

OCEAN NEWS

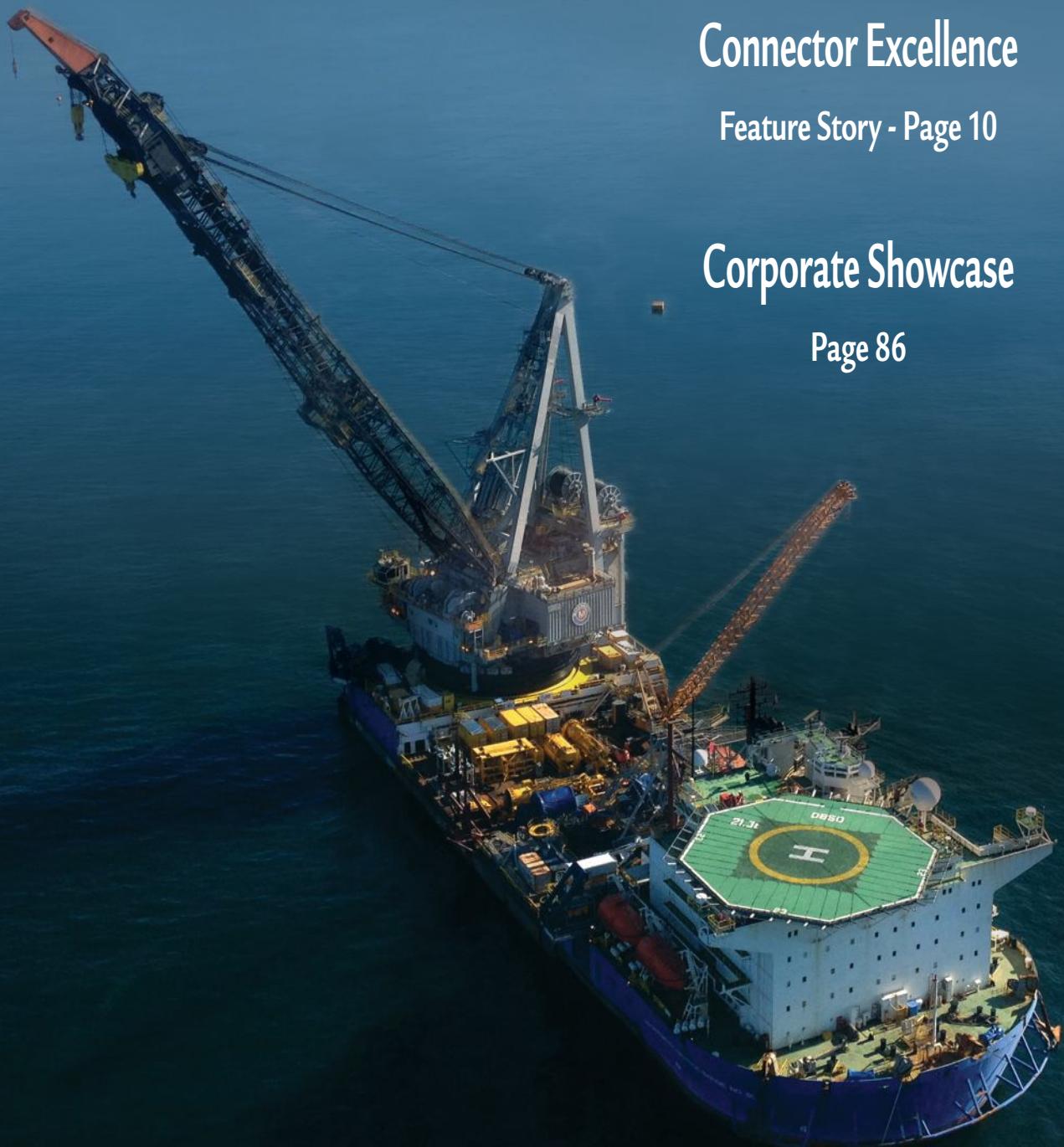
September 2014 www.oceannews.com

& TECHNOLOGY

**SEACON: 46 Years of Subsea
Connector Excellence**

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The background features two ROVs against a dark, watery background. A large yellow and black ROV is positioned in the upper right, partially submerged. A smaller, dark-colored ROV is in the lower left, also partially submerged. Both ROVs have propellers and cameras.

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SAAB

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Offshore Industry



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The McDermott heavy-lift vessel, Derrick Barge 50. (See pg 46)
Photo courtesy of Business Wire.

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OCEAN NEWS & TECHNOLOGY

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- Marine Communications Survey & Exploration Services



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A large, dark blue whale is positioned vertically in the center of the frame, facing upwards. Its head is at the top, showing white spots on its blowhole area. Below it, another whale's tail and part of its body are visible, also oriented upwards. The background is a clear, deep blue.

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EDITORIAL

By John Manock



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Commercial Submarine Cables May Go Green for Science

This month, Taiwan will conduct a public test of its submarine cable-based tsunami warning system as part of Taiwan's National Disaster Prevention Day. The 45-km cable network features broadband seismographs; acceleration seismographs; tsunami pressure gauges; conductivity, temperature, and depth (CTD) sensors; and underwater microphones.

As far as submarine fiber optic networks for scientific applications go, this system is a big one. There are only a handful of cabled ocean observing systems in the world, and they are small in scale. This is not surprising as submarine cable systems are very expensive. Those used for scientific purposes are focused on a regional public safety requirement, such as is the case with Taiwan, or to study an area of the ocean that has particular scientific interest.

By comparison, the global submarine fiber optic cable network for telecommunications traffic is gigantic, spanning the globe with hundreds of thousands of kilometers in every ocean. Imagine if this could be used for scientific purposes? We can only speculate on how much data could be generated by such a network.

However, there are those who are doing more than speculating. The International Telecommunications Union (ITU), a UN agency that coordinates a variety of global telecom issues, including technical standards, is pursuing the concept of "green cables." The basic idea behind green cables is to include sensors to monitor climate and hazard conditions as standard equipment in the repeaters used for commercial subsea telecom cables. Potentially, this would provide a huge amount of data that could advance our understanding of the ocean and climate.

In 2011, the ITU, along with the UN's World Meteorological Organization and UNESCO's Intergovernmental Oceanographic Commission, formed the Joint Task Force (JTF) on Green Cables Systems. The JTF currently has two studies underway. One is to establish the functional and engineering requirements of sensors. It is planned to start modestly, with temperature, pressure, and acceleration sensors and potentially adding an acoustic modem or hydrophone in the future. The second study is to provide a solid business case for submarine fiber optic cable systems suppliers. This, of course, is critically important to the effort.

Stephen Lentz, Director of Network Development for Ocean Specialists Inc. (OSI), is one of the people working on

the Green Cable Initiative. I spoke with him recently, and he summed up the opportunities and challenges nicely.

"Green cable systems are quite an interesting concept," Lentz said. "The three sensor types—temperature, pressure, and acceleration—can monitor sea level, climate, earthquakes, and tsunamis. From a technology perspective, we have the capability to build these systems today, or at least in the very near future. However, the commercial, legal, and funding challenges are significant, and it will be a slow process to address each of these."

The submarine fiber optic cable industry has been around for about 30 years. While the pace of technology, particularly in terms of being able to move larger and larger amounts of data more quickly, has advanced at a rate that, at times, could be described as "break-neck," much of the way in which the industry operates has changed little. There will be those who will resist the effort to change the system, even for the addition of a few sensors into a repeater. Their perspective is a valid one. It is based on the fact that the primary purpose of a submarine fiber optic cable is to carry telecom traffic from one point to another. Gathering scientific data is outside that scope.

The perspective of those who study the ocean, however, is very different. They see the need to understand the ocean as vital to our future. Wouldn't the addition of a few sensors in a repeater, especially as it would not impact the cable's primary function of delivering telecom traffic, be worth the effort?

There is an online interactive map of the global submarine cable network that has been getting a lot of public interest of late. Most of the interest involves gushing over the vastness of the network, which few outside of the industry appreciated until they saw the visual representation. To me, however, thinking about the green cable concept, the map shows not the vastness of the network but the opportunity to gather knowledge. Compare the hundreds of thousands of kilometers of submarine fiber optic cable around the world to the handful of tiny undersea research networks that have been installed to date (which would barely register on the map), and you start to appreciate the potential scientific value of the global network. It may prove to be too good of an opportunity let to pass by.

For more information, visit <http://itu4u.wordpress.com/2014/07/01/green-cables-for-climate-monitoring-and-disaster-warning/>.

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SEACON: 46 YEARS OF SUBSEA CONNECTOR EXCELLENCE

U.S. Company Now Has a Swiss Corporate Parent

History

SEACON began life in 1968 as a very small firm in El Cajon, California, manufacturing electrical connectors for cables used in classified U.S. Department of Defense projects and university oceanographic research. In the intervening 46 years, the company's product line has grown exponentially to include underwater mateable, wet pluggable (metal shell and rubber), moist mate, and dry mate product categories of electrical and fiber-optic connectors. Applications have increased proportionately and now include offshore oil and gas exploration and production, under-sea vehicle operation and research, geophysical survey, and telecommunications. Along the way, the company has become a full-service organization, able to take a product from R&D through design, prototyping, test/evaluation, manufacture, installation, and service. The company's field service department dispatches a trained technician anywhere in the world within a day, from depots in Texas and Brazil. The small staff of 1968 has expanded to more than 800 employees in several countries today.



Product Range

SEACON underwater mateable connector lines include:

- Pressure-Balanced Oil Filled (PBOF) CM2000 electrical connectors, working at up to 7,000 m, in applications including subsea control systems, blowout preventers, seismic exploration, Floating Production Storage and Offloading (FPSO) vessels, classified military programs, and deepwater drilling.
- Hydralight Pressure-Balanced Oil-Filled (PBOF) fiber-optic connectors, working at up to 3,000 m depths, in high-speed communications, production control, pumping and sensing systems, and riser and Permanent Reservoir Monitoring (PRM) systems.
- The Hydralight is a 6- to 48-channel Angle Polished Contact (APC) optical and 1- to 4- channel 1kVAC electrical underwater mateable connector. It is oil-filled and pressure-balanced, working at depths up to 3,000 m. Applications include high-speed communications, production control, pumping and sensing systems, and riser and PRM systems.



SEACON's Hydralight.

• G3 fiber-optic connector, working to 10,000 m, used in high-speed communications; fiber sensing; production control; space-restricted applications; Christmas Tree/tubing hanger systems; and Distributed Temperature Sensing (DTS), Distributed Pressure Sensing (DPS), and Distributed Acoustic Sensing (DAS) systems.

Metal Shell Wet Pluggable connectors include the SEA-MATE electrical connector, working to 6,000 m, for applications including diver communications, UWTV, lights, ROV and ship-to-shore communications, drilling systems, and umbilical links for ROVs and submarines.

SEACON Rubber Wet Pluggable electrical connectors include Wet-Con, All-Wet, Micro Wet-Con, and Globe-Con (Wet Mate version), working at depths to 13,000 m in applications including ROV operations, instrumentation, lights/cameras, UWTV, and internal control pods.

Moist-Mate connectors work to 13,000 m (pressure-balanced versions are available). Special versions of these connectors can be ordered to meet high-voltage requirements working in high-humidity environments. Applications include underwater seismic arrays, land-based seismic exploration, and oil and gas distribution systems.

SEACON dry mate connectors include the Mini-Con, Metal Shell, and API-compliant Metal Shell Series; 55 Series; Hummer; Globe-Con; Rubber Molded; Glass Reinforced Epoxy (GRE); CS-MS; Micro Mini-Con; and 66 series. They work at depths to 13,000 m, depending on material selection, and applications include control systems, BOPs, BOP riser monitoring/drilling control/wellhead and Christmas Tree monitoring, and FPSO vessels.

Recent Company Developments

2014 has been an eventful year for SEACON in two major respects — corporate ownership and technology development.

In July, 2014, SEACON, privately held for 46 years, was acquired by TE Connectivity, a \$13 billion Swiss company. TE designs and manufactures components of electronic connections for industries including automotive, energy and industrial, broadband communications, consumer devices, healthcare, and aerospace and defense. TE has 90,000 employees in over 50 countries. TE will bring an enhanced global sales and marketing network, as well as organic technical resources that SEACON will be able to leverage.

In the technology area, advances have been made in the areas of lower-cost connectors for alternative energy generation, connectors for subsea gas compression, American Petroleum Institute (API) compliance testing, and an adaptation of an existing connector line for use in explosive environments.

Wave & Tidal Electrical Power Generation

Given the finite nature of non-renewable energy sources such as oil and gas, global interest in alternative marine renewable energy sources — for example, wave and tidal energy — has dramatically increased over the last 10 years. Conceptual wave and tidal electrical power generators are now being developed in multiple countries.

An international collaboration centered in Orkney, Scotland is funded by the UK Government and international commercial interests to develop a commercially viable method of generating wave and tidal electrical energy fed through purpose-designed connectors to connect into the UK National Grid. SEACON is providing connector expertise to the project.

FEATURE STORY

Company engineers realized that despite an existing wide range of wet-mate and fiber-optic connector types, to be a viable OEM in the marine renewable energy market, SEACON needed to develop a new, lower-cost power connector. The main project requirement is for 6.6kV, 100-amp, wet- and dry-mate connectors.

SEACON's goal is to create a reliable new shallow-water (i.e., 30 to 60 m working depth) electrical connector that will function long-term (up to 25 years) at approximately 50% of the cost of currently available deep-ocean wet-mate and fiber-optic connectors, without compromising performance. SEACON expects to achieve this by applying its existing proprietary underwater mateable CM2000 electrical and Hydralight fiber optic connectors.

A SEACON-developed 6.6kV, 250-amp Hybrid connector currently called the CM2000 HB has been purpose-designed for the marine renewable energy application and is expected to be available early in 2015. The connector incorporates four power and four optical circuits into a single shell and will utilize existing, proven connection methods. It requires far less space than two individual circuits (connectors). The Hybrid will be tested to ensure that it delivers acceptable long-term performance characteristics despite the demands of the projected harsh working environment. Use of existing components, careful material selection, and designing the product for ease of installation should minimize costs.

SEACON plans to rate the CM2000 HB to handle more than 2MW at 6.6kV AC or more than 1MW at 3.3kV AC; 250 amps equates to approximately 2.3MW. Present generators

are rated at about 1MW, with plans to go to 1.5MW in the near future. Therefore, the new connector will be compatible with generators of considerably higher output than found at the present time.

API Compliance Testing

Also in 2014, SEACON improved its Metal Shell Series connector range, which has been in production since the 1960s and is rated for full-ocean-depth pressure; it now meets the American Petroleum Institute requirements for design and testing in compliance with API Standards API 16D and 17E. Results were favorable, and the next step is to include third-party witness certification for the testing process.

Connectors for Use in Explosive Environments

SEACON has developed a new EXD (explosive gas environment) connector based upon the established SEA-MATE electrical connector, suitable for applications including topside FPSO and drilling vessels. The EXD is currently awaiting certification.

Conclusion

SEACON has prospered over nearly the last half-century by practicing the philosophy that to succeed in business, it is essential to listen to the customer. When a customer articulates a need, SEACON has done whatever was possible to meet that requirement. Sometimes that has involved adapting an existing SEACON product, other times the requirement has sparked the need for R&D to explore the feasibility and



SEACON's CM2000 Connector.

are rated at about 1MW, with plans to go to 1.5MW in the near future. Therefore, the new connector will be compatible with generators of considerably higher output than found at the present time.

Gas Compression Capabilities

TE Connectivity, through its recently acquired businesses, SEACON and DEUTSCH, can provide connectors for subsea gas compression processes. TE DEUTSCH builds wet-mate electrical HV and LV connectors, and SEACON produces wet-mate optical and electrical dry mate connectors. SEACON electro-optical connectors have the flexibility to work with virtually any vendor's cable. Gas compression is significant because of its potential to deliver increased recovery, accelerated production, and operational flexibility to producing fields. Gas com-



SEACON's API-Connector.

develop a new product, and in others the cost made the investment impractical. But even in cases where SEACON could not provide a solution, a dialogue was established with the customer that would continue into future collaborations.

About the Author:

Michael Mulcahy, president of Michael Mulcahy & Associates, Inc., is a former U.S. Navy officer and former Sea Technology Magazine managing editor. He has written more than 100 ocean science and engineering articles. His interests include undersea connectors and cables, marine engineering, naval architecture, commercial diving, ROV operations, and ship salvage engineering. He is a graduate of the University of North Carolina at Chapel Hill.

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Leaders in Underwater Connector Technology and System Solutions

OCEAN INDUSTRY

Woods Hole Group awarded multi-year operation and maintenance contract to support NOAA PORTS®

Woods Hole Group will be working with the National Oceanic and Atmospheric Administration, Center for Operational Oceanographic Products and Services (NOAA CO-OPS) for the operation and maintenance of physical oceanographic real-time system (PORTS®) along the East Coast of the U.S. and along the Gulf of Mexico coast in Texas and Louisiana. NOAA PORTS® is a network of sensors in ports and harbors providing access to information improving maritime commerce and safety.

This is a 5-year contract award including NOAA PORTS® annual operations and maintenance tasks prescribed by NOAA CO-OPS standard operating procedures in the following locations:

- Narragansett Bay
- New London, Connecticut
- New Haven, Connecticut
- New York/New Jersey Harbor
- Delaware River and Bay
- Upper Chesapeake Bay
- Lower Chesapeake Bay
- Charleston Harbor
- Lake Charles, Louisiana
- Houston-Galveston, Texas

Woods Hole Group also was awarded the 5 year Operation and Maintenance Contract to support four NOAA National Water Level Observation Network (NWLON) stations in Texas.

Woods Hole Group will work with its partner, the Conrad Blucher Institute (CBI) for Surveying and Science from Texas A&M University-Corpus Christi, on the work in Gulf of Mexico. CBI (<http://www.cbi.tamucc.edu/>) has a 20-year history of performing this type of work for NOAA and others. CBI conducts innovative research and encourages scientists, professional engineers, and surveyors to develop accurate scientific spatial measurements, and apply technology solutions relevant to the geospatial sciences and issues associated with the Gulf of Mexico region. CBI is home to the largest endowed Geographic Information Science (GISc) program in the U.S.

These systems provide invaluable information to users of the waterways, including the shipping industry, tug services, military personnel, cruise ships, commercial and recreational fisherman, and academic institutions. These systems provide access to real-time quality controlled data (every 6 min) that facilitate safe navigation and promote greater understanding of the waterway system and its environment for research and engineering purposes. With knowledge of water depths, current speeds and direction, the distance from the water surface to overhead bridge superstructure, and other information, ship pilots can navigate safely and more efficiently. The PORTS® systems are intended to reduce the risk of accident and improve maritime commerce. Economic studies also demonstrate that PORTS® reduces groundings by 50% and generates more than \$50 million in annual efficiency benefits.

Woods Hole Group is the leading PORTS® management expert, currently maintaining more than one hundred PORTS® stations along the East Coast and Gulf of Mexico.

For more information, visit www.whgrp.com.



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FUGRO awarded additional contract for MH370 search

The Australian Transport Safety Bureau (ATSB) has awarded Fugro an additional contract for the deployment of two specialist vessels, equipment and expertise in the deepwater search for the missing Malaysia Airlines flight 370 (MH370). Fugro will mobilize its vessels Fugro Equator and Fugro Discovery, both fitted with specialist deep tow survey systems for the work. Since June, the Fugro Equator has been involved in the bathymetric survey of the search area. Fugro and ATSB expect the Fugro Discovery to begin the deep tow search late September with Fugro Equator joining shortly thereafter. The search is expected to take up to 12 months but will understandably end if the missing aircraft is found beforehand. The Australian Government has allocated has AUS \$ 60 million to the ATSB to carry out the search for MH370.

2H Offshore joins deepwater mining consortium

2H Offshore, an Acteon company, has joined an international European consortium comprising 19 leading industry and research organisations to develop deepwater mining solutions. Over the next 4 years, the European Commission funded project, known as Blue Mining, is developing seabed mining practices by creating new cost-effective solutions for environmentally friendly mining and processing in challenging and extreme environments. The Blue Mining project aims to unlock the huge potential of raw materials in untapped areas of the oceans. 2H Offshore has a key role in the development of the vertical transport system and will be working closely with the other consortium members to develop novel methods for correctly simulating the response of the system.

Benthos aviation pinger line sold to RJE

RJE International, Inc. and Teledyne Benthos jointly announced the sale of the Benthos aviation pinger product line, which includes the ELP-362D Underwater Locator Beacon, to RJE. In this transaction, the Benthos intellectual property related to the manufacturing of underwater locator pingers for aviation "black boxes" and associated accessories has been sold to RJE, who will build and manufacture pingers for the aviation market. Benthos has manufactured FAA-approved pingers since it acquired the technology in 1999. RJE has been an active master distributor of undersea location equipment since 1991. Benthos will retain all other technologies in its undersea location, positioning and communications lines, including pinger beacons, locators and transponders for marine applications. RJE will continue to support the diverse products it manufactures or distributes.

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Woods Hole Group names Bob Hamilton president

Woods Hole Group, Inc., announced the appointment of Robert P. Hamilton Jr. ("Bob") to president of the organization, effective immediately to lead the next stage of growth. Dennis Aubrey, who served as president since 2001 transitioned the office to Bob and will serve as CEO.

Hamilton has been with the company since 1994, most recently as V.P. for business development. Under his leadership, Woods Hole Group continued to build a strong backlog with multi-year contractual commitments. Bob had previously served as civil/coastal engineer, business unit director, and V.P. for scientific operations. In his new role, he will oversee operations for the Company's four offices in Massachusetts, Delaware, Florida, and Texas.

Building on the sales growth and profitability in recent years, Hamilton identifies priorities for the business as retaining and attracting personnel, adding financial



strength, and growing revenue. Key areas for growth are related to climate change planning, offshore energy development, and ecological services.

Hamilton received a B.S. in Civil Engineering from Lehigh University and a Masters in Civil Engineering from the Center for Applied Coastal Research at the University of Delaware.

Greenpeace ship Arctic Sunrise departs Russian port after 10 months in custody

More than 300 days after it was illegally boarded following a high profile peaceful protest against Arctic oil drilling, the Greenpeace ship Arctic Sunrise has finally departed Murmansk, Russia en route for its home port of Amsterdam.

The icebreaker has been held in custody since the 'Arctic 30' were apprehended on 19 September 2013. On 6 June 2014, Russia's Investigative Committee informed Greenpeace International that it was annulling the arrest of the Arctic Sunrise. A Greenpeace crew, led by Captain Daniel Rizzotti, finally gained access to the Arctic Sunrise on June 27th, and has spent 3 weeks making the ship seaworthy after finding considerable disorder on board.

ABS and MPA ink MOU to collaborate on maritime R&D

ABS and the Maritime and Port Authority of Singapore (MPA) signed a memorandum of understanding (MOU) to promote maritime research and development (R&D) and innovation.

Over the next 5 years, ABS and MPA will collaborate on maritime R&D in the areas of alternative/clean fuel and developing resilient, next-generation port systems. Both parties will also commit to promote and share maritime thought leadership on technology.

"For more than 50 years, ABS has been committed to working alongside the MPA, industry and academia to foster the safe and environmentally responsible growth of the Singapore marine and offshore industries," said ABS chairman and CEO Christopher J. Wiernicki. "This MOU is a further sign of our commitment to work with all stakeholders in this growing hub of global trade to further R&D efforts that provide practical solutions to today's most pressing challenges."

This latest agreement builds upon ABS-MPA Maritime Technology Professorship program at the Singapore University of Technology and Design.

September 2014

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Ocean News & Technology

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Maritime Administration and the American Bureau of Shipping sign memorandum of agreement

The U.S. Department of Transportation's Maritime Administration (MARAD) and the American Bureau of Shipping (ABS) have signed a new Memorandum of Agreement (MOA) establishing policies and procedures for the survey and classification of MARAD's National Defense Reserve Fleet (NDRF). The MOA establishes a charter that improves the timelines, efficiency and cost effectiveness for surveys and updates terminology, references and regulations. The ABS is a classification society that develops and verifies standards for the design, construction and operational maintenance of marine vessels and offshore structures. The NDRF includes the Ready Reserve Force, federal and state maritime academy training ships, and other unique purpose vessels that are maintained by MARAD for national defense and national emergency purposes.

ABS chosen to class the world's first CNG ship

ABS, a leading provider of global marine classification services, has been chosen to class the world's first compressed natural gas (CNG) carrier ordered by Pelayaran Bahtera Adhiguna, a subsidiary of Indonesia's state-owned power company Perusahaan Listrik Negara (PT PLN). The award for the precedent-setting ship is the latest example of ABS' leadership in the gas ship sector, where the largest share of LNG ships is presently being built to its classification standards. The CNG ship has been designed by China's CIMC Ocean Engineering Design & Research Institute.

Bollinger's Port Fourchon facility goes 13 years without a lost time accident

Bollinger Shipyards, Inc. announced that their Bollinger Fourchon, L.L.C. facility has worked 13 years without a lost time accident. Building on a philosophy that starts at the top, Bollinger Shipyards strives for "0" accidents. Workforce, contractors, and customer safety is priority and an evident core component of facility operations. Through dedication of top management, a proactive workforce, and comprehensive safety program, Bollinger Shipyards continues to achieve high safety objectives. In April 2014, Bollinger was awarded the 2013 "Award for Excellence in Safety" by the Shipbuilders Council of America for the ninth consecutive year. The Shipbuilders Council represents over 120 shipyards located throughout the U.S. In May 2014, Bollinger announced the Bollinger Fourchon North expansion, a 50-acre complex strategically located in the middle of the nation's busiest oil & gas support hub. Bollinger Fourchon North is estimated to be completed in the first quarter of 2015 and has all of the key elements and services for the demanding oil & gas support vessel and service company industry, including a seasoned work force, multiple modern dry-docks, ample lifting capacity with mobile crane units, secure business complex for customers, regulatory agencies and vendors, large fabrication shop, warehouse, secure lay-down area and staging area for projects.

New report on ship accidents in the Baltic Sea 2012 released by HELCOM

A new HELCOM report focusing on the shipping accidents in 2012 in the Baltic Sea area as well as for the longer term data series for 2004–2012 has been published. The annual report compiled by the HELCOM Secretariat is based on the national reports of the 2012 shipping accidents by all HELCOM member countries, including all the Baltic Sea coastal states: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russian Federation and Sweden. According to the reports from the HELCOM members, 149 ship accidents occurred in the Baltic Sea area in 2012. The total number of accidents in the Baltic Sea has been slightly increasing in the last 3 years. Based on the ship movement statistics provided by the regional HELCOM Automated Identification Network (AIS) network, the overall ship traffic in 2012 stayed approximately at the same level as in 2011, an increase from the lower traffic levels in 2009 and 2010. Other findings of the report state that in 2012 there were no reported collisions in the Gulf of Finland and the human element was the main cause of all accidents in the region. Annual reports on shipping accidents in the whole Baltic Sea area have been compiled by HELCOM since 2000. According to the agreed procedure all accidents are reported irrespectively if there was pollution or not.

Largest vessel in the world to be completed in the port of Rotterdam



The Pieter Schelte, the biggest vessel in the world, is to be completed in the port of Rotterdam. Owner and designer Allseas and the Port of Rotterdam Authority have signed an agreement to this effect. The plan is for the Pieter Schelte to arrive in Rotterdam at the end of 2014.

The Pieter Schelte is 382 m long and 124 m wide. The length, in combination with the massive width, makes this vessel unique. It is intended for installing and removing topsides and jackets of large offshore oil and gas platforms in a single lift. At the bow of the vessel is a slot where topsides are lifted. The vessel is also equipped for laying large pipelines and, with her capacity, will be the largest pipelay vessel as well. The vessel can lift topsides of offshore platforms weighing up to 48,000 tonnes and jackets up to 25,000 tonnes.

Final assembly will take place in the Alexiahaven. The inner lake of Maasvlakte 2 currently provides the necessary space. A special pit will be dredged there for the vessel. In the port of Rotterdam, the 65-m long beams of the topsides lift system will be installed. The lifting beams are being constructed in Italy and will be transported by ship to the Netherlands.

"The construction of the Pieter Schelte means a great boost for the maritime industry. We're proud that Allseas is responsible for this innovation and pleased that the port of Rotterdam can make a contribution. It's in line with the Port Authority's endeavour to develop the port further as a centre of the global maritime industry," according to Allard Castelein, chief executive of the Port Authority.

Allseas is world leader in offshore pipeline installation and subsea construction. The company employs over 2,500 people worldwide and has installed over 18,000 km of sub-sea pipelines.

Maaskant Shipyards Stellendam delivers custom built offshore chasers

The delivery of the 7-Oceans to offshore services company Rederij Groen (Scheveningen, the Netherlands) marks a new milestone in offshore support vessel construction. The vessels have been designed in close cooperation with both Rederij Groen and their customer. The seismic research support vessel is constructed by Maaskant Shipyards



Stellendam, part of Damen Shipyards Group, and the first of a series of three identical vessels.

Charterer Dolphin Geophysical opted for a 35-m design from Vestvaerftet in Denmark. This design is even closer to a fishing vessel compared to the two 40-m newbuilds Maaskant delivered to Rederij Groen last year.

For optimal manoeuvrability, two Veth azimuth stern drives (ASD) were chosen. They are each driven by an active front end, frequency controlled electric motor of 500 kW each. Power is generated by three Caterpillar C18 generator sets of 525 kVA. Also, a 90 kW

electric bow thruster is fitted. Accommodation is arranged for a crew of six with extra capacity for eight service crew. The electronic package complies with an A4 service area, which enables the vessel, in combination with the ICE-class notation, to operate in Arctic areas.

The deck arrangement is similar to the earlier delivered SRSV's Astra-G and Aquarius-G, which have been proven to be efficient in their first year of operation.

For more information, visit www.damen.com.

North Sea Atlantic joins the Technip fleet

A ceremony was held in Bergen to officially name the latest new subsea construction vessel to join the Technip fleet, the North Sea Atlantic.

The event was hosted by North Sea Shipping CEO, Hallvard Klepsvik, and his wife, Sigrid Anne Våge, acted as the vessel godmother.

Technip announced in 2012 that it had signed a long-term charter agreement with

North Sea Shipping for an advanced new build construction vessel. During the 2-year construction period, teams from the two companies worked together closely to ensure the project was delivered to expectations. Designed to Technip's specifications, this multi-purpose vessel is capable of undertaking pipelay, subsea construction and IRM projects.

The vessel's design meets the highest requirements for subsea work and although she will work predominantly in the North Sea, she is also suitable for deepwater operations worldwide. This advanced DP class 3 vessel is equipped with a 550 Te active heave-compensated crane and a 2,000 Te underdeck carousel for product storage. She can accommodate an Openable Vertical Lay System for pipelay of flexibles and umbilicals.

Following final commissioning and trials, North Sea Atlantic is scheduled to commence her first projects working in the Norwegian sector of the North Sea from August 2014, followed by projects in the UK North Sea.

For more information, visit www.technip.com.

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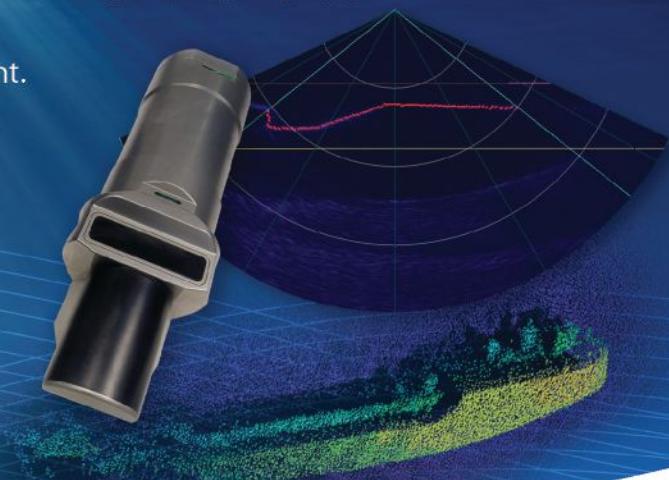
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Wärtsilä wins ship design contract for environmentally sound Gulf of Bothnia ferry

Wärtsilä has been selected as the partner for designing a new ferry as part of the “Midway Alignment of the Bothnian Corridor” project. The scope of the design work will be both initial and basic design. The ferry is designed for sailing between Vaasa in Finland and Umeå in Sweden across the Gulf of Bothnia in the Baltic Sea.



The new vessel is required to be innovative, efficient and environmentally sound. Wärtsilä's solid track record in innovative solutions and technology together with extensive experience in gas fuelled propulsion were important factors in the award of this contract. The design will also take into account the need for operational flexibility since the transport demands on this route vary from season to season. The demand for cargo transports is quite stable in the course of the year while passenger traffic peaks during the summer, therefore flexibility will be important in the concept. Therefore, during peak periods the ferry will run to a tighter schedule than is required at other times when the speed can be reduced in order to save fuel costs. Ice conditions during winter months can be quite severe and the design work needs also to consider the operations during harsh winters.

The ship design phase is scheduled to be finalized by the end of the 2nd quarter in 2015.

For more information, visit www.wartsila.com.

WFS subsea wireless solution for MARIN testing basin

MARIN's seakeeping and maneuvering basin, based in Wageningen, the Netherlands, is one of seven model testing facilities used for testing scale models of both surface and underwater vehicles. The basin is a huge model test facility, measuring 170 m x 40 m x 5 m, with state-of-the-art wave makers and wave absorbers offering the capability

to test a vehicle in uni- and multi-directional waves from various directions.

The purpose of tests in the basin is to quantify and demonstrate the behavior and performance of a vessel under particular conditions. Each vessel goes through an extensive series of tests and refinements to ensure that its physical characteristics are all optimized to produce the desired results.

MARIN approached WFS with a requirement for a wireless data link to allow communications to and from (moving) underwater vessels in their Seakeeping and Maneuvring basin. The wireless data link would be used to control the vehicle in the tank at up to 7 m range, and also to retrieve data from the onboard instrumentation to optimize behavior and performance.

The solution was delivered using a broadband data link from the seatooth® family of subsea wireless instruments from WFS, enabling a high rate of data to be transmitted over a short range, underwater. seatooth® can provide a reliable wireless communications link in the most challenging subsea environments.

For testing moving underwater vessels, a hard wired method of communication (and control) is not practical. Wires between a free sailing vessel and a monitoring system will also introduce extra drag, which is both undesired in testing and will affect the accuracy of the test results. A wireless link like seatooth® enables continuous monitoring for safety and efficiency and is preferable because it provides both continuous information and the opportunity to intervene on a real-time basis if required.

For more information, visit www.wfs-tech.com.

Underwater bow thruster seals replaced in Poland without hindering cargo operations

At the end of June, a Hydrex team replaced the three leaking bow thruster shaft seals of a 400-m container ship in Gdansk, Poland. The operation was performed on-site and underwater using the company's flexible mobdocks. The vessel was able to continue its commercial activities without any hindrance or delay.

Together with all the necessary equipment, the diver/technicians mobilized from the Hydrex fast response center in Antwerp to the vessel's location. After they set up a monitoring station on the quay, the divers started the operation by removing the rope guard covering the thruster seals. They could then perform a detailed inspection of the



seal assembly and make a good assessment of the damage.

The divers removed the first seal and replaced it with a new one that was then bonded. This procedure was repeated with the other two damaged seals. All seals showed cuts at the underside, which had caused the oil leak.

The operation ended with successful leakage tests, the reinstallation of the rope guard and the removal of the flexible mobdocks.

For more information, visit www.hydrex.be.

Marine Jet Power makes breakthrough in Gulf of Mexico crewboat sector

Successful sea trials of Rodi Marine's newest crewboat the M/V Riley Claire have given Marine Jet Power a breakthrough in the fiercely competitive Gulf of Mexico crewboat market. The trial results show that all performance predictions were reached and the product is ideal for this application.

Four MJP 650 CSU waterjets power the new 175 ft (53.34 m) DP2 Certified Crewboat built for Rodi Marine in Layfayette, Louisiana by Swiftships LLC in Morgan City, Louisiana. During sea trials in June, the M/V Riley Claire reached a top speed of 30.3 kts in lightship condition and 24.0 kts fully laden. The vessel's MJP waterjets are powered by four Cummins QSK 50 engines each producing 1800 HP at 1900 RPM and connected through Twin Disc MGX 6848 gearboxes at a 2.03:1 Ratio.

M/V Riley Claire, a USCG Subchapter T and ABS-classed all aluminum fast crew boat is 175 ft in length, has a beam of 25 ft and a molded depth of 13 ft 6 in. While working in the Gulf of Mexico and servicing the offshore oil market she carries a total of 34,500 gallons of diesel and 20,500 gallons of water for operating and an additional 6,700 gallons of diesel and 1,230 gallons of freshwater for the rigs. She is certified to carry 70 passengers and 10 crewmembers.

For more information, visit www.marinejetpower.com.

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OCEAN ENGINEERING 101: Moisture Control in Subsea Housings

By: Kevin Hardy, Global Ocean Design

Excess water vapor in a sealed housing can cause system failure at depth. Condensation due to cold temperatures can fog a camera viewport or short circuit electronic boards. It can cost a researcher his data, “The Shot” from a camera, or even the instrument itself. Prudent designers will provide a means to proactively remove entrained moisture before deployment.

Background Science

The two factors that determine how much water vapor is in the air are 1) the source of water, and 2) the amount of heat available to cause evaporation.

Any closed rigid volume, such as a pressure case, sealed in a warm, moist environment such as on a ship, will contain some amount of water vapor. The volume of any closed pressure-resistant case will remain essentially constant. Changes in ambient temperature will produce small variations in internal air pressure due to the interior air expanding or contracting. However, the change of ambient temperature will have the greatest effect on the entrapped water vapor.

As an instrument descends deeper into a cold ocean, the instrument cools. For a given amount of water vapor captured at warm temperatures in a housing at the surface, the temperature in the deep sea can easily drop below the “dew point temperature,” the minimum temperature needed to keep that moisture vapor in suspension. At the dew point, the relative humidity will be 100% (figure 1.). At the moment the temperature drops another degree, the housing will fill with fog, as water vapor condenses on everything—circuit boards, camera lenses, and the housing interior walls.

By reducing the amount of water vapor present, the dew point temperature can be lowered to below the coldest temperatures found in the ocean.

Application

There are two approaches to reducing water vapor: use of desiccants and exchange of dry air.

Desiccants

Desiccants are hygroscopic materials that absorb water molecules on contact, reducing the amount of moisture present. Desiccants themselves are chemically inert and, therefore, not a hazardous material. They can be carried on board commercial aircraft without concern, though it is advisable to include an MSDS with the product to inform the TSA about the chemical. Desiccants can include a humidity indicator, which change color with the degree of water saturation. One common indicator changes color from blue (fresh) to purple to pink (used). This is very helpful in at-sea operations, giving a visual indicator to personnel preparing the device for deployment.

There are two methods of employing desiccants: passive and dynamic.

The *passive* method simply involves strapping desiccant packages onto the interior frame using a cable tie. Many companies, including MultiSorb Technologies and DryPack Industries, make these packages in many sizes.

Moisture vapor moves around within the entrained volume of a pressure housing primarily by diffusion. As the moisture is removed from the air surrounding a desiccant pack, nearby water

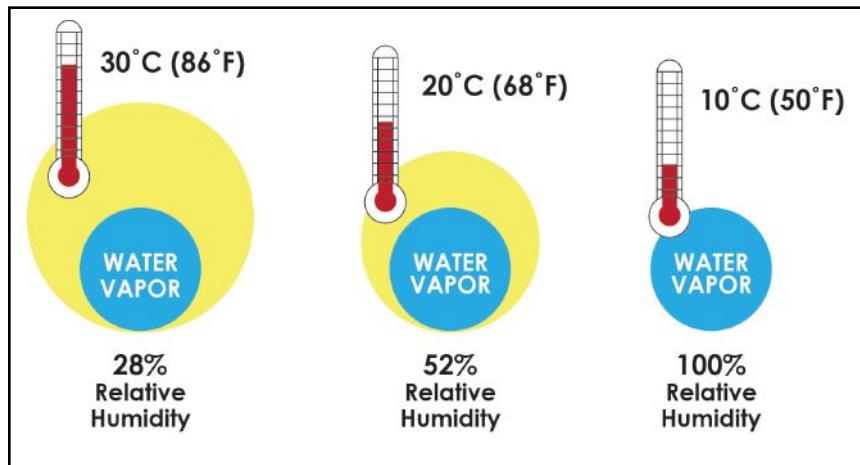


Figure 1. The relationship between relative humidity, temperature, and dew point is shown in this graphic. The actual amount of water vapor (blue) remains the same, but as the temperature decreases, the maximum possible water vapor decreases (yellow). Below the Dew Point Temperature, 50°F in this example, condensation forms. A Dew Point Chart, readily obtained on-line, shows the relationship of Air Temperature, Relative Humidity, and Dew Point over a broad range.

molecules diffuse into the drier region. This takes time, and operators are advised to wait as long as 2 hrs before deployment, time that is not always available.

Use of passive desiccant packs are also useful for capturing outgassing moisture from interior components such as certain polymers, including printed circuit boards, and other materials such as cardboard-covered custom battery packs.

The *dynamic* method involves the use of a vacuum pump as part of a purge system to remove a fraction of the interior air. Care must be exercised to not damage any interior components by pulling too high a vacuum. Generally, removing 1/3 bar is adequate.

With the air partially removed, a negative pressure is created inside the housing as compared to outside. The higher external pressure is used to drive ambient room air through an indicating desiccant chamber, forcing it to lose its moisture. The dry air then enters the sealed housing, mixing with the residual moist air, reducing the overall relative humidity on the interior. The vacuum pump is then used to remove another 1/3 bar of air. Then external air is forced back in, passing again through the desiccant chamber. The interior relative humidity is lowered further by the in-rush of dry air mixing with the residual air. Three or four cycles later, the interior air is as dry as a desert. This technique has proven effective on deployments from inside the Arctic Circle to the bottom of the Challenger Deep in the Mariana Trench.

In a complete system, the use of a self-sealing purge port allows the purge fitting from the purge box to be easily disconnected, while holding a small vacuum within the housing. The self-sealing feature precludes moist exterior air from entering straight through the port, undoing all the work done to purge the system. The small amount of residual vacuum, <1/3 bar differential, beneficially pre-loads the housing seals prior to deployment. Mechanical and electronic sensors can alert the end user to a seal leak and help preclude the

loss of an instrument due to a bad seal.

The vacuum purge system is inherently safe for operation. Once the interior pressure is equalized with the exterior pressure, the flow stops. It is impossible to over-pressurize the interior. The process uses a single port, limiting the number of potential seal failure points. The pressure proof cap can be carefully cleaned, inspected, and replaced.

The vacuum pump can be operated from a universal power supply, allowing operation in any port-o'-call.

One commercial example of this approach is the Model 120 Deck Purge Box from Global Ocean Design (Figure 2). The integrated system incorporates a vacuum pump, universal power supply, U.S. and EU power cords, a three-way valve, desiccant cartridge, vacuum gauge, pressure relief valve, and other advanced features in a small, lightweight Pelican case. It functions with self-sealing purge ports and offers retrofit valves to fit Benthos®

and Vitrovex® spheres, as well purge fittings for Edgetech release housings.

Dry Air Exchange

Dry air may be supplied from 1) a dry SCUBA tank air, 2) dry nitrogen, or 3) a dry refrigerant. It is not advisable to use welding gases or medical oxygen.

Marine air within a housing must be removed in order to replace it with dry air. There are two techniques to do this: a vacuum pump to draw the air out, or displacement using flow-through of a dry gas.

Vacuum Pump: With a vacuum pump, the air is withdrawn from the pressure housing through a single port, lowering the interior air pressure. That air is replaced from a source of dry air, generally a high-pressure compressed gas tank. This method presents several obvious problems:



Figure 2. This Deck Purge Box is an example of a safe and field-tested way to dynamically eliminate excess moisture in undersea instrument housings.

- 1) Safety: it is possible to over-pressurize and rupture a housing;
- 2) Weight and handling: high-pressure bottles are heavy and cumbersome to move about a ship;
- 3) Shipping: high-pressure bottles cannot be shipped full, requiring the bottles be filled on site; and
- 4) Differences in international standards for high pressure fittings may not allow the bottles to be filled on site after all.

Displacement: Another way to purge moist air from a



Figure 3. A self-sealing purge port installed in a glass sphere with the pressure proof cap removed. The center core check valve is seen. With the core check valve sealed, the operator has time to carefully clean and install the face seal o-ring seen on the pressure proof cap in the background.

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housing is to use an inert gas to displace interior air. A heavier-than-air gas can be blown into an upright pressure case, displacing the moist interior air from the bottom up, and the end cap then installed and sealed. No additional seals are required, though the method is less controlled and no partial interior vacuum is retained.

A variation of this method is to place one purge port on each end of the housing, blowing from the compressed dry air source into one end of the pressure housing as the interior air is forced out the other. This mixes the dry air with the moist interior air as it passes through, progressively lowering the interior dew point temperature.

These last two approaches have the advantage of using the high-pressure air to displace the interior air while precluding the danger of over-pressurization. It does require the use of high-pressure air, with the aforementioned shipping dilemmas. The displacement method could use an air pump moving air through a desiccant chamber and into the housing. This would obviate the need for any high-pressure bottles. It does require a second port with the extra seals, and no partial vacuum would remain to pre-load pressure housing seals prior to deployment.

Purge Ports

A “purge port” is a thru-hull fitting that allows for exchange of air between outside and inside. These are also called “vacuum ports.” There are three primary classes of purge ports: open port; self-sealing port; and Pressure Relief Valve (PRV).

The *open port* is simply a hole in the bulkhead behind a sealing plug or seal screw. The sealing plug is generally held in

place by a non-metallic retaining plate and screw. The orifice size is small so the air exchange is restricted, providing a few moments for the operator to install the sealing plug or seal screw while un-dried air is being drawn in by the interior vacuum (Figure 3). Any airflow in or out can compromise the seal by pulling debris across the greased o-ring sealing surface. In seal screw designs, a very small, fine thread, such as a 4-40, is used on the seal screw. This presents the possibility of cross-threading on insertion or over-torqueing and snapping the screw upon installation.

A *self-sealing port* includes an interior check valve that opens when the purge fitting from the purge box is attached and closes when the purge fitting is removed, in a manner similar to a bicycle tire fill valve (Figure 4). It will not seal against ocean pressure, however, and a pressure proof cap is required to protect the plastic valve from exposure to the ocean.

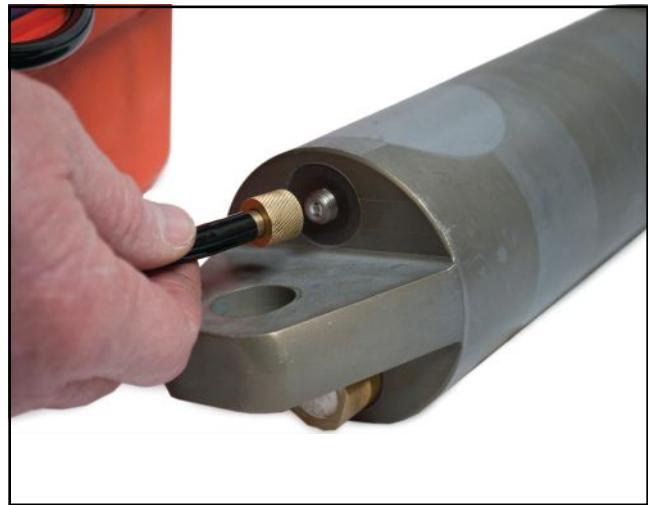


Figure 4. A self-sealing purge port installed in an aluminum pressure case with the pressure proof cap removed. The center core check valve is seen.

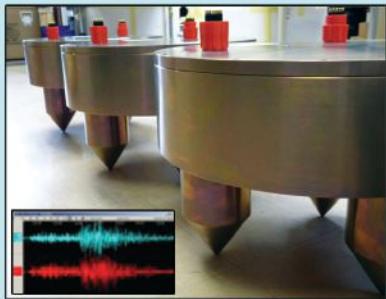
Lastly, a *PRV* is a spring-loaded, one-way check valve designed to relieve internal over-pressure. Internal overpressure may occur with an air-compensated pressurized system returning to the surface or with unexpected battery out-gassing. Some engineers have modified their PRVs to be held open during a purge cycle, allowing a two-way exchange of gasses. Because the interior primary o-ring cannot be inspected or cleaned prior to deployment, there is the possibility that debris may have been carried by the transit of air onto the sealing surface and not removed. Lint, wire insulation, hair strands, or other debris on the sealing surface will compromise the function of the o-ring seal. A more confident solution is to use a PRV for its intended purpose as a safety valve and not as a vacuum or purge port.

The success of at-sea operations can hinge on a field team’s ability to manage water vapor in subsurface equipment prior to deployment. Adding the purge process to the system prep checklist will pay off big rewards in the end.

Further Reading:

Moisture in Electronics (MultiSorb Technologies)
<http://www.multisorb.com/files/9113/4315/2180/article-moisture-in-electronics.pdf>

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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.

Seals use offshore wind turbines as feeding grounds

Offshore wind turbines can provide valuable feeding opportunities for the wildlife population in the area, according to new research carried out by the University of St. Andrews. The study, published in the journal *Current Biology*, found that some seals appeared to deliberately seek out and forage around the structures. The research was carried out by Dr. Deborah Russell, a post-doctoral research fellow at the Scottish Oceans Institute at St. Andrews. Dr. Russell and her fellow researchers gathered data from GPS devices attached to Harbour and Grey seals in the North Sea. The seals' movements around the British and Dutch coasts were tracked, looking in particular at their movements around wind farms and underwater pipelines, and the results were surprising to Dr. Russell. She said, "I was shocked when I first saw the stunning grid pattern of a seal track around Sheringham Shoal"—an offshore wind farm in Norfolk. "You could see that the seal appeared to travel in straight lines between turbines, as if he was checking them out for potential prey and then stopping to forage at certain ones." Dr. Russell added that although the study and its findings are notable, they do not rule out the possibility of adverse impacts of the development or presence of man-made structures on marine wildlife. "The study showed that operational wind farms can provide foraging opportunities for some individuals. However, the study only considered the effect on marine mammals during the operational stage of wind farms," she explained. "It is during the construction phase that wind farms are predicted to have the most dramatic negative effect on marine mammals." "However, future development of such structures "could be designed to maximise any potential ecological benefits to marine wildlife".

NOAA-led study shows Alaska fisheries and communities at risk from ocean acidification

Ocean acidification is driving changes in waters vital to Alaska's valuable commercial fisheries and subsistence way of life, according to new NOAA-led research that will be published online in *Progress in Oceanography*. Many of Alaska's nutritionally and economically valuable marine fisheries are located in waters that are already experiencing ocean acidification and will see more in the near future, the study shows. Communities in southeast and southwest Alaska face the highest risk from ocean acidification because they rely heavily on fisheries that are expected to be most affected by ocean acidification, and have underlying factors that make those communities more vulnerable, such as lower incomes and fewer employment opportunities. The term "ocean acidification" describes the process of ocean water becoming more acidic as a result of absorbing nearly a third of the carbon dioxide released into the atmosphere from human sources. This change in ocean chemistry is affecting marine life, particularly the ability of shellfish, corals and small creatures in the early stages of the food chain to build skeletons or shells. Studies show that red king crab and tanner crab, two important Alaskan fisheries, grow more slowly and don't survive as well in more acidic waters. Alaska's coastal waters are particularly vulnerable to ocean acidification because of cold water that can absorb more carbon dioxide and unique ocean circulation patterns that bring naturally acidic deep ocean waters to the surface. "We went beyond the traditional approach of looking at dollars lost or species impacted; we know these fisheries are lifelines for native communities and what we've learned will help them adapt to a changing ocean environment," said Jeremy Mathis, Ph.D., co-lead author of the study, an oceanographer at NOAA's Pacific Marine Environmental Laboratory in Seattle, and the director of the University of Alaska Fairbanks School of Fisheries and Ocean Sciences Ocean Acidification Research Center. The research presented in the new study examines the potential effects on a state where the fishing industry supports over 100,000 jobs and generates more than \$5 billion in annual revenue and helps maintain the U.S. balance of trade in the global economy. Additionally, approximately 120,000 people or roughly 17% of Alaskans rely on subsistence fisheries for most, if not all of their dietary protein. Fishery-related tourism also brings in \$300 million annually.

Navy, Scripps christens research ship Sally Ride

Credit: U.S. Navy/John F. Williams

The auxiliary general oceanographic research vessel Sally Ride (AGOR 28) was christened 9 August at Dakota Creek Industries, Inc., shipyard in Anacortes, Washington.

Ship's sponsor Dr. Tam O'Shaughnessy broke a bottle across the bow during a christening ceremony. Joining O'Shaughnessy on the platform were Mr. Dick Nelson, president, Dakota Creek Industries, Inc., Matron of Honor; the reverend Dr. Bear Ride, Matron of Honor; Kathleen Ritzman, assistant director, Scripps Institution of Oceanography, University of California San Diego; Kathryn Sullivan, undersecretary of commerce for oceans and atmosphere and administrator, National Oceanic and Atmospheric Administration; and Rear Adm. Matthew Klunder, chief of naval research.

Named after the U.S. astronaut who died in 2012, the Navy's 28th auxiliary general oceanographic research ship will be operated by the Scripps Institution of Oceanography at the University of California in San Diego under a charter-party agreement with the Navy's Office of Naval Research.

The vessel was named after famed astronaut Sally Ride who became famous for launching with the STS-7 crew on space shuttle Challenger in 1983. The first U.S. female astronaut to fly into space, she was only the third woman worldwide to orbit the Earth. After her second launch on the shuttle, Ride left NASA to become a physics professor and a champion for improving science education.

The 238 ft long, 50 ft wide R/V Sally Ride is the second in the Neil Armstrong-class of research vessels and features a modern suite of oceanographic equipment, state-of-the-art acoustic equipment capable of mapping the deepest parts of the oceans, advanced over-the-side handling gear to deploy and retrieve scientific instruments, emissions controls for stack gasses, and new information technology tools both for monitoring shipboard systems and for communicating with land-based sites worldwide.

For more information, visit www.scripps.edu.

GOM 'dead zone' measures over 5,000 sq. mi

The 2014 area of low oxygen, commonly known as the "Dead Zone," measured 5,052 sq. mi as of 1 August 2014. Based on the May nitrogen load from the Mississippi River, the area was predicted by Gene Turner, Louisiana State University, to be 5,708 sq. mi. The size is proportional to the loading of nitrogen in the Mississippi River (in May), and the 2014 size fits well into the model prediction range.

The July distribution of hypoxic waters is most often a single continuous zone along the Louisiana and adjacent Texas shelf, but this year was located in two separate areas. The largest area was off central to southeastern Louisiana between the deltas of the Mississippi and Atchafalaya rivers, and the smaller was off southwestern Louisiana.

The average size for the last 5 years is 5,543 sq. mi and is three times larger than the environmental target approved by a federal/state task force in 2001 and maintained by the same task force in 2008.

These areas are sometimes called “dead zones” because of the absence of commercial quantities of shrimp and fish in the bottom layer. The number of dead zones throughout the world has been increasing in the last several decades and currently totals over 550. The dead zone off the Louisiana coast is the second largest human-caused coastal hypoxic area in the global ocean and stretches from the mouth of the Mississippi River into Texas waters and less often, but increasingly more frequent, east of the Mississippi River.

There is a series of coupled cause-and-effect relationships linking the amount of water emptying into the Gulf of Mexico and water quality in the Mississippi River to hypoxia. The fresher, warmer water in the upper layer is separated from the saltier, colder water in the lower layer, resulting in a barrier to the normal diffusion of oxygen from the surface to the bottom. The excess nutrients delivered by the river stimulate high phytoplankton biomass offshore, which fuels the coastal food web but also contributes to high carbon loading to the bottom layer. The decomposition of this carbon by bacteria leads to the low oxygen that is not resupplied from the surface waters.

For more information, visit www.gulfhypoxia.net.

Huge waves measured for first time in Arctic Ocean

As the climate warms and sea ice retreats, the North is changing. An ice-covered expanse now has a season of increasingly open water that is predicted to extend across the whole Arctic Ocean before the middle of this century. Storms, thus, have the potential to create Arctic swell—huge waves that could add a new and unpredictable element to the region.

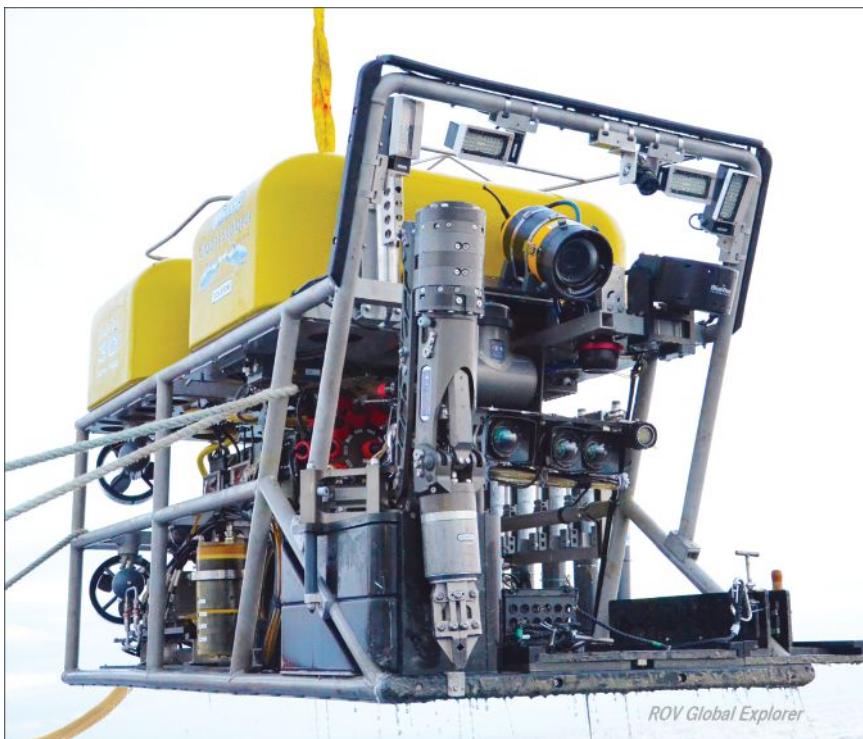
A University of Washington researcher made the first study of waves in the middle of the Arctic Ocean and detected house-sized waves during a

September 2012 storm. The results were recently published in *Geophysical Research Letters*.

“As the Arctic is melting, it’s a pretty simple prediction that the additional open water should make waves,” said lead author Jim Thomson, an oceanographer with the UW Applied Physics Laboratory. His data show that winds in mid-September 2012 created waves of 5 m (16 ft) high during the peak of the storm. The research also traces the

sources of those big waves: high winds, which have always howled through the Arctic, combined with the new reality of open water in summer.

Arctic ice used to retreat less than 100 mi from the shore. In 2012, it retreated more than 1,000 mi. Wind blowing across an expanse of water for a long time creates whitecaps, then small waves, which then slowly consolidate into big swells that carry huge amounts of energy in a single punch.



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This summer Thomson is part of an international group led by the UW that is putting dozens of sensors in the Arctic Ocean to better understand the physics of the sea-ice retreat.

"There are several competing theories for what happens when the waves approach and get in to the ice," Thomson said. "A big part of what we're doing with this program is evaluating those models."

He will be out on Alaska's northern coast from late July until mid-August deploying sensors to track waves. He hopes to learn how wave heights are affected by the weather, ice conditions and amount of open water. "It's going to be a quantum leap in terms of the number of observations, the level of detail and the level of precision" for measuring Arctic Ocean waves, Thomson said. The other author is W. Erick Rogers at the Naval Research Laboratory. The research was funded by the U.S. Office of Naval Research.

For more information, visit www.washington.edu.

Study shows three times more mercury in upper ocean since Industrial Revolution

Although the days of odd behavior among hat makers are a thing of the past, the dangers mercury poses to humans and the environment persist.

Mercury is a naturally occurring element as well as a by-product of such distinctly human enterprises as burning coal and making cement. Estimates of "bioavailable" mercury – forms of the element that can be taken up by animals and humans – play an important role in everything from drafting an international treaty designed to protect humans and the environment from mercury emissions, to establishing public policies behind warnings about seafood consumption.

Yet surprisingly little is known about how much mercury in the environment is the result of human activity, or even how much bioavailable mercury exists in the global ocean. Until now.

A new paper by a group that

includes researchers from the Woods Hole Oceanographic Institution (WHOI), Wright State University, Observatoire Midi-Pyrénées in France, and the Royal Netherlands Institute for Sea Research appears in an edition of the journal *Nature* and provides the first direct calculation of mercury in the global ocean from pollution based on data obtained from 12 sampling cruises over the past 8 years. The work, which was funded by the U.S. National Science Foundation and the European Research Council and led by WHOI marine chemist Carl Lamborg, also provides a look at the global distribution of mercury in the marine environment.

"It would seem that, if we want to regulate the mercury emissions into the environment and in the food we eat, then we should first know how much is there and how much human activity is adding every year," said Lamborg, who has been studying mercury for 24 years. "At the moment, however, there is no way to look at a water sample and tell the difference between mercury that came from pollution and mercury that came from natural sources. Now we have a way to at least separate the bulk contributions of natural and human sources over time."

The group started by looking at data sets that offer detail about oceanic levels of phosphate, a substance that is both better studied than mercury and that behaves in much the same way in the ocean. Phosphate is a nutrient that, like mercury, is taken up into the marine food web by binding with organic material. By determining the ratio of phosphate to mercury in water deeper than 1,000 m (3,300 ft) that has not been in contact with Earth's atmosphere since the Industrial Revolution, the group was able to estimate mercury in the ocean that originated from natural sources such as the breakdown, or "weathering," of rocks on land.

Their findings agreed with what they would expect to see given the known pattern of global ocean circulation. North Atlantic waters, for example, showed the most obvious signs of mercury from pollution because that is where surface waters sink under the influence of temperature and salinity changes to form deep and intermediate water flows. The Tropical and Northeast Pacific, on the other hand, were seen to be relatively unaffected because it takes centuries for deep ocean water to circulate to those regions.

For more information, visit www.whoi.edu.

Lionfish characteristics make them more "terminator" than predator

New research on the predatory nature of red lionfish, the invasive Pacific Ocean species that is decimating native fish populations in parts of the Caribbean Sea and Atlantic Ocean, seems to indicate that lionfish are not just a predator, but more like the "terminator" of movie fame.

The finding of behavior that was called "alarming" was presented by Kurt Ingeman, a researcher from Oregon State University, at the annual meeting of the Ecological Society of America.

Most native predatory fish are attracted to prey when their numbers are high, when successful attacks are easy, and when a minimum of energy is needed to catch and eat other fish, according to previous research done by Michael Webster, a fish ecologist who received his doctorate from OSU. As the population of prey diminishes, the native predators often move on to other areas where, literally, the fishing is better.

The new research concludes that lionfish, by comparison, appear to stay in one area even as the numbers of prey diminish, and in some cases can eat the population to local extinction. They have unique characteristics that make this possible, and, like the terminator, they simply will not stop until the last of their prey is dead.

"Lionfish seem to be the ultimate invader," said Ingeman, a doctoral candidate in the Department of Integrative Biology within the OSU College of Science. "Almost every new thing we learn about them is some characteristic that makes them a more formidable predator. And it's now clear they will hunt successfully even when only a few fish are present. This behavior is unusual and alarming."

This research was conducted on replicated natural reefs in the Bahamas, measuring prey mortality of the fairy basslet—a popular aquarium fish and a common prey of lionfish.



Predation rates were compared between reefs with the invasive lionfish and reefs with native predators alone, and across a range of population levels of the fairy basslet. Ingeman found that when prey fish were present at a low population density, the rate of mortality with lionfish present was four times higher than that caused by native predators alone, such as medium-sized groupers or trumpet fish.

The findings are of some importance, researchers said, because fairy basslet live in small local populations, which are most vulnerable to local extinction. It also shows that the mechanisms that ordinarily regulate population size can be altered.

"Reef fish usually hide in rocks and crevices for protection, and with high populations, there is a scramble for shelter," Ingeman said. "Native predators take advantage of this situation by mostly eating when and where prey are abundant. As prey population levels decline, it takes a lot more energy to catch fish, so the predators often move on to other areas."

Because of this process that scientists call "density-dependent" predation, populations of native prey fish tend to shrink when they get too large, grow when they get too small, and are rarely ever wiped out completely.

Lionfish, however, have such advantages as an invasive species that they apparently feel no need to move on for better or easier hunting. They may not be recognized as a predator by other fish, leading to high mortality even when shelter is abundant. Lionfish are also very efficient hunters, are well-defended themselves by poisonous spines, and can thrive at deep levels in the ocean. They tolerate a wide range of habitats and water conditions, reproduce rapidly most of the year, eat many different species of native fish and may overeat rare species.

Still unclear, Ingeman said, is whether evolutionary pressures may allow native fish in the Atlantic Ocean to adapt new behaviors that provide better defense against lionfish.

For more information, visit www.oregonstate.edu.

The immediate aftermath of an oil spill

The fate of oil during the first day after an accidental oil spill is still poorly understood, with researchers often arriving on the scene only after several days. New findings from a field experiment carried out in the North Sea provide valuable insight that could help shape the emergency response in the

immediate wake of disasters.

It is well known that oil and water don't mix. Less well known is the fact that when petroleum is spilt onto a water surface, a fraction of the oil immediately begins to evaporate into the air or dissolve into the seawater. These dissolved toxic hydrocarbons can threaten aquatic species, while evaporated compounds may pose a risk to rescue workers or populations downwind of an accident site. Publishing in the journal Environmental Science & Technology, a team of European and American researchers report on a unique study focused on the fate of hydrocarbons during the 24 hrs that follow an oil spill.

Following a spill, oil suddenly finds itself in a radically new environment – exposed to light, air, and the water surface after millions of years underground. "In its new environment, the oil immediately begins to change its composition, and much of that change happens on the first day," explains Samuel Arey, a researcher at EPFL and Eawag in Switzerland and corresponding author of the study. Oil is a complex mixture of many hydrocarbon compounds. Certain volatile compounds evaporate within hours, contaminating the overlying atmosphere. Others, such as toxic naphthalene, simultaneously dissolve into the seawater, posing a threat to aquatic life.

In order to collect data on the immediate aftermath of an oil spill, the researchers collaborated with emergency response specialists of the Dutch Rijkswaterstaat to recreate a 4 cu. m oil spill in the North Sea, in a shipping zone already burdened by pollutants, 200 km off the coast of the Netherlands. By studying this relatively small oil release, they were able to gain a better understanding of what goes on in much larger spills, with findings that could be useful to assess the risks to underwater life, as well as to emergency response team workers at the sea surface.

Thanks to a computer model that was tested against the data collected in the North Sea, the researchers are now able to extrapolate their findings to larger spills and other environmental conditions. Results from the study will provide the researchers with tools to better assess the immediate impact of future disasters on humans and on the environment, as well as to plan the emergency response, even in settings that differ strongly from those encountered in the North Sea.

For more information, visit www.nioz.nl.

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CLOUD COMPUTING GOES TO SEA: SHIP DESIGN AROUND SOFTWARE DEFINED NETWORKING (SDN) SYSTEMS

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Cloud computing has taken over many areas of computing/communication systems, in particular in companies with large distributed computer systems and databases. Cloud computing is based on both dynamic computer system virtualization and dynamic network virtualization. In this article we focus on dynamic network virtualization and more specifically on Software Defined Network technology, which basically involves a shift from increasingly “smart” routers/switches to much simpler routers/switches only providing data plane functionalities, whereas the network control plane functionalities are provided by software platforms hosted in computer systems possibly distant from the actual networks (c.f. Pretz, 2013). Specifically the data plane, which transports data packets, is separated from the control plane, which decides how to forward data packets. In SDN, the data plane is controlled by devices called network controllers, which send commands to “dumb” switching nodes (routers) throughout the network (Feamster et al., 2013).

There are several advantages to managing computer networks using SDN. One immediate benefit is that SDN computer systems are much simpler in terms of physical components. Moreover, SDN management of the system provides the ability to immediately reconfigure entire networks on the fly, enabling a more resilient and self-healing system in the event of individual component failure. This also allows for the ability to automatically distribute software upgrades across the system, including security patches. Additionally, there is an open standard for SDNs called OpenFlow (<http://www.opennetworking.org>), which means that SDN systems are not locked to individual proprietary software.

In terms of their use on ships, SDN systems have only been implemented in a piecemeal manner (e.g., bridge, communications, or engine room management). We discuss the benefits of designing a complete ship “from the keel up” with SDN systems so that ship computer operation and management schemes are “in the cloud.” We also discuss scenarios of ship use wherein SDN management for ships has advantages that are beneficial to ship operations in the future.

The shift to cloud computing (or cloud-centric network management) is a shift away from static computer architecture toward systems that are more dynamically reconfigurable. Usually, this is described in terms of “virtual” computer network management (Chen, 2011).

This development has evolved principally to address several challenges to static computer architectures:

1) Storage virtualization – the need and ability to deal with profoundly increasing bandwidth needs often required on either a periodic or an aperiodic “burst” basis rather than continuously;

2) Computing virtualization – the need to automate network service management, including automation of provision of scalable bandwidth-on-demand;

3) Fault tolerance – the need to optimize flexible management of multi-layer computer systems with technology components from different vendors, including improvement in overall system resilience in the event of individual component failure; and

4) Elasticity – the need to reprogram networks on-the-fly to update software concurrently across an entire network, especially for security software updates.

The SDN paradigm was developed to address these needs and has the convenient by-product of significantly reducing the overall complexity of computer network architecture.

This reduced computer system complexity further increases network resilience while reducing system hardware and software costs, along with reducing personnel effort and expenses for system maintenance and supervision.

Status and Needs for Shipboard Computer Networking

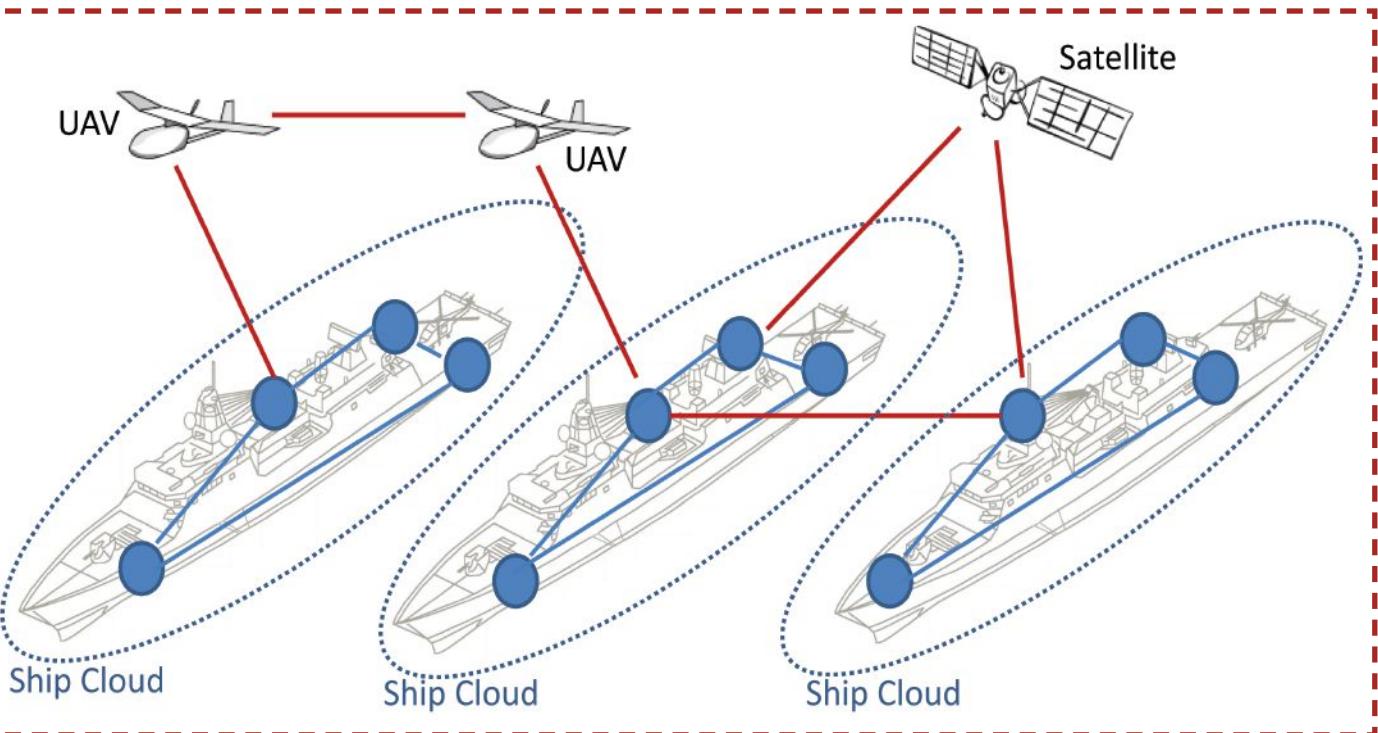
The U.S. Navy’s newest ship USS ZUMWALT will incorporate a number of advances in computer networking (Gallagher, 2013). These advances, however, stop short of full construction of a ship with SDN, or “operating in the cloud.” One need only look at recent reviews of U.S. Naval assessments of ship computer security systems to see that their widespread failure to pass software security inspections due to outdated software is a major problem, where “What the fleet really needs is the ability to sustain a consistent level of readiness” (Capt. David Wirth, Dir. Communications and Information Systems, Third Fleet) (Defense Systems Staff, 2014). Security alone would be one reason to move toward SDN-based shipboard computer networks to enable consistent security software distribution. Updating communication capabilities and other ship software systems using cloud-based management is also important because this can be done not only for an individual ship, but also across an entire fleet. This is clearly another reason why SDN-based systems are certain to be important in the future.

Two possible examples within the U.S. Coast Guard where ship computer systems with SDN could be used are the planned restoration of the Polar Class heavy icebreaker POLAR SEA, and the planned construction of a new heavy icebreaker to replace the POLAR SEA’s currently operational sister ship, POLAR STAR. These and other so-called “multi-mission” ships, whose mission often changes from one cruise to the next, are excellent candidates for construction with SDN-based networking systems. Other ships that are particularly appropriate for SDN computer systems would include similar multi-mission research vessels used by government agencies and universities as well as cruise ships and private luxury yachts. Such ships have data needs that change over time and would benefit from state-of-the-art computer systems as well as the increased resilience provided by SDN system management.

Cloud Technologies: Software-Defined Networking & Network Virtualization on Ships

What is involved in designing a ship with cloud computing infrastructure, and what benefits will accrue? First, a cloud computing infrastructure can include different deployment models: a private cloud, a public cloud, and a hybrid cloud. A private cloud has an infrastructure that is operated for the benefit of a single organization (such as for use by the ship itself, either managed internally and/or by a third party ashore). A public cloud has an infrastructure that is accessible to the general public, such as to enable public access to data from sensors on the ship or for educational outreach. A hybrid cloud is composed of several clouds that form a federation of computing resources (Nell and Grace, 2011), such as for combined management of several ships with different sensor systems operating collaboratively on a mission or for a single ship operating to coordinate activities of multiple unmanned systems, potentially including autonomous underwater vessels (AUVs), autonomous surface vessels (ASVs), and unmanned aircraft systems.

EDITORIAL FOCUS



Example of individual ships with Software Defined Networking (SDN) with the option for collective management of multiple autonomous systems associated with the ship (such as unmanned aircraft) as well as multiple ships coordinated via so-called Hybrid Cloud management.

As modern ship architectures rely more frequently on a unified network infrastructure, both for tactical and non-tactical functions, SDN in the maritime domain would allow greater flexibility in network reconfiguration. Using SDN would allow for rapid and automatic reconfiguration of networks depending on changing storage and communication needs or in the event of component failure.

As noted above, modern ships are often part of a larger communications ecosystem that can comprise adjacent ships, autonomous systems, and onshore command centers. Such diverse interaction schemes can take advantage of the multiple levels of resource aggregation and configuration enabled by SDN and cloud technologies to create a system that allows the implementation of more efficient distributed applications. Additionally, as ship systems increasingly produce larger volumes of data to be managed and transmitted among ship systems (including autonomous components) and shore (including status update datalogs of ship subsystems), SDN systems can take advantage of existing “Big Data” management systems using so-called non-relational (e.g., NoSql) databases by

Google, Amazon, Cloudera, and others.

Finally, as noted above, SDN and cloud technology use has important security implications, allowing the use of reprogrammable platforms to host virtualized security applications (dynamic firewalls, virtual packet classification, and sensitive data protection). The ability to easily update these security software control systems across a fleet represents a considerable cost savings and security benefit over current practices.

In summary, as new ship construction is contemplated by the military; academic oceanographic institutions; the U.S. Coast Guard; and industrial, cruise ship, and private yacht owners, the multiple advantages of constructing ship computer systems based on SDN (i.e., construction of ships with computers “in the Cloud”) are becoming obvious. Reducing costs and increasing networking management flexibility and security are perhaps the principal benefits of SDN. For all the reasons cited above, ships with computer systems “in the cloud” are certain to be built in the near future.

References

Chen, G. 2011. *End-to-End Virtualization: A Holistic Approach for a Dynamic Environment*. IDC White Paper, c.f.: https://www.ibm.com/midmarket/uk/en/att/pdf/End_to_end_Virtualisation.pdf

Defense Systems Staff. 2014. Navy team to boost shipboard cybersecurity. *Cyber Readiness Team to address risks often caused by legacy software and inconsistent configurations*. Defense Systems, May/June:14.

Feamster, N., J. Rexford and E Zegura. 2013. *The Road to SDN*. ACM Queue, c.f.: <http://queue.acm.org/detail.cfm?id=2560327>

Gallagher, S. 2013. *The Navy’s newest warship is powered by Linux*. Ars Technica, Oct. 18: <http://arstechnica.com/information-technology/2013/10/the-navys-newest-warship-is-powered-by-linux/>

Nell, P. and T. Grace. 2011. *The NIST Definition of Cloud Computing*. NIST Spec. Pub. 800-145. C.f.: <http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf>

Pretz, K. 2013. *Software defined networks explained*. IEEE Institute, Aug. 7, c.f.: <http://theinstitute.ieee.org/benefits/ieee-groups/softwaredefined-networks-explained>



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Atlantis Resources awards contract for tidal power turbines

Atlantis Resources has signed a turbine supply agreement with Andritz Hydro Hammerfest to supply three 1.5-MW tidal power turbines for Phase 1A of the MeyGen project, the world's largest planned tidal current energy project, in the Pentland Firth in Scotland. Atlantis also has signed a turbine supply agreement to supply one of its own 1.5-MW tidal power turbines for Phase 1A of the MeyGen project. Contract commencement is contingent on achieving financial close. Atlantis continues to work closely with all relevant financing and contracting parties to reach financial close for Phase 1A of MeyGen.

Interior Department proposes New Jersey offshore wind lease sale

Secretary of the Interior Sally Jewell and Bureau of Ocean Energy Management (BOEM) Acting Director Walter Cruickshank announced the proposed sale of leases for nearly 344,000 acres offshore New Jersey for commercial wind energy leasing. BOEM identified the New Jersey Wind Energy Area in consultation with members of its New Jersey Intergovernmental Renewable Energy Task Force, which includes federal, state, tribal, and local government partners. BOEM proposes to auction the Wind Energy Area as two leases: the South Lease Area (160,480 acres) and the North Lease Area (183,353 acres). The Wind Energy Area begins about 7 nmi off the coast from Atlantic City. Based on an analysis prepared for BOEM by the Department of Energy's National Renewable Energy Laboratory, the New Jersey Wind Energy Area as currently delineated, if fully developed, may be able to support up to 3,400 MW of commercial wind generation, enough to power about 1.2 million homes.

Secretary Jewell announces milestone for commercial wind energy development offshore North Carolina

As part of President Obama's Climate Action Plan to create American jobs, develop domestic clean energy sources and cut carbon pollution, Interior Secretary Sally Jewell announced that the Bureau of Ocean Energy Management (BOEM) has defined three Wind Energy Areas offshore North Carolina, which total approximately 307,590 acres, for potential commercial wind energy development. The announcement builds on BOEM's recent activities to grow offshore renewable energy through the leasing of Wind Energy Areas. BOEM has awarded five commercial wind energy leases off the Atlantic coast: two non-competitive leases (for the proposed Cape Wind project in Nantucket Sound and an area off Delaware) and three competitive leases (two offshore Massachusetts-Rhode Island and another offshore Virginia). The competitive lease sales generated more than \$5 million in high bids for more than 277,500 acres in federal waters. BOEM will hold a competitive auction for an area offshore Maryland in August 2014, and expects to hold additional competitive auctions for wind energy areas offshore Massachusetts and New Jersey in the coming year.

4.9 GW of offshore wind capacity under construction in Europe

The European Wind Energy Association (EWEA) says that, despite installations being than in the first 6 months of last year, offshore wind remains the fastest growing power sector in Europe. AWEA reports that 16 commercial offshore wind farms are under construction totaling 4.9 GW of power capacity, while 224 new offshore wind turbines, totaling 781 MW, were fully grid connected in Europe during the first 6 months of 2014—25% less than during the same period in 2013 (1,045 MW). In addition, 282 wind turbines have been installed but not connected during this period, making a total of 310 offshore turbines awaiting grid connection. Once connected they will add a further 1,200 MW of offshore wind energy capacity. Total installed offshore wind capacity in Europe is now 7,343 MW in 73 wind farms across 11 countries, capable of producing 27 TWh of electricity, enough to meet the needs of over 7 million households—or the entire population of the Netherlands.

Wales' first full-scale tidal energy generator unveiled



Wales' first full-scale tidal energy generator has been unveiled at Pembroke Port by The First Minister of Wales, the Rt. Hon. Carwyn Jones AM.

The patented DeltaStream device developed by Cardiff-based tidal stream technology company Tidal Energy Ltd will be installed in Ramsey Sound, Pembrokeshire, following its unveiling—and will be among the world's first demonstration devices to generate green, sustainable and predictable tidal power.

EU funds worth £8m delivered through the Welsh Government has been invested in the project, with match funding from majority shareholder, Welsh renewable energy company, Eco2 Ltd.

Tidal Energy Ltd's DeltaStream device is the first private marine project to be fully developed in Wales, having secured all the required planning and environmental consents together with a lease agreement from The Crown Estate. The company has also worked with contractors to install the necessary infrastructure to support what will be the first grid-connected freestanding tidal turbine.

Named 'Ysbryd y Mor' meaning 'Spirit of the Sea', the DeltaStream 400-kW demonstration device, weighing 150 tonnes and with a frame 16 m long by 20 m high, has been fabricated and assembled by Pembroke-Dock based company Mustang Marine over the last 6 months.

Invented by Pembrokeshire engineer Richard Ayre, the DeltaStream device is the first project to receive precautionary 'deploy and monitor' environmental consent in a designated Marine Special Area of Conservation', having incorporated a number of design features to minimize any potential impact on the surrounding environment. An extensive suite of monitoring equipment will be installed on and around the device in Ramsey Sound.

The DeltaStream project marks the first step in the delivery of the Welsh Government's March 2014 Plan for its Low Carbon Transition Strategy in marine renewable generation.

Plans for a 10-MW DeltaStream commercial array off St. Davids Head in Pembrokeshire are underway, which will see Tidal Energy Ltd join forces with Eco2 Ltd to install up to nine DeltaStream devices, and generate enough power for approximately 10,000 homes.

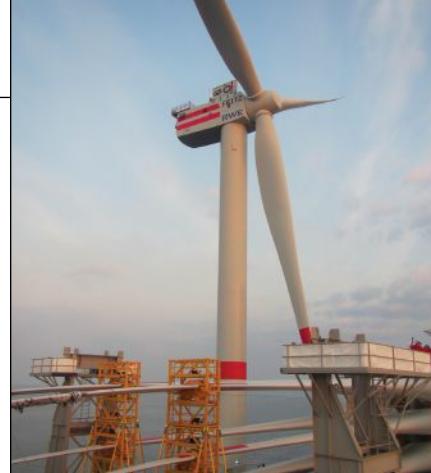
For more information, visit www.tidalenergyltd.com.

Substation erected for Nordsee Ost

A wedding was celebrated on the Nordsee Ost offshore wind farm construction site of RWE Innogy; This is what the construction process is called when the foundation is successfully married to the substation platform. As a result the sea-based transformer substation and all its electrical components have now been successfully completed.

The journey of the 1,800 ton substation started in Danish Aalborg and took 3 days to ship across the North Sea. The substation is 15 m above the construction area of RWE Innogy's Nordsee Ost offshore wind farm, which is located some 30 km north of the island of Heligoland. A floating crane placed the heavyweight substation onto the foundation on Saturday, completing the installation of the heaviest component of the offshore wind farm.

The offshore substation transforms the electricity generated by the 48 wind turbines at 33 kV to a transmission voltage of 155 kV. Submarine high-voltage cables then transmit the electricity to the transformer platform of TenneT where the AC voltage is transformed to 250 kV DC voltage and transmitted to the



nearest grid access point at Brunsbüttel. The grid operator TenneT is responsible for the grid access.

Like the wind turbines, the transformer substation was anchored on a jacket foundation to the seabed and will rise about 40 m above the sea level following final assembly.

Once complete, the Nordsee Ost offshore wind farm will have an installed capacity of some 295 MW and supply the equivalent of about 300,000 private households with electricity per year. Equipped with the currently most powerful offshore turbines, Nordsee Ost ranks among the largest commercial wind power projects off the German coast.

For more information, visit www.rwe.com.

SgurrEnergy kicks off wave and tidal research project

SgurrEnergy has commenced a research project with the University of Edinburgh and ScottishPower Renewables to establish ways to reduce uncertainties for wave and tidal projects. The 3-year project will provide solutions to some of the current issues in order to meet the needs of the growing wave and tidal industry and help to unlock the vast potential of the UK's renewable resources.

For the emerging wave and tidal sector, the issue of energy yield uncertainty represents a real challenge—one that has slowed the growth of the industry for some time.

As part of the University of Edinburgh's Industrial Doctoral Centre for Offshore Renewable Energy (IDCORE), the research campaign will identify individual components of the energy yield estimation process. Based on this research, priority areas will be highlighted and further quantified in order to understand where the biggest reductions can be achieved.

These areas will then become the

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Ocean News & Technology

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focus of targeted research, which will seek to develop improved measurement techniques, modeling tools and yield prediction processes for the benefit of the industry. SgurrEnergy's expertise with wind energy performance prediction and analysis will play a key role in the project.

Analysis and calculation techniques have benefited from a huge amount of development over the years, under considerable pressure from investors who need to know that their project will meet its IRR requirements. Much of this learning is also relevant to wave and tidal technologies.

For more information, visit www.sgurrenergy.com.

DONG Energy sells stake of Gode Wind 2

DONG Energy signed an agreement to sell 50% of the 252 MW German offshore wind farm project Gode Wind 2 to a consortium of Danish pension funds (PKA, Industriens Pension, Lærernes Pension and Lægernes Pensionskasse) that will make 840,000 pension savers co-owners of the wind farm.

The total sales price amounts to approximately EUR 600 million (DKK 4.5 billion), which will be paid in the period from 2014 to 2016. At completion of the transaction, PKA will acquire 24.75% of Gode Wind 2, with Industriens Pension acquiring 10.5%, Lærernes Pension 8.75% and Lægernes Pensionskasse 6%.

Construction of Gode Wind 2 is expected to commence in 2015, and full commissioning for this and the neighboring wind farm Gode Wind 1 is expected in 2016.

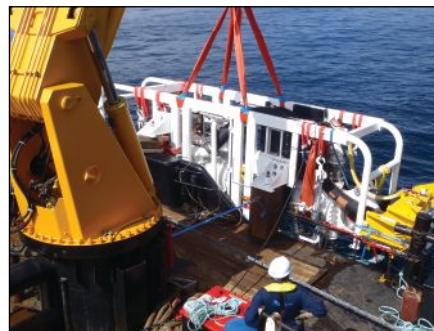
The parties have agreed that DONG Energy will provide operation and maintenance services to Gode Wind 2 from DONG Energy's O&M base in Norddeich. Furthermore, the parties have agreed that DONG Energy will provide a route to market for the power production of Gode Wind 2.

The transaction is subject to approval by the competition authorities. The transaction is expected to be completed in the second half of 2014.

The 252 MW Gode Wind 2 wind farm will be able to supply carbon free power equivalent to the annual electricity consumption of more than 260,000 households. The offshore wind farm will be constructed in the German part of the North Sea, approximately 45 km off the northwestern coast of Germany.

For more information, visit www.dongenergy.com.

Successful cylinder replacement as Oyster 800 summer overhaul passes half way mark



Wave energy company Aquamarine Power has successfully replaced the cylinder module on their Oyster 800 wave machine as their comprehensive summer refit passes the half way mark.

The 23-tonne module was refitted to the 800 kW test machine—located at the European Marine Energy Centre in Orkney—in an operation that took just over 2 days.

"This new module incorporates a number of significant upgrades to the one it replaces—including new check valves, hoses and control and instrumentation. We have worked closely with suppliers Hunger Hydraulik and Calder Engineering to make it robust enough to withstand the extreme forces it will experience during operation," said company chief executive officer Martin McAdam.

For more information, visit www.aquamarinepower.com.

Crown Estate agrees to Celtic Array's decision to cease offshore wind development

The Crown Estate has agreed to Celtic Array Ltd's request to end its offshore wind zone agreement for the Round 3 Irish Sea Zone, allowing developers, DONG Energy and Centrica, to cease development activity and terminate their seabed rights.

Head of Offshore Wind, Huub den Rooijen, said, "We have confirmed the developers' assessment of the zone, which shows that challenging ground conditions make this project economically unviable with current technology. We understand that this will be disappointing for many, but improvements and de-risking of new technologies may one day in the future make it economic to develop in some parts of the area. Whilst we have no plans to re-offer the zone to the market, to improve the understanding of the complex geology in this region we intend to make available the wealth of data from Celtic

Array's activity through our Marine Data Exchange in due course."

Over the last four years DONG Energy and Centrica have conducted widespread survey work across the whole Irish Sea Zone and more detailed intrusive ground investigation.

The offshore wind sector has made steady and significant progress over the last decade and is on course to deliver 10% of the UK's electricity demand by the end of the decade, including from projects within the Irish Sea.

The area continues to benefit from substantial wind resource and by spring next year successful wind farms in the Irish Sea will comprise 2,000 MW of capacity in operation following the completion of the Gwynt y Môr and West of Duddon Sands offshore wind farms. With the extensions to the Burbo Bank and Walney offshore wind projects being awarded Government funding contracts earlier this year, there is also the opportunity for additional new capacity of 918 MW.

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

TenneT installs sixth "socket" SylWin alpha

TenneT has installed its sixth High-Voltage Direct Current (HVDC) offshore platform in the German part of the North Sea. The SylWin alpha converter platform is located approx. 70 km to the west of the island of Sylt (after which the platform is named) and has a capacity of 864 MW for bringing offshore wind energy onshore. At present, the platform is the most powerful installation in the North Sea for converting alternating current into direct current. The installation of HelWin beta—TenneT's fifth HVDC offshore platform with a capacity of 690 MW—was completed just a few days earlier.

The five converter platforms erected by TenneT in the North Sea since the autumn of 2013 will be ready to transport approx. 3.7 GW of offshore wind energy to the onshore grid, starting in the first quarter of 2015. The other offshore grid connections already constructed by TenneT add an additional 0.6 GW of transmission capacity. The German government has decided to increase the transmission capacity for offshore wind energy by 6.5 GW in the period until 2020. In 2015, two-thirds of that target will already be achieved.

TenneT has commissioned Siemens as the main contractor for the work on the SylWin alpha platform.

For more information, visit www.tennet.eu.



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Bollinger awarded six additional fast response cutters

The U. S. Coast Guard awarded a \$255 million contract option to Bollinger Shipyards of Lockport, Louisiana for the production of six more Sentinel-class fast response cutters (FRCs). This option award brings the total number of FRCs under contract with Bollinger to 30, with a current contract value of \$1.4 billion. The FRCs acquired under this contract option are scheduled to be delivered to the Coast Guard in 2017 and will be homeported at various bases around the U.S. On 25 June 2014, Bollinger Shipyards delivered the USCGC Raymond Evans, the tenth FRC to the USCG. Delivered FRC's operating in the Southeastern United States, the Bahamas and the Caribbean have already had a major impact on Coast Guard operations. Recent interdictions by USCGCs Paul Clark and Charles Sexton resulted in the seizure of thousands of pounds of marijuana and cocaine. In addition, FRCs in South Florida have interdicted hundreds of illegal migrants attempting to reach our shores and saved over 100 lives. Coast Guard Flag Officers have consistently termed the FRCs as operational "game changers" for the Coast Guard. The Sentinel-class is fast replacing the Coast Guard's venerable Island-class 110-ft patrol boat. The FRC uses a proven, in-service parent craft design based on the Damen Stan Patrol 4708. It can operate at speeds over 28 kts and is armed with one stabilized, remotely operated 25 mm chain gun and four crew-served .50 caliber machine guns.

\$17.7M awarded for towed arrays

L-3 Chesapeake Sciences Corp., Millersville, Maryland, is being awarded a \$17,772,601 cost-plus-fixed-fee, firm-fixed-price contract for the design, development, production and test of two thin line compact towed arrays, 10 test assets, engineering service hours and provisioning item order spares. This effort is the result of small business innovation research topic number N05-125, Compact Towed Sonar Array. Thin line compact towed array provides the U.S. Naval Fleet with the next generation of array technology to address reliability and maintain mission operational capability. The thin line compact towed array is a reliability improvement array that incorporates compact towed array telemetry while maintaining TB-29A acoustic performance.

ERAPSCO awarded \$166M for sonobuoys

ERAPSCO, Columbia City, Indiana, is being awarded a \$165,997,792 firm-fixed-price, indefinite-delivery/indefinite-quantity contract for the procurement of 141,263 AN/SSQ Series sonobuoys and 5,000 MK-84 Signal Underwater Sound devices. Work will be performed in DeLeon Springs, Florida (51.7%) and Columbia City, Indiana (48.3%) and is expected to be completed in October 2019. Fiscal 2014 other procurement (Navy) funds in the amount of \$165,997,792 will be obligated at time of award, none of which will expire at the end of the current fiscal year.

General Atomics awarded \$10M for electromagnetic aircraft launch system

General Atomics, San Diego, California, is being awarded a \$10,267,000 modification to a previously awarded firm-fixed-price contract (N68335-09-C-0573) for the integration and installation of the electromagnetic aircraft launch system CVN 78 shipboard software and support. Work will be performed in San Diego, California (79%) and Waltham, Massachusetts (21%) and is expected to be completed in October 2015. Fiscal 2011 shipbuilding and conversion (Navy) funds in the amount of \$10,267,000 are being obligated at time of award, none of which will expire at the end of the current fiscal year. The Naval Air Warfare Center Aircraft Division, Lakehurst, New Jersey, is the contracting activity.

Qinetiq signs contract with Autonomous Surface Vehicles for targets



QinetiQ, as part of a new Marine Surface Target Service, has signed a contract with Autonomous Surface Vehicles (ASV) for the supply and operational support of autonomous surface target vessels.

The partnership is part of a new initiative enabling QinetiQ's Marine Surface Target Service to rapidly and effectively meet customer needs for trials and training against appropriate targets. The Marine Surface Target Service is an innovative addition to the wider QinetiQ Target Services, which offers aerial and underwater targets for real test, evaluation and training.

As part of this capability, QinetiQ, working closely with ASV, will supply a range of dynamic surface targets to emulate the threat posed by Fast Inshore Attack Craft (FIAC). With that threat increasing, dynamic surface targets play an essential role in weapon trials and in the training of joint operational teams.

With speeds of over 50 kts, the targets are fast and versatile and can be customized to meet many trial or training requirements, including being fitted with miss distance indication (MDI) systems to provide accurate scoring. Precision tracking using high quality GPS can be provided and thermal, radar and visual enhancements (such as mock weapons) can also be added. The targets are deployable anywhere in the UK (integrated with the QinetiQ managed MOD Air and Maritime Ranges for firing engagements) or worldwide, either in support of single campaigns or as a long-term managed service.

The first QinetiQ-owned vessel to deliver this service is a C-Target 13, which has already seen service in support of a number of contracts at MOD Aberporth for both towing and direct fire engagements.

For more information, visit www.asvglobal.com.

RIMPAC 2014 concludes with enhanced cooperation among 22 nations

The world's largest international maritime exercise, Rim of the Pacific (RIMPAC) 2014, concluded with the participation of 22 nations, 49 surface ships, six submarines, more than 200 aircraft and 25,000 personnel in and around the Hawaiian Islands and Southern California, August 1.

Hosted by U.S. Pacific Fleet, RIMPAC 2014 was led by U.S. Vice Adm. Kenneth Floyd, commander of the U.S. 3rd Fleet (C3F), serving as the combined task force (CTF) com-

mander. RIMPAC is designed to enhance cooperation of the combined forces and improve individual war fighting competencies.

This year's exercise included units and personnel from Australia, Brunei, Canada, Chile, Colombia, France, India, Indonesia, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, People's Republic of China, Peru, the Republic of Korea, the Republic of the Philippines, Singapore, Tonga, the United Kingdom and the United States. The training syllabus included amphibious operations, gunnery, missile, anti-submarine, and air defense exercises, as well as military medicine, humanitarian assistance and disaster response, counter-piracy, mine clearance operations, explosive ordnance disposal, and diving and salvage operations.

RIMPAC 2014 marked the first time that Japan led the scenario-driven humanitarian assistance/disaster relief (HA/DR) response portion of the exercise that facilitated training and certification for expeditionary forces to respond to foreign disasters as a crisis response adaptive force.



RIMPAC 2014 had two new participants this year, Brunei and the People's Republic of China. Additionally, RIMPAC participants who sent a ship for the first time to participate in RIMPAC 2014 included Colombia, India, Indonesia and Norway. This year also marked the first time hospital ships participated in RIMPAC. The Chinese hospital ship, Peace Ark, and USNS Mercy (T-AH 19) conducted personnel exchanges, military medicine exchanges and medical evacuation and mass casualty training, further highlighting the valuable capability hospital ships bring to the Pacific.

For more information, visit www.navy.mil.

A new era of partnership between CTF-151 and China's ETG-150

The Republic of Korea's CTF-151 flagship, Munmu the Great, and Chinese navy units in the Gulf of Aden have fostered greater level of cooperation through joint activity over the summer.

For several weeks concluding at the end of July, Combined Maritime Force's (CMF's) Counter Piracy Force, CTF-151, and the Chinese People's Liberation Army-Navy force in the Gulf of Aden, Escort Task Group 150 (ETG-150), have been increasing their level of cooperation to ensure greater security and freedom in the Gulf. The seed of this newfound cooperation was planted between the Commander CTF-151, Rear Admiral Cho Young-joo ROKN, and the Commander ETG-150 Rear Admiral Huang Xinjian PLA-N, on 10 July 2014. During an open and friendly meeting on board the Chinese flagship Changchun, the two commanders discussed their respective missions and the potential for cooperation. The meeting included a ship tour and a luncheon where Rear Admiral Young-joo and his staff were made to feel most welcome.

Through candid and future-orientat-

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Ocean News & Technology

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ed dialog, the two commanders discussed the necessity for enhanced cooperation between their forces in countering piracy threats to safeguard the legitimate and safe passage of maritime commerce. Specifically, the commanders established that the Chinese navy will continue their operational contribution to tackle piracy threats, which is the common goal of both forces in the strategic region of the Gulf of Aden.

Since this important meeting, ETG-150 has deepened their cooperation with CTF-151 on information sharing about piracy activities, meteorological information, and the positions of escort units when providing convoy escort to ships of all nations. On the basis of this information exchange, both organizations committed to looking for further opportunities for mutual cooperation. A second meeting of the two commanders was held on board the flagship of CTF-151, Republic of Korea ship, Munmu the Great in early August. Rear Admiral Cho Young-joo said he was most appreciative of the Chinese efforts and their commitment to counter piracy operations adding; "Now we can truly say we go together!"

For more information, visit www.combinedmaritimeforces.com.

U.S. increases interoperability with Japan in first GUAMEX

Arleigh Burke-class guided-missile destroyer USS Pinckney (DDG 91) recently completed the first Guam Exercise (GUAMEX) alongside the Japan Maritime Defense Force (JMSDF).

Pinckney operated off the coast of Guam with eight JMSDF ships practicing naval gunnery, anti-submarine warfare, tactical maneuvering, communications drills, and personnel exchanges.

"The purpose of this exercise is aimed at enhancing the interoperability of the U.S. Navy and the JMSDF and strengthening personnel ties between our respective forces," Pinckney's Commanding Officer, Cmdr. Frank Okata said.

Capt. Shan Byrne, commodore, Destroyer Squadron (DESRON) 15,

embarked Pinckney to witness GUAMEX firsthand. At an all-hands call with Pinckney's crew, Byrne stated that GUAMEX allowed the ship to spend time at sea as a ship, learning as a crew, and completing missions as a team. He also remarked on Pinckney Sailors' significant achievements during their deployment.

Pinckney is on deployment in the 7th Fleet area of operations protecting and defending the collective maritime interest of the U.S. and its allies and partners in the Indo-Asia-Pacific region.

For more information, visit www.navy.mil.

UK MOD makes funds available for future of maritime autonomous systems

The UK Defence Science and Technology Laboratory is making £9 million available to support the future of maritime autonomous systems.

The Ministry of Defence, through the Defence Science and Technology Laboratory (Dstl) and in partnership with a number of associations and industry bodies, is making funding available through four initiatives each addressing different areas of maritime autonomy.

Autonomy in maritime unmanned vehicles offers the potential to transform the manner in which many activities are conducted at sea such as the clearance of sea mines and persistent wide area surveillance.

Philip Smith, affordable maritime presence programme manager at Dstl, said, "The opportunities presented by Maritime Autonomous Systems are very exciting. However if we are to fully exploit these opportunities we need to invest in key areas such as "Supervised Autonomy" and "Deployment & Recovery" in order to meet future requirements and position the UK as a world leader in next generation maritime mission systems. The funding we are making available through these four initiatives is a significant step towards achieving this."

For more information, visit www.gov.uk.

HMS Illustrious hands over to HMS Ocean

In a symbolic gesture, the UK's outgoing helicopter carrier has handed over duties to her successor. In the waters off the south coast HMS Illustrious and HMS Ocean met this morning and the baton of protecting the nation's interests handed between the two.

The two ships steamed side by side, in the company of the frigate HMS

Lancaster, to conduct the ceremonial handing over of their duties. HMS Illustrious then peeled away with HMS Lancaster escorting her on her final entry into Portsmouth.

HMS Ocean will now go forward as the Royal Navy's helicopter landing platform and HMS Illustrious will be retired after 32 years of service. As the sole member of her class, the Mighty O was designed to support amphibious landing operations, meaning she is able to deliver troops to the center of the action by helicopter or landing craft. With six helicopter landing spots on her flight deck and space in her hangar to carry many more, Ocean is Britain's biggest warship.

Launched in 1995, the 21,500-ton, Plymouth-based ship has just emerged from a 15-month £65 million refit that saw more than 60 upgrades to her flight deck, hangar and aviation facilities. Her engines, propellers, shafts, rudders and stabilisers were also given a thorough going over to ensure this is ready for the role that lies ahead.

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

America 'sails away' for maiden transit to San Diego homeport

The future amphibious assault ship USS America (LHA 6) departed in commission without ceremony from Ingalls Shipbuilding in Pascagoula, Mississippi in transit to its homeport of San Diego.

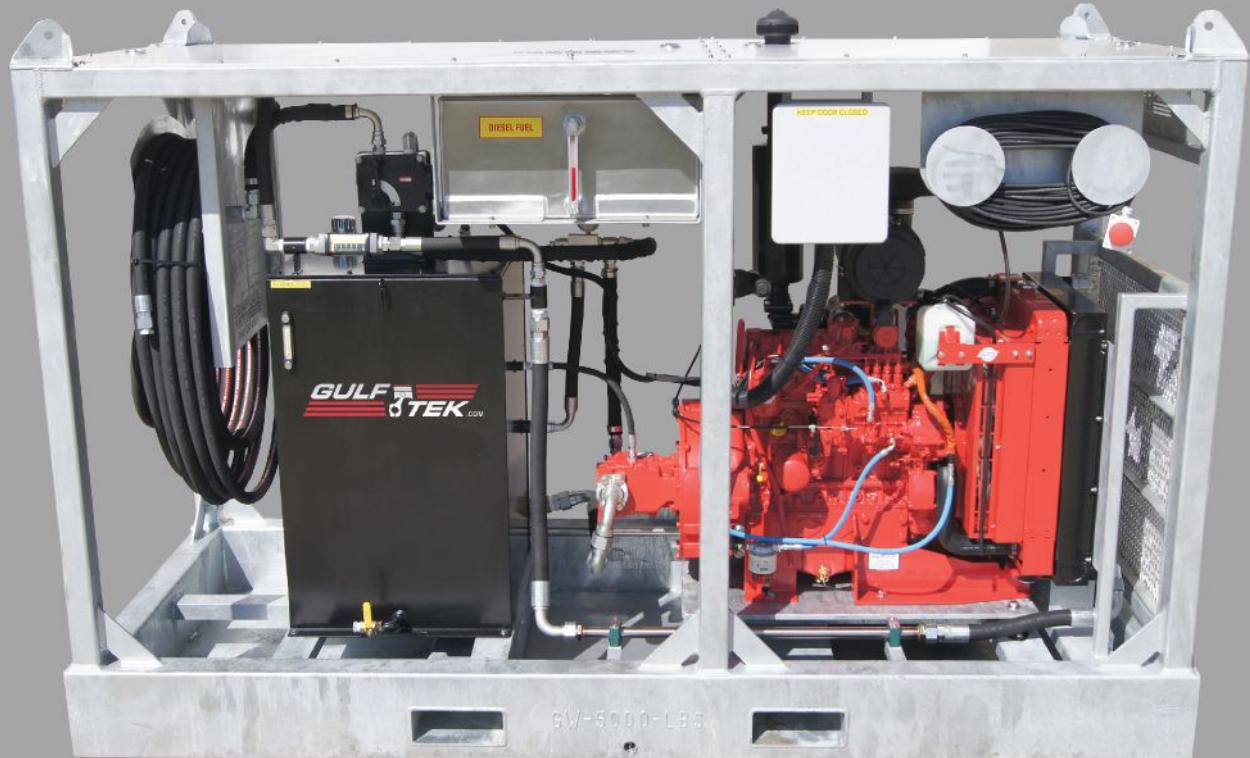
America is scheduled to be formally commissioned during a ceremony in San Francisco, California on 11 October. The Navy officially accepted delivery of the ship from Ingalls Shipbuilding during a ship custody transfer ceremony.

America earned commission status after the crew successfully completed the light-off assessment, anti-terrorism force protection certification and crew certification. These are the three major inspections needed before a U.S. Navy warship can get underway for the first time.

America is scheduled to transit U.S. Southern Command's area of responsibility (AOR) throughout the next couple months. During the transit, referred to as "America Visits the Americas," the ship will engage in cooperative maritime security operations with partner nations in order to maintain access, enhance interoperability and build enduring partnerships that foster regional security in the AOR. In addition, America will embark more than 300 Marines assigned to Special Purpose Marine Air-Ground Task Force (SPMAGTF) South.



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OFFSHORE INDUSTRY

U.S. oil production in 2015 to be highest since 1972: EIA forecast

U.S. crude oil production, rising steadily since 2008, is likely next year to hit its highest level since 1972, according to a forecast by the U.S. Energy Information Administration.

Spurred by the use of hydraulic fracturing or fracking in shale rock deposits, U.S. oil production has jumped from 5 mmbbl per day in 2008 to 7.4 mmbbl per day last year and is expected to average 8.5 mmbbl per day this year and 9.3 mmbbl per day next year, according to the EIA, the analytical arm of the Department of Energy.

Texas and North Dakota now account for almost half of total U.S. oil production. The shale boom, along with a rise in natural gas liquids production, has dramatically lowered petroleum imports. The share of U.S. liquid fuels consumption met by net imports, down from 60% in 2005 to 33% in 2013, is expected to fall to 22% in 2015, which would be the lowest since 1970, EIA reported.

The United States and Canada are expected to account for most of the world's projected growth in production of oil and other liquid fuel through 2015, while China and less developed countries will drive most of the growth in consumption, according to the EIA's July forecast.

Poll says Americans want more oil production, support offshore drilling

Americans overwhelmingly want their country to produce more domestic oil and natural gas, but few believe the federal government is doing enough to encourage such activity, according to a recent industry-backed survey.

The poll, conducted by Harris Interactive for the American Petroleum Institute, shows that 68% of voters across the political spectrum support offshore drilling and the same percentage say they would be more likely to vote for a candidate who supports offshore drilling.

The American Petroleum Institute released its survey of more than 1,000 registered voters as the Obama administration considers what federal waters should be opened up for offshore drilling in the coming years.

Industry trade groups, including the American Petroleum Institute, have pushed the administration to consider

selling leases in the Atlantic, Pacific and the eastern Gulf of Mexico.

New offshore drilling would create thousands of new jobs, pump billions into government coffers and strengthen national security by reducing reliance on other nations that wield their oil and gas supplies as a "destabilizing weapon of diplomacy," API's upstream director Erik Milito said in a conference call with reporters. In the Atlantic alone, offshore drilling could generate 280,000 new jobs and \$51 billion in government revenue, Milito said. Decisions made today affect the nation's future as an international energy superpower, he said.

Sector reviews may account for drop in UK offshore drilling

Exploration drilling activity continues to slide across the UK continental shelf, according to the latest review by Deloitte's Petroleum Services Group. The second quarter 2014 report identified seven exploration and appraisal wells drilled on the UK shelf, down from 12 in the previous quarter and 17 in the second quarter of 2013. No farm-ins were reported to UK assets during the recent quarter.

Derek Henderson, senior partner in Deloitte's Aberdeen office, said rising operating costs have impacted investment decisions.

"It's no secret that the costs facing oil and gas firms on the (shelf) have been a significant issue for some time now," he said. "Research suggests it's now almost five times more expensive to extract a barrel of oil from the North Sea than it was in 2001..."

He added: "In addition, with the fiscal regime under review, it's quite likely that the industry will be waiting until there is a bit more clarity over how this will take shape. The tax environment is a factor that bears heavily on the decisions of all oil and gas companies, especially with corporate tax rates that vary and can reach 81%."

In Deloitte's recent poll of the industry, the overall level of tax drew the largest response concerning issues facing the UK shelf (46% of respondents).

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Oil companies remain complacent about computer dangers: report

Oil companies and others with critical infrastructure are ill-prepared to stop computer system threats, even though more than two thirds have had at least one significant security compromise in the past year, according to a recent study by the Ponemon Institute.

Moreover, the analysis shows that persons in charge of managing critical control systems know their organizations are not ready for the sophistication and frequency of cyberattacks.

Just 17% of the 599 security executives at utility, oil, gas, energy and manufacturing companies surveyed by the research group said they had deployed most of their major information technology initiatives meant to fend off cyberattacks. And only 28% of the respondents said security was one of the top five strategic priorities at their organizations.



"Keeping the 'lights on' and facilities safe are the primary concerns for companies in the critical infrastructure sectors. The number and severity of cyber-attacks on these companies is escalating and endangering those important goals, however," the report asserts.

"What is particularly disconcerting is that many of these targeted enterprises believe they do not have mature, fully secured systems in place. This presents clear risks in downtime, loss of intellectual property and safety of their infrastructures."

Among the findings: 78% of respondents said a successful attack is at least somewhat likely against their control systems within the next 2 years; nearly half of security incidents (47%) were traced to a "negligent employee"; and 24% of the incidents were blamed on negligent employees who had privileged access. Just 68% said they were using state-of-the-art technologies to minimize security risks to control systems.

OFFSHORE INDUSTRY HEADLINES

Research & Development • Environmental Assessment • Discovery

U.S. and EU to restrict technologies to Russia because of Ukraine crisis

The United States plans to impose restrictions on exports of U.S. energy technologies to Russia for use in deepwater, Arctic offshore or shale oil projects, as part of a sanctions package aimed at punishing Moscow for further escalating the crisis in Ukraine. The export restrictions dovetail with similar measures imposed by the European Union.

Under the sanctions, U.S. companies wishing to export such technology to Russia would need to receive permission from the U.S. Department of Energy.

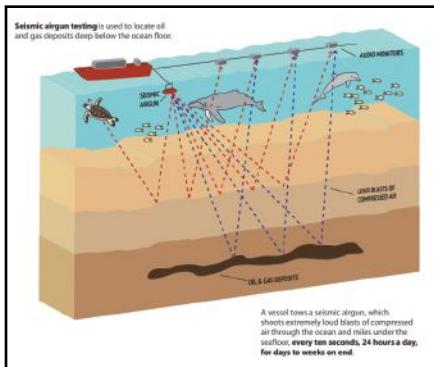
An export ban on such equipment could delay plans by Russia's state-run Rosneft and Gazprom to explore and develop new oil and gas resources in the Russian offshore and Arctic areas by limiting access to Western drilling technology. ExxonMobil and Rosneft were planning to drill the first wells in the Arctic Kara Sea this August, and the first exploration results are expected by the end of November.

EU president Herman Van Rompuy and European Commission president Jose Manuel Barroso said in a joint statement that the package of new restrictive measures agreed to by the EU "constitutes a powerful signal to the leaders of the Russian Federation: destabilizing Ukraine, or any other Eastern European neighboring state, will bring heavy costs to its economy."

The EU said it would reverse its decisions and reengage with Russia if the country starts contributing actively and without ambiguities to find a solution for the Ukrainian crisis.

Feds approve air guns and sonic sensors offshore U.S. East Coast

The U.S. Bureau of Ocean Energy Management (BOEM) has given the oil industry the green light to use air guns and sonic sensors to search for possible oil and gas under Atlantic waters, overriding environmentalists concerned that the seismic research can harm whales and other marine life.



Although geophysical research companies will still have to apply for individual permits to conduct seismic studies along the south and mid-Atlantic coast—and undergo more rigorous environmental scrutiny of their specific plans—the Interior Department's formal decision opens the door for the activity.

The move also helps pave the way for possible drilling off the East Coast in the 2020s by giving the industry a new



IsoMetrix marine seismic data being acquired in the Barents Sea.

chance to prove the oil and gas potential of the area right as Interior is assembling a 5-year plan for selling offshore energy leases beginning in late 2017.

Nine companies have told the Interior Department's BOEM they want to do the work, which would represent the first geophysical data collection along the East Coast in more than three decades.

Environmentalists accused the Obama administration of caving to the oil industry by formalizing an approach that would impose modest limitations on the seismic research instead of mandating more rigorous safeguards or barring the activity altogether.

"For more than 30 years, the Atlantic coast has been off-limits to offshore drilling," said Oceana campaign director Claire Douglass. "Today, our government appears to be folding to the pressure of Big Oil and its big money."

But the oil industry isn't getting everything it wanted. The American Petroleum Institute (API), the National Ocean Industries Association and other groups had unsuccessfully urged the Interior Department to scale back proposed timeouts to watch for animals before ramping up testing and possible requirements that companies shut down activities when dolphins and other animals are nearby.

API officials have called the restrictions "arbitrary and unnecessary," asserting they were based on flawed projections about the number of animals that could be hurt.

"Operators already take great care to protect wildlife, and the best science and

decades of experience prove that there is no danger to marine mammal populations," API upstream director Erik Milito said. "Restrictions that have no scientific basis can easily discourage exploration, private investment and job creation. Regulators should rely only on sound science when setting permit requirements."

Other limitations include closing access to the migratory routes of the endangered North Atlantic right whale and prohibiting multiple seismic surveys from being conducted at the same time.

The Obama administration stopped short of requiring companies to use still-developing, quieter technologies, such as one known as marine vibroseis. BOEM acting director Walter Cruikshank said the agency relied on public comments, scientific research and other evidence in developing the safeguards.

House GOP urges U.S. Interior to open up new offshore drilling areas

More than 160 House Republicans are urging the Obama administration to open up more areas to offshore drilling in a new 5-year lease plan for oil and gas development. They claim that opening areas of the Outer Continental Shelf that have otherwise remained off-limits, such as the Atlantic, Arctic, and parts of the Pacific oceans, would generate roughly \$160 billion between 2017 and 2035.

The U.S. Interior Department is currently gathering comments from oil and gas companies, conservation groups and others to determine which parts of the seabed will be included in its lease sales for 2017 - 2022.

"We believe the department must move forward with a five-year program that continue to lease in the Gulf of Mexico but also includes new areas with the greatest resources potential as well as areas such as the Mid-and-South Atlantic, or the Arctic, where there is strong bipartisan support from members of Congress, governors, state legislators, local leaders and the general public for allowing oil and natural gas development," the letter sent to Interior Secretary Sally Jewell stated.

"A legacy of leasing in existing areas will not put out nation's offshore energy production on sound footing," it added.

Environmental groups also sent a letter to Jewell, warning that expanding lease sales to the Atlantic, Arctic, and other new areas would undermine the president's climate change agenda. They argue that expanding offshore drilling would lead to more air pollution, and harm fragile ecosystems.

The Interior Department recently extended its request-for-information to allow more time for public feedback.

DNV GL's roadmap to regulatory requirements for U.S. floaters

DNV GL has mapped out what is necessary to be in compliance with U.S. Coast Guard requirements to operate FOIs, FSOs and FPSOs in U.S. waters, in what is said to be the first comprehensive overview of its kind.

The roadmap document called "Verification for Compliance with United States Regulations on the Outer Continental Shelf," follows from the Coast Guard's policy letter last year, accepting approval plans and inspections from the class societies DNV GL, Lloyd's Register, and ABS as basis of Coast Guard approval.

However, differences in the accepted rules and standards, and the subsequent variety in the complementing requirements from the CFRs (Code of Federal Regulations) led to uncertainties among operators, both about requirements and final approvals.

"This roadmap removes the uncertainty factor and, by including all the relevant information in a single document, it is a clear path for compliance," said DNV GL's Paal Johansen, who leads the classification business in the Americas. "The roadmap is an example of how we act as a bridge between the industry and the regulators."

FOIs, FSOs and FPSOs in compliance with this document will be given a U.S. class notation indicating compliance with both the DNV class standards and the additional Coast Guard requirements. This statement of compliance will meet all Coast Guard requirements.

"Many operators and owners have welcomed the roadmap," Johansen said. "Owners have expressed a strong desire to freely choose classification society for floating offshore installations in American waters and we know there are many owners, designers, operators and yards that would prefer to work with DNV GL. This document is further proof that they can do so and be confident in the entire regulatory process."

In 2008, DNV was the classification society and CVA for the first FPSO (BW Pioneer) in the U.S. Gulf of Mexico, for the Cascade and Chinook field and is currently working on a classification and CVA project for a floater in the U.S. Gulf for Delta House.

DNV GL has an extensive track record in verification and independent analysis for many U.S. Gulf floaters throughout the past 20 years, including many high-profile failure and accident investigations. DNV GL has a wide portfolio of CVA and development projects for the oil and gas industry in the Gulf of Mexico.

Captured CO₂ to enhance oil recovery at West Ranch field



The WA Parish power plant in Fort Bend County, southwest of Houston, Texas.

NRG Energy, Inc., through its wholly owned subsidiary Petra Nova Holdings LLC, has formed a 50-50 joint venture with JX Nippon Oil & Gas Exploration Corp. (JX Nippon), through its wholly owned subsidiary JX Nippon Oil Exploration (EOR) Ltd., to build and operate the Petra Nova Carbon Capture Project. Using proven technology, the project will be a commercial-scale carbon capture system that captures 90% of the carbon dioxide (CO₂) in the processed flue gas from an existing unit at the WA Parish power plant in Fort Bend County, southwest of Houston, Texas.

The new company has begun construction on the project and, when complete, it is expected to be the world's largest post-combustion carbon capture facility on an existing coal plant. The overall cost, including costs already incurred, is anticipated to be approximately \$1 billion.

Through enhanced oil recovery (EOR), the captured CO₂ will create a revenue stream for the project by increasing domestic oil production at the West Ranch oil-field, jointly owned by the company and Hilcorp Energy Co. EOR is expected to boost oil production at the field from around 500 bbl per day to about 15,000 bbl per day. The West Ranch oilfield is currently estimated to hold about 60 mmbbl of oil recoverable from EOR operations. NRG and JX Nippon each hold a 25% interest in the oil field through the company.

"We are very excited and proud to participate in this epoch-making project in the U.S., which will be able to vitalize the legacy oil fields and to produce a significant amount of oil that might not have been produced without this project, while reducing the footprint to the global environment at the same time," said Shunsaku Miyake, president and chief executive officer of JX Nippon Oil & Gas Exploration Corp.

"Our objective is simple: we want to continue to provide safe, affordable and reliable power to our customers, but without risking the health of the planet as a result of our activities," added David Crane, president and chief executive officer of NRG Energy. "This project is an enormous step in that direction, plus it continues the trend of enhancing domestic oil production, thus further reducing our national dependence on foreign sources of oil."

Previously the project was selected by the U.S. Department of Energy (DOE) to receive a grant of up to \$167 million as part of the Clean Coal Power Initiative Program (CCPI), a cost-shared collaboration between the federal government and private industry.

"With coal expected to remain a significant part of the energy portfolio in the U.S. and internationally, first-of-a-kind projects like Petra Nova will move us towards a low-carbon energy future," Secretary Ernest Moniz in a DOE press release.

The project is expected to capture approximately 1.6 mm tons of CO₂ annually from an approximately 240 MW slipstream of flue gas from WA Parish Unit 8, which has a total net capacity of 610 MW. At this scale, the project can prove the ability to apply coal-based carbon capture technology to existing coal-fueled power plants in the United States and around the world. The CO₂ will be compressed and piped through an 82-mi long pipeline to the West Ranch oilfield, the initial field for the project.

Saipem secures FPSO contracts in Brazil and Angola

Italian oil services provider Saipem has secured new contracts, worth a combined value of about \$600 million, in Brazil and Angola. Under the Brazilian contract, Saipem will lease its Cidade de Vitoria floating production storage and offloading (FPSO) vessel to Petrobras for an additional 4 years and will also undertake work to upgrade the vessel. The Cidade de Vitoria FPSO has been under a lease and operation contract to Petrobras since 2005 and the latest deal has now been extended until 2022. The modification works will increase the produced water treatment capacity and connect two additional gas wells with a high level of condensates by the first quarter of 2016.

Roxtec to supply deck seals for oilfield redevelopment

Cable and pipe seal manufacturer Roxtec has won a major contract to supply one of the largest and deepest oil sea developments in the North Sea. Roxtec's UK and Korean operations are working with global petroleum giant BP on its Quad 204 offshore oil and gas project, where a new floating production, storage and offloading (FPSO) unit is being built. The unit will be located about 80 mi west of Shetland in Scotland. The Quad 204 is being built by Hyundai Heavy Industries in South Korea, the largest shipyard in the world. It will replace the existing Schiehallion FPSO and include an extension of a subsea system with new and replacement flow lines, new and replacement risers and 14 wells in addition to the 52 existing ones. The Quad 204 is designed to operate in harsh weather conditions and, once it has been completed, is expected to produce 130,000 bbl of oil and more than 2 mmcm a day of gas a day. The facility will also provide storage capacity for more than 1 mmbbl of oil with construction due to be completed this summer and oil production commencing by 2017.

Subsea 7 wins \$160M BP contract for the Gulf of Mexico

BP Exploration & Production Inc. has awarded Subsea 7 SA a 3-year \$160-million contract extension for light subsea construction, inspection, repair, and maintenance services in the U.S. Gulf of Mexico. The contract began in the second quarter of this year and will run through the third quarter of 2017. The scope covers the provision of two vessels, including a dedicated vessel on a full-time basis, associated project management and engineering support, ROV-based inspection and intervention, and light construction work. One of the vessels is a newbuild offshore subsea construction vessel, while the other is a light-construction vessel.

MacGregor to supply equipment for ice-class vessels

MacGregor, part of Cargotec, has won an order to supply equipment for three 80-m ice-class vessels and a 96-m shallow water pipe laying barge—all will be constructed for Bumi Armada Berhad, a Malaysia-based international offshore oil-field services provider. The vessels are destined to operate in the Caspian Sea. Equipment delivery is scheduled for mid-November 2014. The order is booked into the second quarter 2014 order intake. Two of the three 80-m ice-class vessels are designed for support services, the third is a multi-purpose duty rescue vessel. All will have a 60-ton bollard pull and will be equipped with MacGregor electro-hydraulic windlass-mooring winches, capstans, tugger winches and storage reels, along with anchor handling-towing winches with a 120-ton line pull and 200-ton brake holding capacity. The first two vessels will be constructed at Keppel Nantong Shipyard in China, and the third vessel will be constructed at Keppel Singmarine Pte Ltd. in Singapore.

Megalodon platform installation contract in GoM goes to McDermott



The McDermott heavy-lift vessel, Derrick Barge 50, will install the Megalodon platform in 391 ft of water, over an existing well site in the Gulf of Mexico. Photo courtesy of Business Wire.

McDermott International has secured a contract to install a platform in the U.S. Gulf of Mexico for Walter Oil & Gas. Under the contract, McDermott will transport and install the 3,300-ton jacket and 2,100-ton topsides on South Timbalier Block 311.

The six-pile Megalodon platform will be placed over an existing drill site with installation operations anticipated to start in the fourth quarter of 2014.

"McDermott is pleased to work again for Walter to support its drilling and production activities," said Dominic Savarino, McDermott International's vice-president and general manager of the Americas. "This project supports our goal to maximize our asset utilization between large contracts through short-term transportation and installation work."

Savarino said McDermott expects to include the project in its third-quarter 2014 backlog. In October 2013, Walter Oil & Gas awarded a contract to Gulf Island Fabrication to build the jacket, piles and topsides for the Megalodon project.

No financial details of the contract were disclosed.

In other U.S. Gulf developments, CGG released the Fast Trax processed data from its Deux multi-client survey covering 357 blocks. The images have been delivered on schedule less than 7 months after completion of the survey.

Deux is the second of a three-survey, multi-client program that CGG is conducting in the Garden Banks, Green Canyon, Keathley Canyon, and Walker Ridge areas of the U.S. Gulf using StagSeis, its next-generation subsalt imaging solution. CGG is currently acquiring Trois, its third StagSeis survey. The location includes several key prospects and multiple discoveries.

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A Damen PSV 5000 vessel.

Damen Shipyards Group PSV 5000 vessels to work in sub-Arctic waters

Atlantic Towing Ltd. (USA) has selected newly designed, ice-strengthened PSV 5000 vessels from Damen Shipyards Group to meet its demanding 10-year offshore support contract with ExxonMobil Canada Properties and Hibernia Management and Development Co. Ltd. (HMDC). The vessels will operate in the challenging sub-Arctic waters of the Hibernia and Hebron oil fields, off Newfoundland and Labrador.

ATL will take delivery of four PSV 5000 vessels, one of which will be equipped for inspection, repair, and maintenance duties. All four will share the same PSV design platform, with the first vessel due in service in the second half of 2016. Featuring Damen's distinctive bow design, the PSV 5000 vessels will include a cost- and emissions-efficient diesel electric power plant.

"These will be safety-critical vessels, working in sub-Arctic conditions in one of the world's foggiest places renowned for strong winds, high waves, snow, and icebergs," said Jan van Hogerwou, manager North America, Damen Shipyards Gorinchem. "All four will benefit from iceberg management tools, while the IRM vessel will feature a 100-ton subsea crane equipped with an advanced heave compensation system for operation in the Grand Banks area."

The combination of the PSV 5000's flare-less bows, slender hull lines, and diesel electric propulsion with azimuth stern drives is designed to minimize fuel consumption and emissions, offer superior sea-keeping and dynamic positioning, and ensure crew comfort, according to the company. Under Damen's Clean Design and Environmental Care Protocol, the vessels will also feature fuel-efficient generators and a selective catalytic reduction system in compliance with forthcoming environmental regulations.

The PSV 5000 vessels will join Atlantic Towing's current fleet of nine

offshore support vessels, playing a key role in the project's iceberg-management program as well as fulfilling standard PSV duties. As part of its contract, Damen has committed to open a Damen-certified service and maintenance center in St. John's, Newfoundland & Labrador.

National Drilling's Al Ghallan jack-up rig undergoes overhaul

Drydocks World has refurbished the National Drilling Co. (NDC) jack-up drilling rig Al Ghallan. The rig is a self-elevating cantilever-type mobile offshore drilling unit with three triangular lattice-type legs that are 234 ft long.

Drydocks World modified three 176-ton spud cans: the program included replacement of cathodic protection, painting, placing height markings, performing an inclination experiment, and updating the rig's operating manuals. The yard replaced about 60 tons of steel in the tanks.

Additional tasks included a major refurbishment of the accommodation, dismantling and overhaul of the rig's three cranes, replacement of high-pressure Koomey lines, and a revamp of pipes around the rig.

Following an engineering study, improvements were made to ventilation in the sewage treatment plant and transformer room. Also undergoing an overhaul were the cantilever skidding gears, air hoists, air tuggers, the raw water tower elevation system, gears and bearings, and



Jack-up Al Ghallan gets a facelift.

dump and equalizing valves. Other work included MPI inspection of legs, painting of the derrick and blasting and painting of hull, tanks and mud pits.

Ultstein Verft delivers newbuild Island Performer to Island Offshore

The Ulstein Verft newbuild Island Performer has been delivered to ship owner Island Offshore. The riserless light well intervention (RLWI/IMR) vessel will serve her first 5 years for FTO, a joint venture between FMC Technologies, Edison Chouest Offshore, and Island Offshore in the Gulf of Mexico.

"The vessel is customized to suit the scope of work in the FTO contract, in which RLWI and inspection, maintenance, and repair (IMR) are the main



Island Performer to work U.S. Gulf.

tasks," said managing director Håvard Ulstein, Island Offshore. "She is able to perform operations at depths down to 9,843 ft, and the contracted work starts at year's end. However, the very first assignment will be for the RogFast connection in Norway, in which the scope of work will be to investigate the sea bottom."

Island Performer has a 276-ton active heave compensated (AHC) crane with a below-deck winch, and carries two deepsea work ROVs – one to be launched through a dedicated moon pool and the other from the starboard side.

Island Performer is the next-generation subsea vessel from Ulstein, with large accommodation, storage, and lifting capacities. It meets the highest standards for station keeping, redundancy, and dynamic positioning, and it is able to retain system integrity and continue operations uninterrupted even after a substantial single failure.

INPEX launches Ichthys' FPSO hull from dry dock at Daewoo shipyard

The hull of the FPSO for the INPEX-operated Ichthys LNG Project has launched from the dry dock at the Daewoo Shipbuilding and Marine Engineering (DSME) shipyard in Okpo, South Korea.

The launch saw the 1,102-ft long by 194-ft wide hull floated out of the dry dock and positioned quayside where construction will continue. The vessel is designed to hold 1 mmbbl of condensate.

The FPSO will be moored about 2 mi from the Ichthys LNG Project's Central Processing Facility (CPF). It will process and store condensate from the CPF and periodically offload stabilized condensate to shuttle carriers for export directly to market.

Once complete, the facility will be towed 3,480 mi to the Ichthys field in the Browse basin offshore Western Australia, where it will be permanently moored to the seabed for the life of the project.



The Brasil Voyager, a tanker owned and operated by Chevron, was built with specific features for offloading oil from Papa-Terra.

First offloading takes place at Papa-Terra Field

The first cargo has been successfully offloaded from what is expected to be Chevron's largest investment in Brazil: the offshore Papa-Terra heavy oil development in the Campos Basin.

"The first offloading at Papa-Terra represents an important milestone for the company, reinforces the progress being made by the project and highlights the success of the partnership between Chevron and Petrobras," said Les Wood, a manager with Chevron Brazil.

In May, the Brasil Voyager, a tanker built specifically for the operation, lifted about 740,000 bbl of oil from Papa-Terra's floating production, storage and offloading (FPSO) vessel. The oil came from the first two production wells in the field.

"This is a significant milestone for the Papa-Terra project," said Kelly Hartshorn, managing director of Chevron's Latin America business unit. "This project will make a positive impact on Chevron's future growth target, and I am proud of the Chevron Brazil team for their efforts to get us to this successful point in the field's development."

The Brasil Voyager is expected to offload around 950,000 bbl of crude from Papa-Terra every 40 days.

"The Brasil Voyager is now bringing cargo to the market, including providing supply to the Pascagoula Refinery, and we look forward to its return to the Papa-Terra Field for the next Chevron shipment," Wood said.

On May 12, production began from a third well at Papa-Terra. Two additional wells are expected to start producing to the FPSO in 2014.

The Papa-Terra Field lies in approximately 3,900 ft of water. The project includes the FPSO as well Brazil's first tension-leg well platform (TLWP), which was installed in the field in April. Heavier-oil production wells will lead to the platform while lighter-oil produc-

tion wells will tie back to the FPSO. First oil from the TLWP is expected later this year.

The project has a planned daily capacity of 140,000 bbl of crude oil and 35 mmcf feet of natural gas.

WJM introduces modular offshore drilling rig design

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

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

The rig has two main modules: the drilling equipment set (DES) and the drilling support module (DSM). The DES has the capacity to access 15 wells arranged in a 3 by 5 matrix and is capable of drilling wells up to 25,000 ft. The DSM is equipped with a pair of rig cranes that streamline installation.

EOC Ltd. enters into contracts for two new vessels

EOC Ltd., one of Asia's leading providers of offshore oil and gas development and production solutions, said it will add two new accommodation-maintenance vessels to its fleet, in line with its focus on growing its offshore accommodation business.

EOC has entered into shipbuilding contracts worth a total of about \$72 million with Xiamen Shipbuilding Industry Co., Ltd. a shipyard based in Xiamen, China, for the two accommodation-maintenance vessels, with options for an additional two similar specification ves-

sels. The shipbuilding contract price does not include owner furnished and nominated equipment.

The Group announced in July that it had entered into an agreement with its largest shareholder, Ezra Holdings Ltd. to consolidate EMAS Marine, Ezra's offshore support services division, under the Group, to create one of the largest offshore support services providers in the Asia-Pacific region by asset value as well as a proposed secondary listing of EOC in Singapore. In addition, the Group also announced the acquisition of an accommodation and support vessel on the same date.

The addition of these two new accommodation vessels is in line with the Group's strategy to continue to grow its fleet and build on its platform as one of the largest offshore accommodation and support services providers in the region.

Sembawang to convert Kaombo deepwater floaters

Saipem France has contracted Sembawang Shipyard to convert two VLCCs to turret-moored FPSOs for the Total-operated Kaombo project, 93 mi offshore Angola.

Full scope of the \$600-million contract covers refurbishment of the VLCCs, construction engineering, fabrication of the flare, helideck, upper turret and access structure, integration of the topsides modules (to be built at Saipem's Indonesian yard) and lower turret components, and pre-commissioning of the FPSOs.

The two converted vessels will each have oil treatment capacity of 115,000 bbl per day, water injection capacity of 200,000 bbl per day, gas compression capacity of 100 mmcf per day, and an oil storage capacity of 1.7 mmbbl. Olympia, the first VLCC, will enter Sembawang Shipyard during the current quarter and the Antarctica during the first quarter of 2015. The project is expected to take 32 months to complete.

OMV Petrom discovers new oil reservoir in Romanian Black Sea

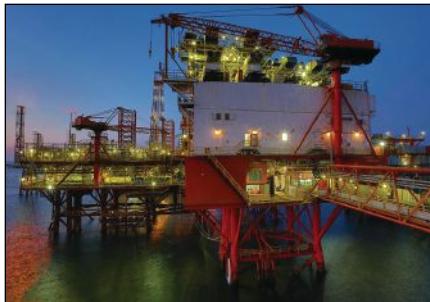
OMV Petrom has discovered a new oil reservoir on the continental shelf of the Romanian Black Sea. The reservoir in the shallow-water Istria XVIII offshore perimeter was identified by OMV's Marina 1 exploration well. The well was drilled to a depth of approximately 2,150 m below the sea bed with production potential of 1,500 to 2,000 bbl per day.

If the discovery is proved to be commercially viable, OMV plans to commence production from the new reservoir over the next 3 to 4 years and may require investment of more than \$134 million.

OMV Petrom executive board member responsible for exploration and production Gabriel Selischi said: "The Black Sea is an important area for OMV Petrom, which continues to have potential for new discoveries."

Currently, production from shallow waters accounts for 18% of the company's hydrocarbons production in Romania.

"OMV is currently looking for hydrocarbon resources in various perimeters in the Black Sea," Selischi said. "We have more than 40 years of experience in



The Marina 1 exploration well was drilled to a depth of approximately 2,150 m below the seabed.

exploration and production in the shallow waters of the Black Sea, and we will continue to invest in the development of the offshore segment."

OMV is currently looking for hydrocarbon resources in various perimeters in the Black Sea.

The company said exploration in the continental shelf of the Black Sea commenced in 1969 and the first hydrocarbon discovery was made in 1980 while the offshore production began in 1987. OMV Petrom has an annual oil and gas production of around 66 mmbbl and a refining capacity of 4.2 million tons.

Camac discovers four new oil and gas reservoirs offshore Nigeria

Camac Energy has discovered four oil and gas reservoirs in the Oyo-8 development well, which was drilled to a total depth of 6,059 ft, located offshore Nigeria in OML 120, the company said.

Drilling operations at the Oyo-8 well, which features a vertical and a horizontal section, started in June. The vertical section was designed to test for further hydrocarbons in the earlier undrilled Eastern fault block of the Oyo field.

A total gross hydrocarbon thickness of 112 ft has been recorded, based on results from the logging-while-drilling data, reservoir pressure measurement and reservoir fluid sampling. Camac will now complete Oyo-8 horizontally as a producing well in the Pliocene formation of the Central Oyo field.

The Oyo-7, which was drilled in October 2013, will also be completed horizontally in the Pliocene formation of the Central Oyo field.

"This is an excellent result from the vertical section of Oyo-8, as it positively established oil presence in new reservoirs in the Eastern fault block," said Segun Omidele, Camac Energy exploration and production senior vice president.

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U.S. to provide 21 million acres in GoM for oil and gas development

The U.S. Bureau of Ocean Energy Management (BOEM) has decided to offer more than 21 million acres offshore Texas for oil and gas exploration and development in a lease sale featuring all available unleased areas in the Western Gulf of Mexico planning area.

Western Gulf of Mexico Lease Sale 238 is scheduled to be held in New Orleans, Louisiana, on August 20, 2014.

Sale 238 will feature 4,026 blocks, covering approximately 21.6 million acres, located from nine to 250 mi offshore, in water depths ranging from 5 m to 3,346 m.

The proposed lease sale is expected to produce 116 to 200 mmbbl of oil and 538 to 938 bcf of natural gas.

BOEM will provide blocks situated, or partially located, within the 3-mi U.S.-Mexico Boundary Area. The blocks within the former Western Gap that are located within 1.4 nmi north of the Continental Shelf Boundary between the United States and Mexico will also be available.

Sale 238 will be the sixth offshore sale under the government's Outer Continental Shelf Oil and Gas Leasing Program for 2012-17.

Colombia oil auction seeks to curtail shrinking reserve life

ExxonMobil Corp., Royal Dutch Shell Plc and Repsol SA were among top bidders for offshore blocks in Colombia's 2014 oil round as explorers stayed away from shale areas.

The round held in Cartagena, northern Colombia, marked the entry of Statoil ASA to the South American state that's betting on offshore and shale deposits to boost reserves amid a failure to make significant onshore discoveries in recent years.

Twenty-six blocks, or 27% of the 95 blocks on offer, received bids, below the 30% the government had been hoping for, Colombia's deputy energy minister Orlando Cabrales told reporters after the bids were announced in July.

Five deepwater and ultra-deepwater blocks received offers out of a total of 19 offshore that were offered. Anadarko Petroleum Corp. was the sole bidder for three blocks, with a joint offer between Repsol, Exxon and Statoil the sole offer for another. A joint bid from Shell and Colombia's state-controlled Ecopetrol SA was the highest bid for a Caribbean site.

Companies shunned areas off Colombia's Pacific coast due to a lack of information. Out of 18 unconventional blocks that were offered, only one received bids, with the highest coming

from Parex Resources Inc. Drillers are waiting to see how the industry develops, the head of Colombia's hydrocarbons agency Javier Betancourt said.

"This was a frontier round," Betancourt said. "It's not the same as mature and proven areas."

A total of 26 blocks received offers, generating a potential investment of \$1.4 billion, Betancourt said, below the \$2.6 billion the agency was seeking. The blocks were to be officially awarded on

August 11. Colombian oil reserves have failed to keep pace with rising production. The country's reserve life—a measure of how much oil is left based on current production—shrank to 6.6 years at the end of 2013, from 6.9 years a year earlier.

Colombia produced an average of 1.008 mmbbl a day of oil in June, up 3.5% from a year earlier, according to a July 7 Mines and Energy Ministry report. The ministry is forecasting average daily production this year of 1.007 mmbbl.



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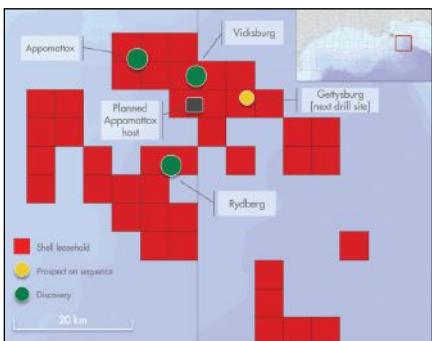





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Shell's Norphlet play in U.S. Gulf.

Shell makes third oil discovery in Gulf of Mexico's Norphlet play

Shell has made a third major oil discovery in the Norphlet play in deep waters of the eastern Gulf of Mexico. The company found oil near its Rydberg exploration well, which is in 7,479 ft of water approximately 75 mi offshore in Mississippi Canyon Block 525.

Shell drilled the well to a total depth of 26,371 ft and found oil reserves more than 400 ft deep.

The company anticipates the resource base to be around 100 boe. The Rydberg well joins the Appomattox and Vicksburg wells, also in the Norphlet play, bringing

the total potential of discoveries to more than 700 million boe.

Shell has an operator interest of 57.2% in the Rydberg discovery, while Ecopetrol America and Nexen, a wholly owned affiliate of CNOOC, have 28.5% and 14.3% stakes respectively.

Shell and Nexen plan to follow up the Rydberg discovery with an exploratory well at Gettysburg in Desoto Canyon Block 398, which is within 10 mi of the planned Appomattox development.

"The Rydberg discovery builds upon our leadership position in the eastern Gulf of Mexico and its proximity to our other discoveries in the area make Rydberg particularly exciting," Shell Upstream Americas director Marvin Odum said.

The Gulf of Mexico accounts for about 50% of Shell's oil and gas production in the United States, with output of about 180,000 bbl per day in 2013.

Antrim finds numerous leads in Skellig block offshore Ireland

Antrim Energy has detailed prospective hydrocarbon resources in frontier exploration license 1/13 in the Porcupine basin offshore southwest Ireland. This covers blocks 44/4, 44/5 (partial), 44/9, 44/10, 44/14 and 44/15, collectively

known as the Skellig block. Antrim acquired a licensing option over the area in 2011 and later farmed out a 75% operating interest to Kosmos Energy.

McDaniel & Associates Consultants, in accordance with National Instrument 51-101, estimates total unrisked potential from 17 identified leads at 1.1 Bboe. Two of the leads, C and M-3, could hold 482 mmboe. The analysis is based on recently acquired 3D seismic data, which suggest a Lower Cretaceous slope fan and channel deposits are present, similar in geometry and seismic character to the Cretaceous oil discoveries offshore West Africa.

CNOOC starts oil production from Panyu project in South China Sea

CNOOC has produced first oil from its Panyu 10-2/5/8 project in the Pearl River Mouth basin of the South China Sea. This takes in the Panyu 10-2, Panyu 10-5 and Panyu 10-8 fields, and was designed to share some of the existing facilities at the Panyu 4-2 oil field. Water depth is around 328 ft. The main new facilities include one wellhead platform and nine production wells. Currently four wells are producing around 9,000 bbl per day. Output is expected to build to a peak of 13,000 bbl per day in 2015.

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Shell starts oil production from Bonga North West off Nigeria

Royal Dutch Shell reported the start of oil production from the first well at its Bonga North West deepwater development, drilled in 1,000 m of water offshore Nigeria. Operated by Shell subsidiary Shell Nigeria Exploration & Production Co. Ltd. (SNEPCo), the development is expected at peak production to contribute 40,000 boe per day to the development.

The \$3.6 billion Bonga development project, which began producing oil and gas in late 2005, was Nigeria's first deep-water development in water deeper than 1,000 m. The 60 sq. km Bonga field lies on OPL 212.

Oil from Bonga North West is transported by a subsea pipeline to an existing Bonga floating production, storage, and offloading vessel that has been upgraded to handle the additional flow. Shell expects four oil wells and two water-injection wells to be connected to the FPSO, from which oil will be loaded on tankers.

SNEPCo holds a 55% stake in the Bonga project. Partners include Esso Exploration & Production Nigeria (Deepwater) Ltd., Total E&P Nigeria Ltd., and Nigerian Agip Exploration Ltd., under a production-sharing contract with the Nigerian National Petroleum Corp.

Brazil's Petrobras sets presalt production records in June

Petrobras June oil production in Brazil averaged 2,008,000 bbl per day, up 1.7% from May's production of 1,975,000 bbl per day. Including production operated by Petrobras for its partners in Brazil, the volume reached 2,135,000 bbl per day, up 2.1% from last month's production of 2,092,000 bbl per day.

In June, presalt production in the Santos and Campos basins increased 6.7% from May, with a volume of 477,000 bbl per day, setting another monthly record. A new presalt daily production record of 520,000 bbl per day was established on June 24. These volumes include the production operated by Petrobras for its partners.

These records are attributed to new projects in the presalt layer, as well as the high production levels of the wells from Lula and Sapinhoá fields.

In total, eight new offshore wells in the Santos and Campos basins started up production in June. Alongside them, 30 new subsea wells started up operation in the first half of the year, twice the amount that started up production in the same period last year.

With the start of operation of the pipe-laying support vessel Polar Onyx on June 24 and the arrival of six more units by the

end of 2014, the company's capacity to interconnect new wells in the second half should be even greater.

Statoil resumes production on Njord A platform in North Sea

Statoil ASA has resumed oil and gas production on the Njord A platform in the Norwegian North Sea after a reinforcement of the platform structure. Production had been shut down since last summer. Extensive analyses and inspections in 2013 revealed a need to reinforce

the platform's structure, and the operator made the decision to close production while reinforcements were made.

Reinforcing the structure consisted of bracing the primary beams and struts and increasing the length of the secondary beams under the platform. Statoil's long-range plan is to further bolster the platform to prepare it for future drilling operations and an extended lifetime on the Njord field. The platform will continue to produce until next summer and then will be taken to shore for additional upgrades.

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ONGC to invest over \$1B in Mumbai High North redevelopment



The Mumbai High field complex.

Oil and Natural Gas Corp (ONGC) plans to invest over \$1 billion in the re-development of its giant Mumbai High North oil and gas field off the west coast of Mumbai. The project will yield an incremental 6.997 million tons of crude oil and 5.253 Bcm of gas by 2030, the company said in a statement.

"The project is designed to carry forward the success of the previous two editions of re-development projects of the fields that were discovered four decades ago," according to the statement.

The facilities envisaged under the project are the installation of five well platforms, one clamp-on facility for wells at an existing platform, associated pipelines and modifications at 13 platforms, drilling of 52 new wells and 24 sidetrack wells.

The facility parts under the project are scheduled to be installed by April 2016, while drilling of wells and the overall project completion is scheduled for May 2017.

Bombay High (now Mumbai High) is located in the Arabian Sea around 160 km west of the Mumbai coast. Discovered in 1974, the field has been operated by ONGC. Production at the field started in 1976.

The oil field consists of two blocks named Mumbai High North and Mumbai High South. The blocks were divided based on shale barrier assisting in independent exploitation of reserves at the north and south fields of Mumbai High.



MOPU-FSO to serve Wassana project off Thailand

KrisEnergy has approval to develop the Wassana oil field in license G10/48 in the Gulf of Thailand. The company plans to use a converted Bethlehem Matt Type jack-up, currently employed on another project offshore Malaysia, as a mobile offshore production unit on Wassana, with 12 to 14 development wells producing to an FSO vessel.

The MOPU jack-up is designed for water depths up to 213 ft with capacity to process up to 20,000 bbl per day of oil and to

inject 15,000 bbl per day of water. KrisEnergy was to take delivery of the MOPU in September when it enters dry dock for inspection and refurbishment works. The company expects to produce up to 10,000 bbl per day of oil from Wassana and will drill other prospects in the license area. Two other oil discoveries, Niramai and Mayura, will undergo appraisal.

Synectics adds Clair Ridge to North Sea portfolio

Synectics has designed and delivered an end-to-end surveillance solution for Clair Ridge—the \$7.6 billion second phase development project taking place in the North Sea's Clair field.

Located 75 km west of the UK's Shetland Islands, Clair Ridge is the most recent high-profile project to feature in Synectics' North Sea portfolio, which also includes developments such as Jasmine-Judy, Golden Eagle, Shell Gannet, Shell Clipper, Erskine and Elgin.

The Clair Ridge development, due for full platform topside installation in 2015, will consist of two bridge-linked platforms: a drilling and production platform and a second for quarters and utilities. Production is scheduled to commence in 2015 and continue for 40 years.

It is estimated that the development will produce around 120,000 bbl of oil per day and will provide a vital hub for future expansion in the area. It will be the first time that BP's award-winning new LoSal® EOR extraction technique for boosting oil yield—achieved by using desalination technology—will be used. This is expected to result in more than 40 million additional barrels being recovered over the lifetime of the field.

Bowleven secures authorization for Cameroon project

Africa-focused oil and gas explorer Bowleven has secured exploitation authorization for the Etinde development off the coast of Cameroon. The authorization gives Bowleven and its joint-venture partners exploitation rights over block MLHP-7 for an initial period of 20 years, with an option to renew for an additional 10 years.

"The award is a significant milestone and enables the progression of the exciting development plans on Etinde," Bowleven chief executive Kevin Hart said. "This is an important project for Cameroon and we are pleased to be able to support the country in its aim to further develop its hydrocarbon resources."

Last June, Bowleven sold a 50% stake in the Etinde oil and gas permit to Lukoil and NewAge for \$250 million. The deal reduced Bowleven's stake in the Etinde permit from 75% to 25% and made NewAge's subsidiary Camop the operator.

Bowleven said the transaction with Lukoil and NewAge allows accelerated appraisal drilling, intended to confirm the additional resources available for the expanding range of gas sales opportunities. Bowleven holds equity stakes in five blocks in Cameroon, with three blocks located offshore in shallow water and two onshore.

BG pursues two offshore Egypt gas developments

BG Group and its partners have submitted a development plan for the Notus high-pressure-high-temperature and Harmatten Deep gas discoveries in the Egyptian sector of the Mediterranean Sea. The plan is in accordance with the El Burg offshore concession agreement. However, the release of funds for any further Egyptian development projects, including West Delta Deep Marine (WDDM) Phase 9b, remains contingent on an improvement in the local investment climate, BG said, adding that it remains in discussions with Egypt's government. The first WDDM Phase 9a well has come onstream; however, the nine-well development will only temporarily offset underlying production declines, the company said.

Iran considers new energy hub off the coast of Qeshm Island

National Iranian Oil Co. plans to develop oil and gas fields offshore Qeshm Island in southern Iran, with a view to create an energy hub on the island within 10 years, according to Iranian news service Shana.

Hengam is the sole field producing light oil in this region, but the offshore Hormuz, Taftan, and Tosan fields could also be developed. Reserves in the area are estimated at 4 Bbbl of oil and 10 tcf of gas. The island could use the nearby gas reserves to produce more than 12,000 MW of electricity, if the finance is provided. The electricity could satisfy the energy needs of power plants in the region for the next 30 years.

In the Persian Gulf, the 3,400-ton living-quarter platform C for the South Pars Phase 12 development has been installed, according to Pars Oil and Gas Co.

Phase 12 is producing 400 mmcf per day of gas, but the new facilities should eventually lift output to 3 bcf of rich gas for export to Iran's national gas grid and to LNG production units. Phase 12 also is expected to supply 120,000 bbl per day of gas condensate and 750 tons per day of sulfur. Petropars is the main contractor.

Hyundai secures \$1.9B order for UAE offshore oil project

South Korea-based Hyundai Heavy Industries (HHI) has secured a \$1.9 billion order from Abu Dhabi Marine Operating Co. (Adma-Opco) for the second package of the Nasr full field development project in the UAE. Under the deal, HHI will build the fixed platforms and lay subsea cables for the project.

HHI will carry out engineering, procurement, construction, installation and commissioning work for the super complex, which will feature a gas treatment platform, a separation platform and an accommodation platform.

HHI will lay 144 km subsea power cables and 55 km infield cables, as well as modify an existing manifold tower and two wellhead towers in Nasr oil field, 130 km northwest of Abu Dhabi. The facilities, which are expected to be completed by the second half of 2019, will increase the daily oil production capacity of the offshore field from 22,000 to 65,000 bbl.

Adma-Opco is developing the Nasr and Satah Al Razboot (SARB) offshore fields along with Umm Lulu field, which is located in the Arabian Gulf 30 km northwest of Abu Dhabi. In June 2013, UAE's National Petroleum Construction Co. (NPCC) was awarded the EPC contract for the first phase of the Umm Lulu project.

Adma-Opco intends to add 300,000 bbl per day of crude oil production with the development of the three fields. The company is planning to increase its daily crude oil production capacity from the current 600,000 bbl to approximately 1,000,000 bbl by 2020.



Umm Shaif offshore oil production facilities.
Photo courtesy of HHI.

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World's most advanced offshore heavy lift crane training simulator

Heerema Marine Contractors (HMC) has selected Kongsberg Maritime's K-Sim Offshore simulation platform to enhance crane operator training and the safe, efficient implementation of heavy lift operations. With the contract signed last May, delivery of what will become the world's most advanced offshore heavy lift crane simulator is planned for September 2015. It will be installed at a new simulation center in the HMC Academy at the company's headquarters in Leiden, the Netherlands.

HMC's requirement when selecting its simulation partner was to develop a system that could train the most competent crane operators and conduct detailed pre-mission training for heavy-lift projects. To meet these requirements, Kongsberg Maritime will develop a unique simulator based on the K-Sim Offshore platform, which is already in use at several high-profile offshore training facilities worldwide, according to the company.

"In addition to the technical capabilities of the K-Sim Offshore Simulator,



especially including its high-level hydrodynamics, it was important to find a simulator supplier that we could work closely with on such an extensive project," said Catina Geselschap, project manager at the HMC Academy. "Kongsberg Maritime demonstrates not only the technical competence to deliver such a complex and sophisticated simulator, but also an open approach that encouraged dialogue and a willingness

to find a solution working in close cooperation with Heerema."

The Kongsberg Maritime scope of supply includes two offshore crane operator domes and a DNV Class A bridge with K-Sim DP simulator, which is based on the same Kongsberg Maritime K-Pos DP systems used on Heerema's vessels. To achieve highly realistic training, the K-Sim Offshore simulator will feature detailed models of three HMC deepwater

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construction vessels—Thialf (Semi-Sub), Balder (Semi-Sub) and Aegir—in addition to several barges (including H-851) and a supply vessel.

Supporting Heerema's plans to use the simulator for project planning, testing and verification, Kongsberg Maritime is also developing a set of library objects and models of offshore installations and equipment used for simulating specific heavy lift projects, such as lifting Jackets, top sides and subsea templates from barge to vessel or from vessel and overboard. Also included in the delivery is an extensive instructor and debrief system, and two deck operator trainers (deck position simulator) designed to train for communication and teamwork between the crane operator and deck operators.

"Heerema is pushing limits with real operations, and the K-Sim Offshore simulator project will push limits within training for heavy-lift applications," said Harald Kluken, area sales manager, Kongsberg Maritime Simulation. "As our most advanced offshore heavy lift crane simulator to date, this project will take the K-Sim Offshore simulator platform a great step forwards in regards to engineering and pre-simulations..."

FMC, operators to develop next generation subsea equipment

Anadarko Petroleum Corp., BP, ConocoPhillips and Royal Dutch Shell have signed an agreement with FMC Technologies to jointly develop next-generation standardized subsea production equipment and systems for producing oil and gas from deepwater high-pressure, high-temperature reservoirs.

The group plans to build the equipment and systems to withstand pressures reaching 20,000 psi and temperatures reaching 350°F. at the mudline, while improving overall deepwater development through the standardization of materials, processes, and interfaces, as well as the enhancement of reliability and operability.

BP previously reported its intention with Maersk Drilling to develop conceptual engineering designs for next-generation offshore drilling rigs as part of the company's Project 20K, an initiative to develop what BP calls "next-generation systems...to help unlock the next frontier of deepwater oil and gas resources." At the time the company said current equipment has a technical limit of 15,000 psi and 250°F.

SwRI launches JIP to further oil and gas separation technology

Southwest Research Institute (SwRI) reports the launch of a multi-million-dollar joint industry project (JIP) to better understand oil and gas separation technology. The objective of the Separation Technology Research Program (STAR Program) is to combine industry knowledge and resources to advance research that could lead to better equipment and test protocols.

SwRI is leading the 3-year program, which is open to operating companies, contractors, and equipment manufacturers. The 3-year membership ranges from \$450,000 to \$75,000 depending on the type of company.

"Separating fluid mixtures into streams of oil, natural gas and water efficiently and cost-effectively using lighter-weight equipment that requires less space is very important to the industry," said Chris Buckingham, a program director in SwRI's Fluids and Machinery Engineering Department and manager of the STAR Program. "The STAR Program will involve this three-phase separation process, as well as gas-liquid separation and liquid-liquid separation."

He added that pooling resources and industry experts allows a more cost-effective approach to solving problems, especially in an environment where companies develop oil and gas fields in partnerships, and that making decisions with common data is beneficial. This collaborative approach means that both company-proprietary and non-proprietary equipment can be tested, with results shared among the members.

Pulse provides real-time wellhead fatigue monitoring system on find

Pulse Structural Monitoring (Pulse), an Acteon company, has provided a real-time wellhead fatigue monitoring system for drilling and well testing operations on the Lancaster discovery, west of Shetland in the UK North Sea. The well operator, Hurricane Energy plc, wanted to check the wellhead fatigue model during drilling operations to prevent significant damage. Real-time monitoring of the motion of the lower marine riser package (LMRP) provided early warning of excessive LMRP movement and instant visualization of any wellhead fatigue damage from the rig.

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Visualization techniques enhance oil and gas training, operations

The latest in 3D animation and imagery are allowing oil and gas companies to enhance worker training and demonstrate technical concepts and techniques. FuelFX, a media and software company almost exclusively focused on the oil and gas industry, works with major operators, oilfield service companies and large manufacturers.

One part creative content provider and one part technologist, FuelFX creates content for marketing and training departments and for the operational side of oil and gas companies to help in those processes. FuelFX chief executive Oliver Diaz, describing the company as a broker of knowledge, said that cutting-edge 3D and visualization technology can allow companies to be more efficient in training workers, as well as improve efficiency and operational safety.

Founded 7 years ago, the company really grew following the 2010 Deepwater Horizon incident, when FuelFX worked with BP plc and other members of the Unified Command by producing daily infographics and visualizations to update the Unified Command team, the White House and U.S. public



3D imaging is helping oil and gas companies tell complicated technology stories. Source: FuelFX.

on the efforts, operational plans and challenges involved in the Deepwater Horizon incident response. Other team members included Transocean, the U.S. Coast Guard, U.S. Department of the Interior, the U.S. Environmental Protection Agency and the Occupational Safety and Health Administration.

3D imaging is not a new thing, but the next thing, representing a step change in communications. The need for using new visualization tools stems from the fact that, most of the time, the magic in the oil and gas industry happens with things that you can't see or that are 5,000 ft underground, or encased in steel or in high-pressure, high-temperature environments, FuelFX's Diaz told Rigzone, on why Hollywood effects and high-end information graphics are used to tell complicated technology stories in the oil and gas industry. These effects allow companies

to sell, understand, and learn how to operate technology, as well as provide business intelligence on the operations side, Diaz said. 3D graphics can range from low-end graphics, such as process diagrams and infographics, to 3D animation in video to interactive media tools such as virtual and augmented reality.

Sercel unveils QuietSea passive acoustic monitoring (PAM) system

Sercel has launched QuietSea, its new passive acoustic monitoring (PAM) system designed to detect the presence of marine mammals during seismic operations. Unlike other separate antenna, PAM systems, Sercel says QuietSea is seamlessly integrated as an add-on within the Sercel Sentinel seismic streamer (Sentinel, Sentinel RD, and Sentinel MS). This allows for enhanced marine mammal detection capabilities in a wide frequency listening range that covers a large variety of vocalizing cetacean species. QuietSea also benefits from synergies with Sercel's Seal 428 marine seismic recorder and SeaPro Nav navigation system to accurately locate marine mammal positions. QuietSea is a tool for complementing the work of marine mammal observers during seismic operations.

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Weather prediction tool to improve offshore facilities, MetOcean says

New Zealand-based MetOcean Solutions is introducing a new weather prediction tool to improve the safe operation of moored offshore facilities in Australia. The tool, dubbed Offshore Motion Forecasts, will help the Australian oil and gas industry better prepare for the consequences of marine weather and avoid operational delays, as well as heavy damage from unanticipated conditions, the company said.

The tool will calculate predictions for a specific location and vessel in marine and adverse weather situations. MetOcean said the tool will solve the problem with a set of analytical equations that will work for any floating facility, such as a floating production storage and offloading vessels (FPSO).

Specifications including length, beam and draft will be used to initially predict the orientation of the vessel.

"Many of the facilities onboard these vessels are not designed to operate in rolling conditions, which can occur when the waves, winds and currents are not similarly aligned," MetOcean Solutions managing director Peter McComb said.

"These moored vessels will weather-vane in response to the environmental conditions and sometimes the vessel can find itself beam on to distantly generated swells. These waves typically have a period range that will excite the rolling motion of the vessel and that's where the problems start."

The company planned to offer the new tool in the last quarter of this year for oil and gas operators and support industries in western Australia.

Applus first to apply augmented reality systems to its technology

Applus RTD is driving forward a research and development program to incorporate augmented reality systems into its technology range.

To demonstrate the value and capabilities of the system, the company has integrated the technology into its RTD IWEX system, which allows detailed inspection and mapping of defects within critical pieces of pipework. It provides users with a 3D image of the inspected object, giving clearer insight into the scale and nature of any existing defects.

As a result, Applus RTD has launched an application that projects the linear IWEX generated digital image around the weld. The position of defects is therefore unambiguously indicated on the pipe, and using only a tablet device and a marker the operator can detect, locate and mark the defect.

First rigless removal of a stuck bottom hole assembly

Claxton Engineering Services Ltd has completed the first rigless removal of a stuck bottom hole assembly (BHA), the company said, adding that the work was completed during a slot recovery operation using an innovative approach at Maersk's Tyra East field in the Danish sector of the North Sea.

The well was drilled in the 1980s and, during construction, the BHA had become stuck in the conductor pipe and prevented well completion. Claxton used its slot recovery methodology and tooling, specialist cutting equipment and a dive support vessel to solve the issue.

The program began with the deployment of a specialist casing cutting system to remove a section of the conductor, which left the stuck BHA intact but exposed. This called for modification of the cutting equipment and the subsea application of a system that is normally used on the surface.

Once the conductor had been cut and removed, Claxton engineers prepared a specialized lifting device using an air hoist on deck deployed through an A-frame, while divers clamped the lifting gear to the BHA. The BHA was too heavy to recover in one piece and had to be cut subsea. This involved using two sizes of diamond wire-cutting machine: the smaller to sever only the exposed BHA, and the larger to cut simultaneously through the remaining conductor stump and the BHA. The cut needed to give a smooth and flush surface on the end of the conductor. Once the cutting machine had sliced through the conductor and the BHA, the top section was recovered.

During planning, the orientation of the remaining BHA relative to the conductor stump was uncertain. Claxton created a whipstock with a slot beneath the landing plate that would enable it to capture the exposed part of the BHA securely in any orientation. The top half of the whipstock would rotate on this base and enable the new well to be kicked off in any direction. The initial project schedule was 20 days. However, the Claxton-led team completed the operation in less than 16 days, including more than 3 days waiting-on-weather.

"This was a very challenging piece of work requiring integrated planning across many departments and companies, not to mention the extensive amount of design, manufacturing and testing of equipment that Claxton designed especially for the job in double-quick time," said Alex Lucas, senior drilling engineer, Maersk drilling department.

Claxton completed the world's first rigless platform well abandonment over a decade ago and has subsequently deployed its cutting and recovery tooling on more than 270 successful conductor cutting, recovery and abandonment operations.



A Claxton 300te securing the conductor during the Tyra East slot recovery.

"The augmented reality application takes our IWEX technology to the next level as operators are able to observe an image of the defect on the weld itself," said Rienk de Vries, technical director at Applus RTD.

"This system has the potential to save operators millions of dollars by increasing efficiency and lowering the risk of incorrect human interactions, resulting in a low percentage of weld rejections. The augmented reality application is also great for training purposes, helping you to understand the 3D presentation of the

weld. We believe it is a revolutionary step in NDT technology."

Applus RTD's Technological and Application Center partnered on the augmented reality project with TWNKLS, an augmented reality agency that focuses on the development and implementation of mobile applications. The project was also recently shortlisted for the Best Augmented Reality Enterprise Solution at the 2014 Auggie Awards.

de Vries added: "We are committed to a program of technological research and development ..."

Aker Solutions awards DNV GL global frame agreement

Aker Solutions has awarded DNV GL a global frame agreement to pave the way for better technology collaboration, more efficient project execution and considerable cost savings. The frame agreement covers the following business segments: subsea, umbilicals, engineering, and maintenance, modifications and operations (MMO) in Aker Solutions' business. The agreement will cover services and cooperation in all the important oil and gas regions (Norway, UK, USA, Brazil, Malaysia) and can be extended to other countries and regions as required. The agreement provides mechanisms for specific joint activities, such as cooperation in front-end engineering and design (FEED) phases and integrated engineering teams (IET). A web-portal will also be set up to allow for exchange of technical and commercial information. The deal with DNV GL encompasses an extensive range of services and will affect services in many different parts of the company's business—advisory services, such as safety, environment, enterprise risk management, asset risk management, technology qualification, maritime advisory, corporate responsibility management. In addition it includes verification and statutory services, system certification (management systems, product compliance, training and personnel certification) and software (engineering products, risk products).

Oceanographic assessment completed in Alaska

RDSEA International, Inc. and Olin Hydrographic Solutions recently completed an oceanographic assessment and side-scan survey for a new platform production facility to be installed in Cook Inlet, Alaska for Furie-Operating Alaska, LLC and Crowley Marine. Furie is presently drilling both exploration and development wells with a jack-up rig in the Cook Inlet region. A platform, pipeline, and onshore production facility will be installed in the summer of 2014 with production commencing in fall 2014.

World first as Subsea Training Centre launches work class ROV training course

The world's first training course in work class ROV operations delivered by an independent training provider has been launched by The Underwater Centre in Fort William. The first intake of students has started on the new 5-week course—An Introduction to Work Class ROV Operations—which will change the way industry recruits and trains its staff. The residential course is taking place at the Centre, which is based on the shores of Loch Linnhe, a tidal sea lake, on Scotland's west coast. Additional courses have been scheduled for the rest of the year to cope with the huge demand for ROV operators forecast by the industry. The training will come under the umbrella of the new ROV Industry Training Academy, which is being established and will be led by a steering group made up of key industry personnel who will ensure the training closely reflects the needs of the industry. This will include basic training introducing technical personnel to the industry and, in due course, more advanced training designed to accelerate ROV personnel through their careers. It will be delivered in a contextual training environment, ensuring it is as realistic as possible to the conditions that are found offshore. Steve Ham, general manager of The Underwater Centre, said that the course was a global first for an independent training provider. The syllabus for the course includes ROV industry familiarization, electrical and electronic systems, a 2-day high voltage awareness course, an introduction to hydraulics, working at height training, ROV operations, including pre- and post-dive checks, Launch & Recovery operations, piloting an observation class ROV and Triton XL26 in an operational environment, and an introduction to ROV maintenance, including electrical retermination of armored umbilical and tether.

SonarWiz training from Chesapeake Technology

Chesapeake Technology will be offering 3-day courses in Rio de Janeiro, Brazil on 8-10 October 2014 and in St. Petersburg, Florida on 9-11 December 2014. The training offers hands-on software experience with the developers on SonarWiz full featured sidescan, sub-bottom, bathymetry and magnetometer software suite.

SMD to supply Sistac with Atom work class ROV



Brazil-based Sistac has taken delivery of an SMD Atom 100-hp 2,000-m rated Work Class Remotely Operated Vehicle (ROV). The Work Class ROV system will be mobilized during the fourth quarter of this year and will be used initially for survey and inspection duties but will provide Sistac with the capability to expand services in the future as a fully integrated tooling platform.

The Atom ultra-compact Work Class ROV is comparable in size to a large electric ROV but with the power to provide true work class capability. The system is suitable for drill support, IRM, survey and construction duties and is especially suited for vessels and rigs with limited deck space.

Sistac requires the latest technology on their ROVs to provide the market with efficient and high performance operations. The new Atom has been supplied with SMD's Dynamic Positioning Control System DVECS-S, the most advanced DP system on the market. DVECS-S is mated to a multi-beam imaging sonar and other acoustic sensors to allow a choice of object relative positioning. This coupled with the ROV's latest generation Curvetech™ multi-platform components illustrate SMD's approach of providing leading technology that is robust, user-friendly and easy to maintain.

SMD has over 50 ROVs operating in Brazil supported by in-country staff providing technical advice, technical support services and spare parts.

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

Greensea upgrades Falcon DR with autonomy and advanced control system

Greensea Systems, Inc., a leading developer of technology for Unmanned Underwater Vehicles, successfully installed their advanced ROV control system, Balefire, on a Saab Seaeye Falcon DR owned by SeaView Systems, Inc. SeaView supported NOAA earlier this summer in the multibeam survey of several shipwrecks in Thunderbay National Marine Sanctuary, Lake Huron, Michigan. To successfully complete the survey, it required the vehicle be able to correlate navigation data and multibeam data accurately, hold station to allow for close-up camera inspection, and conduct automated surveys at constant speeds and planned line spacings. Balefire provides for these capabilities and Greensea worked with SeaView to install and

test the system in less than a week in preparation for the survey.

Combined with a FOG-based INS developed by Greensea, the Balefire control system added autopilots, station keeping, dynamic positioning, autonomous control modes, path following, mission planning, and sensor fusion to the basic Falcon DR ROV system. Balefire provides these functions in a powerful operator workspace that gives pilots an intuitive and powerful interface. Greensea integrated their standard Balefire product to the Falcon ROV by developing a simple software driver for the Falcon handbox controller. No modifications were made to the ROV with the exception of installing the INS. The small Balefire computer simply interfaced with the handbox and the topside interface unit of the Falcon.



SeaView successfully completed the survey for NOAA and delivered superior quality multibeam and video data efficiently and cost effectively with their Falcon system. "Mission planning and operations were a breeze. Not only does Greensea's [Balefire] control system enhance the efficiency of the project, it enhances the efficiency of the ROV by reducing the wear of the thrusters. Integrating the control system will reduce project costs and vehicle maintenance," said Geoff Cook, operations manager for SeaView.

For more information, visit www.greenseainc.com.

Ashtead Technology announces ECA Robotics distributor agreement

Leading international subsea equipment specialist, Ashtead Technology, has increased its product portfolio with an exclusive sales agreement with ECA Robotics for its range of specialist underwater inspection equipment.

The agreement with the French company is for the rights to sell the ECA Hytec range of advanced underwater inspection equipment including ROVs, manipulator arms, cameras and lights.

As part of the agreement, Ashtead Technology will deliver dedicated sales support and product training on the equipment from its facility in Aberdeen.

Ashtead Technology's product sales manager, Kevin Murray-Taylor said:

"This latest prestigious agreement further enhances our ability to supply customers with a wide range of the latest, high functioning inspection and monitoring equipment. In addition, our dedicated and highly skilled technical team is available to offer customers a superior service before, during, and after sale."

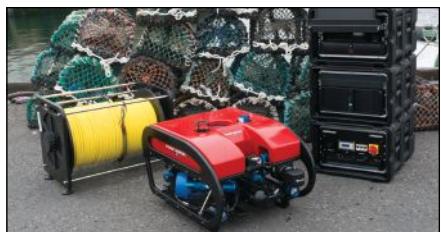
For more information, visit www.ashtead-technology.com.

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The advertisement features a large blue shark logo with red eyes and sharp teeth, enclosed in an oval. Below the logo, the company name "seanic ocean systems" is written in a stylized blue font. The background shows a close-up of ocean waves crashing onto a sandy beach. In the sand, the letters "SOS" are written in a large, dark font. In the bottom right corner, there is a smaller version of the shark logo next to the text "seanic" and the website "www.seanicusa.com".

SeeByte sells additional SeeTrack CoPilot units to Seatrionics



SeeByte, the global leader in creating smart software for unmanned maritime systems, is pleased to announce the sale of an additional five SeeTrack CoPilot licences to Seatrionics. This market-leading software will be integrated into Seatrionics' Predator ROV, allowing the system to benefit from improved capabilities.

SeeTrack CoPilot is the world's most advanced, easy-to-use, plug-and play software that makes piloting any ROV a much simpler task. SeeTrack CoPilot permits pilot controlled auto-transit and stop-and-hover, while providing automated sonar tracking and movement relative to a target.

For more information, visit www.seebyte.com.

NCS Survey Ltd awarded 5-year subsea contract with Ceona

NCS Survey, an Acteon company, has been awarded a 5-year contract for positioning services with SURF company, Ceona. Mobilization has been successfully completed on the first vessel, Ceona's DP3 multi-purpose vessel, the Normand Pacific.

Following initial work in the Gulf of Mexico, NCS Survey will be supporting Ceona for further subsea work in Nigeria at the ABO and OYO fields.

Paul Smith, commercial manager at NCS Survey, commented, "We are extremely pleased to have been selected as a key service partner by Ceona. This contract award underlines NCS Survey's capabilities and highlights our expertise in the global subsea sector. We look forward to a successful relationship with Ceona, and growing our presence in subsea projects worldwide."

For more information, visit www.ncs-survey.com.

MacArtney MERMAC mooring winch for MBARI

The Monterey Bay Aquarium Research Institute (MBARI) has

recently selected a MacArtney MERMAC SC mooring winch solution to empower the deployment and recovery of scientific moorings onboard MBARI vessels R/V Western Flyer and the R/V Rachel Carson.

The new mooring winch represents the second MacArtney winch system in operation with MBARI, adding to a MacArtney ROV and AUV tether management winch system in operation on R/V Rachel Carson.

MBARI was founded in 1987 by David Packard and is located in Moss Landing, California, where its research ships and ROVs are berthed with immediate access to Monterey Bay.

As a private, non-profit research center, MBARI is funded by The David and Lucile Packard Foundation and employs approximately 220 scientists, engineers, operations and administrative staff. MBARI ocean scientists propose and execute innovative studies, both experimental and theoretical—while engineers and operations staff develop and adapt supporting technology.

Monterey Bay is one of the most biologically diverse bodies of waters in the world, and the underlying sub-

13TH ANNUAL MATE International ROV Competition

congratulations winners!

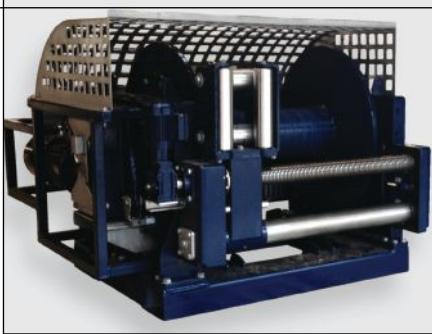
EXPLORER Class	RANGER Class
1st place Jesuit High School Carmichael, CA, USA	1st place Clareville High School Clareville, Newfoundland and Labrador, Canada
2nd place Far Eastern Federal University Vladivostok, Russia	2nd place Cornerstone Academy Gainesville, Florida, USA
3rd place Bauman Moscow State Technical University Moscow, Russia	3rd place Greater New Bedford Vo-Tech High School New Bedford, MA, USA

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Installed onboard MBARI scientific vessels, the winch will be used to effectively deploy and recover scientific moorings—offering a significant upgrade in terms of speed and performance when compared to the current system.

For more information, visit www.macartney.com.

Calecore unites with sister company N-Sea to continue geotechnical and ROV survey operations

Calesurvey, Calecore's offshore geophysical division has seen steady increase in demand over the past 2 years for ROV survey services. In June WROV operations were undertaken onboard the Kommandor Calum for a project west of Shetland while the Kommandor Stuart has been undertaking multiple integrated 2DHR, ROV and seabed testing and sampling campaigns offshore northern Norway.

The Siem Stork will replace the Kommandor Stuart. The vessel is equipped with a new SMD Quasar Work Class ROV and Calegeo supplied seabed geotechnical tools.

The Kommandor Stuart will be heading north with Calecore's geophysical vessel Kommandor Calum and geotechnical borehole vessel Highland Spirit to commence a multi-year contract in the Russian Arctic.

Calecore is forecasting a strong requirement for integrated geophysical, ROV, Environment and geotechnical offshore site investigation solutions for the next 3 years delivered from offices



and bases in UK, Norway, Singapore and Moscow.

For more information, visit www.calegeo.com.

Police and dive teams gear up for underwater search

Many government agencies and public safety dive teams are adding underwater search equipment to help make their operations easier, safer, and faster. Boston Police Special Operations Unit, Tafton Fire Company in Pennsylvania, Benton County and Baxter County Sheriffs Departments in Arkansas, and the Missouri State Water Patrol are a few of the diverse group of agencies using metal detectors, video cameras, and sonars in their search missions.

Every year, the city of Boston, Massachusetts hosts several major

September 2014

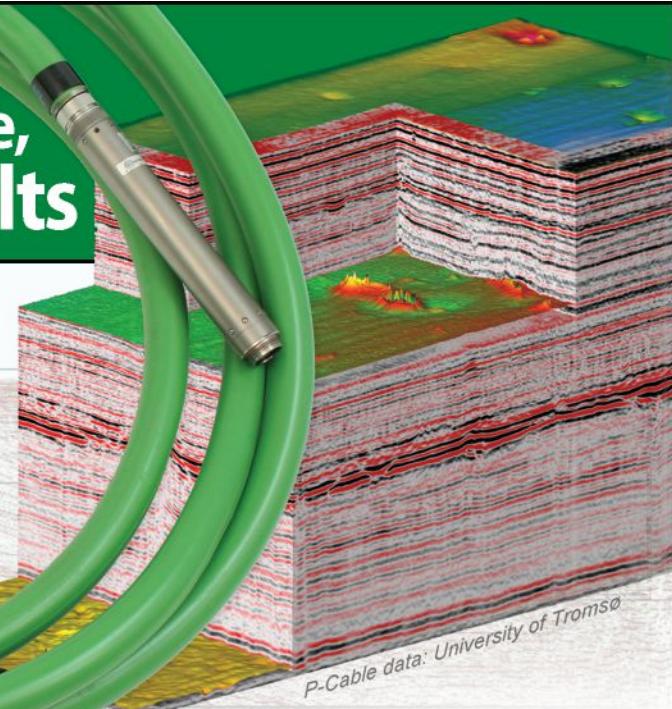
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events that bring in millions of people. The police department's Special Operations Division plans for, and responds to, major emergencies that happen during these events, as well as natural or man-made disasters.

The division maintains a number of support units complete with specialized equipment and, since the city includes 41 sq. mi of water, much of it is designed for the marine environment. When it comes to Boston Harbor, as many criminals have discovered...what goes in, will come out, and its usually the Boston Police Department bringing the evidence to the surface.

To assist in these operations the division has acquired JW Fishers SeaLion-2 ROV. The highly maneuverable remote controlled underwater vehicle is equipped with four high resolution color cameras, can descend to depths up to 1,000 ft, and operate in currents up to 4 kts. The ROV is also equipped with a scanning sonar that allows the operator to see a 400-ft diameter area around the vehicle, regardless of water clarity, an essential feature when working in the murky harbor. The SeaLion can check ship hulls for drugs or contraband, inspect underwater structures for explosives, search for drowning victims, and locate weapons and other evidence disposed of in the city's waterways.

For more information, visit www.jwfishers.com.

Pacific missile range facility cables inspected

Underwater construction team two's (UCT 2) construction dive detachment alfa (CDDA) recently completed inspection and repair of the cables for the Pacific missile range facility in Barking Sands, Kauai.

The team is on the first of four stops during their deployment to the Pacific, where they will be conducting inspection, maintenance, and repair of various underwater and waterfront facilities in support of the Pacific Fleet.



Construction Mechanic 2nd Class Daniel Nichols (SCW/DV) using cable tracker.
(Photo by Steelworker 2nd Class (SCW/DV) Calvin Huckabee).

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Norsat secures order for X-Band VSAT terminals

Norsat International Inc. announced a \$1.7 million order from Datacom Systems International Limited for Norsat's MarineLink COM10X 1 meter X-Band satellite terminal. Norsat will provide its industry leading COM10X marine VSAT to Datacom for installation on naval ships for an Asian-based country. The new COM10X conforms to military standards MIL-STD-901D and MIL-STD-167 for immunity to the high impact shock and vibrations that occur onboard military ships. The Norsat terminals include advanced features such as a high gain antenna, specialized transmit/receive reject filters, a remotely accessible web interface, an integrated satellite database, and a rugged low-loss radome. Norsat's world-leading Low Noise Block downconverter (LNB) will also be integrated into each terminal. Datacom will install ship-wide cable runs from above deck to below deck, deploy mounting pedestals, install air conditioners, integrate a satellite modem, and will conduct testing and commissioning of each VSAT system on multiple ships. In addition to providing the terminals, Norsat will provide training and installation supervision.

SES fits antennas to the UK's latest research vessel

Ships Electronic Services (SES) has won the contract to update the Satellite TV antennas for the "RRS James Cook," the well-known research vessel operated by the National Oceanography Centre (NOC) based in Southampton. Two KVH HD11 antennas will be installed which will provide HD TV on the Ku band Service. The contract comes after SES supplied and installed global HD TV systems for the NOC's new research ship RRS Discovery, that has been heralded as one of the most sophisticated research vessels afloat. The new 99.7-m RRS Discovery was built in Spain and comes from an eminent line of four predecessors of that name dating back to the famous Discovery of Captain Scott. Even while operating in remote ocean areas, the captain and crew of the Discovery will be able to enjoy HD TV via two of latest technology antennas from KVH, the HDII, which can operate on both Ka and Ku band services. SES is one of the UK's most respected marine electronics supply, service and installation companies specializing in communication, navigation and on-board entertainment for the Commercial, Military and Leisure markets. With eight centers strategically located around the UK coast SES can provide fast response to commercial operators directly or through its 24/7 emergency phone line.

Inmarsat's FleetBroadband takes audience on Polynesian adventure

Inmarsat is helping audiences get a feel for life on the high seas aboard a Polynesian canoe travelling around the world. The 72-ft (22-m) Hikianalia is taking part in the Mālama Honua Worldwide Voyage, a 47,000-mi (76,000-km) open ocean journey, alongside its 62-ft (19-m) sister canoe, Hōkūle'a. Hikianalia has been fitted with a solar-powered Cobham SATCOM Sailor 500 FleetBroadband terminal—critical to spreading the islanders' message highlighting the importance of protecting our planet and inspiring communities to look after their resources. FleetBroadband provides Hikianalia with up to a 496-kbps connection to send and receive email for operations and safety information and send content to the voyage website, a Hawaiian TV station and social media. FB500 also means the crew can take part in Google hangouts every week with news stations and students, who have "adopted" a crew member. The canoes act as floating classrooms and represent models of sustainability among the island people, who are famed for their seafaring skills. In addition, AirMax Wi-Fi, supplied by Ubiquiti Networks, enables data transfer from Hōkūle'a to Hikianalia at over 3 mi distance over FB500—crucial in keeping the two boats connected. The 39-month journey organized by the Polynesian Voyaging Society left for Tahiti in May after spending a year traveling around Hawaii. Each boat is crewed by between 12 to 14 sailors using traditional navigation skills, such as star and weather patterns, and ocean and marine life movements. Hōkūle'a is famous for her maiden voyage sailing from Hawaii to Tahiti in 1976 using Polynesian navigation techniques without the aid of modern instruments.

Imtech Marine improves crew welfare with PressReader



Imtech Marine announced that ship's crews will have access to PressReader as a new value-added service to its satellite communications portfolio. Starting in August, Imtech Marine customers will be able to use PressReader for access to full content of more than 2,500 newspapers and magazines in 60 languages from more than 100 countries. These can be read on PressReader via a crew member's PC, laptop and mobile devices on board vessels. PressReader and its cross-platform app give users access to thousands of global publications with just one subscription.

"By adding PressReader to our connectivity portfolio we give a very useful tool for ship-owners to improve the crew morale. With this solution, crew members have access to news and events they're most interested in, their favorite magazines or local news from their home country," said Rob Verkuil, business development manager of Imtech Marine.

Each ship can customize a library of newspapers and magazines based on their particular regional location and passenger demographics. Ships download their selected titles daily via satellite and offer their crew members a local Wi-Fi connection to download them on their personal devices. With this solution, costs remain low for ships while still being able to provide quality service and amenity to the crew. Once a title is downloaded it can be viewed by PressReader users anytime, anywhere throughout the trip.

"The wealth of titles makes it easy for ships to customize a library of publications that caters to the diversity of their crew," said Igor Smirnoff, chief commercial officer at PressReader. "Our PressReader Offline solution is a new industry standard and it has been specifically designed to meet the needs of the marine customers. We are proud to be able to bring them a little bit of home away from home."

PressReader offers thousands of well-known titles like The Guardian, The Moscow Times, The Washington Post, China Daily and The Philippine Star. Imtech Marine will demonstrate PressReader at their booth at SMM in Hamburg this September.

For more information, visit www.imtech.com.

ORBIT selected as supplier for one of the world's principal Navies

ORBIT Communication Systems Ltd., has received a \$2.5 million order to provide satellite communication systems to one of the world's principal navies.

This order comprises the supply of a large number of broadband satellite communication systems (VSAT) that includes OrSat systems at Ku Band and the revolutionary OceanTRx 7-300 systems at C Band. The order also includes a long term multi-year service contract. Both the Ku and C Band system types are based on a unique technology that boasts the best footprint-to-performance ratio on the market. This is significant as it allows for VSAT installations on tight-space platforms.

ORBIT's satellite communication systems are deployed by over 20 navies worldwide. The systems are considered the world's leading solutions of their kind for their technical performance and durability under the most demanding conditions. Equally remarkable is the systems' compatibility with international standards, including performance and regulatory compliance with the demands of the world's largest satellite companies. ORBIT's OrSat systems have set the standard with their unique design, providing industry-leading performance and significant competitive advantages in virtually every performance aspect. Over 1,300 systems of this type have been sold to date with installations on board vessels, representing every market segment, primarily serving the global oil and gas industries on board drilling platforms, oil tankers, merchant ships, fishing vessels, and many others.

For more information, visit www.orbit-cs-usa.com.

Bandwidth demand for maritime to exceed 160 satellite transponders

NSR's Commercial Mobility via Satellite, 10th Edition report finds the maritime market will dominate demand for FSS satellite capacity in large part due to cruise ships, offshore platforms and merchant maritime customers.

At over 980,000 in-service units by 2023, the maritime market will demand almost 160 transponders of FSS capacity, and generate more than \$5.5 billion dollars in retail revenue. Over the next 10 years, a migration towards High-Throughput Satellite (HTS) offerings is quite likely across most maritime markets, except fishing that may see more hybrid systems such as MSS broadband or small VSAT services alongside narrowband offerings.

"Bandwidth demand is rising across most ships, and with more capacity available globally, the industry is in a race to meet the needs for seafarers, crew and passengers that want to stay connected," said Claude Rousseau, NSR research director and co-author of the report.



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MARITIME COMMUNICATIONS

"With growth stabilizing from economic recession in the maritime market, there is more focus on improving operational efficiencies, providing services to crew to retain them, and to ensure compliance with regulations," added Brad Grady, NSR senior analyst and co-author of the report.

With newer, larger, more sophisticated maritime vessels under construction, connectivity and communications will be a key enabler of cost and operational efficiencies—from fishing vessels to cruise ships.

Going forward, the "Fear of Missing Out" for both work and pleasure will trigger a drive to more broadband connectivity, leading vendors to expand into what could be high-growth markets for new bandwidth.

"The passenger market is one visible segment that emulates this trend and as a result will show a doubling of the VSAT market penetration in the next decade," stated Grady. "But at the same time, crew and operational needs in merchant maritime and offshore platforms and vessels will capture the largest slice of the 160 transponders of demand at the end of 2023."

For more information, visit www.nsr.com.

ORBCOMM expands territory and infrastructure

ORBCOMM Inc. announced that Mahd Telecom, ORBCOMM's Muscat, Oman-based national service provider partner for Oman and other Gulf Cooperation Council (GCC) countries, has been granted regulatory approval to provide ORBCOMM services in Oman. Issuance of the service authorization allows for installation of a new ORBCOMM Gateway Earth Station (GES) in Oman and completion of the radio spectrum licensing process. In addition, ORBCOMM has signed an agreement to purchase the ORBCOMM GES located near Rio de Janeiro, Brazil from its local service partner, completing ORBCOMM's ownership consolidation of all Western Hemisphere GES facilities.

The Oman and Brazil GESs, together with 14 other strategically-placed ORBCOMM GES facilities located throughout the world, connect ORBCOMM's satellite constellation to its ground-based network infrastructure. In addition to providing links to ORBCOMM's fleet of first generation satellites, ORBCOMM's global network of GES facilities will also enable ORBCOMM to deliver the advanced services provided by its recently launched ORBCOMM Generation 2 (OG2) satellites, making ORBCOMM's M2M communications offerings even more efficient, reliable and globally available.

"With the successful launch of the first OG2 mission and the impending improvements in service, we are focusing on all aspects of our network to deliver the best satellite M2M product in the industry," said Marc Eisenberg, chief executive officer of ORBCOMM. "The new authorization and GES installation in Oman will significantly improve service levels in the Middle East region and provide satellite access to a new major market for deployment of ORBCOMM solutions. Furthermore, ORBCOMM's purchase of the Brazil GES completes our Western Hemisphere GES consolidation program, bringing increased efficiencies and service reliability enhancements for our customers throughout the Americas, the Atlantic Ocean, and even parts of Africa."

"We have been following ORBCOMM's growing momentum with great excitement and are pleased to have the ability to help bring ORBCOMM's products and services to the GCC and broader Middle East region," said a representative from Mahd Telecom. "We believe that given Mahd Telecom's understanding of the local customer base and ORBCOMM's broad range of M2M offerings we will be able to offer new products and services to the oil & gas sector as

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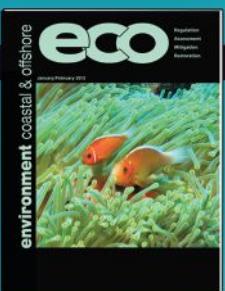
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well as address several underserved markets such as refrigerated and dry fleet container tracking and many new projects focused around the maritime industry not only in Oman, but also throughout the region."

ORBCOMM expects to continue to expand its global communications network through its ongoing efforts to open new markets in additional countries and the construction of additional GESs in key locations to serve these new markets.

For more information, visit www.orbcomm.com.

Globecomm provides VSAT connectivity for PBJV Group

Globecomm Maritime has been awarded a contract to provide VSAT connectivity to PBJV Group's barge Kota Laksamana 101. Globecomm will provide Ku-Band VSAT connectivity with L-band back-up to the specialist vessel during its deployment in waters off Bintulu.

The barge, which accommodates up to 300 personnel, was recently chartered to Petronas, a fully integrated energy company based in Malaysia. Under the terms of the deal, PBJV is required to provide a dedicated 512 kbps up and down link to Petronas staff working on board the vessel.

Coordinating between VSAT specialists in the U.S., the Netherlands and Singapore, Globecomm installed and commissioned the equipment to meet the start of the charter in late April.

Although PBJV specified a pure data solution via a single satellite beam, the below deck equipment is also equipped with a VoIP solution. If Kota Laksamana 101 is awarded future charters in locations outside the current coverage, Globecomm can remotely re-configure the equipment to connect to other VSAT satellite operators.

Globecomm Maritime VSAT solutions deliver flat rate monthly pricing, with options including hardware leasing for approved packages and customers, Ku-band unlimited usage and L-band airtime. This core package includes all components and configuration needed to provide the vessel with global seamless connectivity.

The service provides both ship and crew with always-on, unlimited bandwidth for business and personal applications, enabling users to maximize the benefits of a maritime broadband connection while relying on dedicated quality of service.

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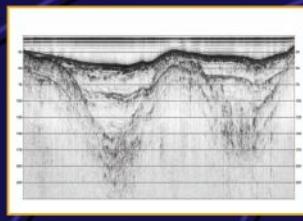
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Xtera awarded contract to build new system

Xtera Communications, Inc., announced the award of a contract on a turnkey basis by the Defense Information Systems Agency (DISA), an agency of the U.S. Department of Defense, to build a new submarine fiber optic cable system to be performed in the Southern Command area of responsibility. The cable system is approximately 1,500 km long and will enable connectivity to the Defense Information System Network (DISN) via fiber optic technology. Xtera will supply its turnkey 100G optimized submarine system solution for this project, including undersea optical repeaters, Nu-Wave OptimaTM Submarine Line Terminal Equipment (SLTE), cable and all marine services. Xtera's new undersea repeaters are unique in using Raman optical amplification to produce very low noise levels and thus allow the distance between repeaters to be maximized. Xtera's 100G SLTE technology, launching multiple 100G wavelengths into the optical fiber for high total throughput, is well established, with its first deployment on a submarine system in early 2012.

ASE to be extended to Cambodia

NTT Communications Corporation (NTT Com) announced that the Asia Submarine-cable Express (ASE) will be extended to Cambodia to provide reliable, high-capacity communication infrastructure for the increasing number of multinational companies operating in the Mekong region. The extension is based on an agreement that NTT Com has reached with Chuan Wei (Cambodia) Co. Ltd. Under the agreement, NTT Com will lay Cambodia's first submarine optical fiber cable. The ASE will provide highly reliable, high-capacity communications connecting Cambodia and other countries in the Greater Mekong Subregion with major locations elsewhere in Asia, including Singapore, Hong Kong and Japan. The arrival of the ASE also will enable NTT Com to provide local customers with even higher quality Internet network services. NTT Com continues to upgrade and expand its global submarine-cable infrastructure, including through introduction of a 100 Gbps optical transmission system incorporating digital coherent technology. In addition, the company is expanding its number of ASE connection points and Nexcenter global data centers in Southeast Asia to provide high-quality network, data center and cloud services in end-to-end one-stop solutions. The ASE submarine cable is routed away from the Bashi Channel and the south coast of Taiwan, areas that frequently experience earthquakes and typhoons. The ASE also takes the shortest route of any submarine cable connecting Japan to Hong Kong and Singapore. Global companies are increasingly investing in Cambodia to take advantage of government incentives for foreign investment. Located in the middle of the Southern Economic Corridor stretching from Bangkok and Ho Chi Minh City, Cambodia is experiencing rapid economic growth. In turn, the need for reliable, high-capacity networks is rising to meet the increasing communication demands of locally based multinational companies.

6 Alpha completes UXO survey of Channel Islands route

6 Alpha Associates, the strategic advisor for managing specialist offshore risks, has completed a contract with Pelagian Ltd, a specialist subsea cable and hydrographic survey consultancy, supporting the Channel Islands Electricity Group in managing prospective unexploded ordnance (UXO) risk for the cable route for the Channel Islands' latest electricity connection to Northern France. With the Channel Islands looking to increase the amount of imported energy, and increase the number of installed projects to enhance their security of electricity supply, the project forms an important part of meeting the islands' future energy needs. The cable runs from Armanville, Normandy to Gorey on the island of Jersey. Over the course of the contract, 6 Alpha Associates provided UXO risk mitigation advice, analysis of processed geophysical survey data and ultimately, sign-off the cable route to warrant that the UXO risk to cable installation works had been reduced as low as reasonably practicable (ALARP). 6 Alpha's work began with a desktop detailed UXO Threat and Risk Assessment study to ascertain the likely or possible UXO threat, before moving on to collaborate with Pelagian Ltd to derive a marine survey specification for execution by the Purchasers survey contractor. Once the survey data were available, 6 Alpha reviewed the processed information to identify prospective UXO.

Van Oord's cable-laying vessel launched



Van Oord's new DP2 cable-laying vessel Nexus was successfully launched at Damen Shipyards in Galati, Romania on 30 June 2014.

The 123-m long multipurpose vessel will be deployed installing electrical cables for offshore wind farms. With a beam of almost 28 m and a dynamic positioning system, Nexus vessel will be equipped with a huge cable carousel with a capacity of more than 5,000 tons and an offshore crane that will enable it to lay heavy and long export cables. The vessel has accommodation for 90 people. Van Oord and Damen have jointly developed the vessel.

Van Oord has made the investment in this innovative vessel to pursue its strategy to offer Engineering, Procurement and Construction (EPC) contracts to offshore wind farm developers.

Nexus will be operational in the spring of 2015. The vessel's first project will be the Gemini wind farm, 55 km off the coast of Schiermonnikoog.

For more information, visit www.vanoord.com.

ABB awarded order for power project in Canada

ABB has won an order worth approximately \$400 million from NSP Maritime Link Inc., a subsidiary of Emera Inc., to supply a high-voltage direct current (HVDC) power transmission solution creating the first electricity link between the island of Newfoundland and the North American power grid. The order was booked in the second quarter of 2014.

The Maritime Link Project is a 500-MW, high-voltage direct current (HVDC) connection that will enable clean, renewable electricity generated in Newfoundland and Labrador to be transmitted to the North American grid in Nova Scotia. The stabilizing features of ABB's latest HVDC Light solution will also allow Nova Scotia to integrate additional renewables and contribute to Canada's emission-reduction efforts.

The Maritime Link will deploy ABB's HVDC Light Voltage Source Conversion (VSC) technology incorporating a full VSC bipolar configuration to further enhance system availability. In addition to the two converter stations for the

±200 kilovolt (kV) HVDC link, the project scope also includes two 230-kV alternating current (AC) substations in Newfoundland, one 345-kV AC substation in Nova Scotia and two cable transition stations. The project is scheduled for commissioning in 2017.

ABB's HVDC Light solution leads the way in VSC technology and the company has delivered 13 of the 14 commissioned VSC links in the world. HVDC Light continues to be a preferred solution for long-distance underground and underwater power links and interconnections like the Maritime Link Project.

This technology is increasingly being deployed across a range of applications. These include integration of renewable energies from land-based and offshore wind farms, mainland power supply to islands and offshore oil and gas platforms, city center in-feeds where space is a major constraint and cross-border interconnections that often connect across the seas. Its ability to meet grid code compliance ensures robust network connections regardless of application.

For more information, visit www.abb.com.

VSMC awarded export cable installation contract

VSMC has won contracts for cable work at two offshore wind projects. First, Siemens NL has contracted VSMC to design, supply and install infield cables between 48 wind turbine generators and 6 export cables to the onshore substation of the Westermeerwind Wind Farm. The work for VSMC also includes seven dike crossings (HDD), cable terminations and testing. VSMC will start the HDD in August 2014, followed by cable installation in April 2015.

The wind farm will be built in the IJsselmeer (Lake IJssel), between Urk and Lemmer (the province of Friesland), the Netherlands. Each of the 48 turbines has a capacity of 3 MW.

In addition, VSMC has been awarded a €110 million contract by Dudgeon Offshore Wind Limited, owned by Norwegian companies Statoil and Statkraft, for the export and inter-array cabling for the Dudgeon Offshore Wind Farm.

VSMC will start in 2015 by performing two 1,100-m horizontal directional drillings at the landfall, followed by the installation of two 42-km export cables in 2016. The scope of work also

includes the design, supply, installation, terminations and testing of 67 inter-array cables with a total length of approximately 100 km.

The Dudgeon Offshore Wind Farm is located 32 km off the coast, north of the town of Cromer in North Norfolk, United Kingdom, and 20 km to the northeast of the Sheringham Shoal Offshore Wind Farm. The 67 wind turbines have a total capacity of 400 MW.

VSMC, a strategic joint venture of Boskalis and VolkerWessels, adds another project to their track record for Statoil and Statkraft. They successfully completed the installation of the export and inter-array cables for the Sheringham Shoal Offshore Wind Farm in 2012 and are committed to completing this project successfully as well.

For more information, visit www.vsmc.nl.

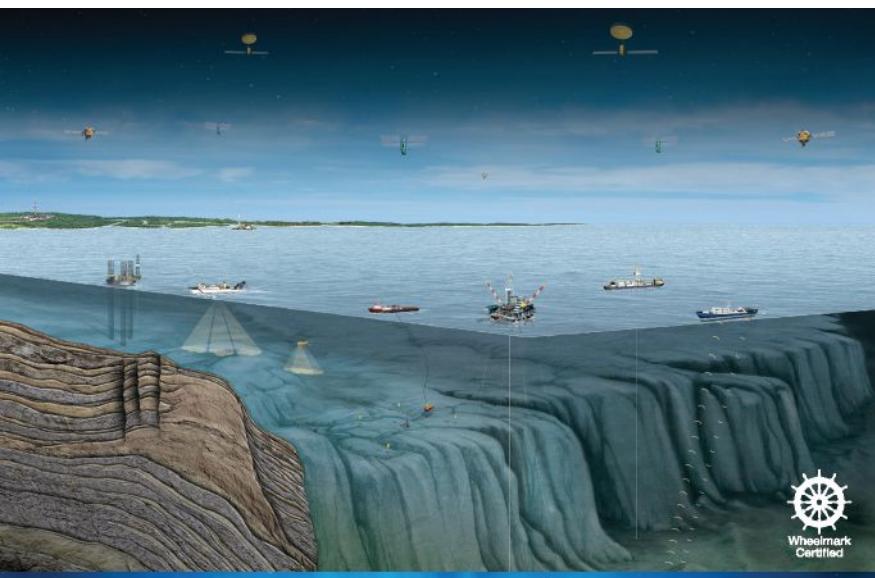
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Energinet.dk buys cables for Horns Rev 3 offshore wind farm

ABB and Prysmian have been awarded the contract to deliver the 220-kV, high-voltage cables that will transport the electricity from the future offshore wind farm Horns Rev 3 in the North Sea to the Danish electricity grid.

While ABB will deliver the just under 33 km long submarine cable connecting the offshore wind turbines with the coast at Blåbjerg, Prysmian will deliver the land cables. The cable connection bringing the wind turbine electricity to Energinet.dk's substation in Endrup by Esbjerg will be either 50 or 60 km long, depending on which route The Danish Nature Agency suggest in the EIA process.

The submarine cable will be produced at ABB's cable factory in Karlskrona in Sweden. The land cables will be produced in Pikkala in Finland. Transportation and laying are included in the DKK 215 million large contract. The contract for the land cable amounts to DKK 82 million and does not include undergrounding.

The landing facilities have a budget of DKK 1.5 billion. Construction is scheduled to start in spring 2015. The plant must be ready by the end of 2016.

The basis for entering the contracts is the Danish Ministry of Climate, Energy and Building's approval of the investment. This approval has been received.

For more information, visit www.energinet.dk.

Ofgem green lights Scottish subsea link

Ofgem has given the green light for a new subsea link in the north of Scotland. Scottish Hydro Electricity (SHE) Transmission's significant upgrade of the electricity network is a £1.2 billion project. It is expected to connect 1.2 GW of new renewable electricity generation following completion in 2018. This will help meet Britain's renewable target at a lower cost to consumers.

The new subsea link will connect the electricity grid on either side of the Moray Firth. SHE Transmission has already submitted more details on the project, and Ofgem is currently analyzing them to check that the spending, technical and delivery plans for the upgrade are appropriate and offer value for money for consumers. If Ofgem finds that the project could be delivered for less, then it will lower the amount



of funding allowed to complete it. We will consult on the detail of the funding proposals this autumn.

Ofgem has also announced changes to the methodology for calculating what generators pay to use the electricity transmission network. This change is being made to better reflect the costs that different generators have on the system. It will come into effect on 1 April 2016. Ofgem analysis indicates the changes will lead to a more efficient system that will benefit consumers.

The methodology will retain the

locational signal to encourage generators to build as close as possible to where energy demand is. This reduces the need to build costly infrastructure such as electricity pylons. The main update will recognize that renewable generation uses the system less than traditional forms of generation and so imposes lower costs. The change will therefore more accurately reflect the costs that different generators put on the electricity network.

For more information, visit www.ofgem.gov.uk.

NEC wins FASTER supply contract

A consortium of six global companies announced that they have signed commercial agreements to build and operate a new transpacific cable system, to be called "FASTER," with NEC Corporation as the system supplier. The FASTER cable network will connect the United States to two landing locations in Japan. The total amount of investment for the FASTER system is estimated to be approximately US\$300 million.

In order to address the intense traffic demands for broadband, mobile, applications, content and enterprise data

exchange on the transpacific route, FASTER will feature the latest high-quality 6-fiber-pair cable and optical transmission technologies, with an initial design capacity of 60 Tbps (100 Gbps x 100 wavelengths x 6 fiber-pairs).

This new cable system will be landed at Chikura and Shima in Japan and will feature seamless connectivity to many neighboring cable systems to extend the capacity beyond Japan to other Asian locations. Connections in the United States will extend the system to major hubs on the U.S. West Coast covering the Los Angeles, San Francisco, Portland and Seattle areas.

The six-company consortium is composed of China Mobile International, China Telecom Global, Global Transit, Google, KDDI and SingTel. The name FASTER was adopted to represent the cable system's purpose of rapidly serving surging traffic demands.

Construction of FASTER will begin immediately and the system is targeted to be ready-for-service during the second quarter of 2016.

For more information, visit www.nec.com.

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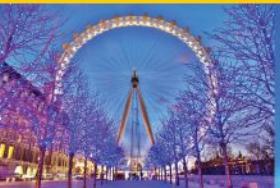
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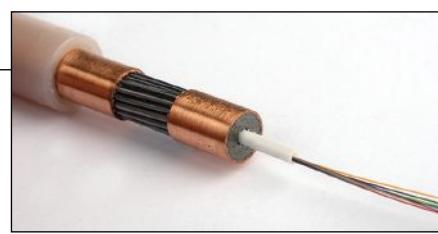
SubPartners secures cable for APX-West build

SubPartners Pty Ltd has announced that TE SubCom has reserved 3,300 km of SL17 submarine cable for use within the APX-West cable system.

In preparation for the deployment of APX-West, the early manufacture by TE SubCom of 3,300 km of the required cable demonstrates the collective commitment SubPartners and TE SubCom share for building these systems.

Delivering both systems within 24 months is key to meeting the expectations of the foundation customers supporting APX-West and APX-Central; Singapore to Perth and Perth to Sydney, respectively. The secured cable along with most major permits already attained means that SubPartners can finalize the few remaining commercial agreements while committing to its installation timelines.

The constructed cable represents almost the entire deepwater cable component for APX-West and provides SubPartners with a significant head start on their APX-West project as it reduces significantly the time between Marine



Route Survey and cable installation.

APX-West is a four fiber-pair system using the latest state-of-the-art ultra-long haul design delivering much needed capability and resiliency to the region. It will connect Perth, Australia to Changi North, Singapore with planned branches to Jakarta, Indonesia and Christmas Island. The system is approximately 4,700 km long and has an initial design capacity of up to 32 Tbs. It is expected to be Ready for Service in the second quarter of 2016.

APX-Central is a four fiber-pair system utilizing complementary technology to APX-West bringing diversity to trans-Australia connectivity. It will connect Perth to Sydney with planned branches to Adelaide, Melbourne and Hobart. The system is approximately 5,300 km long and has an initial design capacity of up to 32 Tbps. It also is expected to be Ready for Service in the second quarter of 2016.

For more information, visit www.subpartners.net.

Hawaiki chooses Equinix for Australian cable landing station

Equinix, Inc. announced that one of its International Business Exchange™ data centers in Sydney has been selected by Hawaiki Cable Limited as the site of the company's landing station in Australia and prime interconnection point. The Hawaiki submarine cable landing station in SY3 will be located directly within Equinix's global data center footprint made up of over 100 data centers.

Hawaiki is building a 14,000-km cable system providing trans-Pacific connectivity between Australia, New Zealand and the United States; trans-Tasman connectivity between Australia and New Zealand; connectivity from Hawaii to the continental United States; and Pacific islands connectivity to New Zealand, Australia and the United States. The entire system is planned to go live in early 2016.

The landing station will provide cross-connect opportunities for all Equinix customers collocated in its Sydney data centers, and will give Hawaiki direct access to potential customers.

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

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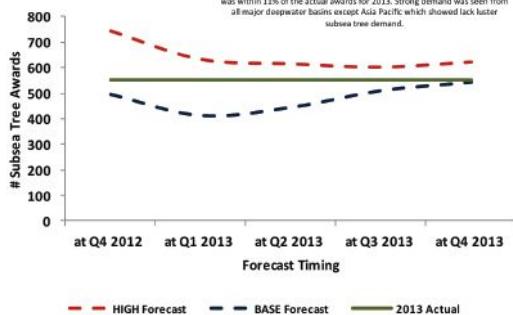
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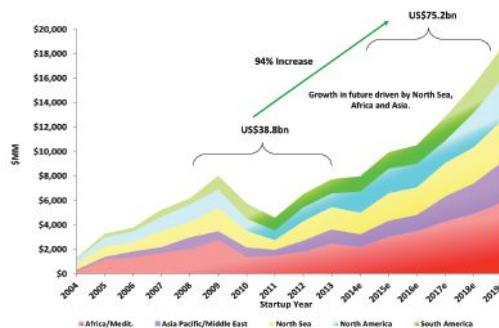
Quest Global Subsea Tree Award Score Card 2013 Subsea Tree Awards

Over the 12 months prior to the end of 2013, Quest's mean use forecast was within 11% of the actual awards for 2013. Strong demand was seen from all major deepwater basins except Asia Pacific which showed lack-luster subsea tree demand.



Global Subsea Capex

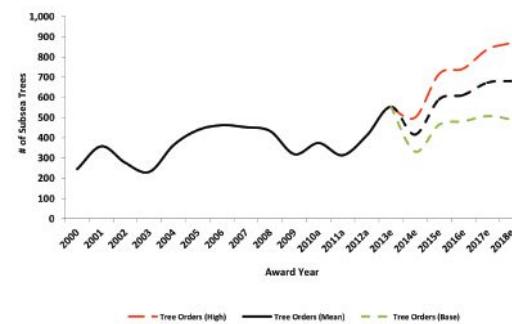
Forecast spending 2014-2019e \$75.2bn



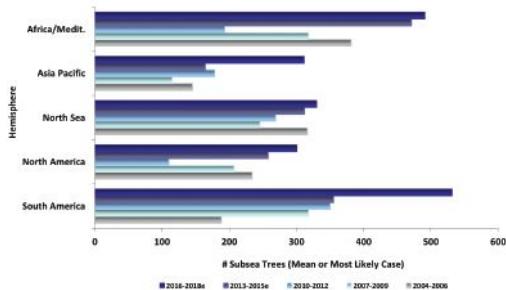
TOTAL Global Subsea Production Market Spend Forecast - \$75.2Bn



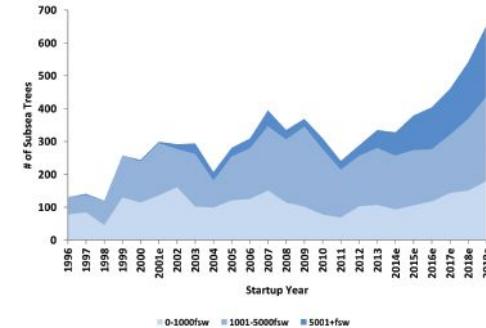
Global Subsea Tree Awards Momentum Builds



Global Subsea Tree Awards by Year 2004-2018e (Mean Case) 3-Year Buckets



Global Subsea Tree Startups by Water Depth 1996-2019e Startups – Normalized Case



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Monthly Stock Figures & Composite Index

Industry Company Name	Symbol	Close(Mid) August	Close(Mid) July	Change	Change %	High	52 week	Low
Diversified, Production Support and Equipment Companies								
Baker Hughes, Inc.	BHI	67.05	72.98	-5.93	-8.1%	75.64	46.09	
Cameron Intl. Corp.	CAM	72.49	68.62	3.87	5.6%	74.53	52.50	
Drill-Quip, Inc.	DRQ	99.85	104.47	-4.62	-4.4%	121.07	94.99	
Halliburton Company	HAL	68.23	70.40	-2.17	-3.1%	74.33	46.48	
Tenaris SA	TS	42.82	45.52	-2.70	-5.9%	49.87	40.63	
Newpark Resources, Inc.	NR	12.49	11.76	0.73	6.2%	13.64	10.43	
Schlumberger Ltd.	SLB	105.34	114.74	-9.40	-8.2%	118.76	80.00	
Superior Energy Services, Inc.	SPN	34.08	36.35	-2.27	-6.2%	37.05	22.85	
Weatherford International, Inc.	WFT	21.27	22.50	-1.23	-5.5%	24.88	13.07	
Deep Down, Inc.	DPDW	1.60	1.81	(0.21)	-11.6%	2.70	1.44	
FMC Technologies	FTI	59.83	60.81	(0.98)	-1.6%	63.92	47.58	
Total Diversified, Production, Support and Equipment.....	585.05	609.96	-24.91	-4.1%	656.39	456.06		
Geophysical / Reservoir Management								
Dawson Geophysical Company	DWSN	23.16	27.54	-4.38	-15.9%	37.61	22.93	
Mitcham Industries, Inc.	MIND	13.47	13.33	0.14	1.1%	17.87	12.65	
Compagnie Gnrale de Gophysique-Veritas	CGV	9.03	11.61	-2.58	4.50%	25.85	8.38	
Total Geophysical / Reservoir Management.....	45.66	52.48	-6.82	-13.0%	81.33	35.58		
Offshore Drilling Companies								
Atwood Oceanics, Inc.	ATW	48.51	50.23	-1.72	-3.4%	58.46	44.88	
Diamond Offshore Drilling, Inc.	DO	43.92	48.98	-5.06	-10.3%	66.97	43.69	
ENSCO International, Inc.	ESV	48.25	54.23	-5.98	-11.0%	62.25	47.85	
Nabors Industries, Inc.	NBR	25.90	28.89	-2.99	-10.3%	30.24	15.21	
Noble Drilling Corp.	NE	26.94	32.75	-5.81	-17.7%	35.54	25.06	
Parker Drilling Company	PKD	6.26	6.41	-0.15	-2.3%	8.67	5.54	
Rowan Companies, Inc.	RDC	29.13	31.81	-2.68	-8.4%	38.65	28.99	
Transocean Offshore, Inc.	RIG	38.73	44.01	-5.28	-12.0%	55.74	38.01	
Total Offshore Drilling.....	267.64	297.31	-29.67	-10.0%	356.52	249.23		
Offshore Contractors, Services, and Support Companies								
Helix Energy Solutions Group, Inc.	HLX	25.56	24.32	1.24	5.1%	28.00	19.44	
Gulf Island Fabrication	GIFI	19.5	19.91	-0.41	-2.1%	26.82	18.06	
McDermott International, Inc.	MDR	7.48	7.54	-0.06	-0.8%	9.36	6.58	
Oceaneering International	OII	67.28	73.55	-6.27	-8.5%	87.64	66.00	
Subsea 7 SA	SUBCY.PK	16.91	17.68	-0.77	-4.4%	22.32	16.29	
Technip ADS	TKPPY.PK	23.04	26.03	-2.99	-11.5%	31.32	21.08	
Tetra Technologies, Inc.	TTI	11.27	11.11	0.16	1.4%	13.43	9.25	
Cal Dive International, Inc.	DVR	0.78	1.30	-0.52	-40.0%	2.17	0.68	
Total Offshore Contractors, Service, and Support.....	171.82	181.44	-9.62	-5.3%	221.06	157.38		
Offshore Transportation and Boat Companies								
Seacor Holdings, Inc.	CKH	80.80	79.00	1.80	2.3%	99.00	75.25	
Gulfmark Offshore, Inc.	GLF	39.76	43.40	-3.64	-8.4%	53.89	37.35	
Bristow Group	BRS	70.49	74.08	-3.59	-4.8%	85.70	64.10	
PHI, Inc.	PHII	38.38	38.41	-0.03	-0.1%	42.70	33.50	
Tidewater, Inc.	TDW	49.40	50.28	-0.88	-1.8%	63.22	45.51	
Trico Marine Services, Inc.	TRMAQ.PK	0.04	0.04	0.00	0.0%	0.11	0.01	
Hornbeck Offshore	HOS	43.18	42.19	0.99	2.3%	59.93	37.44	
Total Offshore Transportation and Boat	322.05	327.40	-5.35	-1.6%	404.55	293.16		

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Monthly Stock Figures & Composite Index

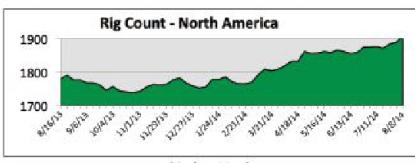
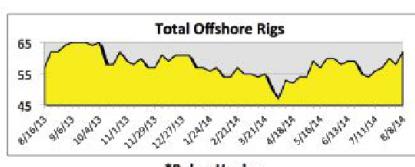
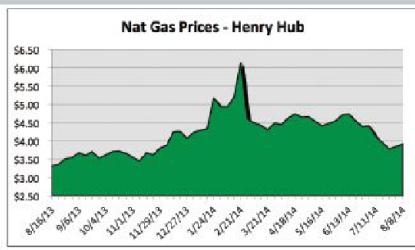
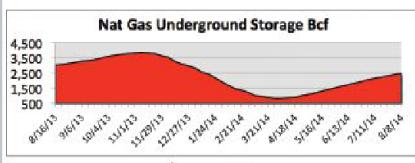
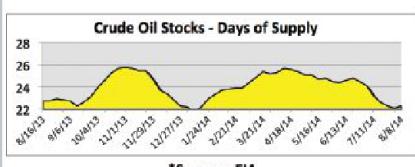
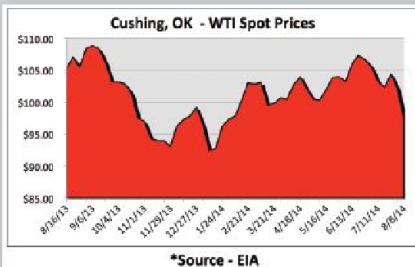
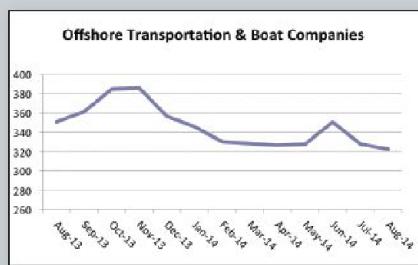
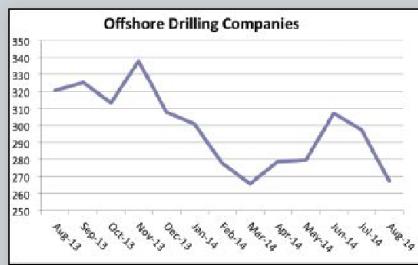
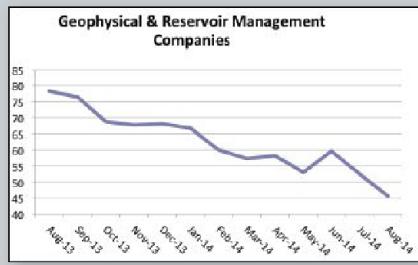
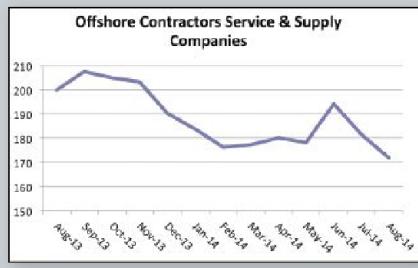
Industry	Close(Mid) August	Close(Mid) July	Change July	Change % July	High 52 week	Low 52 week
Diversified, Production Support & Equipment Companies						
Total Diversified, Production, Support and Equipment	585.05	609.96	-24.91	-4.1%	656.39	456.06
Total Geophysical / Reservoir Management	45.66	52.48	-6.82	-13.0%	81.33	35.58
Total Offshore Drilling	267.64	297.31	-29.67	-10.0%	356.52	249.23
Total Offshore Contractors, Service and Support	171.82	181.44	-9.62	-5.3%	221.06	157.38
Total Offshore Transportation and Boat	322.05	327.40	-5.35	-1.6%	404.55	293.16
Total Offshore Source Index	1,392.22	1,468.59	-76.37	-5.2%	1,719.85	1,191.41

DISCLAIMER

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

Oil & Gas Industry Trends

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



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

Gulf of Mexico Data

Current Deepwater Activity

Operator	Area	Block	Lease	OCS Rig Name	Prospect Name	Water Depth (ft)
Shell Offshore Inc.	WR	508	G17001	NOBLE JIM DAY	Stones	9,556
Anadarko Petroleum Corp.	AT	261	G16890	CAL-DIVE Q-4000	Vortex	8,344
Shell Offshore Inc.	AC	857	G17561	H&P 205	Great White	7,824
Shell Offshore Inc.	DC	398	G25854	NOBLE GLOBETROTTER	Vicksburg/Gettysburg	7,579
ExxonMobil Corp.	WR	584	G20351	MAERSK VIKING	Julia	7,138
Anadarko Petroleum Corp.	KC	875	G26771	COIL TUBING UNIT	Lucius	6,822
Anadarko Petroleum Corp.	KC	875	G26771	ENSCO 8500	Lucius	6,822
Noble Energy, Inc.	MC	782	G33757	ATWOOD ADVANTAGE	Caterpillar	6,569
Murphy Exploration & Production Co.	DC	178	G25850	T.O. DISCOVERER DEEP SEAS		6,560
Chevron USA, Inc.	KC	829	G25814	T.O. DISCOVERER CLEAR LEADER	Buckskin	6,428
BHP Billiton Petroleum (GOM) Inc.	AT	618	G08035	T.O. DEEPWATER INVICTUS	Neptune at 574	6,266
Repsol E&P USA Inc.	KC	642	G33335	ENSCO DS-5		6,124
Anadarko Petroleum Corp.	WR	52	G25232	DIAMOND OCEAN BLACKHAWK	Shenandoah	5,874
Shell Offshore, Inc.	WR	95	G25234	STENA ICEMAX	Yucatan North	5,860
Eni US Operating Co. Inc.	MC	772	G16647	COIL TUBING UNIT (N.O. #2)	Triton (mc)	5,639
Eni US Operating Co. Inc.	MC	772	G16647	T.O. DEEPWATER PATHFINDER	Triton (mc)	5,639
BP Exploration & Production, Inc.	MC	776	G09866	SEADRILL WEST VELA	Thunder Horse North	5,638
BP Exploration & Production, Inc.	MC	778	G09868	T.O. DISCOVERER ENTERPRISE	Thunder Horse North	5,631
Eni US Operating Co. Inc.	MC	773	G19996	NABORS POOL 140	Devil's Tower	5,610
BP Exploration & Production, Inc.	AT	362	G34584	ENSCO DS-4		5,588
Anadarko Petroleum Corp.	GC	903	G24197	ENSCO 8505	Heidelberg	5,274
Anadarko Petroleum Corp.	GC	903	G24197	ENSCO 8506	Heidelberg	5,274
Chevron USA, Inc.	GC	807	G31752	PACIFIC SANTA ANA	GC 807 (Anchor Well)	5,230
Shell Offshore, Inc.	MC	687	G05863	ATWOOD CONDOR	Mensa	5,150
Hess Corp.	MC	726	G24101	STENA FORTH	Tubular Bells	4,570
Shell Offshore, Inc.	MC	812	G34461	NOBLE DANNY ADKINS		4,471
Freeport-McMoRan Oil & Gas LLC	GC	733	G35004	T.O. DEEPWATER CHAMPION		4,463
BP Exploration & Production Inc.	GC	782	G15610	PRIDE MAD DOG SPAR RIG	Mad Dog Phase 2	4,427
BP Exploration & Production Inc.	GC	627	G25174	SEADRILL WEST SIRIUS		4,416
Freeport-McMoRan Oil & Gas LLC	GC	645	G18423	HOLSTEIN SPAR RIG	Holstein	4,344
BHP Billiton Petroleum (GOM) Inc.	GC	653	G20084	GSF C.R. LUIGS	Shenzi development	4,238
Chevron USA, Inc.	GC	596	G16759	T.O. DISCOVERER INSPIRATION	Tahiti North	4,023
Chevron USA, Inc.	KC	10	G27698	T.O. DISCOVERER INDIA		3,965
Freeport-McMoRan Oil & Gas LLC	GC	643	G35001	NOBLE SAM CROFT		3,885
Anadarko Petroleum Corp.	GC	534	G22974	NOBLE BOB DOUGLAS	Saratoga	3,864
LLOG Exploration Offshore, LLC	MC	79	G27259	SEADRILL SEVEN LOUISIANA	Humphrey	3,861
Shell Offshore, Inc.	MC	809	G09873	NOBLE DON TAYLOR	Princess	3,853
Shell Offshore, Inc.	MC	809	G12166	H&P 204	Princess	3,800
Shell Offshore, Inc.	GC	248	G15565	T.O. DEEPWATER NAUTILUS	Glider	3,233
Shell Offshore, Inc.	VK	956	G06893	NABORS 202	Ram-Powell	3,214
Shell Offshore, Inc.	MC	762	G07957	NOBLE BULLY I	Deimos	3,140
Anadarko Petroleum Corp.	GB	668	G17407	HARKAND SPEARFISH	Gunnison	3,137
Anadarko Petroleum Corp.	GB	668	G17407	WIRELINE UNIT (L.J. DIST)	Gunnison	3,137
Shell Offshore Inc.	GC	158	G07995	H&P 202	Brutus	2,985
Shell Offshore Inc.	MC	807	G07963	H&P 201	Mars (Ursa/Princess)	2,945
Statoil Gulf of Mexico LLC	MC	718	G34456	MAERSK DEVELOPER	Juno	2,918
Shell Offshore Inc.	GB	427	G07493	NOBLE JIM THOMPSON	Cardamom	2,719
LLOG Exploration Offshore, LLC	MC	503	G32334	ENSCO 8503	WhoDat	2,643
Chevron USA, Inc.	GC	205	G05911	NABORS 85 (MAYRONNE 162)	Genesis	2,590
Anadarko Petroleum Corp.	VK	869	G13065	WIRELINE UNIT (N.O. #2)	Nile	2,423
Noble Energy Inc.	GC	40	G34536	ENSCO 8501		2,079
Energy Resource Technology GoM, Inc.	GC	237	G15563	ENSCO 8502	Phoenix	1,940
Marubeni Oil & Gas (USA) Inc.	GC	155	G16698	NOBLE DRILLER	Manatee	1,939
Anadarko Petroleum Corp.	VK	825	G05778	HELIX 534	Neptune (VK)	1,711
Anadarko Petroleum Corp.	VK	825	G05778	WIRELINE UNIT (N.O. #3)	Neptune (VK)	1,711
SandRidge Energy Offshore, LLC	GC	65	G34539	H&P 206	Bullwinkle	1,353
SandRidge Offshore, LLC	EB	110	G02650	NABORS S.D. IV	Tequila	660

Deepwater prospects with drilling and workover activity: 57

Current Deepwater Activity as of Monday, 4 August 2014

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,498	35,626	2,461
201 to 400	115	1,120	20
401 to 800	233	877	10
801 to 1,000	356	582	9
1,000 & above	3,330	1,950	26

Rig Activity Report 8 August 2014

Location	Week of 8/8	+/-	Ago	+/-	Ago
Land	1832	+18	1814	+135	1697
Inland Waters	14	-3	17	-10	24
Offshore	62	+4	58	+5	57
U.S. Total	1908	+19	1889	+130	1778
Gulf of Mexico	60	+2	58	+5	55
Canada	387	-5	392	+29	358
N. America	2295	+14	2281	+159	2136

Activity by Water Depth Information current as of Monday, 11 August 2014

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

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

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SIDUS releases Deep Blue Vector

SIDUS Solutions, LLC, a highly specialized manufacturer of surveillance equipment, positioning devices and integrated systems has released its newest pan & tilt positioner—the SS260 Series “Deep Blue Vector.”

Able to withstand subsea, deep sea and hazardous areas, this electrically driven, high torque, 2-axis positioning device has a single turn resolution of 0.001° (precision of movement) and the repeatability of position of $.01^\circ$ incorporates superbly machined, extremely low backlash gears and a field serviceable modular design.

This positioner series increases overall operational efficiency, and offers enhanced stability, accuracy and resolution. The advanced electronics allows for any remote settings via the data connection or internet and the modular design simplifies routine maintenance requirements. This device is designed for any application that demands large loads to be positioned remotely (>150 lbs) and contains internal software allowing for seamless integration with your existing equipment—new or legacy.

SIDUS offers EPCi-Engineering, Procurement, Construction & installation support with the capability to interface/integrate their systems with all of the major automation/PLC/SCADA systems.

For more information, visit www.sidus-solutions.com.



Toeboard Links (T5)

Intrepid Industries Inc. announced immediate availability of Toeboard Links (T5), enabling engineers, fabricators and end-users a more economical way to encircle pipe penetrations in grating and deck plate.

Many customers have already benefited from its previous product line, Grating Penetration Collars (GPCs). The new T5s will allow greater flexibility, greater cost savings, and better availability. The T5 offers greater flexibility in that it can enclose openings for pipe as small as 1 in. while providing a standard look around all penetrations. They will offer greater cost savings in comparison to its GPC family and they are maintenance-free, unlike welded banding. Lastly, since many times these are installed at the end of a job, they will be readily available for purchase and shipment to the job site.

For more information, visit www.intrepidindustries.com.



New PML buoy a swell solution

PML's new near-surface ocean profiling buoy enables scientists to gain accurate measurements from the top few metres of the ocean. Gas transfer across the air-sea interface is a major link in the great global chemical cycles that drive life and other processes on our planet. Knowing which gases are being absorbed or emitted by the ocean, how the quantities change seasonally and, most importantly, how much gas is moving across the sea surface, is crucial to our understanding of how these cycles work and how climate may be affected in the face of global change.

While measurements in the atmosphere and below the surface are relatively easy to obtain, the shallow band just above and below the sea surface can prove extremely difficult to sample. Yet, it is within the few metres either side of the air-sea interface that the most telling measurements for air/seas gas transfer can be obtained. Assessing dissolved gas concentration gradients close to the sea surface requires good depth precision.

The traditional jib-mounted method of lowering instruments into the sea cannot provide this except in the rare event of a very calm sea state. Even in a light swell, the instrument pack can rise and fall through a depth of metres in the water col-

umn. Such movement can result in a series of measurements that are inaccurate, at best, and misleading, at worst. PML scientists, faced with this challenge while on research cruises, have come up with a simple and effective solution. By suspending instruments below a floating buoy, which rises and falls with the swell, measurements can be taken at a constant depth. PML's Near Surface Ocean Profiler acts as an instrumentation platform that can be lowered into the sea and left to drift away from the influence of the "mother ship". Instrument sampling depth is remotely-controlled by a winch and tubing back to the mother ship, enabling sample seawater to be pumped aboard for analysis. A tether is then used to retrieve the buoy for loading before moving to the next sampling location.

"This is a simple and highly effective way of overcoming what has always been a problem when gathering surface seawater samples in the open ocean," said Dr. Tom Bell, who led the team developing the buoy. "We now have greater confidence in the measurements we are taking and that is important if we are to understand the flux of gases between the ocean and atmosphere. This is crucial for our understanding of how the ocean may be responding to increasing amounts of carbon dioxide in our atmosphere."

The buoy has already been tested in the dynamic seas of the western English Channel but it will make its real research debut on a cruise into the Celtic Sea. Ph.D. student Richard Sims will be operating the buoy on the cruise, which begins this week and will last for 4 weeks.

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



PRODUCT NEWS

New Tritex Multigauge 5700 Datalogger

Dorchester-based, Tritex NDT has launched its new Multigauge 5700 Datalogger metal thickness gauge. The new gauge, has all the advantages of the very popular

Multigauge 5600 but with the added benefit of storing readings on the gauge. The Multigauge 5700 Datalogger includes an onboard memory for recording measurements in either a grid or string format, or combination of both. The readings are then transferred to a PC or laptop using wireless technology, which also allows remote gauging if required.

The versatile intuitive software includes simple wizards that guide the user in setting up templates or files for various applications. The gauge has been designed in line with Tritex's concept of Simple, Accurate and Robust.

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

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

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

For more information, visit www.tritexndt.com.

Technitrade invests in 3D mechanical scanning sonar from Teledyne BlueView

Teledyne BlueView, Inc. is pleased to announce that Technitrade, part of the Geoaction group located in Arpajon France, has invested in a BV5000 3D Mechanical Scanning

Sonar. This easy to operate high resolution measurement instrument can be used for detailed underwater structural inspection, complementing the workflow of specialist dive teams, conventional sonar survey & terrestrial LiDAR techniques. This purchase adds to the 2D multibeam imaging sonar Technitrade invested in from Teledyne BlueView earlier this year.

"Technitrade's investment in the BV5000 enables them to support our local customers with first-hand knowledge on the



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equipment and quickly deploy a system for training and demonstrations," said Ted Germann, chief sales & marketing executive at Teledyne BlueView.

"The GeoAction group is continually investing in new technology, the addition of the BV5000 has expanded our business and capabilities for underwater imaging," said Marcel Tardivon, president of the Geoaction Group. "Our group includes Technitrade, Subtop and Aquatopo, all of which have long associations with Teledyne and are pleased to be working with Teledyne BlueView and their innovative range of sonar solutions."

For more information, visit www.blueview.com.

easily adapted for specific user needs. Developed as a mission-planning, monitoring, post-processing and reporting tool, this software technology has been successfully deployed on numerous surveys, military and security operations and scientific experiments.

For more information, visit www.seebyte.com.

New development kit for spectral sensing in the lab or field

Ocean Optics has introduced a new set of spectral sensing tools for researchers in the lab or field. The STS Developers Kit brings together its powerful STS spectrometer, a Raspberry Pi microcomputer, customizable software, and wireless capabilities in single package for integrating spectral sensing quickly and easily. Right out of the box, the kit can be quickly configured for a variety of measurements, cutting set up time and speeding data collection. Lab researchers can use the kit as a platform to build a compact bench-top spectral absorption system, or take advantage of its WiFi connectivity for remote measurements such as plasma emissions inside reactors. Compact and lightweight, the STS is also ideal for field work. It can be bundled as a hand-held instrument, used to measure solar irradiance, UV dosimetry, reflected color of plants and animals, volcanic emissions, or water quality. It can be run from a tablet with wireless control or setup as a remote station and run from the lab.



SeeByte successfully launches SeeTrack Military V4

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

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

Chris Hurt, BAE Systems Business Development, said, "I was truly impressed by the way the new version of SeeTrack Military handles multiple missions from a single Geographical Information System. It's as simple as choosing a region in the world, say the Firth of Forth, and all the missions and mission plans ever generated for that place are made instantly accessible. I don't believe any other system offers this capability."

SeeTrack Military is an open-architecture platform solution for rapid on-site analysis and data fusion that can be

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The STS Developer Kit takes advantage of the Raspberry Pi's flexibility and adaptability to enable new uses for spectroscopy. Once connected to a WiFi network, the spectrometer can be controlled through phone, tablet, or computer web browser. The WiFi range is up to 150 m, and all data are securely stored to the onboard SD card. While it comes pre-loaded with this simple interface and is ready to use out of the box, the development platform makes it fast and easy to customize the kit to specific projects.

The web scripting API enables quick development of custom scripts and applications, allowing the STS and Raspberry Pi to perform even more complex tasks. Ocean Optics SeaBreeze drivers communicate directly to the spectrometer via USB interface. A Daemon Service software enables more autonomous functionality as well as coordination with other hardware such as switches or even controlling sampling accessories.

For more information, visit www.oceanoptics.com

Trimble introduces new Pacific Crest bluetooth-enabled data link for field communications

Trimble introduced the new Pacific Crest® XDL Rover 2, an advanced, high-speed, wireless data link built to withstand the rigors of GNSS/RTK surveying and precise positioning. The XDL Rover 2 is equipped with Bluetooth® wireless communication for ease in configuration and operation. It can be quickly configured with an Android device in the field and UHF data can be transmitted via Bluetooth to a paired host device for operational efficiency.

The XDL Rover 2 is a lightweight, ruggedized UHF receiver designed for digital radio communications between 403 and 473 MHz in either 12.5 or 25 kHz channels. It is designed for high performance over the entire band. The XDL Rover 2 is pocket sized and provides for cableless operations. It features an internal, rechargeable battery for ease of use and portability that allows long operational hours.

"The XDL Rover 2 is an ideal, high-speed radio receiver for field operations

that require a one-way communications link," said Jess Cobb, business area director for Trimble's Radio Communications Group. "Its interoperability with existing equipment and greater functionality allow customers to rapidly deploy the XDL Rover 2 for maximum productivity."

This sophisticated radio leverages the latest generation XDL modem technology while remaining backward compatible with existing Pacific Crest and other products. By deploying the technology, users can instantly communicate with GNSS precise positioning receivers that share the same protocols throughout the world.

The XDL Rover 2 joins the line of XDL products that includes the XDL Micro, a transceiver OEM module. The XDL Micro is a 0.5-2.0 W UHF transceiver designed for integration into



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products that require either a one- or two-way radio communication link. The XDL radio line is based upon the successful Pacific Crest ADL products.

The new XDL Rover 2 is available now through Trimble's Pacific Crest international dealer network.

For more information, visit www.PacificCrest.com.

exactEarth announces the availability of new density maps

exactEarth Ltd., the leading provider of Satellite AIS data services, announced the release of exactAIS Density Maps™, providing customers with an easy and quick method to view the millions of ship AIS messages produced by the exactAIS® service. These maps will be offered in both a pre-generated or fully customizable version in order to suit the user's needs and their areas of interest.

The vessel density mapping showcases how it is possible to use the AIS data to analyze shipping patterns and trends at differing scales. Data on shipping density can be particularly useful in assessing ship strike risk, developing mitigation

measures, analyzing the efficiency of shipping routes and for investigation into shipping activity around sensitive areas such as the nearly 6,000 marine protected areas across our oceans.

For more information, visit www.exactearth.com.

Tritech Gemini profiling sonars for STR

Tritech is pleased to announce the sale of multiple Gemini 620pd multibeam profiling sonars to Subsea Technology and Rentals (STR).

The sales of Gemini 620pd, the latest technology for subsea profiling operations, are significant for Tritech as they follow on from the successful introduction of the Gemini Narrow Beam Imager (NBI) to the company's multibeam range. STR, who has recently refocused their business, already offers a comprehensive suite of Tritech industry-standard sensors and sonars for rental. This latest purchase will augment their rental pool and further support customer requests for a multibeam bathymetric profiling tool.

Tritech's Gemini 620pd profiling

sonar operates at 620 kHz and is able to provide 10-mm range results with an angular resolution of 0.5°. The Gemini 620pd can be configured as a single-head system, or set up as in a dual-head mode for accurate pipeline profiling utilising the Gemini Hub for accurate synchronisation while processing.

Users of the Gemini 620pd profiling sonar have the option to run the system in equidistant or equiangular mode, depending on the survey and target of interest, while monitoring real-time roll correction and automatic bottom tracking.

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

New subsea certified standard gauge

Since last year, The Subsea Company has been tweaking its already precise proprietary equipment and parts and ensuring that all subsea pressure gauges are subsea certified. What does that mean to the consumer? Each gauge is individually calibrated, hydrostatically tested and certified for deepwater use.

Each subsea pressure gauge has an advanced bourdon tube design and is

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manufactured for long-term, deepwater deployment. Subsea Gauges are designed to pass annual calibrations and recertification and, in addition, the Zytel case provides superior corrosion and chemical resistance with a flexible structure that adds reliability to the internal breathing diaphragm for better depth compensation. The black face with white lettering on the gauge provides exceptional readability in low light conditions.

For more information, visit www.thesubsea.com.

Pre-launch of new Simrad trawl sonar

Simrad will be launching a new multibeam trawl sonar, which is planned for release during the first quarter of 2015. Fishermen will be able to take advantage of the multibeam's high refresh rate, which provides an even quicker update of the net opening compared to a conventional scanning sonar.

In response to growing customer demand, Simrad is developing the new multibeam trawl sonar by combining the company's proven transducer, elec-



tronics and sensor technology.

The swat will cover 240 in. x 20 in. and each beam is 3 in. x 20 in. to give an unprecedented resolution. In addition, the new multibeam trawl sonar features an upsounder that scans upwards and spots potential missed targets.

During recent testing in the Bering Sea, the multibeam trawl sonar provided images of the net opening along track in the downsounder view. The results of the tests were outstanding and even showed the sonar providing updates of the net opening with the fish entering when the net was touching the bottom of the seabed; this is usually a challenge for multibeam trawl sonars.

The multibeam trawl sonar will be a new option available in the Simrad

FX80 Catch Monitoring system, which uses standard third wire cables to communicate digitally with the vessel.

Simrad is also announcing the upcoming release of the FS35 Mini Trawl Sonar at Nor-Fishing. Designed for applications where size and weight are critical performance criteria and where the FS70 is too big or has the wrong frequency, the FS35 Mini Trawl Sonar is ideal for smaller vessels with smaller nets, or when fishing for smaller targets such as shrimp, sardines, and cuttlefish.

The FS35 will be delivered either as a 330-kHz or a 675-kHz system, giving high-resolution images of smaller targets.

The FS35 uses the standard Simrad FS electronics platform with a new direct-drive motor assembly. The FS35 is similar to operate as the FS70 and the TS15. This interoperability makes the FS35 the perfect back-up unit for the FS70, enabling the vessel to still see the opening of the net.

The FS35 is due for launch during the fourth quarter of 2014.

For more information, visit www.simrad.com.

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CORPORATE SHOWCASE

Industry leaders...

Company profiles...

Corporate forecasts...

From subsea technology and equipment to oceanographic instrumentation, learn what these industry leaders are saying about their companies today and their expectations for 2015...

CORPORATE SHOWCASE



See ad on page 7

With a cumulative 1,000 years of experience supporting the oil and gas industry and the largest inventory of scientific field equipment in the world, CSA Ocean Sciences Inc. (CSA) is uniquely situated to support your desktop and field needs required to deal with potential environmental impacts throughout the world. Having worked in more than 70 countries for numerous clients, CSA's specialty is providing these services with attention to logistical detail while maintaining superior technical quality. For over 40 years, CSA has offered and successfully performed highly regarded consulting services that integrate environmental and social impact studies for domestic and international Energy clients. The numerous environmental studies completed by CSA meeting recognized industry and international standards of practice include baseline surveys (i.e., habitat characterizations), monitoring studies, fate and effects modeling, impact assessments, and restoration/mitigation programs (e.g., coral relocation and artificial reef design and siting).

Services Offered by CSA

- Environmental Impact Assessment
- Habitat Injury Assessment and Restoration
- Environmental Monitoring
- Marine Environmental Services for Oil Spill Response
- Biodiversity and Habitat Characterization
- Coastal Permitting
- NEPA-Compliant Documentation and Analysis
- Geophysical & Oceanographic Surveys
- Ocean Sound Solutions
- Marine Mammal Services
- GeoSpatial Services



Ocean Sound Services

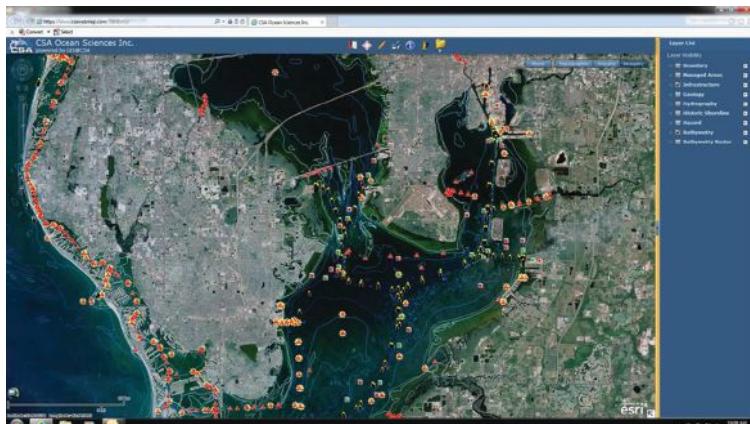
CSA's Ocean Sound group provides acoustic solutions to the marine environment by investigating sources of sound and their potential impacts. CSA provides a unique solution for acoustic

monitoring using project-specific hardware deployments, towed arrays, autonomous recorders, drifters, and fixed buoys. We can provide acoustic detection, classification, and metrics for marine species and anthropogenic sound sources. CSA is able to collect and archive nearshore and offshore data, conduct periodic data transfers, provide App-based alerts of acoustic events, and, under certain conditions, transmit data in real-time to a web server. Mitigation measures are also available that include expert passive acoustic monitoring (PAM) operators and marine mammal observers (MMOs). In addition, CSA offers a rigorous training program for both PAM and MMO certifications.



GeoSpatial Services

Recognizing the critical contribution of GIS to the industry, CSA has invested heavily in GIS resources and utilizes it as an important tool to support environmental and marine services. As part of this investment, CSA has initiated the development of a web-based GeoPortal that will unify and facilitate planning and response needs along coastal ecosystems in a secure and up-to-date framework. The program combines current and real-time spatial intelligence data to inform decision making, linking environmental resources and their sensitivity, infrastructure, and facilities' location and status as well as crisis response plans. A GeoPortal is a central interface that enables users throughout an organization(s) to search, view, evaluate, edit, share, analyze, and collaborate on a wide variety of spatial and related on-spatial data in an enterprise environment. GeoPortal databases allow for the rapid discovery and efficient delivery of relevant data, saving users both time and money. Visit <https://www.csawebmap.com/GeoPortal/> to view some of CSA's GeoPortal capabilities.



CORPORATE SHOWCASE



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Forum Energy Technologies, Inc. (FORUM), headquartered in Houston, Texas, is a leading global manufacturer of mission-critical, complex, stocked, and custom oilfield products and related after-market technical services for use onshore and offshore. We have assembled some of the most wellknown brands in our industry and bring innovative solutions to our worldwide customers. Our 3,800 experienced employees are dedicated to helping our customers improve safety and performance while lowering their operating costs.

Forum is organized into two areas of oil and gas industry expertise. Drilling and Subsea includes products from the reservoir to the wellhead and from the drilling floor to the seafloor. Production and Infrastructure encompasses equipment used from the wellhead to the refinery and in the production and transportation lines.

Subsea Technologies: Forum's subsea product line includes one of the world's most comprehensive range of ROVs used for inspection, survey, and deepwater construction. Forum is proud to own two of the most respected ROV brands in the industry: Perry™ and Sub-Atlantic™.

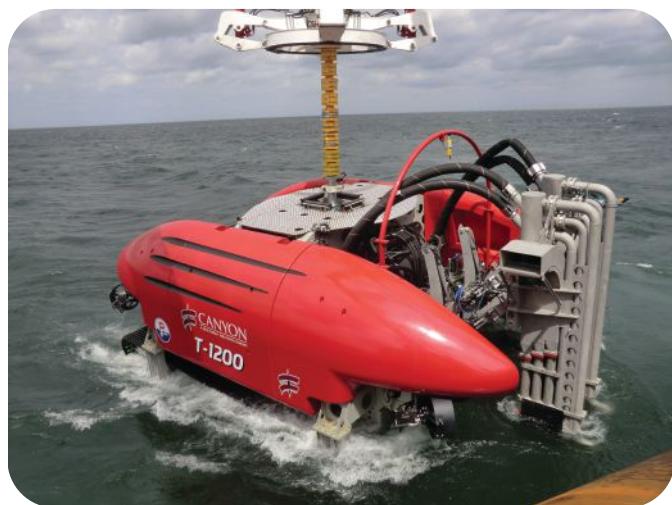
Forum's other subsea products include Dynacon launch and recovery units; tethering systems; simulation software; data acquisition software; subsea rental and tooling sales; Geoscience Earth & Marine Services; UKPS Personnel Services, Syntech syntactic foam buoyancy and Forum's latest subsea acquisition, Moffat Subsea Engineering, which specializes in subsea pipeline inspection, gauge launch and recovery systems, and subsea connectors.

Forum Subsea Technologies has recently introduced several new products.

The **Perry™ XLX Evo** is the next generation Perry work-class ROV and offers the industry one of the most robust, reliable, and dependable ROVs in the industry. These new, extremely powerful ROVs can operate to depths of 4,000 m supported by a payload of 250 kg and can be deployed in demanding environments, which make it ideal for deepwater operations that require significant power to lift, position, and install subsea field equipment. Also, the XLX can be outfitted with many subsea tooling applications to handle most any underwater application.



The **Perry™ T-1200**, made specifically for Canyon Offshore, is a heavy trenching system that can produce a trench to a depth of 3 m in all seabed conditions, from sand to stiff clays. Capable of deploying non-conducting water jetting tools with backwash and educator debris clearance systems, this cable and pipe burial ROV can carry an optional backfill and pipe following tool over long stretches.



The **Blowout Preventer Actuation Tool** is designed to be operated by a work-class ROV with speed and accuracy to close a blowout preventer remotely, delivering over 300 L of fluid per minute at pressures up to 7,500 psi. It fully actuates most BOPs in under 45 sec, which safely and effectively seals the wellbore.



Forum Subsea Technologies is continually expanding its product line to meet clients' complex needs and challenges. Forum is Everything Remotely Possible™. To learn how we can help solve your next subsea challenge, visit www.f-e-t.com/subsea or e-mail subsea.sales@f-e-t.com.

CORPORATE SHOWCASE



SeaBotix® delivers revolutionary advancements to a diverse suite of underwater observation-class MiniROV systems that are responsive to demanding professional applications.

As a world-leading manufacturer of capable underwater MiniROVs, SeaBotix Little Benthic Vehicles (LBV®) and vectored Little Benthic Vehicles (vLBV®) perform a multitude of tasks including maritime security, search and recovery, hull and pipeline inspection, hazardous environment intervention, aquaculture, oceanographic research, and more.

Established in 2001 by industry icon Donald Rodocker, SeaBotix is a pioneer in the development of observation-class ROVs with continued advances in tethers, thrusters, video systems, and a revolutionary Crawler System enabling unprecedented stability on ship hulls and other hard surfaces. Depth rated between 150 and 4000 m, LBV and vLBV can be fitted with sonar, HD cameras, scaling lasers, TMS (tether management system), LARS (launch and recovery system), work-class ROVs (WROV) fly-outs, and a number of other components.

SeaBotix provides complete training, service, and repairs for all products at our state-of-the-art 17,000 sq. ft waterfront San Diego facility as well as worldwide customer designated locations.

Complete ROV Packages

The LBV200-4 is our most compact, complete ROV package for general observation and light work, such as object recovery, with a depth rating to 200 m (600 ft). The LBV200-4 is simple to set up and operate and includes a high-resolution color camera and depth and temperature settings. The standard lateral thruster allows for sideways flight and the ability to fight currents from any direction.



LBV200-4

Many optional sensors are available, including scanning and navigation sonars (allowing for operation in zero-visibility waters), tracking systems, and a single-function manipulator with multiple attachments.

The LBV300-5 expands on the capabilities of the

LBV200-4 by adding a second vertical thruster and an increased depth to 300 m (1,000 ft). Many optional sensors are available. Add the revolutionary wheeled Crawler Skid Assembly with patented Vortex Generator and the system is capable of attaching to any relatively flat surface of any material, such as ship hulls and port infrastructure for unprecedented stability, even in strong currents.

The vLBV series of SeaBotix ROVs uses the same powerful, vectored thrust system found on much larger ROVs in off-shore applications. Vectored thrust provides high power in any horizontal direction, allowing for unprecedented control, stability and capability necessary in open waters at depth. Dual vertical thrusters allow for higher payload capabilities, and rapid vertical

See ad on page 4



vLBV

ascents/descents. The vLBV is available, in 300 m (1,000 ft) and 950 m (3,000 ft) versions. Many optional sensors are available including: scanning and navigation sonars (allowing for operation in zero-visibility waters), tracking systems, and a single-function manipulator with multiple attachments.

Add the revolutionary tracked Crawler Skid Assembly with patented Vortex Generator and the system (vLBC) is capable of attaching to any relatively flat surface of any material. Sensor data is the highest quality possible with the operator not having to fight currents or continuously pilot the vehicle during critical infrastructure inspections.



LBV

Crawler Skid

SeaBotix Containerized Delivery System (CDS)

The first rapid response, fully self-contained, 4,000 meter depth rated ROV system; the CDS is a revolutionary system for deep water observation and light duty work. This container has a single point lifting system and can be operated by two persons from vessels as small as 40 meters. It is simple to deploy, operate, and service. CDS offers a fully self-contained deep water observation package, including customizable control room, workspace, active heave compensated winch, LARS, TMS, and 4,000 m rated vectored ROV (vLBV4000). CDS can go in deep water with a variety of sensors such as sonar, high resolution cameras, grabbers and more.

For more information about SeaBotix® products, visit www.SeaBotix.com or e-mail info@SeaBotix.com.

CORPORATE SHOWCASE



TELEDYNE OIL & GAS

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Teledyne Oil and Gas (TOG) is a world leader in the sub-sea interconnect and asset integrity industry. The product lines that make up TOG (Cormon, DGO, Impulse, Impulse-PDM, ODI, Storm Cable and VariSystems) deliver high reliability products to the oil and gas, defense, communications, and oceanographic industries. The products offered by TOG include wet-mateable and dry-mateable electrical and fiber optic interconnect systems, penetrators, cable terminations, and corrosion, erosion, pressure and temperature sensors. With production facilities across the United States and Europe and service centers around the world, TOG is able to meet the demands of a global customer quickly and efficiently.

Our Reliability model is central to the Teledyne Oil and Gas culture. This is best expressed in the three core reliability areas at TOG: Reliability in Product Development, Reliability in Product Support, and Reliability Advancement through close partnering with our customers. These three interrelated areas continually support each other, bringing reliability full circle from first development discussions for a new product, through deployment and the life cycle of the product line.

Reliability is initially implemented into new product technology through Reliability in Product Development. From initial concept development, tools are implemented and the results are used to drive the frontend engineering effort focused on reliability. The first step is to establish reliability requirements, which flow down from customer requirements and TOG's own high standards for reliable products. Tools are planned and integrated into the product development schedule. Failure Modes, Effects, and Criticality Analysis (FMECA) are performed on every product design and build process. These identify the potential risks in the design and manufacturing of a product, and steps are taken to mitigate all potentially high risk items. This analysis is performed with all stakeholders, including customers and third-party companies involved in the development. The analysis results drive design changes and feed into testing, which is the next stage of reliability development. Through comprehensive Design

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RELIABILITY: SCIENCE AND ENGINEERING

LEVELS OF RELIABILITY



SCIENCE

ENGINEERING

CUSTOMERS

TELEDYNE OIL & GAS

TELEDYNE SCIENTIFIC COMPANY
A Teledyne Technologies Company

Reliability Partnerships

Building partnerships with customers...



...and sharing the benefits of reliability.

TELEDYNE OIL & GAS

Verification Testing (DVT), product qualification and Accelerated Life Testing, it verifies a product will be able to perform its required task, initially and throughout its intended life. The results of these and other tools such as Finite Element Analysis, Block Diagram Analysis, and Beta Testing is used to summarize and demonstrate reliability and its growth throughout product development, providing the customer with confidence that they are purchasing a highly reliable product.

Reliability work on a product does not end when the first product ships. With Reliability in Product Support, the product is constantly re-examined throughout its life, with an emphasis on finding areas for improvement. Performance data are tracked on all parts, failed and operational. These data are examined to understand potential failure modes under various conditions and to look for areas of improvement. Improvements focus on potential failure modes and customer usability to reduce operation related failures. TOG works with our customers and the end users of our products to validate our data and recommend design enhancements. Additionally, critical suppliers to TOG are identified and audited to ensure that the highest quality components are used to provide for the highest reliability products to TOG's customers. Reliability is an important concept for everyone at TOG. As a result, Reliability Advancement is implemented at every possible opportunity. This includes advancing the knowledge of TOG employees through regular training, internally and at Reliability Engineering conferences. This supports TOG's goal of constantly being at the forefront of reliability. By actively working on the research and development of new reliability models and techniques, TOG's commitment to stay on the forefront of reliability and continue advancing reliability knowledge is evident.

One question remains: Does your supply chain have a robust Reliability model?

CORPORATE SHOWCASE



Innovation • Experience • Results

See ad on page 63

Since 1969, Geometrics has been a world leader in the design, manufacture, sales, rental, and service of rugged, portable, easy-to-use, and technologically-innovative geophysical instruments for land, sea and air subsurface investigations. The company's main product lines include proton precession and cesium magnetometers, high-resolution seismographs, environmentally-friendly digital marine streamers, and electrical conductivity imaging and resistivity systems. Applications for our instruments include natural resource exploration, geotechnical and environmental assessments, ordnance detection, surveillance and marine tectonic research. They are also used in locat-



ing archaeological and treasure sites and for teaching and research. For over 40 years, colleges, universities, research institutions, government agencies, and exploration firms have

been depending on our experience and expertise to perform state of the art geophysical and environmental surveys.

Geophysical instruments are often subjected to extreme stress heat and cold, rain and dust, shock and vibration that would daunt the designers of conventional products.

Geophysical instrumentation must also have the highest level of technology, incorporating user interfaces that are simultaneously easy to use and sufficiently powerful to give in field answers. Geometrics' products are designed to operate under some of the most extreme conditions.

Geometrics products are highly computerized with daylight visible graphical interfaces. Our land and marine seismographs offer with 24 bit resolution. Our cesium magnetometers operate on "atomic clock" optically pumped technology for the highest resolution portable magnetometers available. In addition, Geometrics' unique measurement systems for determining soil and rock conductivity provide deep sounding in a cost effective manner. Our rugged and durable designs are field proven to deliver consistent reliable and accurate performance, enabling our customers to work faster and smarter.

Geometrics is headquartered in San Jose CA with representative offices and service centers worldwide.

GeoEel Digital Seismic Streamer in North Pole



Photo by Leif Anderson - Courtesy of University of Aarhus and Geological Survey of Denmark and Greenland



See ad on page 72

Global Ocean Design LLC manufactures unique components, sub-systems, and deck support gear for science, commerce, and defense undersea free vehicles.

Products include a Deck Purge Box and self-sealing purge ports for interior moisture control, thru-hull pressure activated switches, burnwire activated pelican releases, sphere mounting rings and plates, and sphere adapter ports. Our Beacon Board enables a surface ship to locate up to 10 discrete free vehicles on the surface using a portable handheld device that provides range and bearing within 8nm. An LED strobe assists in night recovery.

Free vehicles, sometimes called "benthic landers," are the most cost-effective way to get samplers and sensors to the seafloor. Landers can remain in situ for extremely long durations, and be deployed from size-appropriate charter vessels operated from ports close to the site of interest. Some landers are light enough to be lifted with one hand, yet strong enough to reach the bottom of any ocean trench.



Global Ocean Design can drill and spotface borosilicate glass spheres, providing end-users the ability to upgrade their flotation spheres to instrument spheres, or add new ports to existing instrument spheres. Smaller components can be tested in our pressure chamber rated to 18,000 psi with four electrical feed-throughs.



Global Ocean Design was founded in June 2011 by Kevin Hardy, following his career at Scripps Institution of Oceanography/UCSD that spanned more than 40 years. In that time he designed, constructed and operated landers around the world including the deepest trenches in the Atlantic and Pacific. He was invited by James Cameron to join his **DEEPSEA CHALLENGE** Expedition in 2011/2012, where he earned the nickname "Lander Commander".

For more information visit us at www.globaloceandesign.com.

CORPORATE SHOWCASE

HYDROID

A KONGSBERG COMPANY

Part of Kongsberg Maritime's AUV Group, Hydroid is the world's most trusted manufacturer of advanced Autonomous Underwater Vehicles (AUVs). REMUS AUVs, along with the HUGIN AUV, provide innovative and reliable systems for the marine research, defense, hydrographic, and commercial offshore/energy markets. REMUS and HUGIN vehicles are the most advanced, diversified, and field-proven AUVs in the world. REMUS AUVs are the only combat-proven AUVs in continuous operation with the U.S. Navy.

Historically, the sheer magnitude of the ocean has made comprehensive exploration unfeasible. Hydroid's REMUS AUVs are changing that by offering a flexible alternative to surface vessels.

They can glide along the surface, dive to deep depths, explore shallow waters, or hover in hazardous areas where



navigation is difficult. Use of REMUS AUVs has reduced the high costs of ocean exploration while increasing the quality of scientific marine data. Using Hydroid AUVs for undersea mine reconnaissance has helped save lives by eliminating human divers from mine fields, and these customizable undersea robots have helped solve many plane and ship disaster mysteries. REMUS AUVs also provide scientists with important data on pressing global issues, including climate change, the world's declining fish population, and environmental disasters.

As leader of the team that originally developed the REMUS AUV at Woods Hole Oceanographic Institution (WHOI), Christopher von Alt co-founded Hydroid in 2001, creating an independent company to commercially manufacture, support, and further develop the REMUS systems. In 2008, Hydroid was acquired by the Norwegian technology conglomerate Kongsberg Gruppen. Kongsberg had already developed the successful HUGIN line of AUVs that have been the industry leader in the offshore market for years. Now, with Hydroid as a subsidiary of Kongsberg Maritime, the Kongsberg AUV Group is the recognized industry leader, providing a full AUV product line to accommodate subsea applications up to 6,000 m.



See ad on page 55



Marine Sonic Technology, Ltd.

Marine Sonic Technology, Ltd. (MSTL) is a leading provider of Ultra High Resolution SideScan Sonar Systems. Our SeaScan product line is one of the most advanced in the world. With applications in many fields such as Military, Search & Rescue, Oil & Gas, Scientific Survey, & Oceanic Construction.

Offering High Definition Digital and Adaptive CHIRP models our systems can be configured for towed, deep tow, & AUV / ROV applications. MSTL developed the highest resolution transducer on the market at 1800kHz and offer many transducer packages ranging from 150kHz to 1800kHz. Systems ship standard with your choice of dual frequencies like 300/900kHz, 600/1200kHz, & 900/1800kHz.

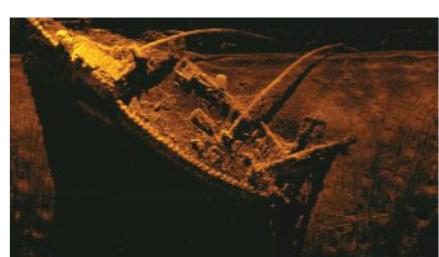
MSTL's SeaScan Survey Software is the most intuitive and powerful SideScan software available. With extremely powerful tools and ease of use it can handle almost any task without the need for extensive training. SeaScan Survey collects and saves in raw data & can integrate into 3rd party mosaic software packages like SonarWiz. Upgrades are available free for the life of your system and can be downloaded and installed from our website.



We provide the longest warranty in the industry at 3 full years along with free technical assistance 24

hours a day, 365 days a year for life. You will be given direct contact with our technical care team who have years of hands on field experience using and troubleshooting these systems in the field. Get the answer when you need it!

Marine Sonic Technology, Ltd. is based in Yorktown, Virginia USA and has been in business since the early 1990's. We pride ourselves in having the best relationships with our customers and will do everything possible to ensure the success of your mission.



CORPORATE SHOWCASE



See ad on page 82

OceanServer Technology, Inc. is a leading provider of man-portable Autonomous Underwater Vehicles (AUVs), three-axis Digital Compasses, and high efficiency lithium Ion battery-based power solutions for embedded OEM application. The Iver AUV is an affordable, commercial vehicle used by customers around the globe for bathymetric and water quality surveys, sub-surface security, sensor development and general research.

IVER AUV

The Iver is a simple-to-operate AUV system that incorporates

a Windows-based open software architecture and a well-defined hardware interface that enable researchers and OEMs to quickly adapt the Iver for a variety of applications. The vehicle comes standard with OceanServer's VectorMap Mission Planning and Data



Presentation tool to simplify survey operations. Common payloads included Side-scan sonar (SSS), Doppler velocity log (DVL), acoustic Doppler current profiler (ADCP), conductivity, temperature and depth (CTD) sensor, and multi-beam imaging sonar. Researchers and developers can choose one of the three Iver Expandable Payload (EP) models that offer a dedicated second CPU and an intuitive API for customizing software, creating remote helm commands or sensor development.

The VectorMap program can input virtually any geo-referenced chart, map or photo image, allowing the operator to intuitively develop missions using simple point-and-click navigation. The base vehicle, with a starting price at just over US \$50,000, gives university, government and commercial users an affordable base-platform for survey applications in water quality, hydrography, security and general research. OceanServer Technology is a privately held company headquartered in Fall River, Massachusetts.



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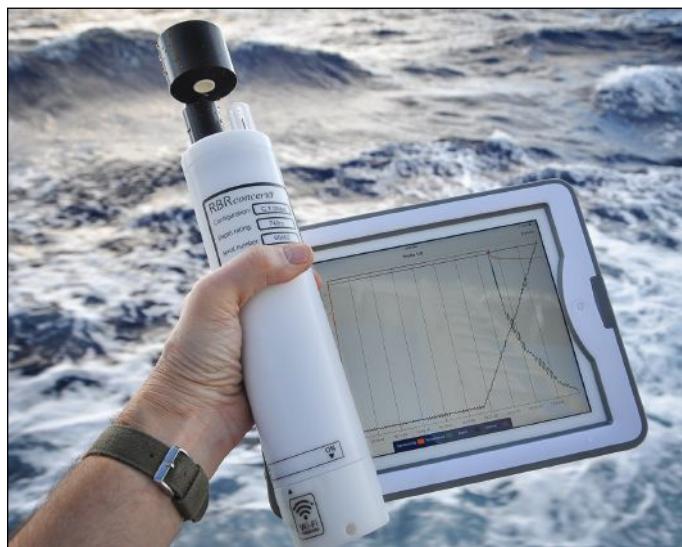
At RBR, we are far more than just a data logger manufacturer: we are passionate about oceanography and water quality. With over 35 years of experience in the field, our innovative spirit drives us to understand the world around us. In this aim, RBR has released a new generation of loggers for use in the harshest environments; our products provide improved reliability, flawless measurements, and high-precision accuracy even in the most unpredictable conditions.

Our loggers are available in several standard configurations and are customizable with the sensors you require. They can operate in up to 740 m of water, provide up to 30 million readings, and deploy for over 5 years on one set of batteries. Some configurations are available in a deepwater version that can operate in up to 10,000 m of water (sensor dependent). RBR's family of loggers include the single- and dual-channel, RBRsolo, RBRvirtuoso, and RBRduo and the multi-channel RBRconcerto and RBRmaestro to measure various parameters, including temperature, pressure, and dissolved oxygen, conductivity, turbidity, tides, or waves to list a few. Our loggers are now available with twist activation, an iOS App and a WiFi interface for wireless communications – no more cables.

The RBRduo C.T and RBRconcerto C.T.D loggers are the essential tools for any oceanographer charged with mea-

suring salinity. As fluctuations in the ocean's global water cycle can impact ecological factors and climate change, monitoring the density and stability of salinity are of significant environmental concern. Our products accommodate specialized sensors for oceanographic, freshwater, cryospheric, estuarine, and coastal monitoring.

Located in Ottawa, Canada, RBR delivers superior submersible data recorders, controllers, and sensors to provide accurate and reliable measurements. For more information visit www.rbr-global.com.



Danos recently named **Glenn Gros** general manager of the company's fabrication division. In addition to the day-to-day management and oversight of Danos' nearly 30-year-old fabrication yard at the company's headquarters in Larose, Gros will also be responsible for establishing the company's new waterfront fabrication yard. The addition of a new waterfront facility will allow Danos to pursue large structures and modules, adding to its current fabrication capabilities. Prior to joining Danos, Gros, an LSU graduate with a degree in mechanical engineering, has held leadership positions at J. Ray McDermott, Cameron Process Solutions, Unifab International, Oil States Skagit SMATGO, and RCI. "Glenn brings over 40 years of fabrication and project management experience and we're proud to have him lead our growing fabrication division," said Mark Danos, construction and fabrication division manager.

Halliburton promoted **Jeff Miller**, the company's executive vice president and chief operating officer, to president and announced his appointment to the board of directors, both effective August 1. Miller has served as Halliburton's executive vice president and COO since 2012, working with the company's senior man-

agement team in developing and executing operational strategy and ensuring that the company's short- and long-term focus is aligned with its strategy. He began his career at Halliburton in 1997 and has held various senior management roles in the company's global operations and business development. Miller holds a bachelor of science degree from McNeese State University and has a master of business administration degree



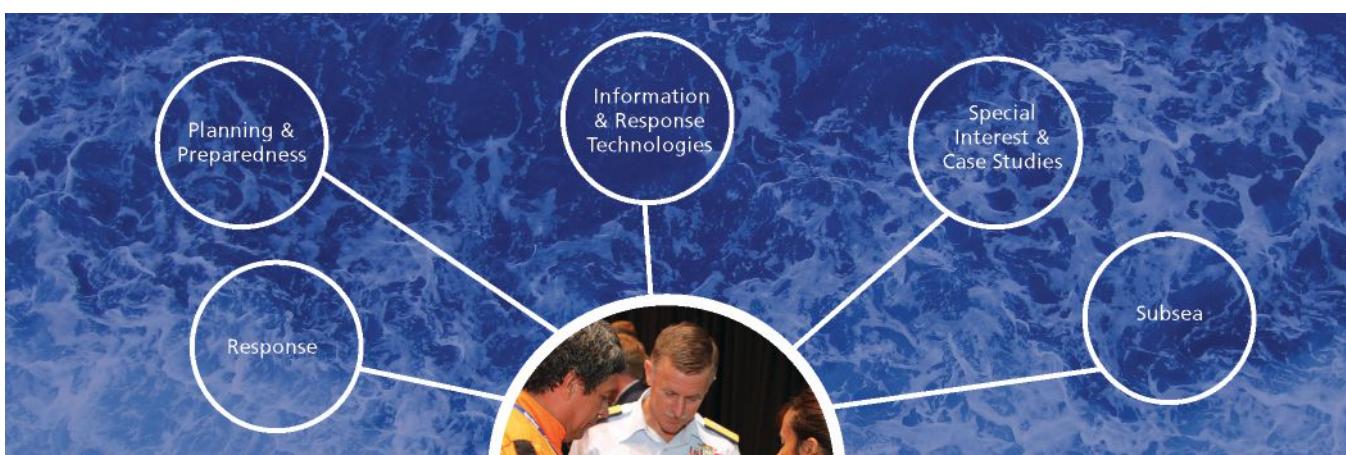
Miller

from Texas A&M University. He is a certified public accountant and a member of the Texas A&M University Dwight Look College of Engineering Advisory Council.

Foster Marketing named **Kathleen Murrill** as public relations account executive and **Alex Mouton** as digital associate. Murrill will enhance the firm's public relations abilities as a member of the public relations team based in Houston, Texas. She will be responsible for coordinating media events, public relations campaigns and handling public relations for Foster Marketing's energy clients, including writing and distributing news

releases and articles. She was previously selected for internships with the Houston Chronicle and New England Center for Investigative Reporting. Mouton will boost the firm's online efforts as the digital associate based in Houston. She will focus on social media content planning and monitoring, digital media reporting, online analytics tracking and will assist with website maintenance. Mouton gained energy industry experience as an intern for Weatherford International's corporate communications department.

Diamond Offshore Drilling, Inc. appointed **Ronald Woll** senior vice president and chief commercial officer. Based in Houston, he will have oversight of company marketing and contract acquisition activities. He has an extensive background in oilfield services in a career covering business development, manufacturing, supply chain, and business process re-engineering. Prior to joining Diamond Offshore, Woll served as senior vice president, supply chain at Halliburton, and previously worked for Bertelsmann, PricewaterhouseCoopers and General Electric. He graduated Summa Cum Laude in industrial engineering from the State University of New York. He also holds a master's degree.



DECEMBER 2-4, 2014
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Wave energy firm Aquamarine Power has appointed experienced financier **Douglas Robb** as their new chief financial officer. Robb's role will be to bring in further private and public sector investment in support of the firm's ambitious commercialization plans. Robb joins Aquamarine Power from Cornelian Asset Managers where he was director of finance, compliance and operations. Prior to this, he held roles with Lloyds Banking Group and PricewaterhouseCoopers where he focussed on areas including real estate and corporate restructuring.



Robb

Tim Shaw returns to the CSA Ocean Sciences Inc. operations group after 8 years as an instructor in the Marine Technology program at Cape Fear Community College in Wilmington, North Carolina. Shaw worked previously as a field operations specialist with CSA from 2001 to 2006. Prior to that, he was a Marine Technician, R/V Cape Hatteras, with Duke University Marine Laboratory in Beaufort. A graduate of CFCC with an associates degree in Applied Sciences in Marine Technology, Shaw will be responsible for the management of project field operations from pre-job planning to post-marine operations. Tim and his family recently relocated from Wrightsville Beach to Jupiter.

Jose Troncoso joined the Ocean Specialists' team on August 4th. Jose earned both his bachelor and master of science degrees in Mechanical Engineering from Tufts University, and he holds a masters in General Management from Harvard University. He has worked in the defense and aerospace industry, leading the manufacturing process and engineering groups as the Project Manager. Troncoso also worked in the medical equipment manufacturing industry, leading manufacturing engineering groups. He will provide project engineering support to OSI staff while also focusing on business development.

Paul Douglas has been promoted to the role of VP operations with **Bruce Stuart** joining Proserv as VP sales and business development for Europe and West Africa (EWA) from FMC Technologies. Douglas takes overall responsibility for two of Proserv's key Aberdeenshire facilities including its Birchmoss test and assembly hub, which provides subsea, drilling and production services, and its Kintore-based marine technology center. Douglas joined Proserv in 2011 as VP commercial before

going on to become general manager of its Kintore facility. He has extensive expertise in leadership, business development and commercial management working with companies such as GE Oil & Gas, Vetcogray, BP and Fugro. With a career spanning more than 30 years in the oil & gas industry, Stuart has built up an enviable track record in strategy and leadership particularly in Europe, West Africa and North America. Formerly UK & Canada sales and marketing manager at FMC Technologies, Stuart has also worked in senior sales roles within Cameron and Dril-Quip.

Claxton Engineering Services, an Acteon company, has appointed **Martin Jolley** as vice president sales and commercial to spearhead its global sales and commercial strategy. Providing leadership and vision to direct the company's sales, marketing, commercial and tendering divisions, Jolley will be based in Claxton's UK head office, overseeing commercial development aimed at expanding the business worldwide. Jolley's appointment underlines Claxton's commitment to global expansion and growth of operations. Claxton recently secured its biggest ever riser contract—for the development of the Hanz field, offshore Norway.



Jolley

Dr. Graham Allen will take up a permanent position as Head of the British Oceanographic Data Centre (BODC) on 4 August. The BODC's role is to facilitate high-quality research outcomes by connecting stakeholders to oceanographic data and the knowledge from this, with consequential economic, environmental and societal impacts. Graham comes to the NOC with an early career background as a physical oceanographer, having gained his Ph.D. from the University of Wales, Bangor in 1995. In recent years, he has managed diverse teams in the commercial IT business, most recently as general manager for software product development with a New Zealand-based company providing software systems to the global retail oil industry.

iXBlue, a global leader in navigation and positioning systems for offshore and defense applications, has significantly increased support and product availability in Brazil. This is in line with the company's strategic plans to accelerate sustainable long-term growth in this important and expanding market. iXBlue navigation and positioning products are extensively used by survey, EPC, and other offshore national and international organizations involved in Brazil off-

shore projects. This includes Petrobras projects in Saipinao/Guará-Lula pre-salt discoveries of Santos Basin. iXBlue's products are valued by players in the oil and gas value chain for their high performance, enhanced efficiency, and unparalleled reliability.

Following the announcement by **SEACON (europe) Ltd** earlier this year as being named winners of a Queen's Award for Enterprise in International Trade, a celebration and presentation of the award took place at the company's manufacturing facility located in Great Yarmouth, Norfolk, UK on Wednesday 30 July 2014 where the Queen's Lord-Lieutenant for Norfolk, Mr. Richard Jewson attended and presented the official glassware. Also present was the Queen's Deputy Lieutenant, Mr. Richard Butler and the Mayor for Great Yarmouth, Mrs. Marleen Fairhead, the Mayor's Consort, Mr. Peter Fairhead, Mrs. Sharon Stone from the Lieutenancy office and Mr. John Rimmer, International Trade Advisor for East of England International. The Queen's Award for Enterprise is the highest accolade that a UK business can achieve and was made in recognition of SEACON (europe)'s continued growth and commitment to its international customers and year-on-year progress, not just in revenue but in customer relations and overall business development.

Servi Group, the market leader for hydraulic solutions and systems in the Norwegian offshore industry, has announced their expansion into the American market. Servi, which develops and produces custom hydraulic systems, cylinders and valves will now open a new production facility in Houston, Texas.

J2 Subsea, an Acteon company, has opened a new facility in New Iberia, Louisiana to make its extensive range of remotely operated vehicle (ROV) tools more readily available for subsea operations in the Gulf of Mexico. This facility, which includes a new hydraulic workshop for tool preparation, servicing and support, will provide torque tools, analyzers, Webtool cutters, intensifiers, grinders, work packs, jetties and cleaners to ROV and diving companies in North America.

MacArtney is pleased to announce the opening of a dedicated slip ring service facility in Singapore. Operating out of a new and purpose-designed in-house workshop equipped with the latest tools and equipment, the new service facility is capable of performing complete refurbishment, repair and maintenance of all standard Moog Focal slip ring models.

CALENDAR & EVENTS

September 14-19, 2014
Oceans '14 MTS/IEEE
St. John's, Newfoundland
www.oceans14mtsieeejohns.org

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

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

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

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

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

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

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

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

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

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

October 28-29, 2014
Offshore Energy
Amsterdam, The Netherlands
www.offshore-energy.biz

October 29, 2014
Offshore Wind Installation & Maintenance
Amsterdam, The Netherlands
www.owimconference.com

November 1-5, 2014
Restore America's Estuaries
Washington, D.C.
www.estuaries.org

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

November 5-7, 2014
Oil Comm
Houston, TX
www.oilcomm.com

November 17-18, 2014
Offshore Asset Retirement, North Sea
Aberdeen, UK
www.decomworld.com/asset-retirement

December 2-4, 2014
Clean Gulf
San Antonio, TX
www.cleangulf.org

September 2014

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2014 EDITORIAL CALENDAR

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JANUARY

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

FEBRUARY

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

MARCH

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

APRIL

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

MAY

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

JUNE

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

JULY

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

AUGUST

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

SEPTEMBER

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

OCTOBER

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

NOVEMBER

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

DECEMBER

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

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