks South Brent reservoir.

"Subsea processing and gas compression represent the next-generation oil and gas recovery, taking us a big step forward," said Margareth Øvrum, Statoil's executive vice president of technology, projects and drilling.

Statoil started Åsgard subsea gas compression in mid-September. According to the company, the two projects represent two different technologies for maintaining production at a time when the reservoir pressure falls after a certain time.

Subsea compression serves as a vital technological leap to develop the concept of a subsea factory.

"Subsea processing and gas compression represent the next-generation oil and gas recovery. The recovery rate from the Gullfaks South Brent reservoir may be increased from 62% to 74% by applying this solution in combination with other measures," Statoil operations west cluster senior vice president Kjetil Hove said.

The technology can also be used to tie-in other subsea wells to the wet gas compressor through existing pipelines.

A wet gas compressor does not require gas and liquid separation before compression. It simplifies the system, requiring smaller modules and a simpler structure on the seabed. The system comprises a 420-ton protective structure, a compressor station with two 5-MW compressors totalling 650 tons, and equipment that is required for power supply and system control on the platform. Before the starting of the subsea compressor, the companies made preparations on the Gullfaks platform.

The Gullfaks licence is operated by Statoil with 51% stake, while Petoro owns 30% and OMV has a 19% stake.

### **Noble Energy brings Big Bend oil online in deepwater Gulf of Mexico**

Noble Energy Inc. has started oil production from the Big Bend field development in the deepwater Gulf of Mexico. The single-well field was ramping as expected and anticipated to reach a maximum gross production rate of about 20,000 boe per day within a few weeks. About 90% of the volumes being produced are oil.

In addition, the company continued to accelerate the Dantzler development

and expected first production by early November. Big Bend and Dantzler, located in Mississippi Canyon 698 and 782, respectively, are subsea tiebacks to the third-party Thunder Hawk production facility.

Noble Energy operates Big Bend with a 54% working interest, along with W & T Energy VI LLC with 20%, Red Willow Offshore LLC with 15.4%, and Houston Energy Deepwater Ventures V LLC with 10.6%. Noble Energy operates Dantzler with a 45% working interest.

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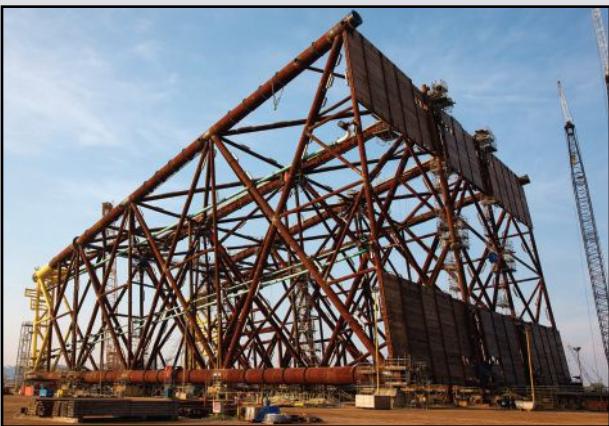
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## McDermott wins EPCI project for 4 wellhead jackets offshore Qatar



*Jackets are scheduled for fabrication by McDermott International's Dubai, U.A.E.-based fabrication facility.*

McDermott International, Inc. has been awarded a sizeable brownfield project by Qatar Petroleum for the engineering, procurement, construction and installation (EPCI) of four wellhead jackets, the company said.

Installation of two jackets in the Bul-Hanine field offshore east of Doha has been scheduled to be completed by December 2016 with the remaining two scheduled for completion in July 2017. The total weight of all four structures combined is 3,495 tons.

"McDermott's integrated EPCI capabilities are critical to these offshore projects," said Tom Mackie, McDermott's vice president, Middle East. "This award is another example of collaboration with our customers to meet their critical production and project requirements."

He said the award is expected to be executed with McDermott's internal resources and backed by "our proven track record of designing, building and installing offshore and subsea solutions."

Revenue for the order was to be included in McDermott's third quarter 2015 backlog.

McDermott has been delivering projects in Qatar for more than 40 years. Detailed design engineering and procurement is expected to be performed by McDermott's teams in Dubai, U.A.E. Jackets are scheduled for fabrication by McDermott's Dubai, U.A.E.-based fabrication facility. Vessels from the McDermott global fleet were scheduled to undertake the installation work.

### SNH, Perenco sanction Cameroon Kribi FLNG project

Golar LNG said it received final approval for its Cameroon floating liquefied natural gas (FLNG) project, due to be commissioned in the second quarter of 2017.

At a ceremony in Yaoundé, Cameroon's state oil and gas company Société Nationale des Hydrocarbures (SNH), Perenco Cameroon, Golar Hilli Corp., and Golar Cameroon executed a binding gas convention.

This endorses installation and operation of the GoFLNG vessel in Cameroon waters to receive supplies from the offshore Kribi fields. SNH should also approve the tolling agreement

shortly. This establishes the terms under which Golar will provide liquefaction, storage, and offloading services to SNH and Perenco as upstream joint venture partners.

Golar is now in a position to draw down up to \$700 million in finance to finance the cost of converting the Hilli to an FLNG vessel, currently in progress at the Keppel Shipyard in Singapore. All three upstream parties have been working for the past 2 years on this nearshore export project in an area of benign sea states. Golar says 500 bcf will be allocated over 8 years from the Kribi fields—equivalent to 1.2 million tons per day of LNG—which will be exported to global markets via the Hilli.

### Technip to deliver umbilicals for Angola's East Hub

Eni has contracted Technip Umbilicals and Angoflex to supply umbilicals for its Block 15/06 East Hub development offshore Angola. The project is 217 mi north of Luanda in water depths of 1,476 to 1,968 ft. Technip's scope covers project management and manufacture of around 9.3 mi of dynamic and static steel tube umbilicals.

Technip Umbilicals' plant in Lobito, Angola, supported by Technip Umbilicals in Newcastle, northeast England, will manufacture the consignment, which is due to be delivered during the second half of 2016. Last year Eni commissioned the group to fabricate and install flexible and rigid pipelines in block 15/06.

### Subsea 7 to install subsea network for East Nile phase

Pharaonic Petroleum Co. has contracted Subsea 7 S.A. for subsea services at the East Nile Delta Phase 3 project (END-3) offshore Egypt. These will be employed for development of the Taurt and Ha'py fields.

The project scope includes installation engineering, procurement, and fabrication of rigid spools and installation of pipeline, umbilical and subsea structures to develop resources from two wells, including 5 mi of umbilicals and pipeline, for water depths of 262 to 295 ft.

Petrojet will fabricate the spools at its yard in Egypt. Offshore installation is due start in the current quarter using Subsea 7's Rockwater 2 and Seven Borealis vessels.

### Centrica says North Sea Butch oil heading to BP's Ula

Centrica Energy Norway and partners have decided to develop their Butch discovery in the southern Norwegian North Sea as a subsea tie-in to the BP-operated Ula field complex, 8 mi to the west. The wellstream will be transported to the Ula platform for processing.

Butch's oil will be exported via the Ula oil export pipeline to the Ekofisk offshore complex and from there through the Norpipe trunkline to the Teeside terminal in northeast England. Produced gas from Butch will be injected into the Ula field reservoir to improve oil recovery.

"The subsea tie-in is an innovative solution re-using the Oselvar infrastructure at the Ula platform," said Henning Eide, Butch development manager at Centrica Energy Norway.

The Butch field was discovered in 2011. Centrica estimates recoverable reserves in the range of 27 to 51 mmboe, of which 95% is oil. Production should start in 2019, building to a peak of 35,000 boe per day, the company said.

Centrica estimates total investments at NOK 6-7 billion (\$732 to 854 million). The partners are due to take a final investment decision in late 2016.



*BP-operated Ula platforms*

## Norway's far north projects should address iceberg impact, says PSA

Petroleum Safety Authority (PSA) Norway is examining potential threats of icebergs and sea ice as field development offshore Norway moves farther north. Ice cover in Norway's far north varies in extent with the seasons and from year to year. Due to the effects of the Gulf Stream, the southern Barents Sea is normally ice-free year round, but icebergs and sea ice can cause problems to installations if they collide.

According to PSA's ice specialist Arne Kvitrud, ice could theoretically occur at Eni's Goliat field, although the likelihood is so small that disconnection of the floating platform is not a requirement. Farther north, however, the future Johan Castberg facilities will need to be disconnected if ice gets too close. Spray is the chief cause of icing on units.

"The best solution is to avoid ice hitting the platform at all. It could damage risers or other structures. So the aim is to keep well clear," Kvitrud said. "The most recent drilling jobs have had to be 50 km (31 mi) from the marginal ice zone. Should that get any closer, the rig must disconnect. No operations have been so close to the ice edge."

## Tullow fully financed to meet commitments for TEN project

Tullow Oil has confirmed that it is fully financed to meet its commitments for the deepwater Tweneboea-Enyenra-Ntomme (TEN) development offshore Ghana. TEN is on budget to deliver first oil in mid-2016, Tullow said, adding that the projected cost is around \$4.9 billion.

The MODEC-supplied FPSO for the development, constructed in Singapore, was named Prof. John Evans Atta Mills by Ghana's First Lady Dr. Lordina Mahama, ahead of sail away at the end of this year. The FPSO is named after the late Prof. John Evans Atta Mills, who was Ghana's president at the time of first oil from Jubilee in the same offshore concession, the company said.

The 1,115-ft long, 184-ft wide vessel is designed to produce 80,000 bbl per day of oil, with gas processing capacity of 170 mmcf per day, storage for 1.7 mmbbl of oil, and water injection capacity of 120,000 bbl per day. And the vessel will be anchored in 4,675 ft of water.

Highlights during the first half of this year included running two well completions and starting work on a third; installing four subsea Christmas trees; completing fabrication in Ghana of anchor piles for the FPSO, ahead of the offshore installation campaign; and transportation of specialist subsea manifolds and umbilicals from the United States.



The MODEC-supplied FPSO is named after Prof. John Evans Atta Mills.

December 2015

47

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## iSURVEY secures positioning framework contract with Total E&P UK Limited

iSURVEY, a leading provider of survey and positioning services to the global oil and gas, offshore renewables and telecommunications markets, has secured a framework contract with Total E&P UK Limited for the provision of rig move navigation and positioning services.

With an effective date of 12 October 2015, the 3-year framework contract will give the iSURVEY team the opportunity to provide platform, rig and vessel-based positioning services to Total's offshore operations in the UKCS.

Total currently has multiple drilling rigs on hire, all of which have the potential to require positioning during moving operations.

Andrew McMurtrie, managing director of iSURVEY, said, "This framework contract award is testament to the quality of work and results iSURVEY regularly provides for our clients. It is extremely promising to see that the services offered by iSURVEY are being recognized within the industry."

"Having launched our Aberdeenshire base in 2014, the past year has seen iSURVEY's UK side of operations grow in a very short space of time, and we look forward to continuing the expansion of our services and working closely with Total over the coming years."

For more information, visit [www.isurvey-group.com](http://www.isurvey-group.com).

## DeepOcean awarded post-lay trenching works in Australia

DeepOcean 1 UK Ltd., a subsidiary of DeepOcean Group Holding BV (DeepOcean), announced that the company has been awarded a contract for the provision of post-lay trenching and survey works in Australia. Works will be performed from DeepOcean's DPII MSV Volantis using the 2,800 hp jet trencher UT-1.

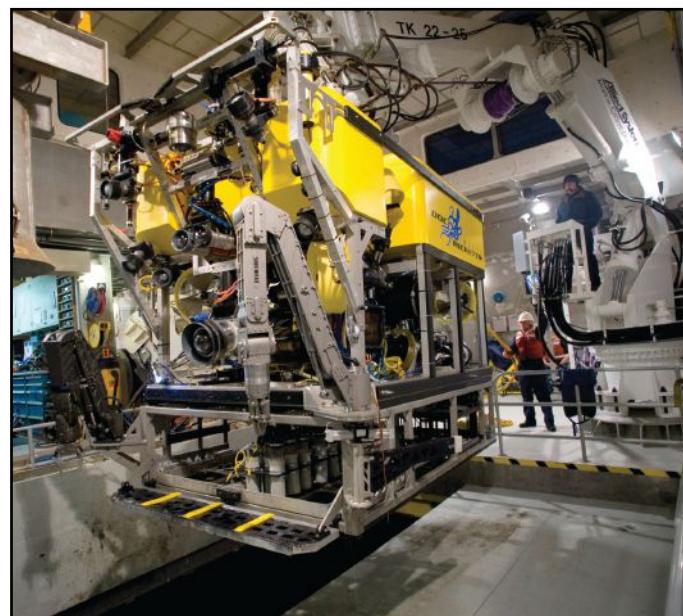
DeepOcean has a long track record of providing trenching services for oil and gas contractors and operators in the Asia Pacific Region. This contract for post-lay intervention works is scheduled for Q4 2015 and will see DeepOcean's Volantis mobilize from current works offshore Malaysia to Australian waters.

The contract was won recognizing DeepOcean's track record in trenching operations and the advanced technology of DeepOcean's UT-1. The 2,800 hp free-flying ROV jet trencher has proven to deliver cost efficient solutions worldwide, trenching over 650 km of various products ranging from small diameter cables to large diameter rigid trunk lines. Tony Stokes, Managing Director of Asia Pacific & Middle East, states, "We are extremely pleased to receive this award in Australian waters. This project highlights the requirement for such front-end trenching technology in the region and the demand for expertise found within DeepOcean and the UT-1. We look forward to a successful campaign and growing our presence in Australian waters".

For more information, visit [www.deepoceangroup.com](http://www.deepoceangroup.com).



## Sonardyne Ranger 2 USBL delivers spectacular positioning for MBARI expedition



ROV tracking technology supplied by Sonardyne Inc. in Houston to the Monterey Bay Aquarium Research Institute (MBARI) provided spectacular performance during an expedition to study recently discovered deep-sea hydrothermal vents in the Gulf of California.

Installed on MBARI's Western Flyer research vessel, the Ranger 2 USBL system was used to track the position of the ROV Doc Ricketts as it dived down 12,500 ft (3,800 m) to the seafloor and flew around the Pescadero Basin vent field, collecting video and samples for analysis. Despite the challenging conditions created by the vents spewing out super-heated seawater and suspended solids, the Ranger 2 provided 3-m accuracy at that depth and stability of positioning.

MBARI have been users of Sonardyne's original Ranger 1 USBL technology since 2000, when a system was first fitted to the Western Flyer. During that time, it has supported a wide range of expeditions off the California coast where water depths rapidly reach beyond 13,000 ft. However, it was noted that on occasions, multi-path signals reflecting off the vessel's twin hulls and noise from ROV thrusters could interfere with transponders signals coming from great depths.

"Challenging conditions like these are exactly why we developed 6G—our sixth generation acoustic positioning platform," said Kim Swords, Senior Applications Engineer with Sonardyne. "6G systems like Ranger 2 use Wideband 2 digital signal architecture to provide robust navigation, greater precision and fast position updates in all scenarios, deep or shallow and on all types of vessel. We were confident that by upgrading the Western Flyer to the latest 6G standard, MBARI's deep water vehicle operations would be faster, more accurate and more efficient."

As part of the upgrade, the Western Flyer was fitted with Sonardyne's deep water optimized HPT 7000 USBL transceiver. Co-located with it on the vessel's deployment pole was LodeStar, Sonardyne's premium grade motion sensor—a configuration referred to as Optimised USBL. This integration achieves a tightly compensated solution and allows the posi-

tioning accuracy obtainable from Ranger 2 to be maximized.

The MBARI research project to investigate the Pescadero Basin vent field included repeated dives in April 2015 by the ROV Doc Ricketts to accurately map the site and gather samples that have subsequently been shown to contain both carbonate minerals and hydrocarbons. During the missions, the positioning repeatability of the Ranger 2 was shown to be just a few metres, performance that enabled MBARI's ROV pilots to save time by flying directly to points of interest.

For more information, visit [www.sonardyne.com](http://www.sonardyne.com).

#### **Novacavi supplies special umbilical cable for high power ROV**

Novacavi has recently supplied a custom umbilical cable suited to support a high power work ROV system to operate alongside larger vessels.

Kapacitet A/S, a Danish company focused on technology and product development, asked Novacavi to conceive and manufacture a special buoyant cable from the idea phase through to

the finished high quality accessory to an innovative subsea product. Such a remote-controlled underwater robot is now performing at the highest standards of execution and reliability.

Novacavi showcased this cable and its extensive production at Oceanology International China.

For more information visit, [www.novacavi.it](http://www.novacavi.it).

#### **Kongsberg Evotec to deliver ROV LARS to Bourbon Offshore**

Kongsberg Evotec, a fully owned subsidiary of Kongsberg Maritime, has signed an agreement with Bourbon Offshore Norway for the delivery of the sophisticated E-LARS Launch and Recovery System for Remote Operated Vehicles (ROV). The delivery will take place in December 2015. The system is to be installed on an advanced new VARD 2-12 ARCTIC design AHTS vessel, which is developed for worldwide operations, including arctic regions.

Kongsberg Evotec has through the development of E-LARS focused on environmental factors and safety of the operator and the equipment. The positive

qualities of the permanent magnet motor technology used in the E-LARS system combined with a customized control system introduces significant operational advantages including accurate heave compensation with minimal power use.

To ensure safe and efficient ROV launch and recovery, the E-LARS control system provides the operator with continuous information about capacity utilization, the amount of regenerated power, umbilical status and history. This supports the operator to utilize the ROV mission operational window in an efficient and very environmentally friendly manner. Kongsberg Evotec has also designed the system in order to minimize the need for maintenance.

"Kongsberg Evotec is to us a new supplier of launch and recovery systems for ROVs. The equipment fits well with the vessel's dedicated hangar and operation profile. We have great expectations both of the equipment and of the further collaboration with Kongsberg Evotec," says Bjørn Remøy, CEO of Bourbon Offshore Norway.

For more information, visit [www.km.kongsberg.com](http://www.km.kongsberg.com).



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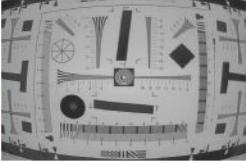
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## Fugro awarded extension of geophysical and geotechnical contract by PEMEX

Fugro (Mexico) in conjunction with long-time associates, Diavaz, has been awarded an extension of the ongoing offshore geophysical and geotechnical campaign by the Mexican national oil company, PEMEX.

Geotechnical field operations, laboratory testing and Geoconsulting activities will support exploration drilling activities in the Bay of Campeche and deepwater locations in the Perdido area. The value of the contract extension is approximately USD 13 million. The field program is planned to start in October 2015, from the ultra-deepwater geotechnical and well services vessel Fugro Synergy, while the Geoconsulting program will continue through 2016. This contract extension represents a continuation of Fugro's longstanding and successful relationship working with PEMEX and reinforces Fugro's market leadership internationally as the preferred service provider for geotechnical, geophysical and geoconsulting services.

Fugro's geotechnical soil data collection, lab testing and consultancy services are centered around onshore and offshore site investigation. The geotechnical information is used to design foundations for deepwater wells, offshore structures, on and offshore pipelines, ports, large buildings, bridges, and other infrastructure. Fugro is the largest global supplier of offshore geotechnical services.

For more information, visit [www.fugro.com](http://www.fugro.com).

## Falcon best for Perenco Oil in West Africa

The Saab Seaeye Falcon ROV has won over Perenco Oil in West Africa.

"For me, the Falcon is the best tool for our operations," says Cédric Fratacci at Perenco Oil and Gas, Gabon, declaring it to be: "A small, yet highly efficient ROV."

He describes how their new Falcon is undertaking a range of tasks at their Gabon operations, including pipeline and jacket surveys, rig assistance and FSO inspection.

It has also been deployed with their diving team to remove debris from the seabed ready to clear the approach for the arrival of a rig.

Later the Falcon was sent down to check the position and security of spudcan penetration in the sand.

Cédric Fratacci welcomes the cost savings of using the Falcon rather than a diving team for dedicated operations.

"The Falcon can dive to a greater depth than a diver and avoids the need for decompression time," he says.



But when diving is unavoidable, he adds, "the Falcon can assist in the diving activity by becoming an external camera for the diving supervisor."

The world-wide success of the Falcon in the energy industry and other sectors comes from its small, easily manhandled size, together with five powerful thrusters for precise maneuverability and steadiness in strong cross-currents while undertaking precision tasks and observations.

Also, its distributed intelligent control system with each device on the vehicle having its own microprocessor allows a choice of tools and sensors to be easily added or changed, making it an ideal platform for numerous intricate and demanding subsea applications.

As a module-focussed concept, the Falcon generates automatic diagnostics on power-up to ensure that each device is fully interfaced and working correctly.

For more information, visit [www.seaeye.com](http://www.seaeye.com).

## MacArtney and EdgeTech have joined forces to extend scientific and technological research capacity of R/V *Tubitak Marmara*

The Scientific and Technological Research Council of Turkey, Tubitak, has taken delivery of a 2000-DSS combined side-scan sonar and sub-bottom profiler system manufactured by EdgeTech, a leading U.S. manufacturer of underwater sonar technology solutions. The system, which is supplied by MacArtney Underwater Technology, will be used on board Turkish multipurpose Research Vessel *Tubitak Marmara* carrying out studies of marine pollution, marine biology, and explorations of offshore oil fields, pipeline surveys, wrecks, UXOs, etc.

The system combines EdgeTech's highly successful line of side-scan sonars and sub-bottom profilers into one fully integrated system. It comes complete with a combined towfish, digital telemetry that runs over a single coaxial cable up to 6,000 m long and a topside processor running EdgeTech's DISCOVER acquisition software.

The R/V *Tubitak Marmara* is already equipped with two MacArtney COR-MAC Q winches and a CTD solution with sensors for conductivity, temperature, depth, PAR, dissolved oxygen, pH and light transmission. By placing the recent order for a combined side-scan sonar and sub-bottom profiler system, Tubitak has wanted to take advantage of the properties that are characteristic of MacArtney's launch and recovery systems. The systems are multifunctional, which enables the scientists to use the winches both for towing their new product and for CTD-profiling. In consequence, Tubitak benefits from acquiring a system from MacArtney being easily adaptable with their other systems.

For more information, visit [www.macartney.com](http://www.macartney.com).

## Subsea 7 saves time with Sonardyne 6G and SPRINT

Subsea engineering, construction and installation company, Subsea 7, has successfully used acoustic and inertial navigation technologies from Sonardyne International Ltd. during a project to install flowlines, risers and subsea structures at a major new deep water field development in the Gulf of Mexico, due to commence production in 2016.

To meet the complex positioning requirements of the project, Fred Goodloe III, project surveyor for Subsea 7, worked closely with Sonardyne's in-house Survey Support Group (SSG) to determine the optimum configuration of subsea, ROV and vessel-based equipment. For a low-risk, multi-functional and cost-effective solution, a combined acoustic and aided-inertial navigation approach was adopted comprising Fusion 6G LBL (Long BaseLine) and SPRINT inertial navigation technologies.

For the installation of the flowlines and structures, a high precision seabed array of Sonardyne Compatt 6 transponders was deployed. The SSG assisted Subsea 7 in designing the array, optimising array geometry and modelling acoustic ray bending paths to ensure the design produced a robust array that met the stringent positioning tolerances required and offered sufficient redundancy in acoustic observations.

The work identified that the quantity of transponders needed for the project could be reduced through the use of Sonardyne's inertial navigation sensor, SPRINT, installed on the survey team's ROV that was being used for touch-down monitoring.

For more information, visit [www.sonardyne.com](http://www.sonardyne.com).

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## Iridium and Furuno announce strategic partnership

Iridium Communications Inc. and Furuno Electric Co., Ltd. announced a strategic partnership in which Furuno will be marketing Iridium satellite services and products initially in Japan. As part of this agreement, Furuno will be developing a new part of its portfolio of satellite communications service with Iridium. That may include the Iridium Pilot® antennas, powered by the Iridium OpenPort® broadband service, providing the industry's only pole-to-pole mobile wireless coverage for ships at sea; Iridium GO!®, the world's first truly global online smartphone access device; weather resistant Iridium Extreme® handset; and the Iridium Short Burst Data (SBD) service.

Furuno will focus on providing its customers with the benefits from the capabilities that will be enabled by Iridium NEXT, the company's next-generation satellite constellation.

The Iridium global mobile satellite network delivers reliable communications, anywhere on the planet—even polar regions—and its unique mesh architecture of 66 cross-linked satellites is less susceptible to inclement weather or interference that may impact the performance of other systems. This reliable, truly global coverage is necessary for critical maritime communications.

For more information, visit [www.iridium.com](http://www.iridium.com).

## Intellian to partner on RigNet's new contract with global offshore drilling customer

Intellian has been selected as the hardware partner on RigNet's recently announced contract to provide remote communications solutions to a premium offshore driller across its entire global fleet of existing and newbuild rigs.

RigNet, a leading global provider of remote managed communications solutions, telecoms systems integration services and collaborative applications to the oil and gas industry, will provide comprehensive solutions across the customer's fleet of jackups, drillships and semisubmersibles operating in the U.S. Gulf of Mexico, Asia Pacific, Europe and Africa regions. The contract will require Intellian to supply 17 v240M terminals, delivering the combination of flexibility and robustness key to enabling the provision of reliable remote communications solutions.

The Intellian v240M, a 2.4-m multi-band maritime antenna, is the first VSAT antenna designed for the maritime industry with fully automatic switching between Ku-band and C-band. Multi-band satellite communications are becoming an increasingly important capability in the offshore oil and gas market. Vessels operate in a wide geographic area to enable them to maximize vessel returns and therefore require the ability to switch frequency bands as they move between operational areas.

For more information, visit [www.intelliantech.com](http://www.intelliantech.com).

## Globecomm, MariConnect deliver solutions to global fishing fleets

Globecomm and MariConnect announced that their long-term partnership has just achieved a benchmark in delivering a hybrid M2M and VSAT solution to over 50 shipping vessels.

The solution serves customers inclusive of major fishing fleets like Katla Seafood and Samherji of Iceland, Germany's Deutsche Fischfang Union and Royal Greenland Pelagic. Onboard services delivered include Internet, email, VOIP and video news and entertainment. Ships are provided with a secure and customized M2M portal that allows vessel operators to track production efficiencies such as the weight of fish versus fuel consumed.

"New and increased exploration of the Norwegian, Greenland and Barents Seas is driving demand for reliable VSAT services," said Höskuldur Darri Ellertsson of MariConnect. "The reach and flexibility of Globecomm's VSAT network is enabling us to extend all of our services into this important region."

For more information, visit [www.globecommsystems.com](http://www.globecommsystems.com).

## Trials demonstrate new high capacity, low latency inter-vessel broadband communications



The Norwegian Coastal Administration (NCA), Norwegian Coast Guard and the Norwegian Clean Seas Association for Operating Companies (NOFO) took part in a comprehensive, full-scale trial of Kongsberg Maritime's unique "MBR" (Maritime Broadband Radio) inter-vessel communication system in the North Sea this June.

During the North Sea exercise, MBR was used as the communication platform for data exchange and co-ordination of simultaneous operations. Units were mounted on multiple operational assets, including a plane that streamed real-time surveillance video directly to the vessels, thus giving them a new perspective and a completely different situational understanding.

By installing MBR communication units on every vessel/asset involved in an operation, a broadband link is established and a maritime 'information highway' created—one that enables high-speed, high capacity, low latency transfer of data, without the need for additional infrastructure and no prospect of data "disappearing" en-route. There are also no airtime charges; data transfer between vessels and assets is free once an MBR network has been established.

Ketil Aasebø, senior advisor for the NCA's Emergency Response division, commented, "The NCA, in cooperation with the Coast Guard and NOFO, conducted a test of Kongsberg Seatex Maritime Broadband Radio on board our surveillance aircraft LN-KYV and a number of emergency response vessels. The tests demonstrated that the capacity and reach of MBR is very promising.

"While conducting an oil-on-water verification test on the Frigg field, we received live images from our surveillance aircraft at a distance of some 100 nmi. The ability to transmit live images and video from a surveillance aircraft to seagoing units for oil spill response is incredibly important. MBR proved itself to be a stable communication medium for this purpose."

Exceeding 50 km sea-level operational range, MBR is a true game changer in interconnectivity between vessels. It is set to become a crucial, cost-effective component in complex multi-asset offshore operations that take place across large areas with multiple teams working simultaneously. MBR supports complete situational awareness through enhanced communication between vessels, facilitated by seamless broadband data, voice and HD video transfer between all assets in the network.

For more information, visit [www.km.kongsberg.com](http://www.km.kongsberg.com).

### NSSLGlobal trials Wi-Fi on Royal Navy vessels

NSSLGlobal has announced the trial of its Wi-Fi service across selected British Royal Navy and Royal Fleet Auxiliary ships. The service, based on NSSLGlobal's proven technology for the commercial shipping sector, but modified for the Royal Navy, will for the first time allow crew to use their personal devices to connect with friends and family through Internet services and applications.

The Wi-Fi service is an all-in-one access control facility deployed as a gateway for managing Wi-Fi hotspots to enable BYOD (Bring your own Device) to be rolled out to naval vessels. It will provide the user with a secure, available, supported and legally and morally compliant Internet service providing access over existing ship bearers (whether satellite, ADSL or 3G/4G). The service has coverage across the main recreational areas of the vessel and will allow sailors to access social media applications such as Facebook, news and personal banking.

HMS Iron Duke recently showcased the new Wi-Fi enabled access as part of the DSEI—Defence and Security Equipment International exhibition in London in September.

For more information, visit [www.nsslglobal.com](http://www.nsslglobal.com).

### WMS strikes deal with cruise line

Wireless Maritime Services, LLC (WMS) and Fred. Olsen Cruise Lines have signed an agreement to install a fleet-wide cellular and Wi-Fi network, beginning the fourth quarter of 2015.

"I'm delighted to partner with a supplier who has the same passion we have for improving connectivity at sea. This new partnership will deliver a significant improvement to the overall wireless, cellular and data service we offer to our guests and crew, introducing cutting edge technology and improved bandwidth speeds," said Damon Impett, the UK head of IT for Fred. Olsen Cruise Lines.

Staying connected is an important component of travel and vacationing. With the WMS engagement, Fred. Olsen guests will enjoy the very best in communications, allowing them to view and interact with cruise information, access email, browse their favorite websites and keep in touch with family and friends. With these services, Fred. Olsen continues to demonstrate its commitment to doing the utmost to make every part of the cruise experience special.

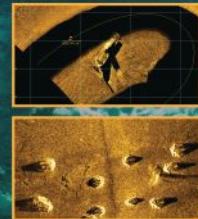
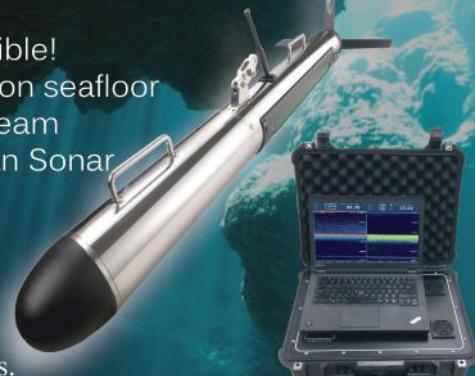
For more information, visit [www.wmsatsea.com](http://www.wmsatsea.com).



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## MARITIME COMMUNICATIONS

### Polarcus continues on Marlink C-band VSAT

Dubai-based geophysical services company Polarcus has extended its global VSAT (Very Small Aperture Terminal) contract with Marlink for an additional 3 years. The contract includes on-going provision of reliable voice and data connectivity through Sealink™, Marlink's C-band VSAT solution for Polarcus' fleet of seismic vessels. This year the fleet will also be migrated from a dedicated configuration to a shared non-contended configuration using the new iDirect X7 modem to benefit from more dynamic bandwidth allocation to optimize connectivity.

Polarcus' ultra-modern seismic fleet is widely recognized as one of the most environmentally friendly in operation today. With an environmental profile based on investments in green technologies within both marine and seismic, and a commitment to a pioneering environmental agenda, reliable and smart IP connectivity is a key requirement for Polarcus.

Marlink provides VSAT based broadband connectivity to support Polarcus' vessel operations and enables the fleet to operate safely and efficiently worldwide. Using smart IP connectivity from Marlink, Polarcus can monitor advanced operations from shore and execute quick interventions when needed.

As part of the contract extension with Marlink, Polarcus will continue to receive reliable global VSAT coverage while benefitting from a faster link, with an increased Committed Information Rate (CIR) of 512/1536 Kbps and a Maximum Information Rate (MIR) of 1536/3096 Kbps. Possible through the move to iDirect X7, the MIR is a burstable bandwidth increase, ensuring that Polarcus in addition to its guaranteed IP connectivity always has potential for more throughput if available at the time.

For more information, visit [www.marlink.com](http://www.marlink.com).

### EUKOR chooses Inmarsat connectivity across its fleet

Inmarsat and Intellian have announced a significant deal with EUKOR Car Carriers. The deal will enable EUKOR, one of the world's largest shipping companies specializing in the transportation of cars and other rolling cargo, to take advantage of the latest technology offered by Intellian and Inmarsat's new high-speed broadband Global Xpress (GX) network.

EUKOR has selected Intellian's latest GX100 terminals to equip its 27 vessels with regional connectivity powered by GX in the Indian Ocean Region. Once all three GX satellites are live and operational, EUKOR will be able to harness the Fleet Xpress service on a global basis.

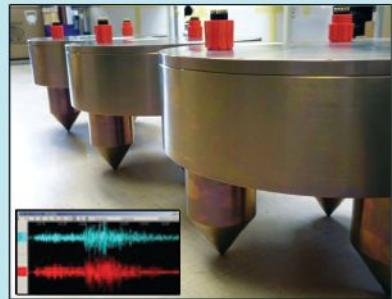
A spokesperson for EUKOR commented on the significance of the new contract saying, "Operational efficiency, vessel safety and environmental performance is at the heart of EUKOR's business operations. The eventual installation of Fleet Xpress on 27 of our vessels represents another step in optimizing our fleet across these areas. The decision to prepare our vessels now, not only means that our fleet will have immediate access to Fleet Xpress as soon as it becomes available but that our vessels are already able to access Global Xpress capability when operating in certain geographical areas. With a worldwide network connecting over 220 ports, truly global connectivity is essential for positioning us to best meet our customers' needs now and in the years to come."

Fleet Xpress is an integrated Ka-band/L-band service that will deliver the world's first globally available high-speed broadband service from a single network operator.

The high-performance, high-throughput network will open up unlimited possibilities for maritime applications, real-time monitoring and data analysis that will enable smarter and more efficient shipping.

For more information, visit [www.inmarsat.com](http://www.inmarsat.com).

# Seafloor Communications Specialists



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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.



## ITC Global lands new offshore energy services customer

ITC Global has been awarded a multi-million dollar deal with an international offshore energy services company. The multi-year contract for VSAT connectivity was designed to deliver a highly efficient and reliable network service while streamlining the customer's operating costs and focusing on integrated features including pooled bandwidth, integrated 4G LTE network access, GSM picocell coverage, and access to transit network services. ITC Global is handling the system build out and integration and testing, with most deployments being completed in the North Sea and Gulf of Mexico.

To support the customer's crew communications needs, ITC Global's new comprehensive crew welfare solution, ITC Crew LIVE, is being deployed on each vessel via separate 1-m stabilized antenna systems. The dedicated system provides crewmembers with reliable wireless access for voice, Internet and content streaming and does not compete with the corporate network requirements onboard each vessel. This

ensures that business and recreational use are kept entirely separate to provide the best user experience for everyone during work and leisure time offshore. The solution offers crews the ability to purchase allocated bandwidth for their laptops, phones or other personal devices. Service is delivered through ITC Global's self-service customer portal system, which is currently successfully managing more than 3,000 individual crewmember user accounts across multiple customers.

As part of the communications solution design, the entire system is being integrated to enable the customer to use the crew welfare network or 4G service as back up to the corporate network.

For more information, visit [www.itcglobal.com](http://www.itcglobal.com).

## RigNet wins EPC contract for wind farm infrastructure development

RigNet, Inc. announced that its RigNet TSI business has been awarded a multi-million dollar contract to deliver communications systems and infrastructure for a high-voltage transmission platform in an offshore wind farm located in

the German sector of the North Sea. The award of this contract by a leading UK-based offshore contractor continues RigNet's long-term success in the delivery of integrated telecommunications and operations support systems for a diverse range of applications and industries.

RigNet TSI's scope of work includes the integration and delivery of critical facility communications infrastructure, including structured cabling, local area network (LAN), wireless LAN (WLAN), telephony, public address / general alarm (PAGA), closed circuit television (CCTV), access control (ACS), meteorological systems, navigation and lifeboat radio support for the platform.

"This project demonstrates RigNet TSI's ability to deliver proven, reliable and cost-effective communications solutions to both traditional hydrocarbon-based and renewable energy operations," said Gerry Gutierrez, RigNet TSI Group Vice President. "We are proud to be a valued supplier to this contractor as demand for renewable energy continues to grow worldwide."

For more information, visit [www.rig.net](http://www.rig.net).

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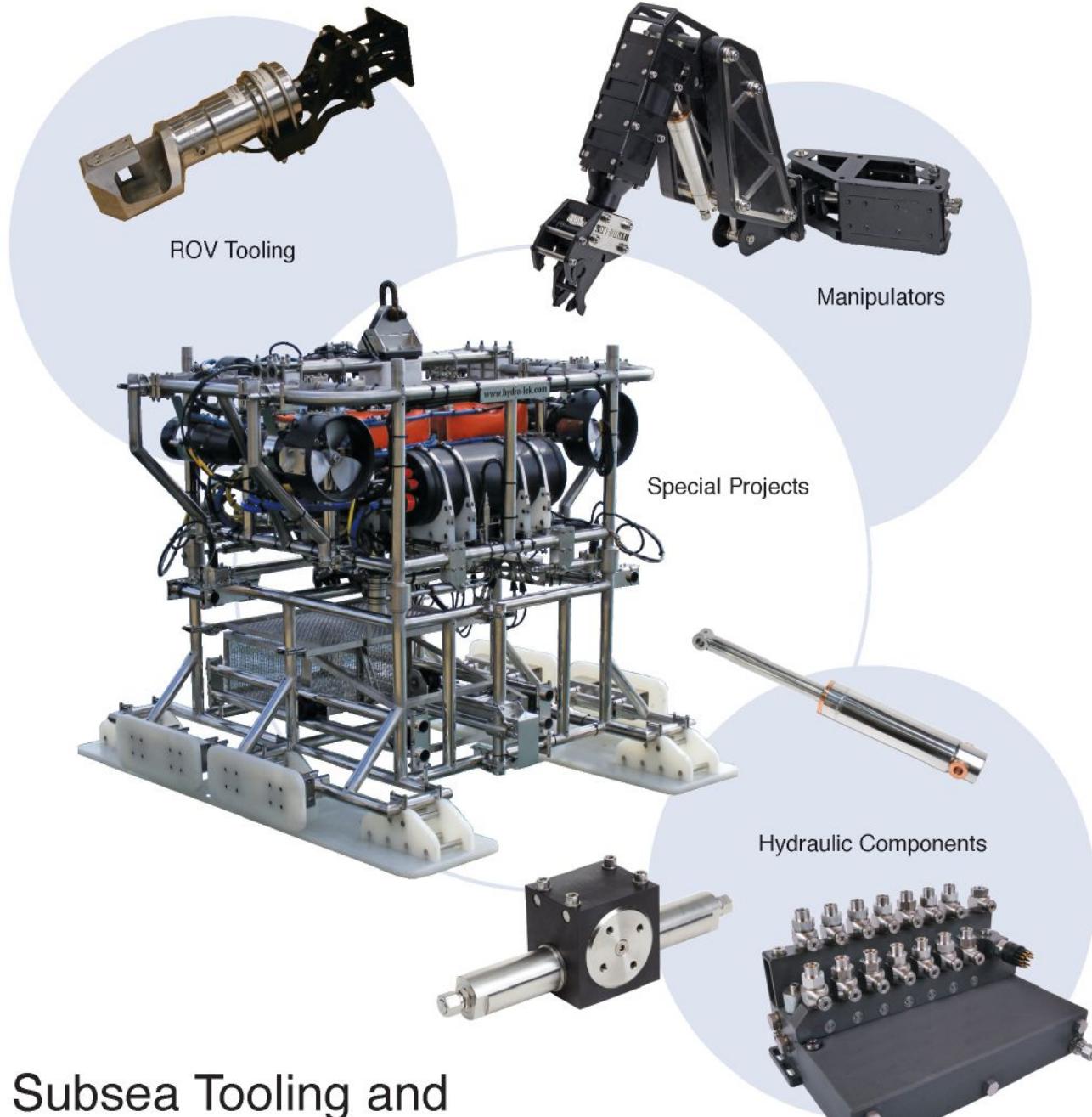
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## DeepOcean awarded wind farm installation contract

A contract for the provision of cable installation and trenching work for DONG Energy's Race Bank offshore wind farm has been awarded to DeepOcean 1 UK Ltd, a subsidiary of DeepOcean Group Holding BV.

Offshore work will be undertaken in 2016/2017 with DeepOcean's in-house fleet of dedicated cable installation and trenching vessels.

When operational, Race Bank will have a capacity of up to 580 MW, providing enough green energy to power over 400,000 UK homes. The wind farm will consist of 91 wind turbines each with a 6 MW capacity and will be built almost 17 mi off Blakeney Point on the North Norfolk coast, and a similar distance from the Lincolnshire coast at Chapel St. Leonards.

DeepOcean has a long track record of subsea power cable installation on critical infrastructure projects. In addition to the installation and trenching of a total of 91 inter-array cables, with a combined length of 106 km, the Race Bank contract scope includes the associated route engineering, pre-lay grapnel run operations, installation of cable protection system and messenger wires. The cables will be post-lay trenched by one of DeepOcean's in-house trenching assets. Offshore work will be undertaken in two campaigns, commencing in Q3 2016 and Q1 2017 respectively.

For more information, visit [www.deepoceangroup.com](http://www.deepoceangroup.com).

## Prysmian awarded first contract in China

Prysmian Group has been awarded a contract by Hainan Second Cross-Sea Interconnection Tie Project Management Co., Ltd. (a subsidiary company of China Southern Power Grid, the grid operating company in South China) worth a total of more than \$ 140 million for the design, supply, installation, and commissioning of a submarine power cable link for the second interconnection between Hainan island and China mainland.

The new submarine cable link will side the existing 500 kV cable circuit connecting Guangdong power grid and Hainan power grid effectively improving the quality of electricity supply between the two provinces. One of the island's key customers to benefit from the extra power will be a 1,300 MW nuclear power plant being built in Changjiang County. The combined capacity of the submarine power cables and the nuclear power will help boost Hainan's efforts of being an international tourism island.

The new Hainan interconnection comprises four HVAC (High Voltage Alternating Current) 500 kV single core SCFF (self-contained fluid filled) cables to be laid under the Qiongzhou Strait in southern China, along a 32-km route. The cable system will link the Gangcheng transformer substation in Guangdong's Zhanjiang to the Fushan transformer substation in Hainan's Chengmai County and have a transmission capacity of 600,000 kW. Cables will be operated in AC configuration, but are designed to work in DC configuration as well. All cables will be produced in the Group's excellence center for submarine cables in Arco Felice, near Naples (Italy) and marine installation operations will be performed by the Group's owned Giulio Verne cable-laying vessel. Delivery and commissioning is scheduled for the first quarter 2019.

The Group already has an established presence and employs over 1,500 employees in nine manufacturing plants, located in Baoying (high-voltage cables), Tianjin and Suzhou (special cables for industrial applications), Suzhou (systems and network components), Shanghai (submarine cables), Wuxi (optical cables), Wuhan (optical fibers and multimedia systems), Nantong Haixun and Nantong Zhongyao (elevators systems). The Group is a leading supplier and installer of submarine cable links throughout the strategic and high-growth Asia Pacific Region, with milestone projects such as the Penang Island in Malaysia, the Java-Bali link in Indonesia, the Cheju Island in Korea, the Ha Tien-Phu Quoc in Vietnam, the CNP-1 project in the Philippines and the Basslink interconnector in Australia.

For more information, visit [www.prysmian.com](http://www.prysmian.com).

## KIMONAS system to be launched



Cyta, the premier telecommunications provider in Cyprus, and Telecom Italia Sparkle, the international services arm of the Telecom Italia Group announced that the new KIMONAS subsea cable subsystem linking Cyprus with Crete will come into full commercial service by the end of 2015.

KIMONAS will be Cyta's first wholly owned optical fiber cable subsystem connecting Cyprus and Greece. The subsystem, which will connect Cyta's cable station in Pentaskhinos with MedNautilus Cable Station in Chania, complements alternative Cyta's segments on the MedNautilus subsea cable network and in particular the MINERVA and ATHENA rings, which connect Cyprus with Sicily, and Athens with Crete, respectively.

Extending to Athens through the ATHENA ring and beyond to Bulgaria via Thessaloniki, by utilizing fiber infrastructure of wholly-owned subsidiary Cyta Hellas in Greece, KIMONAS will facilitate the creation of a new telecommunications corridor, connecting the Balkans and Central Europe with Egypt and other Middle East destinations, via Cyprus. At the same time, it will allow the interconnection to Turkey in the East and Italy and other European destinations in the West, through Telecom Italia Sparkle's network.

For more information, visit [www.cyta.com.cy](http://www.cyta.com.cy).

## N-Sea successfully completes UXO campaign

N-Sea has successfully completed an unexploded ordnance (UXO) survey, ID and disposal campaign for the TenneT project, BorWin3. Taking place between January through August of this year, the work scope involved surveying the seabed to identify and remove undiscovered explosive devices along the cable route of BorWin3.

Transmission system operator, TenneT's grid connection system connects wind parks in the North Sea with the high-voltage grid onshore. The survey campaign undertaken by N-Sea comprised a geophysical survey (multibeam, Side Scan Sonar, Sub Bottom Profiler and Magnetometry) of 137 targets within the main cable corridor and adjacent anchor corridors, totaling almost 2,000 km.

N-Sea managed this project from Eemshaven, with a local team managing all nearshore and offshore vessels while processing all acquired data. Four survey vessels were utilized, including the Noordhoek Pathfinder.

For more information, visit [www.n-sea.com](http://www.n-sea.com).

## NKT Cables awarded order for wind farm

NKT Cables has been awarded the order for delivery and installation of the export cable system for the Galloper offshore wind farm in a consortium with VBMS, a Dutch marine contractor.

For NKT Cables, the contract value will be EUR 53 million. The order comprises the supply of 94 km of 132 kV high-voltage submarine cables, with the first phase delivered ready for installation in late 2016. The second and last phase will be delivered ready for installation in 2017.

The Galloper offshore wind farm will have a capacity of up to 340 MW and will be sited in the Thames estuary, approximately 27 km off the coast of Suffolk, England.

For more information, visit [www.nktcables.com](http://www.nktcables.com).

## Huawei Marine contracted to build CBCS

Huawei Marine has announced that it will construct the Cameroon-Brazil Cable System (CBCS), connecting Africa to Latin America. The project is invested by CamTel and China Unicom; Telefónica will support the initiative providing its international facilities and experience.

CBCS, which is approximately 6,000 km long, will cross the South Atlantic connecting Kribi in Cameroon to Fortaleza in Brazil. Utilizing Huawei Marine's leading 100G technology, it will have an initial system capacity of 32 Tbps with 4 fiber pairs and come into service at the end of 2017. Huawei Marine will deploy its 6fp submarine Repeater 1660, the industry's first innovative titanium repeater, which boasts a slim-line profile to allow direct lay and plough burial. This simultaneous operation significantly reduces system installation costs by eliminating the need for an expensive secondary, post-lay burial operation.

For more information, visit [www.huawaimarine.com](http://www.huawaimarine.com).

## AquaComms selects Ciena for transatlantic network

To support surging demand for transatlantic connectivity, Aqua Comms Limited (AquaComms) selected Ciena® to facilitate 100G connectivity on its new AEConnect Cable System from New York to London and beyond to greater Europe. Leveraging Ciena's GeoMesh solution, AquaComms will provide low-latency, reliable and scalable connectivity to support the needs of the web-scale providers that underpin today's international cloud connectivity.

The route will also enable transatlantic connectivity for global carriers and multi-national enterprises. By providing private dedicated connections, AEConnect will lower network costs and enable higher, more consistent network performance for end users.

AEConnect is a new subsea cable system that is a diverse transatlantic route and spans more than 5,400 km connecting New York with the west coast of Ireland, including deep water

branching units for future landing station connectivity. In addition to the transatlantic segment, the system supports metro networks, data center inter-connectivity (DCI) and access to all of the major data centers in Dublin, as well as from Wales to London.

AquaComms is deploying Ciena's 6500 Packet-Optical Platform, powered by WaveLogic 3 Extreme coherent optics, to provide 100G services between points of presence (PoP). This

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high-capacity network will help meet the demands from increasing data traffic crossing the Atlantic Ocean, which between 2014 and 2021 has a forecasted 41% CAGR according to TeleGeography.

The new low-latency and high-availability network will provide critical connectivity for global data centers, cloud-based networks, financial services and content providers, such as international DCI for Equinix. The innovative design of the AEConnect system will allow AquaComms and its customers to take advantage of advanced modulation schemes such as 8QAM and 16QAM that provide greater spectral efficiency and reach.

With Ciena's programmable platforms, AEConnect will be able to utilize emerging technologies such as Software Defined Networking (SDN), to support bandwidth-intensive applications, ensuring that international organizations can take advantage of resilient and secure connectivity to leverage economic opportunities across the Atlantic Ocean.

For more information, visit [www.aquacomms.com](http://www.aquacomms.com).

## Linxtelecom Chooses Ekinops for Baltic upgrade

Linxtelecom, a Netherlands-based international service provider, has chosen Ekinops to provide equipment for a 4 Tbps submarine optical ring linking the three major cities in the Baltic Sea.

Ekinops announced that the Linxtelecom ring, over submarine cable, is now operational and connects Tallinn, Estonia; Helsinki, Finland; and Stockholm, Sweden. It enables Linxtelecom to offer vastly higher bandwidth to its customers through its 40 channels of 100 Gbps capacity.

Linxtelecom turned to Ekinops to replace an existing optical network in order to meet the growing demand from its customers. Linxtelecom was looking for a network that could provide a wide range of multi-protocol services, including 10G and 100G Ethernet, STM64, 8G, and 10G Fiber Channel, enabling the carrier to meet any type of customer demand.

The company also wanted to minimize its operational expenses. The Ekinops solution offers compact size and very low power consumption, which

is ideally suited to meet Linxtelecom operational objectives. In addition, because of its ability to transmit over long distances, the Ekinops gear eliminates the need for signal regeneration in intermediate sites and allows connectivity of spans up to 220 km.

Linxtelecom operates in 14 countries in Europe and the Baltic Sea region, including Poland, Russia, Georgia, Azerbaijan, and Kazakhstan. Linxtelecom was established in 2000 and is the owner of data centers in St Petersburg, Moscow, Tallinn, and Warsaw, and offers turnkey connectivity solutions to carriers, governmental organizations, and enterprises.

For more information, visit [www.linxtelecom.com](http://www.linxtelecom.com).

## FASTER will land at CoreSite's Los Angeles campus

CoreSite Realty Corporation announced that CoreSite will host the FASTER submarine network's Los Angeles landing, directly connecting the West Coast of the U.S. with Japan. Backed in part by Google, FASTER addresses the traffic demands for broadband and mobile content on the trans-Pacific route.

FASTER is backed by a total of six investing companies, including Google, China Mobile International, China Telecom Global, Global Transit, KDDI and Singtel, and has been designed with 6-fiber-pair cable and optical transmission technologies with an initial capacity of 60Tb/s (100Gb/s x 100 wavelengths x 6 fiber-pairs). The FASTER system is expected to begin operating during the second quarter of 2016.

"CoreSite drives high-performance solutions to business requirements by connecting strategic communities of interest supported by best-in-class network and computing services," said Tom Ray, CEO of CoreSite.

CoreSite's Los Angeles campus includes the One Wilshire data center (LA1) as well as the 424,000 sq. ft Wilshire Annex (LA2), connected by robust dark-fiber assets. With over 500 current customers, 230 of which are networks, CoreSite's LA campus is one of the most densely interconnected data center campuses in the world, making it a strategic landing point on the FASTER cable system. Using FASTER, CoreSite customers will benefit from a state-of-the-art route connecting businesses to the APAC region.

For more information, visit [wwwcoresite.com](http://wwwcoresite.com).

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# OFFSHORE STATS & DATA



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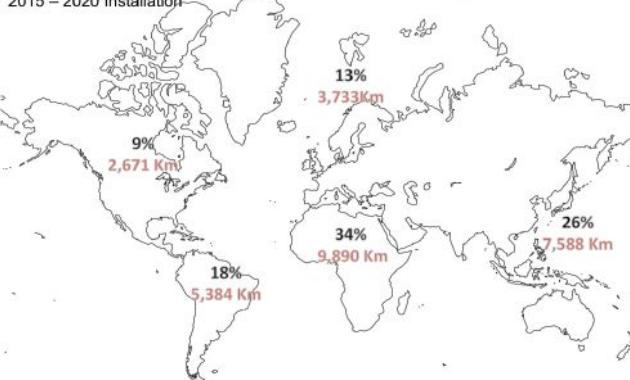


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## Quest Offshore Activity Report

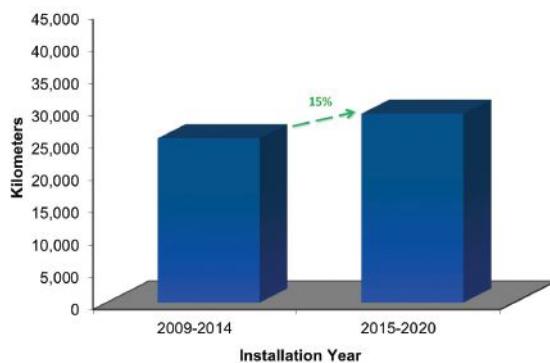
### Deepwater Pipeline Demand: Regional Share

2015 – 2020 Installation



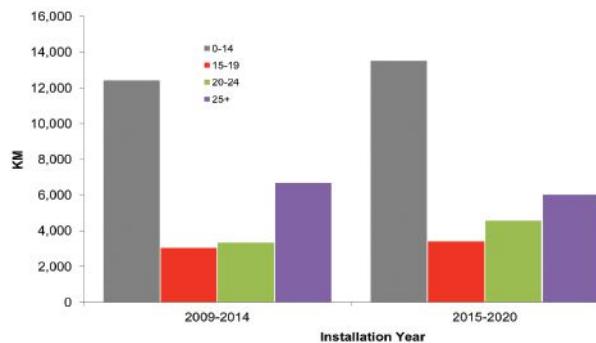
### Worldwide Pipeline Demand Growth

2009 – 2014 vs. 2015 – 2020



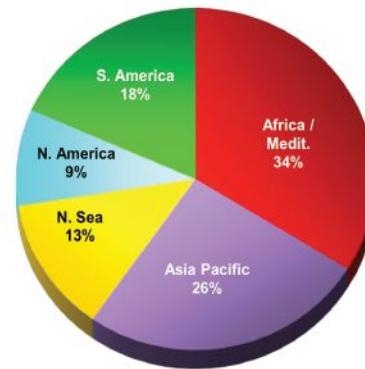
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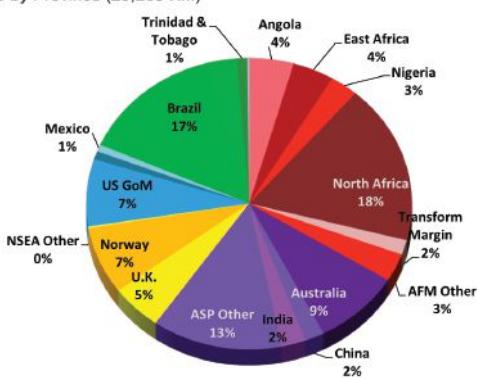
### Worldwide Pipeline Demand by Region

2015 – 2020 Installations (29,265 KM)

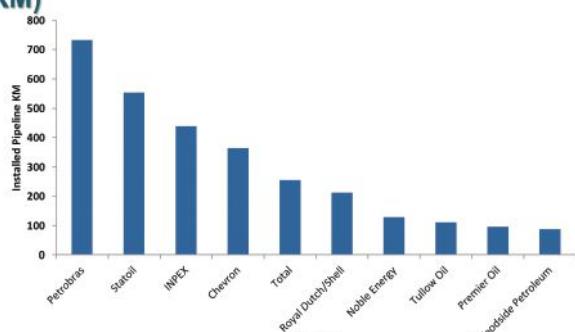


### Worldwide Pipeline Demand

2015 – 2020 by Province (29,265 KM)



### 2015e Top Operators by Pipeline Installation (KM)



Note: Top Operator Analysis is inclusive of infield flowline and export pipelines only. Trunk lines are excluded.

FOR MORE DETAILED INFORMATION

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# Gulf of Mexico Data

## Current Deepwater Activity

Operator		OCS		Prospect Name	Water Depth (ft)
	Area	Block	Lease	Rig Name	
Shell Offshore Inc.	WR	508	G17001	NOBLE JIM DAY	9,560
ExxonMobil Corp.	WR	584	G20351	MAERSK VIKING	7,138
Shell Offshore Inc.	MC	566	G08831	NOBLE GLOBETROTTER	7,015
Chevron USA Inc.	WR	758	G17015	T.O. DISCOVERER CLEAR LEADER	6,968
BP Exploration & Production Inc.	GC	743	G15607	SEADRILL WEST AURIGA	6,826
BP Exploration & Production, Inc.	GC	743	G15607	T.O. DEVELOPMENT DRILLER II	6,814
Union Oil Co. of California	WR	634	G18745	PACIFIC SHARAV	6,803
Marathon Oil Co.	WR	225	G32668	MAERSK VALIANT	6,779
Murphy Exploration & Production Co.	DC	134	G23488	DIAMOND OCEAN BLACKRHINO	6,167
Repsol E&P USA Inc.	KC	686	G33341	ROWAN RENAISSANCE	6,162
BP Exploration & Production Inc.	MC	778	G14657	THUNDER HORSE PDQ	6,031
Statoil Gulf of Mexico LLC	WR	160	G34634	T.O. DISCOVERER AMERICAS	5,861
Anadarko Petroleum Corp.	WR	51	G31938	DIAMOND OCEAN BLACKHAWK	5,857
LLOG Exploration Offshore, LLC	MC	427	G31498	SEADRILL SEVEN LOUISIANA	5,768
BP Exploration & Production Inc.	MC	775	G09866	SEADRILL WEST VELA	5,673
Murphy Exploration & Production Co.	MC	819	G27312	T.O. DISCOVERER DEEP SEAS	5,672
BP Exploration & Production Inc.	MC	776	G09867	SEADRILL WEST CAPRICORN	5,636
Freeport-McMoRan Oil & Gas LLC	MC	127	G19925	NOBLE TOM MADDEN	5,467
Freeport-McMoRan Oil & Gas LLC	MC	84	G08484	ROWAN RELENTLESS	5,404
Anadarko Petroleum Corp.	GC	903	G24194	NOBLE BOB DOUGLAS	5,254
ExxonMobil Corp.	AC	65	G09249	COIL TUBING UNIT (L.J. #3)	4,852
Cobalt International Energy, LP	GB	958	G30876	ROWAN RELIANCE	4,846
BP Exploration & Production Inc.	MC	383	G07937	ENSCO DS-3	4,727
ExxonMobil Corp.	EB	946	G08212	COIL TUBING UNIT (L.J. #3)	4,657
Anadarko Petroleum Corp.	GC	726	G24179	ROWAN RESOLUTE	4,655
ExxonMobil Corp.	EB	946	G08211	WIRELINE UNIT (L.J. #2)	4,653
ExxonMobil Corp.	EB	946	G08211	COIL TUBING UNIT (L.J. #2)	4,653
ExxonMobil Corp.	EB	946	G08211	T.O. DEEPWATER CHAMPION	4,653
ExxonMobil Corp.	EB	946	G08212	T.O. DEEPWATER CHAMPION	4,652
Anadarko Petroleum Corp.	GC	683	G18421	DIAMOND OCEAN BLACKHORNET	4,473
BP Exploration & Production Inc.	GC	782	G15609	MAD DOG SPAR RIG	4,428
Bennet Oil & Gas, LLC	AT	63	G13198	HELIX Q5000	4,418
Hess Corp.	MC	725	G22898	STENA FORTH	4,311
Chevron USA Inc.	GC	640	G20082	TRANSOCEAN DEEPWATER ASGAD	4,292
BHP Billiton Petroleum (GOM) Inc.	GC	609	G16764	T.O. DEEPWATER INVICTUS	4,288
Statoil USA E&P Inc.	MC	942	G24130	MAERSK DEVELOPER	4,200
Chevron USA Inc.	GC	596	G16759	T.O. DISCOVERER INSPIRATION	4,023
Freeport-McMoRan Oil & Gas LLC	GC	643	G35001	NOBLE SAM CROFT	3,885
Chevron USA Inc.	GB	978	G26693	T.O. DISCOVERER INDIA	3,803
Anadarko Petroleum Corp.	EB	602	G14205	WIRELINE UNIT (L.J. DIST)	3,678
Eni US Operating Co. Inc.	MC	35	G26234	ENSCO 8506	3,532
Shell Offshore, Inc.	MC	807	G07963	OLYMPUS N88	3,037
Shell Offshore, Inc.	MC	807	G07958	H&P 201	2,945
Shell Offshore, Inc.	GB	341	G15879	CAL-DIVE Q4000	2,006
Energy Resource Technology GOM, Inc.	GC	237	G15563	NOBLE DANNY ADKINS	1,957
LLOG Exploration Offshore, LLC	MC	794	G34909	NOBLE AMOS RUNNER	1,462
Hess Corp.	GB	216	G14224	NOBLE PAUL ROMANO	1,450
Stone Energy Corp.	VK	989	G07923	H&P 100	1,290
Stone Energy Corp.	MC	26	G31474	ENSCO 8503	1,113
Fieldwood SD Offshore LLC	EB	160	G02648	WIRELINE UNIT (L.J. DIST)	940
Whistler Energy, LLC	GC	18	G05809	NABORS MODS 201	760
Chevron USA Inc.	GB	189	G06358	WIRELINE UNIT (L.C. DIST)	718
Fieldwood SD Offshore LLC	EB	110	G02650	NONE RIG PA OPERATION (LJ)	660
W&T Offshore, Inc.	EW	910	G13081	H&P 203	557

Deepwater prospects with drilling and workover activity: 54

Current Deepwater Activity as of Monday, 2 November 2015

### Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,264	36,265	2,257
201 to 400	84	1,127	20
401 to 800	192	899	10
801 to 1,000	280	579	9
1,000 & above	2,793	2,084	28

### Rig Activity Report 6 November 2015

Location	Week of 11/06	Week Ago	Week +/-	Year Ago
Land	734	-4	738	-1125
Inland Waters	5	1	4	-8
Offshore	32	-1	33	-21
U.S. Total	771	-4	775	-1154
Gulf of Mexico	32	0	32	-19
Canada	185	-6	191	-225
N. America	956	-10	966	-1379
				2335

Activity by Water Depth Information current as of Monday, 2 November 2015

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

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

# Monthly Stock Figures & Composite Index

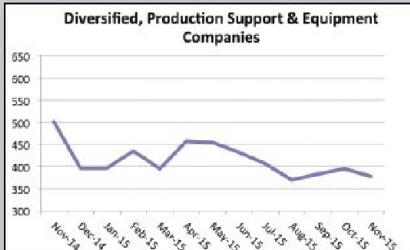
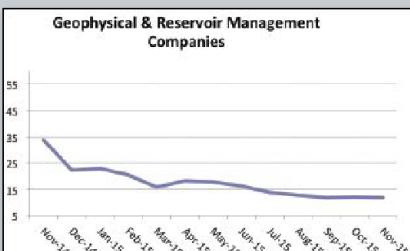
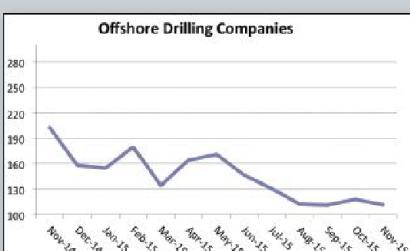
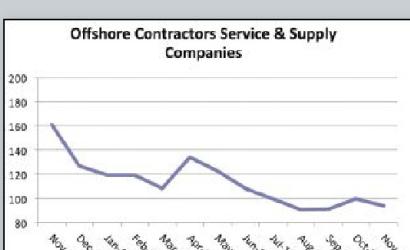
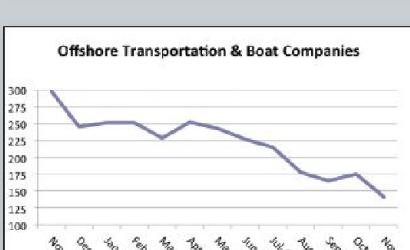
Industry Company Name	Symbol	Close(Mid) November	Close(Mid) October	Change	Change %	High 52 week	Low
<b>Diversified, Production Support and Equipment Companies</b>							
Baker Hughes, Inc.	BHI	48.86	55.43	-6.57	-11.9%	70.45	44.11
Cameron Intl. Corp.	CAM	66.88	66.93	-0.05	-0.1%	71.22	39.52
Drill-Quip, Inc.	DRQ	59.26	64.64	-5.38	-8.3%	93.54	53.37
Halliburton Company	HAL	37.47	39.46	-1.99	-5.0%	51.78	30.93
Tenaris SA	TS	24.84	25.51	-0.67	-2.6%	37.12	22.85
Newpark Resources, Inc.	NR	5.67	5.96	-0.29	-4.9%	12.65	4.89
Schlumberger Ltd.	SLB	76.29	76.95	-0.66	-0.9%	99.21	66.57
Superior Energy Services, Inc.	SPN	14.95	15.71	-0.76	-4.8%	26.95	12.35
Weatherford International, Inc.	WFT	10.16	10.12	0.04	0.4%	16.75	7.21
Deep Down, Inc.	DPDW	0.43	0.55	-0.12	-21.8%	1.15	0.43
FMC Technologies	FTI	32.31	32.99	-0.68	-2.1%	57.55	27.94
<b>Total Diversified, Production, Support and Equipment.....</b>	<b>377.12</b>	<b>394.25</b>	<b>-17.13</b>	<b>-4.3%</b>	<b>538.37</b>	<b>310.17</b>	
<b>Geophysical / Reservoir Management</b>							
Dawson Geophysical Company	DWSN	3.95	3.45	0.50	14.5%	9.39	2.93
Mitcham Industries, Inc.	MIND	4.35	4.20	0.15	3.6%	9.54	3.54
Compagnie Gnrale de Gophysique-Veritas	CGV	3.55	4.43	-0.88	-19.9%	10.95	3.36
<b>Total Geophysical / Reservoir Management.....</b>	<b>11.85</b>	<b>12.08</b>	<b>-0.23</b>	<b>-1.9%</b>	<b>29.88</b>	<b>9.83</b>	
<b>Offshore Drilling Companies</b>							
Atwood Oceanics, Inc.	ATW	15.30	18.19	-2.89	-15.9%	38.84	14.15
Diamond Offshore Drilling, Inc.	DO	21.20	20.82	0.38	1.8%	40.00	16.51
ENSCO International, Inc.	ESV	17.33	16.69	0.64	3.8%	40.23	13.26
Nabors Industries, Inc.	NBR	9.15	10.65	-1.50	-14.1%	17.33	8.90
Noble Drilling Corp.	NE	12.60	13.04	-0.44	-3.4%	21.61	10.34
Parker Drilling Company	PKD	2.67	3.04	-0.37	-12.2%	4.55	2.34
Rowan Companies, Inc.	RDC	19.51	19.73	-0.22	-1.1%	25.13	14.63
Transocean Offshore, Inc.	RIG	14.04	15.93	-1.89	-11.9%	26.66	11.26
<b>Total Offshore Drilling.....</b>	<b>111.80</b>	<b>118.09</b>	<b>-6.29</b>	<b>-5.3%</b>	<b>214.35</b>	<b>91.39</b>	
<b>Offshore Contractors, Services, and Support Companies</b>							
Helix Energy Solutions Group, Inc.	HLX	5.8	6.97	-1.17	-16.8%	27.70	4.57
Gulf Island Fabrication	GIFI	10.05	12.15	-2.10	-17.3%	22.70	8.74
McDermott International, Inc.	MDR	5.65	5.44	0.21	3.9%	6.00	2.10
Oceaneering International	OII	43.34	46.91	-3.57	-7.6%	70.95	37.00
Subsea 7 SA	SUBCY.PK	7.63	8.05	-0.42	-5.2%	12.23	7.05
Technip ADS	TKPPY.PK	12.71	13.25	-0.54	-4.1%	19.67	11.30
Tetra Technologies, Inc.	TTI	8.62	6.99	1.63	23.3%	8.98	4.62
<b>Total Offshore Contractors, Service, and Support.....</b>	<b>93.80</b>	<b>99.76</b>	<b>-5.96</b>	<b>-6.0%</b>	<b>168.23</b>	<b>75.38</b>	
<b>Offshore Transportation and Boat Companies</b>							
Seacor Holdings, Inc.	CKH	53.03	64.07	-11.04	-17.2%	78.95	51.78
Gulfmark Offshore, Inc.	GLF	5.05	7.70	-2.65	-34.4%	32.37	4.40
Bristow Group	BRS	29.14	34.78	-5.64	-16.2%	72.37	24.95
PHI, Inc.	PHII	20.54	26.31	-5.77	-21.9%	42.60	15.58
Tidewater, Inc.	TDW	10.28	15.11	-4.83	-32.0%	39.24	9.91
Trico Marine Services, Inc.	TRMAQ.PK	11.07	11.66	-0.59	-5.1%	14.35	10.22
Hornbeck Offshore	HOS	12.55	15.91	-3.36	-21.1%	32.87	12.20
<b>Total Offshore Transportation and Boat .....</b>	<b>141.66</b>	<b>175.54</b>	<b>-33.88</b>	<b>-19.3%</b>	<b>312.75</b>	<b>129.04</b>	

December 2015

Ocean News & Technology

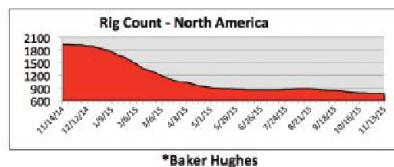
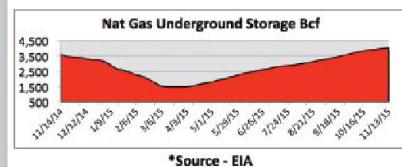
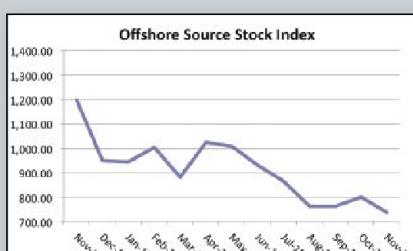
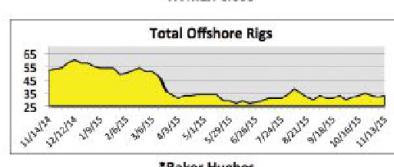
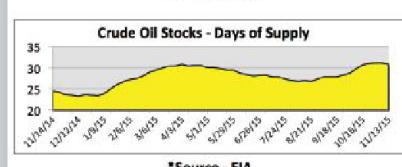
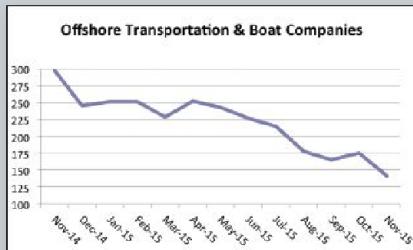
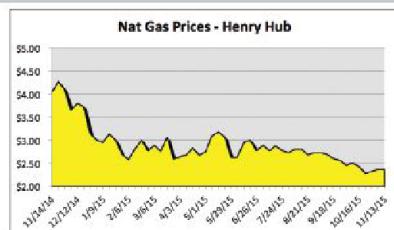
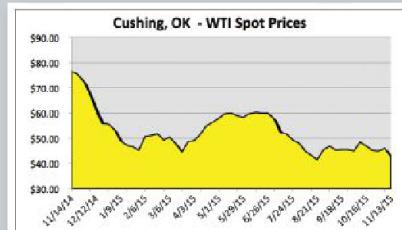
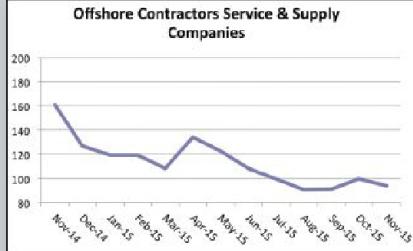
64

# Monthly Stock Figures & Composite Index

Industry	Close(Mid) November	Close(Mid) October	Change	Change %	High 52 week	Low
<b>Total Diversified, Production, Support and Equipment</b>	377.12	394.25	-17.13	-4.3%	538.37	310.17
						
<b>Total Geophysical / Reservoir Management</b>	11.85	12.08	-0.23	-1.9%	29.88	9.83
						
<b>Total Offshore Drilling</b>	111.80	118.09	-6.29	-5.3%	214.35	91.39
						
<b>Total Offshore Contractors, Service and Support</b>	93.80	99.76	-5.96	-6.0%	168.23	75.38
						
<b>Total Offshore Transportation and Boat</b>	141.66	175.54	-33.88	-19.3%	312.75	129.04
						
<b>Total Offshore Source Index</b>	736.23	799.72	-63.49	-7.9%	1,263.58	615.81
<b>DISCLAIMER</b>						
The information on this page is provided for information and comparison purposes only and should not be used to make financial and business decisions and is accurate to the best of our knowledge for the period indicated.						

## Oil & Gas Industry Trends

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



Positive trend, at least 3 weeks  
 Color: Green

Changing trend, less than 3 weeks  
 Color: Yellow

Negative trend, at least 3 weeks  
 Color: Red

## LUXUS Dual 360° P/T heavy-duty pan-and-tilt unit

The LUXUS brand of MacArtney instrumentation represents cameras, lights, controllers, and accessories—together with the latest novelty now being launched: a slip-ring based pan-and-tilt unit. The LUXUS series serves the purpose of combining operational and service flexibility, excellent performance and reliability in the most severe subsea environments.



The sturdy and modern design of the different LUXUS units and their versatile first-rate specifications make them ideal for a multitude of demanding underwater tasks and uses.

Being rugged and durable enough for virtually any environment, the LUXUS Dual 360° P/T is ideal

for heavy-duty operations involving various tools and instruments like work class ROVs, rock dump ROVs, trenchers, and ploughs as well as for surveillance operations.

Being based on standard housings, the LUXUS series allows for swapping (e.g., lights and cameras) in the field in a fast and convenient manner.

The unique properties of the LUXUS Dual 360° P/T feature qualities like a high torque of 100 Nm and a payload of 100 kg. Besides, this LUXUS product is the first pan-and-tilt unit to feature unlimited movements of both 360° pan and 360° tilt. This is made possible by means of the mounted slip rings enabling full-scale activation and thus facilitating operation at all angles.

The LUXUS Dual 360° P/T is very easily integrated with existing underwater vehicles, systems and sensor platforms. It is ideal for combination with MacArtney's other LUXUS products like the LUXUS HD Ethernet camera, the LUXUS Power LED, and the LUXUS High Power LED lights. The LUXUS Dual 360° P/T can be controlled via the LUXUS P&T Controller or directly by means of the software that comes with the unit, installed on a PC.

For more information, visit [www.macartney.com](http://www.macartney.com).

## Valeport expands into optical sensors and debuts with Fluorometer launch

66

Ocean News & Technology

Valeport has just released a new range of optical sensors, which debuts with the launch of a Fluorometer for measurement of Chlorophyll, Rhodamine and Fluorescein.

Created for inshore, coastal and oceanographic monitoring, this new sensor delivers a high performance measurement of Chlorophyll *a*, Rhodamine and Fluorescein in a compact and robust package ideal as a standalone sensor for ROV, AUV and third-party integration or used as part of a multi-sensor array and data logger.

The Hyperion Fluorometer is offered as standard in a 6,000 m depth rated, titanium housing and has a wide range (9-30V DC) isolated power supply, data output up to 32Hz and standard RS232 communications. The system is supplied with Valeport's DataLog x2 Windows software for instrument set up, and display of data in real time.

The Hyperion Fluorometer design is also integrated as an option into Valeport's new miniCTD Fast Profiler.

For more information contact visit [www.valeport.co.uk](http://www.valeport.co.uk).



## Ocean Signal introduces rescueME MOB1 for the first time at Europort

Ocean Signal introduced its innovative rescueME MOB1 for the first time at Europort with Netherlands distributor True Heading.

Ideal for a range of commercial applications and already selected by operators in the renewables market for use by windfarm workers, the rescueME MOB1 is the world's most advanced Man Overboard locating device, incorporating both AIS and DSC technologies within the most compact product on the market. It also has an integrated strobe light with moulded lens to ensure the survivor is easily spotted in poor light conditions.

The award-winning device is designed to easily integrate into inflatable life jackets, including those that are specifically developed for commercial use when heavy-duty clothing or protective gear is being worn.

At 30% smaller than similar products, the rescueME MOB1 measures just 134 mm high by 38 mm wide by 27 mm deep and weighs 90 g.

Operating within a temperature range of -20°C and +55°C, the rescueME MOB1 has a comprehensive self-test facility and a 7-year battery life.

For more information, visit [www.oceansignal.com](http://www.oceansignal.com).



December 2015

## FluoroSense™ Handheld Fluorometer now available for Phycocyanin Estimates

Turner Designs now offers phycocyanin (PC) as an optical configuration of their FluoroSense handheld fluorometer to assist with identification of PC containing algae typically associated with Harmful Algal Blooms (HABs).

Obtaining both PC and chlorophyll estimates helps in determining whether additional testing is required to check toxicity levels in a body of water.

The FluoroSense is the smallest, easiest to use handheld fluorometer available. Its simple two-button keypad enables users to quickly power on the instrument and take a reading to estimate chlorophyll or PC in almost any aquatic habitat. There is no warm-up time required—chlorophyll or PC  $\mu\text{g/L}$  estimates are displayed in seconds.

The FluoroSense plastic molded enclosure boasts an extremely lightweight, small, waterproof design, while offering a high degree of durability. With a very low power draw, the FluoroSense can take over 10,000 measurements on a single pair of AA batteries. Factory calibrated, the only maintenance required is simply rinsing after use.

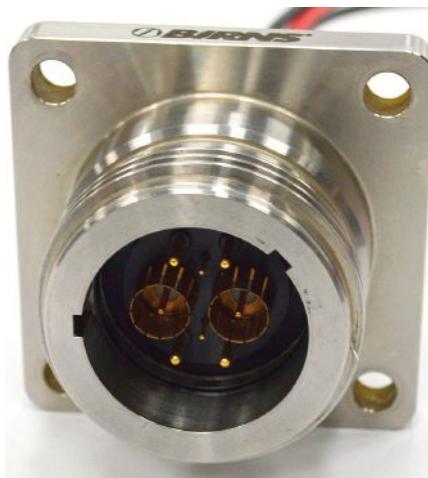
The PC FluoroSense can estimate phycocyanin concentrations spanning the linear range from 0–199  $\mu\text{g/L}$  and resolve down to 1  $\mu\text{g/L}$  of PC. Together with the chlorophyll FluoroSense, this is the ideal tool for quickly assessing pigment levels of algal blooms.

For more information, visit [www.turnerdesigns.com](http://www.turnerdesigns.com).



## Birns introduces revolutionary new coax contacts

BIRNS, Inc. has launched a new range of coaxial subsea connector contacts with unheard of performance characteristics. The BIRNS Millennium™ series connectors developed with the new contacts have had groundbreaking testing results, including a maximum insertion loss of 0.7 dB at signal frequencies to 3 GHz, with an associated maximum Standing Wave Ratio (SWR) of 1.7:1. Even more remarkable, the new coax contacts withstand open face hydrostatic pressure to depths of 1,433 m so far in initial testing protocols, with more testing currently underway. Additionally, the new design provides incredible ease of assembly and connects directly to a standard MIL-STD-348 SMA connector.



RF contacts in the subsea connectivity market are typically unable to withstand any open face pressure resistance whatsoever (or offer poor signal performance), due to the design demands of controlling electrical impedance and the challenges found affecting characteristic performance of dielectric materials. “The geometry of a typical  $50\Omega$  coax contact consists of a center conductor, outer conductor and a dielectric between. The ratio of the distance between the center conductor and outer conductor must be maintained to prevent impedance discontinuity,” said Jeff Hager, BIRNS mechanical design engineer. “Preventing the dielectric and/or center conductor from being extruded from the outer conductor or creating a leak path under pressure would have to include radial transitions, seals, and compression resistant materials—however, coax contact designers in the marine industry have historically avoided such features to control impedance.”

BIRNS achieved its new pressure resistant coax line with a proprietary

design, optimizing transitions to prevent extrusion and minimize impedance discontinuities. Plus, its engineers incorporated seals made of low dielectric constant materials to prevent leakage under pressure and utilized a high compression strength dielectric material, which also has a low dielectric constant.

For more information, visit [www.birns.com](http://www.birns.com).

## Hybrid ARV - New Product Launch from Aquabotix

Aquabotix announces the launch of Hybrid ARV to meet the evolving demands of underwater exploration and inspection. Hybrid ARV is the first true hybrid AUV/ROV for shallow water.

Hybrid ARV is single person deployable and has full Windows support for mission management, remote control and data viewing and analysis. Portable and battery powered, the Hybrid ARV configuration includes:

- Five Swiss made high torque motors;
- Side scan sonar, GPS—also available: scanning sonar, DVL, USBL, WiFi, and Bluetooth;
- Sensor package including depth, temperature and digital compass—additional environmental sensors available;
- 1080 p true HD quality camera with continuous focus and tilt;
- 100 m of neutrally buoyant tether for ROV operation;
- Depth rating 100 m—also available with 300 m depth rating;
- 8 lbs of payload capacity for customer specific applications; and
- High intensity LED lighting.

Hybrid ARV operates on lithium battery technology with a standard operational run time of 4 hours. All mission planning is completed in an intuitive windows based application to run the vehicle in autonomous operation. Switching to ROV operation is simple, attach the tether to remotely control the vehicle’s six degrees freedom of motion. From case to the water in under 3 minutes, the Hybrid ARV is easy to deploy and requires no daily maintenance beyond charging.

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For more information, visit [www.aquabotix.com](http://www.aquabotix.com).

## CSA unveils Fmvsea

CSA Ocean Sciences Inc. (CSA) is pleased to announce their release of FMVsea, a unique service provided by CSA's Environmental Data and Geospatial Services (EDGS) division. FMVsea is a Full Motion Video service that supports creation of integrated digital video and GIS products (FMV) that will revolutionize the collection, interpretation, and visualization of information collected during field surveys. Features include on-the-fly FMV creation, interactive target identification and a projected field of view bounding box for setting context. FMVsea and the associated services allow actual creation of the Full Motion Video, batching processing, customized target dictionary development, video resizing for better performance in ArcGIS Desktop and video conversion to different formats, all fully compatible with Esri products.

CSA provides scientists the value of a continuously updated bounding box representing the camera's field-of-view that is calculated and displayed in ArcGIS Desktop. This provides scale for objects in the video, enables users to evaluate spatial parameters, and, when combined with other data layers such as bathymetry or habitat maps, provides immediate context for what they are seeing in the video.

For more information, visit [www.csaocean.com](http://www.csaocean.com).

## Mini-Pod inflatable survival platform

Salvare Worldwide is best known for its innovative inflatable survival platform, the Seapod, but now its new smaller cousin, the Mini-Pod, is proving to be just as popular across even more markets. Like the Seapod, the aim of the Mini-Pod is to provide a place of refuge and buy hours rather than minutes for survivors waiting to be rescued from the sea.

Although it doesn't take the place of a life raft or life jacket, the device solves the age old problems of quick deployment, visibility, and staying safely out of the water to avoid hypothermia. It has all the qualities of its cousin the Seapod but it's much smaller and oblong shaped, meaning it's even more lightweight and quicker to deploy in man overboard situations.

Once upon a time if someone fell in the water you'd throw them a life ring, but now it looks like a very good idea to throw them a Mini-pod instead. Would you rather be on it or in it?

Because of its compact size, the Mini-Pod can be deployed to survivors within a very accurate range, which is not always possible to do with a life raft due to its weight and size.



The Mini-Pod auto inflates and because of its symmetrical design, it will always inflate the right way up, which is something you cannot guarantee with a liferaft.

It is not hugely affected by wind conditions and the skirt around the outside adheres to the water surface, making the whole platform extremely stable in all conditions. The Mini-pod has a small freeboard which enables easy boarding even when wearing a life jacket. Rescuers can either pull survivors back to the boat in a man overboard situation, or come alongside the survivor and use the Mini-Pod's freeboard to get the victim back onboard.

Like the Seapod, the Mini-Pod is equipped with Solas approved LED lighting and its highly visible bright Yellow/Orange color makes it easy to spot out at sea.

For more information, visit [www.salvare.co.uk](http://www.salvare.co.uk).

## SonarWiz adds sophisticated CUBE gridding engine

In a major development allowing users to immediately visualize vast amounts of bathymetry, sub-bottom, and sidescan data, Chesapeake Technology has added a robust new gridding engine to its industry-leading SonarWiz software.

The new gridding capabilities allow users to quickly and easily create swath bathymetry and amplitude grids using complex algorithms such as the NOAA-supported Combined Uncertainty and Bathymetry Estimator (CUBE). Users can view and edit the resulting grids within SonarWiz, and then export them to 20 industry standard GIS and visualization formats.

Traditional backscatter processing systems deliver their output as one-dimensional tiff or jpeg images that do not reflect the full range of amplitude data modern sonars collect. SonarWiz now allows customers to grid amplitude data and generate summary statistics for each sonar node. The resulting grid product is a statistically meaningful measure of seafloor amplitude but at much more manageable data volumes.

For more information, visit [www.chesapeaketech.com](http://www.chesapeaketech.com).

## Ocean Aero begins taking Submaran™ S10 orders

Ocean Aero has announced they are taking orders for the Submaran™ S10 for expected delivery beginning January 2016. The Ocean Aero Submaran™ S10 is the first wind and solar-powered surface and sub-surface vessel designed for extended autonomous ocean observation and data collection.

Equipped with a unique retractable wing-sail that folds down for submerging, the Submaran S10 can dive 10 m and remain under water to avoid poor weather conditions, traffic or detection.

Easily transported by land, sea or air, the multipurpose Submaran™ S10 has the power and payload capacity for a wide range of sensor systems. The combination of solar and wind power enables Submaran deployment for extended periods of time in extreme conditions.

The Submaran will be available as an entire system sale, or with the flexibility of System as a Service (SaaS) deployment (lease model) with vessels configured to suit specific customer needs.

For more information, visit [www.oceanaero.us](http://www.oceanaero.us).

## Tritech Gemini sonars for renewables company

Tritech continues to grow within the renewables market with orders from Irish tidal turbine company, OpenHydro Group Limited.

Following evaluation of Tritech's multibeam technology, OpenHydro has purchased a number of Gemini imaging sonars to monitor the installation and recovery of tidal turbines and sub-sea base units for its current and future projects. The company also purchased an additional Gemini sonar, which will be permanently installed on a tidal turbine to monitor the environment. This sonar was provided with the Tritech SeaTec software package which provides target tracking and probability classification functionality.

All Tritech Gemini sonars are provided with a software package which provides users with a real-time image and with basic target tracking capabilities. The SeaTec software upgrade is customised to meet the specific needs of the customer.

Gemini 720i operates at 720 kHz to provide high-resolution sonar imagery at a 120m range and with a full 120 degree field of view, it is ideal for long and short range detection.

For more information, visit [www.tritech.co.uk](http://www.tritech.co.uk)

# SubOptic 2016

[www.suboptic.org](http://www.suboptic.org)

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## Early Bird Registration is Now Open

The Preliminary Programme for the  
Event will be available in  
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from [www.suboptic.org](http://www.suboptic.org)

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Bristow Group Inc., a provider of helicopter services to the offshore energy industry, is combining its CFO group with its mergers, acquisitions and integration group and appointed **Don Miller** as senior vice president and chief financial officer. Miller is replacing **John Briscoe**, who is pursuing other business opportunities. Miller, who joined Bristow in 2010, was until recently senior vice president, mergers, acquisitions and integration. He has 30 years of experience in finance, capital markets and M&A and was responsible for creating the mergers, acquisitions and integration group at Bristow that led to the acquisition of Cougar Helicopters, Eastern Airways and Airnorth. Prior to joining Bristow, Miller spent 9 years with Enron North America. Prior to Enron, he held financial positions with Citicorp Securities and with Dean Witter Reynolds.

Makovsky, an independent integrated communications firm, said that **Loretta Prencipe** joined the agency as group vice president, energy. Prencipe will work closely with Andy Beck, Makovsky's executive vice president of energy and sustainability and former head of the U.S. Department of Energy's Office of Public

Affairs. Prencipe began her career in energy communications with SunEdison, where she helped establish the company as a solar industry leader. Most recently, Prencipe was vice president at Qorvis MSLGROUP, where she provided strategic counsel for a Russian LNG company on U.S. public affairs and communications.

Her work won awards for both the firm and clients. Prior to that, Prencipe worked at New West, where she served as editor-in-chief of the U.S. Department of Energy's Energy Empowers website.

Maana, a pioneer in search engine technology for big-data-fueled solutions, announced the expansion of its team serving the oil and gas industry. Energy companies utilize big-data analytics as a means to improve operational efficiencies. Maana said its search and discovery platform makes it easier for companies to search, correlate and analyze the massive amounts of data generated by multiple disparate systems across upstream opera-

tions. **Peter Breunig** will form and chair Maana's new oil and gas customer advisory board. Breunig spent over 30 years at Chevron in upstream technical support, application and research. Other employees with extensive oil and gas expertise who have joined Maana are **Erhan Eren** and **Jeff Dalgliesh**. Eren is the company's business development manager, based out of Houston. Dalgliesh is a drilling and completions technology enterprise architect and Maana's search enabled solutions leader.

The International Marine Contractors Association named **Allen Leatt** as chief executive officer. Leatt has been senior vice president for engineering and project management at Subsea 7. He is a Fellow of the Royal Academy of Engineering, a Fellow of the Institution of Civil Engineers, and a chartered engineer in the UK. IMCA also has named **Richard Benzie** as technical director.

ProSep has restructured internally and reorganized. **Patrick McCarthy** is the new CEO. He replaces Neil Poxon who remains with the company until year end. McCarthy has served on the board for the past year. The restructuring includes new research and development.



Prencipe

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Global marine technology company, Kongsberg Maritime has appointed a new business manager for the Offshore Production division of its Kongsberg Maritime Ltd base in Aberdeen. **David Wilson** has over 27 years' experience in the marine engineering industry, the vast majority of which has been spent with Kongsberg Maritime. He has played an integral role within a number of teams, holding key positions within technical sales and business development, covering Offshore Support, Offshore Survey and Construction, Merchant Shipping, Marine Research and Naval markets.

Forum Subsea Rentals (FSR) has strengthened its senior management team with the promotion of **Nicki Nicholls** to the role of global business director. Ms Nicholls will be responsible for managing and developing the ambitious long-term growth plans for all Forum's rental product lines. She will be based in FSR's newly opened operations centre in Westhill, Aberdeen. In addition, **Christian Blinkenberg** has been appoint-



Wilson

ed global sales and marketing director of FSR's Global Services division.

**Seatrronics**, an Acteon company, has formed a new partnership with **Lateral AS**, a Norwegian subsea tooling firm specialised in improving offshore performance. The new agreement will provide Seatronics' global customer base with access to the FlexiCal product line. FlexiCal is an ROV mounted caliper that allows for direct measurements from point-to-point with real-time readout.

**Ashtead Technology** has secured a global asset management agreement with **Blue Ocean Monitoring** to store, maintain and supply underwater gliders for ocean data monitoring. Blue Ocean Monitoring is a world-leader in the provision of ocean data solutions using autonomous subsea and surface glider technology.

Canadian based **AXYS Technologies Inc** (AXYS) and Belgium based **3E NV** (3E) are pleased to announce they have jointly signed a memorandum of understanding (MOU) regarding future collaborations and cooperation activities. Collaboration activities planned under the MOU include commercially driven research, development and demonstra-

tion as well as sharing market trend information and innovative problem-solving techniques to meet and exceed client requirements and expectations.

The acquisition of **Imtech Marine** by **Pon Holdings** and **Parcom Capital** has been finalized. The European Commission has approved the takeover of the leading maritime service provider. Imtech Marine will continue to operate independently and will, in the coming period, further focus on its growth ambitions.

**Subsea Technology and Rentals** is excited to announce a new partnership with Norwegian subsea tooling experts **IKM Technique**. This agreement will enable STR to further provide complete technology solutions by offering an extensive range of industry leading ROV tooling, service and support from its UK base and regional agents.

**Unique Group**, the leading integrated subsea and offshore solution provider, has acquired **Oceanwide Safety at Sea** in a deal that joins two global leaders in the diving industry. Oceanwide is market leading in the design, construction and maintenance of self-propelled hyperbaric lifeboats.

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# CALENDAR & EVENTS

December 2015

**72**

Ocean News & Technology

## OCEAN NEWS & TECHNOLOGY

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**2** Describe your job function (circle 1):

- |                    |                          |
|--------------------|--------------------------|
| 1. OWNER           | 5. BUYER                 |
| 2. MANAGER/PROF    | 6. SALES                 |
| 3. ENG'R/SCIENTIST | 7. OTHER (Specify) _____ |
| 4. TECH'N/OPERATOR |                          |

**3**

Describe your organization (circle 1):

- |                                  |                                  |
|----------------------------------|----------------------------------|
| A. SHIPS, CONSTRUCTION, SALVAGE  | O. DIVING EQUIPMENT/SERVICES     |
| B. U/W VEHICLES/COMPONENTS       | P. CONSULTING, DATA SERVICES     |
| C. NAVIGATION/POSITIONING        | Q. MARINE ELECTRICAL/ELECTRONICS |
| D. RESEARCH & DEVELOPMENT        | R. COMPUTER SERVICES/SOFTWARE    |
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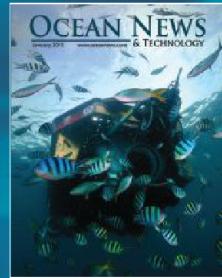
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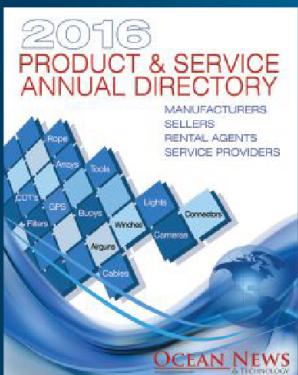
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 Email: info1@watson-gyro.com  
 Website: www.watson-gyro.com  
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*Specializing in precision positioning and motion sensing systems for use in undersea cable laying, buoy and current monitoring, magnetic field measurement, yacht and ferry stabilization, remotely operated vehicles, sonar, camera and antenna stabilization, heading reference and surface ship navigation. We can customize our products to meet your specifications.*

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 13355 Berlin, Germany  
 Tel: +49 (0) 30 4679 862-0  
 Fax: +49 (0) 30 4679 862-01  
 E-mail: sales@evologics.de  
 Website: www.evologics.de



*EvoLogics provides the world's most advanced spread-spectrum underwater communication systems (S2C) with multi-channel data management, networking capability, built-in tracking and positioning functions with USBL. Data loggers, acoustic wake-up module and releasers optionally included. Deployments in offshore platforms (FPSO, ABS), environmental monitoring, defense systems, ROV and AUV operations and more. Applications include simple positioning and sensor information to transmission of underwater photos.*

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**ASL Environmental Sciences, Inc.**  
 #1-6703 Rajpur Place, Victoria  
 BC, Canada V8M 1Z5  
 Phone: +1 250 656 0177  
 Fax: +1 250 656 2162  
 E-mail: asl@aslenv.com  
 Web: www.aslenv.com



*ASL provides physical oceanographic consulting services and instruments. Services: flow measurement, ice studies, wave measurement and analysis, numerical modeling, and remote sensing. Products: Ice Profiler- measures ice-keel depths; Acoustic Zooplankton Fish Profiler- monitors the presence and location of zooplankton, fish or sediments; and the WERA NorthernRadar - measures surface currents and waves from shore up to 200km. ASL has a large lease pool of oceanographic instruments.*

## CONTROS Systems & Solutions GmbH

Wischhofstraße 1-3, Bld. 2  
 24148 Kiel, Germany  
 Tel: +49 (0) 431 260 959 00  
 Fax: +49 (0) 431 260 95 901  
 E-mail: contact@contros.eu  
 Website: contros.eu



**CONTROS**  
 Systems & Solutions GmbH

*CONTROS Systems & Solutions GmbH develops, produces and markets in-situ underwater sensor systems to detect hydrocarbons, pCO<sub>2</sub>, dissolved oxygen, Total Alkalinity, and fully integrated systems down to full ocean depth to gather the most efficient and reliable data in any condition and in combination with data logging and software solutions.*

## Falmouth Scientific, Inc.

1400 Route 28A, PO Box 315  
 Cataumet, MA 02534-0315 USA  
 Tel: +1 508 564 7640  
 E-mail: fsi@falmouth.com  
 Website: www.falmouth.com



## Sensors – Systems – Service

*Falmouth Scientific, Inc. designs and manufactures precision oceanographic instrumentation and systems. Product areas include:*

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- Current, Wave, and Tide meters
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## nke Instrumentation

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*Contact : Valérie Le Pen - vlepen@nke.fr or Gouven Prud'homme - gprudhomme@nke.fr  
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 Contact: Patrice Brault - pbrault@nke.fr*

## Nortek AS

Vangskroken 2  
 1351 Rud, Norway  
 Tel: +47 67 17 45 00  
 E-mail: inquiry@nortek.no  
 Website: www.nortek-as.com



*Scientific instrumentation company developing and distributing Acoustic Doppler Current Profilers (ADCP), wave systems and current meters for use in oceans, rivers, lakes and laboratories. Products feature deployment planning software, real-time data collection and support from our technical team and provide technological solutions to offshore industries, engineers, research and renewable energy.*

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 E-mail: info@rbr-global.com  
 Website: www.rbr-global.com



*Based in Ottawa, Canada and established in 1976. The company is an industry leader in the design, development and manufacture of high precision instruments for oceanographic, freshwater, groundwater and cryospheric research. Products include CTDs, small temperature or depth loggers, tide gauges, wave loggers, and multi-parameter sondes.*

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 Email: Sales@romor.ca  
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 Contact: Darrin Verge, President & CEO

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

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 Email: Klein.Mail@L-3com.com  
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December 2015

79

Ocean News & Technology

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 Website: www.newindustries.com  
 Contact: Bill New



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

# OCEAN INDUSTRY DIRECTORY

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8860 Fallbrook Drive  
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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@subseaamerica.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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E-mail: sales@seacon-ap.com  
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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.

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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.**  
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San Jose, CA 95131 USA  
Tel: +1 408 436 1102  
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.

**Oceaneering International, Inc.**  
11911 FM 529  
Houston, TX 77041  
Tel: 713.329.4500  
Contact: Bill Mallin  
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E-mail: info@qstar.es  
Websites: www.qstar.es & www.rovs.eu



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**Teledyne SeaBotix**  
2877 Historic Decatur Road, Suite 100  
San Diego, CA 92106 USA  
Tel: +1 619 450 4000  
Fax: +1 619 450 4001  
Contact: Alasdair Murrie  
E-mail: SeaBotixInfo@Teledyne.com  
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Fax: +1 610 458 3010  
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Website: www.videoray.com  
Contact: Brian Luzzi



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## UNDERWATER VIDEO EQUIPMENT

**Kongsberg Maritime Ltd.**

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Tel: +44 (0) 1224 226500  
Fax: +44 (0) 1224 226501  
Email: km.cameras.uk@kongsberg.com  
Website: www.km.kongsberg.com/cameras  
Contact: Mark Esslemont



*Kongsberg Maritime Ltd is a world leader in providing harsh environment underwater camera & imaging technology and marine CCTV systems to the Offshore Oil Field & Renewable Energy, Power Generation, Scientific, Maritime and Military sectors.*

**ROVSCO, Inc.**

5263 Barker Cypress Road, Suite 600  
Houston, TX 77084  
Tel: +1 281 858 6333  
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E-mail: sales@rovoco.com  
Website: www.rovoco.com  
Contact: Jessica McKenney



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

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# ADVERTISER INDEX

December 2015

82

Ocean News & Technology

BIRNS, Inc.	5	<a href="http://www.birns.com">www.birns.com</a>
CSA Ocean Sciences Inc.	4	<a href="http://www.csaocean.com">www.csaocean.com</a>
CUCE	71	<a href="http://www.cuce.ca">www.cuce.ca</a>
CSnet International, Inc.	55	<a href="http://www.csnetinternational.com">www.csnetinternational.com</a>
DeepWater Buoyancy	84	<a href="http://www.DeepWaterBuoyancy.com">www.DeepWaterBuoyancy.com</a>
DeepSea Power & Light	49	<a href="http://www.deepsea.com">www.deepsea.com</a>
ECA Robotics	21	<a href="http://www.eca-robotics.com">www.eca-robotics.com</a>
EvoLogics GmbH	83	<a href="http://www.evologics.de">www.evologics.de</a>
FORUM Energy Technologies, Inc. (F.E.T.)	9	<a href="http://www.f-e-t.com">www.f-e-t.com</a>
Global Ocean Design	53	<a href="http://www.globaloceandesign.com">www.globaloceandesign.com</a>
GoM Oil Spill & Ecosystem Science Conference	70	<a href="http://www.gulfofmexicoconference.org">www.gulfofmexicoconference.org</a>
Hydro-Lek	52	<a href="http://www.hydro-lek.com">www.hydro-lek.com</a>
Hydroid, Inc.	26	<a href="http://www.hydroid.com">www.hydroid.com</a>
InterOcean Systems, Inc.	43	<a href="http://www.interoceansystems.com">www.interoceansystems.com</a>
JW Fishers Manufacturing, Inc.	25	<a href="http://www.jwfishers.com">www.jwfishers.com</a>
Kystdesign AS	51	<a href="http://www.kystdesign.no">www.kystdesign.no</a>
LinkQuest, Inc.	17	<a href="http://www.link-quest.com">www.link-quest.com</a>
MacArtney A/S	3	<a href="http://www.macartney.com">www.macartney.com</a>
New Industries	41	<a href="http://www.newindustries.com">www.newindustries.com</a>
Nortek AS	7	<a href="http://www.nortek-as.com">www.nortek-as.com</a>
Oceaneering International	39	<a href="http://www.oceaneering.com">www.oceaneering.com</a>
Ocean News	73, 74, 81	<a href="http://www.oceannews.com">www.oceannews.com</a>
Ocean Specialists, Inc.	59	<a href="http://www.oceanspecialists.com">www.oceanspecialists.com</a>
Okeanus Science & Technology	45	<a href="http://www.okeanus.com">www.okeanus.com</a>
Outland Technology	54	<a href="http://www.outlandtech.com">www.outlandtech.com</a>
Quest Offshore Resources, Inc.	56	<a href="http://www.questoffshore.com">www.questoffshore.com</a>
Radoil	34	<a href="http://www.radoil.com">www.radoil.com</a>
Rowe Technologies, Inc.	42	<a href="http://www.rowetechinc.com">www.rowetechinc.com</a>
Seacon	16	<a href="http://www.seaconworldwide.com">www.seaconworldwide.com</a>
SeaRobotics	60	<a href="http://www.searobotics.com">www.searobotics.com</a>
Shark Marine Technologies, Inc.	47	<a href="http://www.sharkmarine.com">www.sharkmarine.com</a>
SonarTech Co., LTD	53	<a href="http://www.SonarBeam.co.kr / www.sonartech.com">www.SonarBeam.co.kr / www.sonartech.com</a>
SubOptic 2016	69	<a href="http://www.suboptic.org">www.suboptic.org</a>
Subsalve USA	54	<a href="http://www.subsalve.com">www.subsalve.com</a>
Teledyne AG Geophysical Products	23, 62	<a href="http://www.aggeophysical.com">www.aggeophysical.com</a>
Teledyne Cable Solutions	62	<a href="http://www.teledynecablesolutions.com">www.teledynecablesolutions.com</a>
Teledyne Cormon	62	<a href="http://www.cormon.com">www.cormon.com</a>
Teledyne DGO	23, 62	<a href="http://www.dgo.com">www.dgo.com</a>
Teledyne Impulse	23, 62	<a href="http://www.teledyneimpulse.com">www.teledyneimpulse.com</a>
Teledyne Marine Interconnect Solutions	23	<a href="http://www.teledynemis.com">www.teledynemis.com</a>
Teledyne ODI	23, 62	<a href="http://www.odi.com">www.odi.com</a>
Teledyne Oil & Gas	23, 62	<a href="http://www.teledyneoilandgas.com">www.teledyneoilandgas.com</a>
Teledyne RDI	27	<a href="http://www.rdinstruments.com">www.rdinstruments.com</a>
Teledyne SeaBotix	14	<a href="http://www.SeaBotix.com">www.SeaBotix.com</a>
Teledyne Storm Cable Solutions	23	<a href="http://www.stormcable.com">www.stormcable.com</a>
Tritex NDT	44	<a href="http://www.tritexndt.com">www.tritexndt.com</a>
Underwater Intervention	61	<a href="http://www.underwaterintervention.com">www.underwaterintervention.com</a>
VideoRay	2	<a href="http://www.videoray.com">www.videoray.com</a>

# UNDERWATER COMMUNICATION AND POSITIONING SOLUTIONS

# Evo Logics®



## S2C TECHNOLOGY: COMMUNICATION AND TRACKING COMBINED

- time, space and cost-saving solutions
- low power consumption for autonomous operations
- advanced data delivery algorithms, addressing and networking, remotely configurable settings
- extendable platform with multiple configuration options: power-saving Wake Up module, acoustic releaser, additional sensors, custom solutions, OEM versions available

## USBL POSITIONING SYSTEMS

**simultaneous** positioning and communication - no need to switch between positioning mode and modem mode

- flexible SiNAPS positioning software
- reliable data transmissions
- range: up to 8000 m
- accuracy: up to 0.04 degrees

## UNDERWATER ACOUSTIC MODEMS

reliable data transmissions even in adverse conditions, customizable R-series modems, light and compact M-series "mini" modems, **new S2CM-HS high-speed modem**, special editions for developers, S2C communication and positioning emulator - remote access or standalone device

- range: up to 8000 m
- depth: up to 6000 m
- data rate: up to 62.5 kbps

## LBL POSITIONING SYSTEMS

highly accurate, precise and stable performance, simultaneous positioning and data transmissions

- flexible SiNAPS positioning software
- reliable data transmissions
- range: up to 8000 m
- accuracy: better than 0.01 m

**NEW HIGH-SPEED  
'MINI' MODEM**  
62.5 kbps  
**AVAILABLE NOW**



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