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Offshore Oil — Riding the Waves

Page 38

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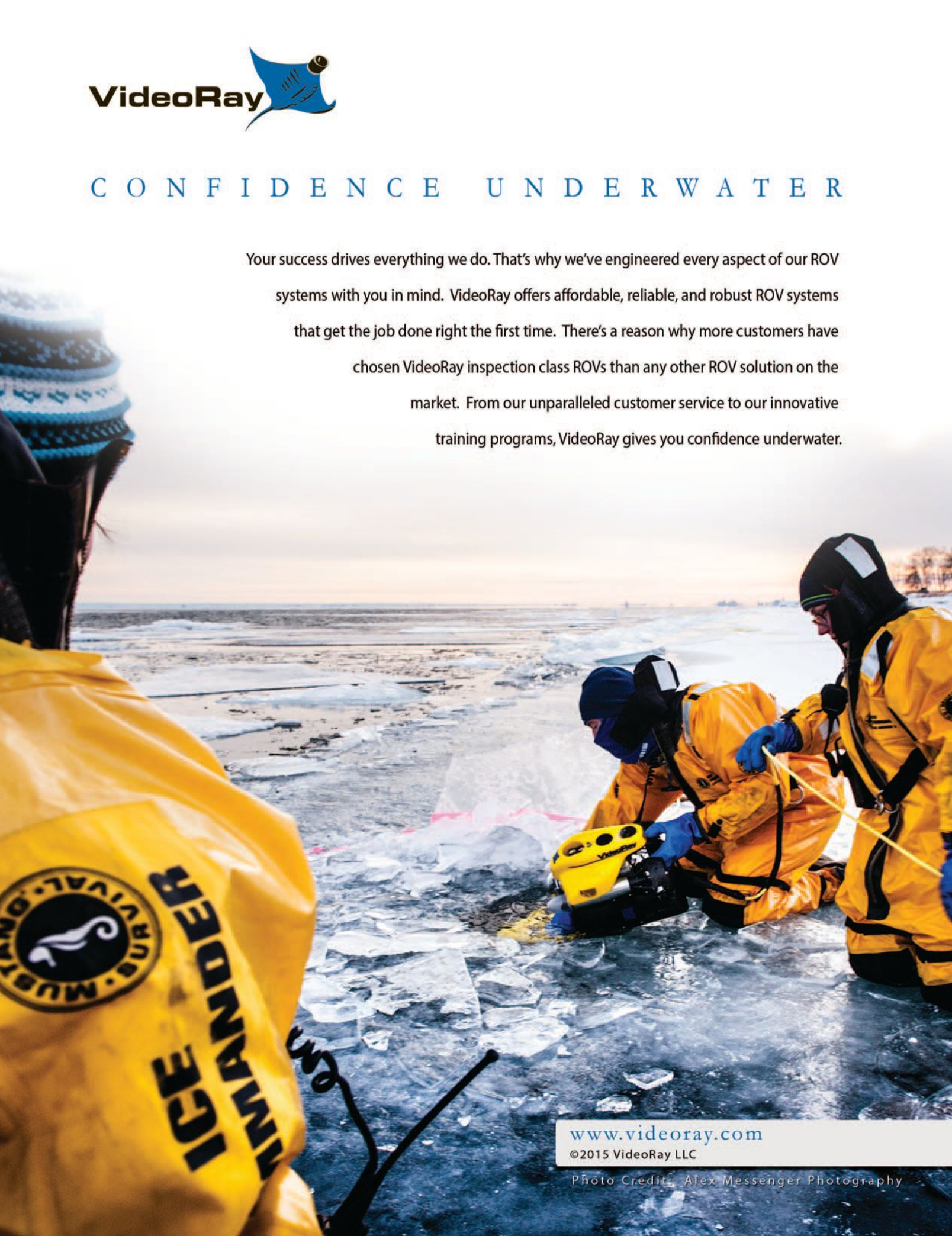

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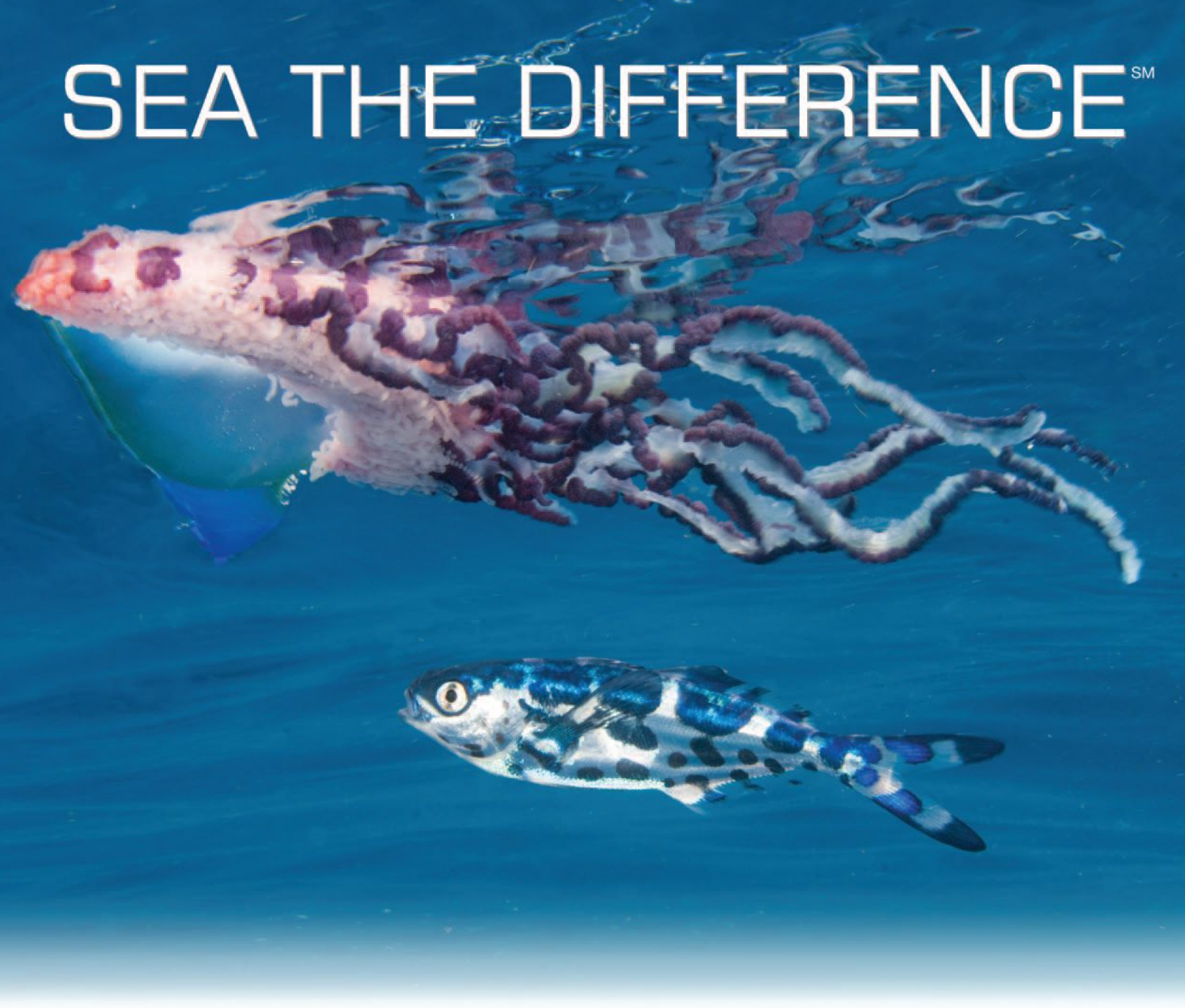

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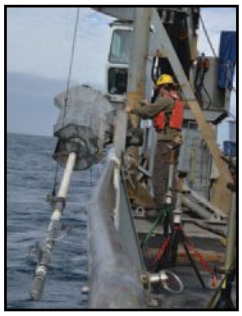
in this issue

Ocean Industry



Offshore Industry

Editorial Focus

10 The Little Sub that Could

30 Free Vehicles: Lander Technologies Mature

38 Forecast– Offshore Oil – Riding the Waves

14 Ocean Industry Briefs

16 Maritime Transportation

20 Ocean Science

24 Ocean Energy

28 Defense

35 Offshore Industry Headlines

40 Upstream Oil & Gas

54 Underwater Intervention

60 Maritime Communications

64 Subsea Cables

Product Spotlight

27 Analox

Departments

8 Editorial

69 Offshore Stats and Data

74 Product News

78 People & Company News

80 Calendar & Events

83 Ocean Industry Directory

Cover Photo

The Great White submersible piloted by Scott Cassell begins a dive along the beautiful coral reefs of Tioman, Malaysia with a journalist to observe healthy corals and coral bleaching to offer a real-life comparison.

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More News, More Technology, More Data

in the next issue

Editorial Focus
- Subsea Fiber Optic Networks
- Decom & Abandonment

Product Focus
- Connectors, Cables & Umbilicals
- Diver Detection Systems

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By John Manock

New Applications for Subsea Fiber in O&G Markets Emerge

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I have written before for ON&T about the application of submarine fiber optic cable systems to the offshore oil & gas (O&G) market. The benefits that fiber cables bring to offshore operations are numerous and have been well documented, but the market has yet to fully materialize.

The history of subsea fiber for offshore O&G shows an occasional large network deployed to serve multiple platforms followed by a lengthy period of little to no activity. The absence of steadier deployment has been frustrating to supporters of subsea fiber, but is part of the learning curve that normally occurs when bringing a new technology to an established industry.

Submarine fiber optic cable suppliers, however, seem to be showing more optimism about the future of this market. The deployment of new subsea networks serving offshore O&G platforms is becoming a bit steadier. There are several large-scale systems at various planning stages, perhaps leading to fewer and shorter periods between deployments.

There are also new applications within the offshore O&G market. One of these is 4D Permanent Reservoir Monitoring (4D PRM), which is used to increase the recovery of oil from subsea fields by continuously monitoring seismic data in an offshore field. By doing so, the movement of gas and water in the reservoir can be observed and the field operator can form an image of where the hydrocarbons were produced and how much remains.

Traditionally, a 4D seismic acquisition survey of a field involved the repeated towing of streamers from a seismic vessel. This process is expensive and complicated and usually performed every couple of years. With 4D PRM, the streamers are already embedded in the seafloor, which allows the data acquisition process to be conducted much more frequently and at less expense.

Statoil, one of the oil companies at the forefront of 4D PRM, says that the technology has helped increase its oil recovery rate on the Norwegian Shelf to 50%, compared to the global average of 30%. Statoil expects 4D PRM to contribute to its goal of a 60% recovery rate.

For subsea cable suppliers, it is worth taking note of the 4D PRM systems. These systems involve the installation of large cable networks — a network under construction on the Snorre and Grane fields will use approximately 700 km of cables. While this may pale in comparison with multi-thousand-kilometer transoceanic networks, it is still a sizeable amount of subsea cable. For example, the size of the Snorre/Grane PRM network, when construction began in 2013, put it in the top one-third of the subsea cable installations begun that year.

In November, Alcatel-Lucent Submarine Networks, one of the leading suppliers to the submarine fiber optic cable market, completed its acquisition of Optoplan, a leading provider of 4D permanent reservoir monitoring solutions for offshore oil and gas production. This was the first major move by the submarine cable industry into the 4D PRM market. Whether it is the beginning of a trend remains to be seen, but the move is significant.

Meanwhile, other developments also point to a growing market for subsea fiber in the offshore O&G business. As I mentioned earlier, connecting platforms for large-scale subsea cable systems have become a bit more frequent, if still only a handful. If nothing else, the greater level of discussion of building such networks is a good sign, but there is more going on than that. A diverse group of telecom operators is beginning to take notice of the potential new market for offshore O&G networks. These include the traditional national carriers as well as new ventures looking to fill niches currently unserved by other types of telecom operators.

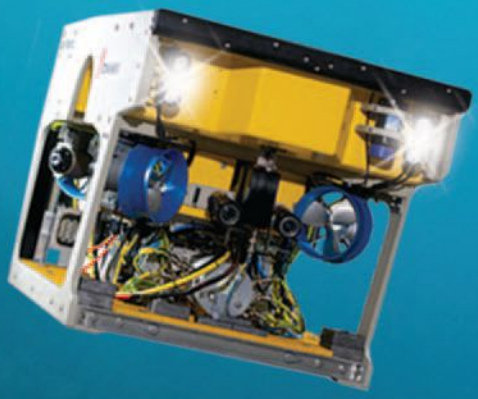
In the past 2 years, for example, traditional telecom operators in Thailand and Cyprus have become involved in subsea fiber networks serving offshore O&G facilities. Other carriers are looking to get involved in similar projects that are in the planning stages in several regions around the globe. Newer telecom ventures such as Radius Oceanic Communications and Nextgen also are targeting the offshore market.

The traditional carriers bring their experience in telecommunications, while the newer players bring innovation. Both are needed to overcome the difficulties inherent in connecting and providing services to platforms.

Overall, the future for subsea fiber for offshore O&G looks promising. It could still be a small, niche market for submarine system suppliers for years to come, but the advantages of fiber make its use in this market inevitable. When subsea fiber does become widespread, it could be a win-win situation for both industries.

sub-Atlantic

OPERATIONAL RESILIENCE



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THE LITTLE SUB THAT COULD

Author: Gregg Mikolasek, CFO & Director, Undersea Voyager Project, rECOn Missions
Contributor: Scott Cassell, CEO & Founder, Undersea Voyager Project, rECOn Missions

In the spring of 2013, the Undersea Voyager Project (UVP) committed to an ambitious proposal to complete a year-long retrofit of its K-250 submersible, ship it via container to Tioman, Malaysia, and perform 36 dives with 33 journalists over the course of 1 week as part of Luminox-Crystal Time's Save Our Seas Project. The mission: 1) introduce the non-diving community in Asia, through the eyes of their journalists, to the fragile coral reef ecosystem and 2) by showing its beauty and fragility, stress the importance of conservation of this incredible resource.

Photo: Gerald Kong

Background

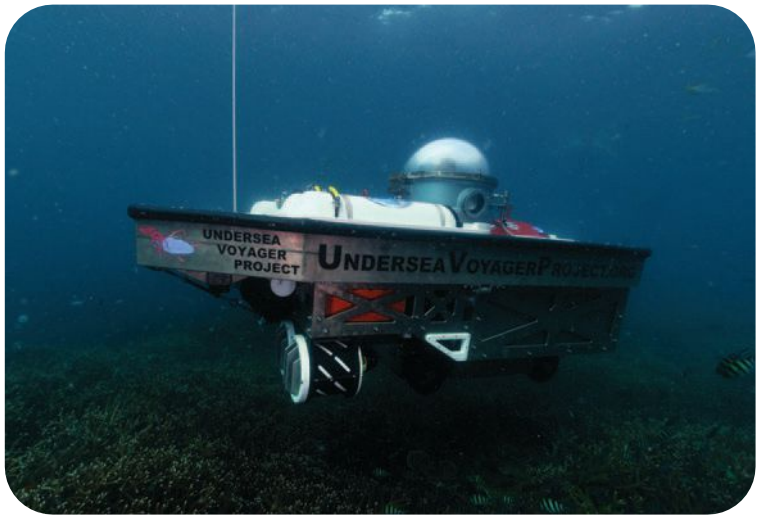
The potential to undertake a project of this magnitude began in 2006, when UVP's president, Captain Scott Cassell, discovered an old K250 hull rusting in someone's backyard in southern California. Making a deal to purchase the rusting hulk resulted in an 8-year restoration project. Through the selfless efforts of numerous volunteers with a variety of specialized skills and countless hours invested, the old K250 was transformed into the newly christened "Great White" — UVP's capable little flagship.

In 2012, after the restored sub made more than 100 dives, it was decided to again transform the Great White into a much more capable research and diver support platform. This redesign would see the sub pulled from service for more than 8 months and, with the promise made to send the sub to Tioman, create a race to the finish to complete the sub in time to undertake the scheduled Asian Undersea Voyage (ASIAUV) mission.

Not your ordinary K-250

The original K250, designed by Kittredge in the 1960s as a small personal submersible, was not a very capable design in terms of providing diver support or performing scientific work. In fact, they did not even have pilot life support basing sub dive duration on pilot estimates of available O_2 and the buildup of CO_2. However, one of its primary advantages lies in its portability. The K250 is capable of being trailered behind a small SUV and being launched from almost any boat ramp or from the deck of a vessel with a 3,500-lb crane.

In the summer of 2012, a complete redesign of the UVP's K250 exoskeleton was undertaken by a volunteer technician. Improved propulsion, shifting of air ballast and oxygen supply cylinders to an external location, addition of a diver breathing system, increased ballast capacity, and improved external lighting and camera systems were all goals for the sub's external structure and systems in addition to the primary goal of improving the K250's stability in the water. Also included in the redesign was the implementation of a dual CO_2 scrubber system and reserve with a 72-hr life support capability and both O_2 and CO_2 monitoring and a more modern, functional, and comfortable interior. The end result was the creation of a two-person (if you like each other) submersible capable of rapid cycling and hosting two cameras on each quarter bow and one camera on a stern, all providing video images on interior screens to aid in pilot operations. The Great White also has two external life support stations for two divers, including two 50-ft long umbilicals (one on either side in special below-deck storage) fed by two 150-cu. ft Blue Steel cylinders supporting diver operations in tandem with a sub mission.



With the departure date for the ASIAUV mission barely a month away, the sub finally underwent its first ballast system test. A failed baffle resulted in another system redesign. But a deeply committed team managed to work for 16 hrs a day nonstop until they completed all systems. On the last available day before shipping the sub to Asia, the team successfully tested the remodeled Great White. Every test was passed with flying colors — from deep tests, maneuverability testing, and emergency procedures (including an uncontrolled emergency ascent). With the sub in full operational condition, it was loaded into the container and shipped to Tioman.

About 30 days later, the sub arrived in Tioman and began what would prove to be an incredible and rewarding mission, the first international one for the Undersea Voyager Project. It would have the UVP/Luminox Team working with dozens of journalists and even engage in dialogue with the King of Brunei.

Project ASIAUV

The 'Save the Seas II' mission developed by Luminox-Crystal Time and UVP was designed to offer access to the coral reefs and the human effects upon them by media that normally would not be able to see them for themselves.

In September 2013 a minimum crew of three traveled to Tioman, Malasyia to meet up with the UVP centerpiece, the submersible Great White.

On the first day of submersible operations, Scott Cassell, Kerry Franciscovich, and the volunteer technician performed three test dives to make certain that 8,000 mi of travel in a shipping container hadn't harmed any systems on the sub. The sub performed very well within the design parameters even though she proved to be underpowered in a 2.5 to 3 kt current, leading Cassell to survey areas protected from currents. Just off the coast of the resort was a tiny island a mere 300 m away that provided numerous perfect dive sites. The team stowed the sub overnight on a mooring buoy in 10 ft of water just offshore. That night, a powerful storm blew through, crashing 6-ft waves onto the shore rocking the tiny sub in a fury of 45 to 55 mile-an-hour winds, so the team took turns watching the sub most of the night fearing for her safety. In the morning, there she was...floating at the dock as if eager to dive. After a brief operations check, she proved to be in perfect operating order.

The dives began in a deeper zone to just over 100 ft deep where there was evidence of plastic pollution along the coral reef. Supported by Franciscovich and the technician, Cassell performed 11 dives on Day 1 with a reporter in the observer station (laying down on the hull deck facing out the 16-in. port) during each dive. Cassell maneuvered the sub around the corals to within mere inches from the front port, allowing the reporters to see the wonders of the coral reef right in front of their eyes. Of course, Cassell had more on his mind than site seeing, so on each dive he also showed the reporters the plastic

pollution with the tiny snails crawling all over it. *"These snails are grazing the algae growing on this decomposing plastic by using their radula...which is a spike-covered tongue. With the algae scraped up by the radula into the snail are micro particles of plastic...which is in turn eaten by fish, which in turn gets eaten by bigger fish, which then often gets eaten by us. You are watching how plastic enters the ocean food chain and how it enters humans."*

The next day, the weather calmed down and the dive operations were moved to the shallower reef, where Cassell quickly found dead and dying corals victim of coral bleaching. Once again, Cassell showed reporters an healthy ecosystem followed by coral bleaching caused by a warming ocean, invasive algae species suffocating corals caused in part by agricultural runoff, and broken corals from net fishing (even though the area was a protected zone).

Towards the end of the dive day, Cassell noticed that one of the dome-ring clamps was bending downwards more on each dive and he and the technician determined it was from the shipping company using it as an additional anchor-point to secure the sub inside the container. On the last dive of the day, the clamp failed, preventing the dome-ring from creating an air-tight seal and allowing water to trickle into the sub and onto one of the reporters just as the sub began to blow her ballast air to begin the dive. Like a trooper, the reporter laughed it off and even though she lost her chance to dive said she still loved the sub.

That night, Cassell and the technician worked the problem and determined that it could not be fixed in the field, but they did come up with a plan to save the last dive day. Just 2 in. below the dome ring on the front of the hull are two steel tabs used for securing the dome closed during road travel when towed via trailer. They decided that the technician would secure the dome closed from the outside during each dive by clamping a bolt through the tabs and securing it with a wing nut. It worked perfectly.

The following day, the sub made 12 more successful dives with 12 journalists without a hitch. The last day of diving was saved by a $0.50 wing nut.

The magic of this little sub is that she can take reporters, political leaders, and teachers underwater to see face-to-face the beauty of our oceans and the human-caused damages. The ASIAUV media support reached approximately 64 million people in Asia in the form of editorials, newspapers, video blogs, news casts, and magazines.

Photo: Gerald Kong

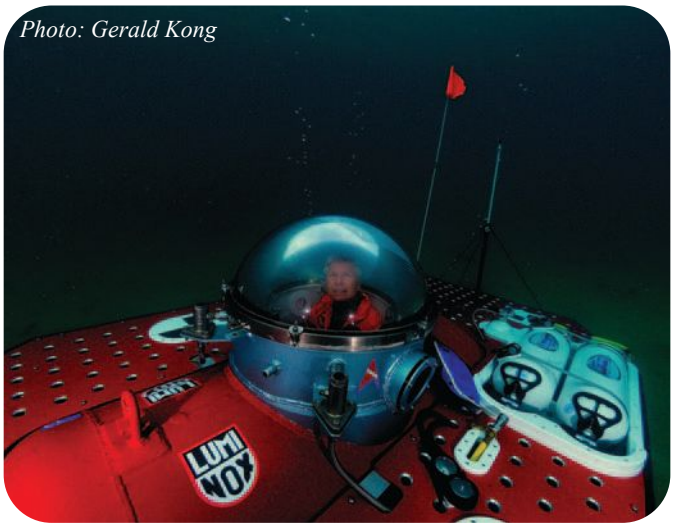


Photo: Gerald Kong

End result: The team successfully performed 33 dives with 33 journalists from nine countries. Not bad when you realize that five volunteers built a non-profit and then a tiny submarine in a garage with very modest donations.

"Someday," said UVP's CEO Scott Cassell, *"we will get that big donation and be able to buy a submersible that can take paying clients underwater to extend our mission to a much greater audience. We did this mission with a tiny, TINY fraction of what Google spends or NOAA or virtually anyone else and still reached millions of people. Imagine what we could do with the budget of a single Chevron Fuel Station or a single Starbucks Coffee store."*

The Undersea Voyager Project is a non-profit (501-c-3) public-benefit company for Oceanic Research and Educational Outreach. Founded by undersea explorer, Capt. Scott Cassell, the Undersea Voyager Project is designed to utilize manned submersibles to take a physical look at the first 100 to 1,000 ft of seawater (which is the largest environment on Earth) on a continuing series of missions to explore the Earth underwater.

The UVP's mission is to advance scientific knowledge and our understanding of the oceans' current condition and mankind's influence and communicate findings (including its inter-relationship with the global climate, the life within, and discoveries of new life) to a global audience. With the "Youth Ambassador Program." UVP will inspire children to look to the sea as a career.

UVP is privatizing ocean exploration and science by inviting the public to participate...in other words...everyone is invited!

Missions planned for 2015 are to dive the sub with seven gill and great white sharks, explore an underwater forest of still-standing trees that slid into an alpine lake 3,500 years ago and film them, and use the sub as diver support to remove lost drift nets on a shipwreck that are still killing thousands of fish per year...all with donations. Luminox is our only corporate sponsor, and they do more for the oceans than any other watchmaker—something they should be very proud of. We wouldn't enjoy ASIAUV's success without them and look forward to future joint missions.

For more information, visit www.underseavoyagerproject.org.

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in this section

Ocean Industry Briefs	14
Maritime Transportation	16
Ocean Science	20
Ocean Energy	24
Defense	28

Gulf of Mexico Research Initiative awards $140M to support research

The Gulf of Mexico Research Initiative (GoMRI) has selected 12 research consortia to conduct scientific studies of the impacts of oil, dispersed oil, and dispersant on the Gulf of Mexico ecosystem and public health. These research investments focus on improving our fundamental understanding of the implications of events such as the Macondo well blowout, and on developing improved spill mitigation, oil and gas detection, characterization and remediation technologies. The consortia were chosen following a competitive, merit review process that evaluated research applications submitted to GoMRI in response to its RFP-IV program solicitation. Through the RFP-IV program, GoMRI is awarding $140 million to support research to be carried out from 2015 through 2017. For the past several years, GoMRI has reached out to the public health research community. For a list of research consortia selected for funding, visit www.gulfresearchinitiative.org.

Greenpeace calls on WCPFC to ban FADs and high seas fishing

Greenpeace calls for urgent action to protect the economic and environmental sustainability of key Pacific tuna stocks as major tuna interests meet in Apia for the 11th Regular Session of the Western and Central Pacific Fisheries Commission (WCPFC). "Pacific tuna are in serious trouble. Bigeye tuna is overfished, down to 16% of its original population, and yet, as the China Tuna Industries failed IPO demonstrates, fishing companies continue to hammer them like there's no tomorrow," says Lagi Toribau of Greenpeace. "It is time for the WCPFC to tackle unchecked overfishing, and ensure member countries follow the rules or face stiff penalties." "To address the ongoing decline of bigeye tuna, the Commission has to tackle fish aggregating device (FAD) use," continues Toribau, "the data makes it absolutely clear that FADs have a devastating impact on juvenile bigeye, and unless the WCPFC declares a total ban on FADs, this meeting is just talk." FADs are currently banned for a 4-month period each year, a rule that Greenpeace says, demonstrates an awareness of the damage FADs cause, but the 4-month ban is inadequate. Backed by strong scientific evidence and worrying stock decline, Greenpeace says any use of FADs by purse seine fleets is unacceptable.

Research team discovers intact "ghost ship" off the coast of Oahu

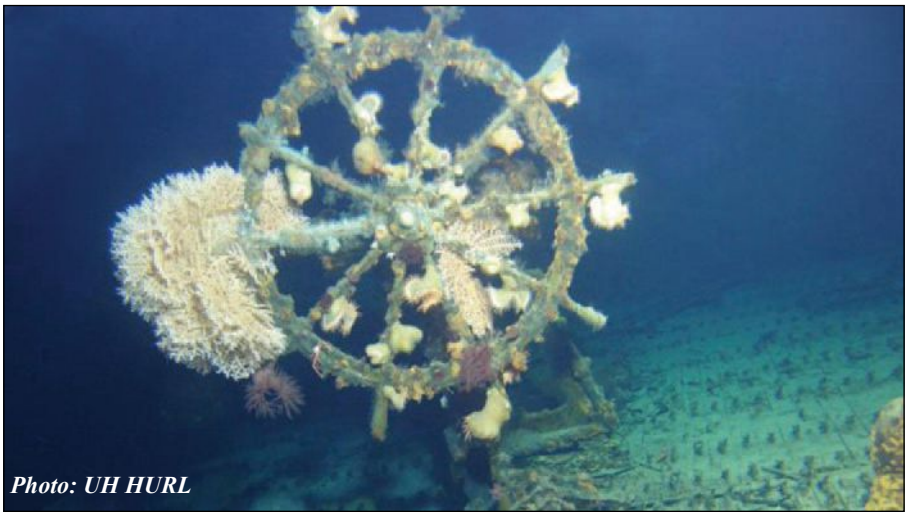


Photo: UH HURL

Researchers from the University of Hawai'i at Mānoa and NOAA's Office of National Marine Sanctuaries announced the discovery of an intact "ghost ship" in 2,000 ft of water nearly 20 mi off the coast of O'ahu. Sitting upright, its solitary mast still standing and the ship's wheel still in place, the hulk of the former cable ship Dickenson, later the USS Kailua, was found on the seabed last year on a maritime heritage submersible mission. On the mission were the Hawai'i Undersea Research Laboratory's (HURL's) Terry Kerby, and Drs. James Delgado and Hans Van Tilburg of the maritime heritage program in NOAA's Office of National Marine Sanctuaries.

"It is always a thrill when you are closing in on a large sonar target with the Pisces submersible and you don't know what big piece of history is going to come looming out of the dark," said Kerby, HURL submersible pilot. "One of our first views of the USS Kailua was the classic helms wheel on the fantail. The ship was surprisingly intact for a vessel that was sunk with a torpedo. The upper deck structures from the bow to the stern were well-preserved and showed no sign of torpedo damage."

Launched in Chester, Pennsylvania, in early 1923 for the Commercial Pacific Cable Co., Dickenson was a vital part of a global network of submarine cable that carried telecommunications around the world. When the cable reached Hawai'i for the first time in 1901, it was a major step in establishing not only a key link in the network, but also in connecting the islands to the rest of the world with near-instant communication. Dickenson arrived in Hawai'i and started work in July of that year. Repairing cable and carrying supplies, Dickenson served the remote stations at Midway and Fanning Island from 1923 until 1941.

Dickenson was also famously chartered by Cable and Wireless Ltd., the British telecommunications company also operating in the Pacific, to evacuate company employees from Fanning Island, a destination well known to Dickenson's crew as they regularly steamed to provision and supply the C.&W. stationed there. With Britain at war with Germany and its Axis partners, it was feared the station would be a target, as the company's stations had also been targets for German raiders in World War I. Dickenson arrived at Pearl Harbor with the Fanning evacuees on the morning of 7 December 1941, sailing into a port at war. Some of the evacuees on Dickenson noticed a submarine following their ship, only to see it disappear as U.S. forces attacked the sub and drove it off.

For more information, visit http://www.manoa.hawaii.edu.

NOAA establishes new panel to guide ocean exploration

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

"This distinguished board will advise NOAA on priority areas for exploration, investments in new technologies, and a strategic plan for greater understanding of our planet's last frontier," said NOAA chief scientist Richard W. Spinrad, Ph.D., who will serve as liaison to the board for NOAA administrator Kathryn Sullivan, Ph.D. "I congratulate these individuals on their selection, and look forward to working with them to achieve the next generation of ocean exploration."

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

• VADM Paul Gaffney USN (ret) board Chair. He is currently a fellow at the Monmouth University Urban Coast institute and served as a commissioner on the U.S. Ocean Policy Commission.

• James A. Austin, Jr., Ph.D., senior research scientist, University of Texas Institute for Geophysics.

• Amanda Demopoulos, Ph.D., research ecologist, U.S. Geological Survey.

• Jacqueline Eaby Dixon, Ph.D., dean, College of Marine Science, University of South Florida.

• Christopher R. German, Ph.D., senior scientist, geology and geophysics, Woods Hole Oceanographic Institution.

• Ambassador Cameron Hume, business consultant.

• John R. Kreider, senior vice president, advanced technology, Oceaneering International, Inc.

• David Lang co-founder, OpenROV.

• Darlene Lim, Ph.D., research scientist, NASA Ames Research Center.

• Nicolette Nye vice president for communications and external relations, National Ocean Industries Association.

• Dominique Rissolo, Ph.D., executive director, Waitt Institute.

• Richard J. Rikoski Ph.D., CEO and chief scientist, Hadal, Inc.

• Lance M. Towers, director, advanced technology programs, the Boeing Company.

WWII landing craft salvaged

Unique Seaflex (Seaflex), a division of Unique Maritime Group, are delighted to report their key involvement in the re-floating of the only surviving landing craft from D-Day 1944. Working in conjunction with Salvesen UK, Seaflex deployed 230t of buoyancy from its office in The Isle of Wight to the operation in Birkenhead Docks Liverpool.

The project to lift and save LCT 7074 began in March 2014, almost exactly 4 years to the day after she had sunk. The vessel came out of service at the end of the WWII after numerous successful deployments to the Normandy beaches; she was converted to a naval repair facility for a short while, then became a floating nightclub,and was berthed in Liverpool from around 1950.

Salvesen UK, a Liverpool-based contractor, was engaged by Comet Technical Services on behalf of the National Museum of the Royal Navy to conduct a dive survey and some NDT inspection of the vessel during March, the result of which was that the hull was deemed in good enough condition to attempt the refloat. A grant of nearly one million pounds was awarded by the National Memorial Heritage Fund and operations recommenced on the 22nd of September.

After 3 weeks of diving to clean the vessel and prepare her for internal diving operations, the landing craft was ready to be refloated. Although for salvage operations open-ended parachute-style air lift bags are generally preferred, this was one of those jobs where a combination of the relatively shallow depths and the need to squeeze buoyancy into tight spaces meant that enclosed units fitted with pressure release valves were the ideal solution.

For more information, visit www.uniquegroup.com.

Stena Bulk joins WOC

Stena Bulk has become the latest member of the World Ocean Council (WOC), the growing global business leadership alliance on ocean sustainability, science and stewardship.

Stena Bulk is the first WOC Member from Sweden, expanding the geographic scope and diversity of the WOC coalition of responsible ocean industry operators.

Stena Bulk strives to create more sustainable shipping with one of the safest and most modern fleets in the world, providing safe and cost-efficient transport of crude oil and refined petroleum products and chemicals. The company prioritizes a commitment to safety and a concern for the environment within a competitive transport economy and its strategy for identifying new markets and new business opportunities.

For more information, visit www.oceancouncil.org.

New DNV GL recommended practice for subsea lifting

The completion of a joint industry project (JIP) to improve existing standards and regulations around subsea lifting operations has resulted in a new recommended practice (RP). The recommended practice developed by DNV GL, the leading technical adviser to the oil & gas industry, provides guidance on the proper design and correct operation, as well as regular inspection and maintenance, of subsea cranes and lifting appliances. The aim is to reduce the overall risk and safeguard personnel during lifting operations and to improve the integrity and efficiency of equipment throughout its lifetime.

Demand for subsea lifting operations is increasing and becoming more complex with more activity taking place in deeper and harsher environments resulting in stricter lifting requirements. The rapid development of subsea cranes and lifting appliances to keep pace with the market has subsequently introduced several technical challenges around safe and efficient deployment and recovery of objects to and from the seabed.

The RP is applicable to lifting appliances used in subsea lifting operations. In practice this generally means an offshore or subsea crane, an A-frame with winch or other types of winch system and covers lifting of unmanned objects. The recommendations provide guidelines on the evalution of existing lifting appliances as well as the design and qualification of new lifting systems for subsea operations.

DNV GL will be presenting the new RP to delegates at The Norwegian Society of Lifting Technology (NSLT) Subsea Lifting Operations seminar, taking place in Stavanger from 2-3 December. The focus of the seminar is to exchange knowledge on various challenges in marine operations involving subsea lifts.

Eighteen key international offshore players were involved in the initial JIP project, which started in January 2012.

For more information, visit www.dnvgl.com.

ABS awards approval in principle for first cylindrical FLNG production unit design
ABS, the leading provider of classification services to the global offshore industry, has granted approval in principle (AIP) for the Sevan cylindrical floating LNG production unit concept for offshore production, storage and transfer of LNG, LPG and condensate. The next generation FLNG design concept is based on the proven circular and geostationary Sevan FPSO design, which is being used in the Norwegian and Central UK North Sea and offshore Brazil and is under construction as the first application of an FPSO unit to be installed in the Barents Sea. The full scope of design review for the FLNG concept includes an assessment of the feasibility of the structural strength of the equipped FLNG hull and process topside structure as well as a global performance and safety analysis conducted in accordance with the ABS Rules and Guides for floating LNG units. The Sevan FLNG production unit will have a proprietary cylindrical hull capable of operating in more than 3,000 m (10,000 ft) water depth and in harsh environments, such as extreme North Atlantic and cyclonic conditions. The unit design is based on environmental load calculations for a 100-year return storm in the Barents Sea. Similar to the Sevan FPSOs, the FLNG unit's axio-symetric hull shape enables high capacity for LNG storage and deck loads and tolerance for weather spreading and eliminates the need to weathervane in rough seas. The unit can be designed to have gas processing and liquefaction up to 4 MTPA and store up to 240,000 cu. m of LNG and 36,000 cu. m of condensate. Some of the most significant advantages of a cylindrical hull design are the elimination of the need for a turret and swivel and the favorable motions with very little roll and pitch, as well as reduction of typical wave induced fatigue loads and minimized hull deflection, which simplifies the topsides design.

Union members ratify Ingalls Shipbuilding contract extension
Huntington Ingalls Industries announced that the Pascagoula Metal Trades Council (PMTC) and local chapters of the International Brotherhood of Electrical Workers (IBEW), United Federation of Special Police and Security Officers (UFSPSO) and Office and Professional Employees International Union (OPEIU) approved an extension of the collective bargaining agreement with the company's Ingalls Shipbuilding division. An agreement with the International Association of Machinists (IAM) independent 29 and 33 machinists was not reached, but the union has asked for continued discussion.

Department of Transportation releases port planning and investment toolkit
The U.S. Department of Transportation's Maritime Administration (MARAD) released the first module of the Port Planning and Investment Toolkit, a manual designed to aid U.S. port authorities with planning and funding for crucial port infrastructure improvements. Titled Funding Strategy Guide, this module provides guidelines, analytic tools, and resources to help port authorities develop comprehensive business plans and the financial structures needed to implement them. The release of this product supports the Build America Investment Initiative, which aims to expand public-private collaboration on infrastructure development and financing in the U.S. Funded with $400,000 from MARAD, the toolkit was created by a joint effort between the agency, the American Association of Port Authorities (AAPA), and a wide range of experienced port stakeholders. It features a range of finance options, including economic blueprints that have supported billion dollar domestic port and multimodal transportation projects.

Maritime Administration announces extension of the Voluntary Intermodal Sealift Agreement (VISA)
The Maritime Administration (MARAD) has announced the extension of the Voluntary Intermodal Sealift Agreement (VISA) program until 1 October 2019. The VISA program creates a partnership between the U.S. government and the maritime industry to provide commercial sealift and intermodal shipping services and systems necessary to meet military mobilization requirements. Through the VISA program, transportation solutions are developed in peacetime to anticipate Department of Defense requirements. More than 90% of the U.S. flag fleet vessels that the military can use to carry supplies are committed to the VISA program.

Ceona christens flagship Ceona Amazon vessel

Ceona has bolstered its pioneering fleet of next generation vessels with the christening of its flagship asset, the Ceona Amazon, which has been delivered in less than 2 years of the letter of intent (LOI) for its construction being signed.

The game-changing Ceona Amazon has been internally designed at Ceona and purpose built to perform in multiple pipelay and operational modes. She also features a large storage capacity and heavy subsea construction capability with her versatility setting her apart as a deepwater field development asset.

Shipbuilding specialist Lloyd Werft successfully delivered the Ceona Amazon on schedule in Bremerhaven where the vessel was officially christened by her Godmother, Mrs. Cynthia Huber from Houston, Texas.

Lloyd Werft delivered the Ceona Amazon within time and budget, and the vessel has also successfully undergone sea trials ahead of schedule.

Following her christening, the Ceona Amazon will transfer to Huisman yard in Schiedam, The Netherlands, where she will ultimately be equipped with a 570 tonne multi-lay pipe tower and two heavy duty 400 tonne offshore cranes–all of which have already been built by Huisman, a global leader in lifting, drilling and subsea solutions, and are ready to be installed.

The innovative G-lay pipelay system, developed and patented by Ceona, features an inclinable lay spread with a top tension of 570 tonnes and a rigid firing line system. It combines the offshore assembly of rigid pipe joints along a traditional firing line, then plastic bending of the pipe through a route similar to that of a reel-lay vessel, completed by a vertical exit through the moonpool (J-lay).

With capacity to carry 8,500 tonnes of pipe, the Ceona Amazon will be able to lay rigid and flexible pipelines and umbilicals, and install heavy subsea structures or floaters (TLP, semi or FPSO) using its two 400-tonne subsea cranes working in tandem.

The Ceona Amazon is 199.4 m long and 32.2 m wide, drawing 8.0 m with a gross tonnage of 33,000. She is due to enter service early 2015.

Carnival Corp. and Fincantieri sign MOU to support cruise industry growth in China

Carnival Corporation & plc, the world's largest cruise company, announced it has signed a memorandum of understanding (MOU) with Fincantieri S.p.A., the world's largest cruise ship building company, to explore the possibility of a shipbuilding joint venture aimed at accelerating development and growth of the cruise industry in China.

The MOU between Carnival Corporation and Italy-based

Fincantieri outlines the framework for evaluating and exploring a potential shipbuilding joint venture for constructing cruise ships for the Chinese market.

The signed MOU with Fincantieri follows the news that Carnival Corporation and the China State Shipbuilding Corporation (CSSC), China's largest shipyard, had signed an MOU in mid-October to work together on a potential collaborative joint venture focused in shipbuilding in China.

Both MOUs involving Carnival Corporation include the possibility of forming a shipbuilding joint venture that could become a three-way arrangement involving Carnival Corporation, Fincantieri and CSSC. In concept, the potential shipbuilding joint venture would be the first three-nation collaborative effort to build the first-ever, world-class cruise ships constructed in China.

As part of the possible joint venture, Carnival Corporation would work closely with CSSC and Fincantieri to provide its ship design and shipbuilding expertise to create the vision, definition and overall specifications for the China-built cruise ship for the Chinese market. Fincantieri and CSSC would work closely together in the proposed venture on shipbuilding production capacity in China. Based on Fincantieri's broad experience as the largest shipbuilder in the world, the company would provide specialist services to help augment CSSC's world-class shipyards that have a strong track record of delivering quality industrial vessels.

The Chinese Ministry of Transport (MOT) projects China to be the second largest global cruise market after the U.S. in the next several years based on economic growth, increased spending power of Chinese consumers and growing demand for cruise vacations. China could see 4.5 million cruise passengers by 2020, according to the MOT, and is expected to eventually become the world's largest cruise market. Potential partnerships like the ones being explored between Carnival, Fincantieri and CSSC are aimed at supporting the MOT's pro-growth cruise policies and the rise of overall tourism in China.

New data communications module for Rockfleet vessel tracking system

Rock Seven, the established manufacturer of Iridium-based satellite tracking & communication systems and airtime provider, has introduced a new Machine-to-Machine (M2M) data communication module for its RockFLEET vessel tracking system. The module adds new possibilities for improving vessel operations through the use of data to reduce fuel consumption or enhance equipment maintenance processes.

Based on Rock Seven's established RockBLOCK platform, the optional M2M module enables on board equipment to be interfaced with RockFLEET, allowing two-way data transfer between vessel and shore. It can be used for low-cost delivery of data such as vessel telemetry or condition monitoring, or for more intelligent operations such as initiating automatic alerts based on environmental conditions.

With no annual contract and Pay As You Go use, RockFLEET is designed to simplify and reduce the cost of single vessel and entire fleet tracking, support-

ing ship-owners to increase safety and efficiency through improved fleet management. It provides pole-to-pole global position data using the Iridium Short Data Burst' (SBD) capability.

The new RockFLEET M2M data module is a low-cost point of purchase option and is installed at the factory, without changing the size or shape of the compact (13 cm diameter / 4 cm high) RockFLEET unit. Integration with on-board equipment is available using a variety of serial protocols, while RockFLEET's open API ensures data in any format can easily be delivered to the users own applications.

For more information, visit www.rock7.com.

Technip introduces the Deep Explorer diving support vessel

Technip has unveiled the name for its latest newbuild Diving Support Vessel (DSV), currently being built by Vard. The state-of-the-art vessel will be known as the 'Deep Explorer.'

The high-specification vessel will be equipped with the latest technology in terms of navigation (Dynamic Positioning class 3) and will feature a 24-man saturated dive system. With her large deck area, working moonpool, work-class ROVs and a 400Te offshore crane, she will also be able to deliver diverless construction activities.

Following the detailed engineering and design phase, construction of the ship's hull commenced at Vard Tulcea in Romania a few months ago. On completion of the hull, the vessel will be towed to Vard Langsten in Norway for final equipment outfitting and commissioning. She is scheduled to join the Technip fleet in 2016.

Purpose-designed for the demanding requirements of the North Sea and Canadian markets, the Deep Explorer will be capable of working in extreme weather conditions. Her potential area of operations remains global.

For more information, visit www.technip.com.

Oman Shipping Company takes delivery of Adam LNG

Oman Shipping Company (OSC) has taken delivery of one of the world's most advanced fuel efficient LNG carriers – the Adam LNG.

The 162,000 cu. m capacity vessel was built by Hyundai Heavy Industries (HHI) in Ulsan South Korea. It will operate worldwide with 25 crew including four Omani cadets.

OSC Acting Chief Executive Officer, Tarik Al Junaidi said the Adam LNG is a powerful demonstration of the Muscat-based company's"'driving commitment to constant innovation" in its fleet which now numbers 43 vessels and is one of the biggest in the Gulf (see factfile). He said the Adam LNG will be offered on the open market to oil and gas companies worldwide.

"This state-of-the-art LNGC offers considerable benefits to customers," he said. "Its innovations mean it is exceptionally fuel efficient, cost effective and environmentally friendly. We have listened to industry and we understand this is what customers want. Our core activity is oil and gas transportation.

For more information, visit www.omanship.co.om.

Imtech Marine equips first LNG-hybrid barge

Imtech Marine equipped the first LNG-hybrid barge with its latest green technology by order of Becker Marine Systems in Hamburg to supply the AIDA cruise fleet with energy. The LNG-hybrid barge is fitted with Imtech Marine's electrical solutions and fire extinguishing equipment. In addition, Imtech Marine installed the complete ventilation systems with corresponding heat recovery and sea water cooling systems, supporting the hybrid barge's green approach by saving energy through reduced heating and cooling requirements.

The regulations regarding a ship's emissions are becoming stricter. From 2015, new exhaust gas emission requirements (e.g., Sulphur Emission Control Area (SECA)) will come into effect. To meet regulations and the increasing environmental awareness of the shipping companies, new environmentally friendly platforms, like the LNG-hybrid barge, are being developed.

In 2015, the first LNG-hybrid barge will serve the AIDA cruise fleet at the port of Hamburg, reducing the cruise ship's sulphur oxide, nitrogen oxide, carbon dioxide and particle emissions. During the summer season, the hybrid barge will provide electrical energy for the AIDA and other cruise ships. In winter, during the cruise off-season, the LNG-hybrid barge will provide both electrical energy and heat for the public grid.

For more information, visit www.imtech.com/EN/Marine.

GE Transportation delivers first EPA Tier 4 emissions-compliant marine diesel engines

GE Transportation announced the first delivery of its latest marine diesel engines to GE Marine distributor Cummins Mid-South. The new engines meet EPA Tier 4 and IMO Tier III Emissions standards (ABS Certification and Green Passport) – reducing NOx emissions by 70% when compared to EPA Tier 2 or IMO Tier II.

Cummins is integrating the five 12V250 engines into gensets designed to power Oceaneering's new vessel, MSV Ocean Evolution, which is expected to launch in early 2016.

GE Marine's breakthrough engine technology eliminates the need for a Selective Catalytic Reduction system (SCR) for exhaust gas after-treatment and for storing or using urea aboard a vessel. The result preserves valuable cargo and tank space.

A study to be published in early 2015 commissioned by GE Marine from Jensen Maritime compared GE Marine's in-engine Tier 4 solution to a competitor's solution requiring urea after-treatment on a typical line-haul tug. GE Marine provides a significantly less complex solution with no additional onboard equipment or storage for urea as well as no dockside support infrastructure for urea storage and processing. GE Marine's engine takes up about only 25% of the engine room space required by the competitive solution and GE Marine's engine weighs about only 25% of the competitor's solution.

For more information, visit www.getransportation.com.

Keel laying for Maersk Supply Service subsea support vessel

Maersk Supply Service, DeepOcean UK and Damen have held the keel laying ceremony of Maersk Supply Service's new subsea support vessel at Damen Shipyards Galati (Romenia).

A key milestone was achieved in the progress of the new-building project, when the formal keel laying ceremony took place at Damen Shipyards Galati. In keeping with shipbuilding tradition, a commemorative plaque incorporating 3 special coins was welded to a corridor section of building block number 116.

The ceremony was attended by the shipyard workforce attached to the project, alongside representatives from Damen, Maersk, DeepOcean and Lloyd's Register, who certified the milestone achievement.

Carsten Plougmann Andersen, CEO of Maersk Supply Service, said: "Keel laying of this vessel is the very physical evidence of Maersk Supply Service strengthening our position in the Sub Sea Support vessel market. We are looking very much forward to continuing the good cooperation with all involved parties to achieve delivery in February 2016."

"This next generation cable lay vessel in combination with our survey and trenching capabilities will enable us to bundle our services for customers in the offshore power cable and umbilical markets. The versatile new vessel will be well suited for installation and burial projects using its 7,000 tonne carousel from land-fall to deepwater and also in remote geographical locations. The vessel is designed to meet the high standards demanded by North Sea Oil and Gas customers. We are delighted to be working with Maersk Supply Service and Damen to bring this high capability vessel to the market," Tony Inglis, DeepOcean UK managing director ends.

For more information, visit www.damen.com.

ABS releases guide for LNG fuel ready vessels

ABS, a leading provider of classification and technical services to the global marine industry, has published the ABS Guide for LNG Fuel Ready Vessels to support members and clients in preparing newbuildings for future conversion to gas propulsion.

The Guide formalizes the process for clients who wish to plan for conversion to LNG fuel at a future date by providing a detailed review and approval and an associated class notation.

"ABS is a leader in LNG as fuel, with a number of newbuilding and conversion projects in progress, and there is strong interest in preparing for a future in which LNG takes a bigger role," says ABS chairman and CEO Christopher J. Wiernicki. "The Guide for LNG Fuel Ready Vessels draws on our practical experience by providing a detailed approval process and a notation that clarifies the extent to which a vessel is LNG Fuel Ready."

The Guide includes a basic level of Concept Design Approval, with a design review for approval in principle (AIP), and two optional levels for general design approval and installed equipment, which constitute a complete review and survey of the system to be installed on the ship.

The first optional level is a General Design Review that allows an owner to approach a shipyard with a reviewed design package for the gas-fueled system at the time of conversion.

The second optional level is Detail Design Approval and Installation which constitutes a complete design review and survey of a system that will be installed on the LNG ready ship in accordance with the ABS Guide for Propulsion and Auxiliary Systems for Gas Fueled Ships.

The first level provides an AIP and a descriptive note in the ABS Record, the second level a Statement of Compliance with a descriptive note listing the parts of the system that have been reviewed. The third level results in an LNG Fuel Ready class notation for the parts of the system that have been installed, confirming that the fuel system is in full compliance with the ABS Guide to Gas Fueled Ships at the time of the newbuilding contract.

For more information, visit www.eagle.org.

Bioluminescence to assess fish stocks
Research by the National Oceanography Centre (NOC) explores a promising new method of forecasting bioluminescence, which may improve the monitoring of movements in the ocean, such as fish shoals and internal waves. As fish move through the sea they churn the water around them. This movement disturbs the bioluminescent organisms, triggering a chemical reaction that emits a flash of light. The combined flashes of hundreds of thousands of organisms give the impression of a constant glow of blue light, which Aristotle termed 'flaming seas' around 410 BC. This research, conducted by Dr.Charlotte Marcinko of the NOC, is the first time that anyone has examined how bioluminescence could be predicted by modelling the bioluminescent organisms themselves. Previously scientists have used relationships between bioluminescence and other biochemical environmental variables to try and predict when and how much bioluminescence there would be in a given area. The study by Dr. Charlotte Marcinko, published in the Journal of Marine Systems, uses a simple ecological model to simulate seasonal changes in the abundance of a particular type of bioluminescent organisms called dinoflagellates. Charlotte explains why she embarked on this research. "I once went on a cruise and saw bioluminescence lighting up the boats wake…I just looked at it and I couldn't help but wonder what caused it. A lot of people say it is mystical, I can see why they think that….people also think it's rare, it actually isn't. It happens nearly everywhere in the ocean." It is not yet known why dinoflagellates emit light. One key theory is that the flash of light is intended to startle predators. The other is the "burglar alarm" hypothesis, in which the light is intended to alert larger predators to the presence of the one threatening the bioluminescent organisms themselves, thereby using the larger predictors as "body guards." This research was funded by NERC as part of the LAMP project at the National Oceanography Centre.

Scientists urge protection of world's deltas
Extensive areas of the world's deltas — which accommodate major cities such as Shanghai, Dhaka and Bangkok — will be drowned in the next century by rising sea levels, according to a comment piece in Nature. In the article, Dr. Liviu Giosan, a geologist with the Woods Hole Oceanographic Institution (WHOI), and colleagues call for maintenance efforts to be started now to avert the loss of vast expanses of coastline, and the consequent losses of ecological services, economic and social crises, and large-scale migrations. The authors state the problems start upstream; deltas are built from sediments deposited at the mouths of rivers, but dams and river engineering have lowered rates of sediment flow. The Nile and the Indus, for example, carry 98% and 94% less mud respectively than they did 100 years ago. At the coast, rising seas resulting from warmer global temperatures are eroding delta plains, increasing the chance of flooding. Coastal lands lower than a meter in elevation will be inundated within a century. Lack of quantitative knowledge of basic delta processes is hindering efforts to develop maintenance strategies for deltas, the authors say. At the same time, the role of healthy marshes in coastal processes needs to be more fully understood. Giosan and colleagues call for river sediment flows to be restored, and natural land-building methods to be exploited in delta plains under worldwide monitoring programs coordinated and guided by United Nations committee of experts.

Underwater robot sheds new light on Antarctic sea ice

SeaBED vehicle (Photo: P. Kimball/ WHOI).

The first detailed, high-resolution 3-D maps of Antarctic sea ice have been developed using an underwater robot. Scientists from the UK, U.S. and Australia say the new technology provides accurate ice thickness measurements from areas that were previously too difficult to access.

The results, published in the journal Nature Geoscience, step up the pace of research in the polar regions aimed at understanding the dramatic sea ice changes in the context of climate change.

Scientists use a range of technologies and techniques to measure sea ice thickness. Satellite observations can measure large-scale thickness from space, but interpreting the data accurately can be difficult due to snow cover on the ice. Measurements made on the sea ice by drilling holes, together with visual observations from ships, are critical for building a more complete picture, but difficulties in getting access to thicker areas of sea ice leaves gaps in the data. Now, with the AUV known as SeaBED, scientists have an invaluable new tool to fill this gap.

While most oceanographic survey instruments look down at the seafloor, SeaBED was fitted with an upward-looking sonar in order to measure and map the underside of sea ice floes. The AUV operated at a depth of 20 to 30 m and was driven in a lawnmower pattern. These lines of data were merged to form high-resolution 3D bathymetric surveys of the underside of the ice.

The yellow SeaBED robot, which is approximately 2 m long and weighs nearly 200 kg, has a twin-hull design that gives the robot enhanced stability for low-speed photographic surveys.

The data from SeaBED, combined with airborne measurements of sea-ice surface elevation, ice coring surveys, and satellite observations, vastly improves scientists' estimates of ice thickness and total sea ice volume.

The team deployed AUVs as part of two Antarctic cruises (IceBell and SIPEX-2) in 2010 and 2012 in the austral spring. First on the British Antarctic Survey's RRS James Clark Ross and the second on the Australian icebreaker the RSV Aurora Australis. Three locations around the Antarctic Peninsula were mapped–the Weddell, Bellingshausen and Wilkes Land sectors covering an area of 500,000 sq. m.

The next steps are for the scientists to do large-scale surveys that can be compared to large-scale observations from aircraft and satellites.

For more information, visit http://www.antarctica.ac.uk.

CSA successfully relocates south Florida corals

CSA Ocean Sciences Inc. (CSA) is currently monitoring the health of 149 corals successfully relocated in association with a submarine fiber optic cable system laid offshore Hollywood, Florida in the fall of 2013. The cable system traverses nearly 17,500 km of seafloor and now connects Florida to South America, the Caribbean, and Central America. CSA provided comprehensive consulting services for the initial acquisition of the cable's permits and also served as the permitting agent to ensure compliance regarding pre-installation, post-installation, mitigation, and monitoring.

At the onset of the project, CSA worked closely with county, state, and federal agencies and the client to facilitate positive pre-application communication and to simplify and streamline the complicated Florida multi-agency permitting process. Creative routing suggestions through reef gaps and cable landing alternatives eliminating beach construction were included in the cable project design to minimize regulatory challenges and environmental impacts.

Through the use of benthic video surveys and existing spatial data, CSA mapped the cable route of least impact through the environmentally sensitive reef system populated with listed endangered coral species, such as the staghorn coral (*Acropora cervicornis*) and elliptical star coral (*Dichocoenia stokesii*). Using underwater navigation systems, CSA divers carefully delineated the cable route through the reef, relocating listed corals from the planned cable pathway. After cable deployment, CSA divers relocated and re-attached additional benthic organisms dislodged during the cable installation.

As a part of mitigation efforts for the cable installation, CSA also removed and disposed of more than 400 tires from Osborne Reef, a well-meaning but unsuccessful artificial reef created from the placement of over 1 million tires in the 1970s. Unfortunately, over time, the tire bundles broke apart and drifted onto adjacent natural reefs damaging them in the process. The tires removed for mitigation were those closest to the natural reef edge with the highest mobility and greatest potential for crushing and covering the natural reef.

For more information, visit www.csaocean.com.

Hawaii poised to develop new research reserve on Oahu

NOAA accepted the State of Hawaii's nomination of the Heeia Estuary for possible inclusion in the National Estuarine Research Reserve System. The state nomination package submitted by the Governor of Hawaii was reviewed and found to meet all NOAA requirements for this phase of the designation process.

The Heeia Estuary is located in Kaneohe Bay on the northeastern, or windward, shore of the island of Oahu. The estuary includes many unique natural and cultural resources that, if designated, will be preserved for current and future generations to enjoy. The site also would become an area for local ecosystem-based research, providing data and information for local governments, community leaders, national leaders, school children, and interested residents, turning all into better stewards of coastal resources.

Designation of the site could be realized by 2016. NOAA will continue its efforts in collaboration with the Reserve in Hawaii.

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

Warmer Pacific could release millions of tons of methane

Off the West Coast of the United States, methane gas is trapped in frozen layers below the seafloor. New research from the University of Washington shows that water at intermediate depths is warming enough to cause these carbon deposits to melt, releasing methane into the sediments and surrounding water.

Researchers found that water off the coast of Washington is gradually warming at a depth of 500 m, about a third of a mile down. That is the same depth where methane transforms from a solid to a gas. The research suggests that ocean warming could be triggering the release of a powerful greenhouse gas.

While scientists believe that global warming will release methane from gas hydrates worldwide, most of the current focus has been on deposits in the Arctic. The research estimates that from 1970 to 2013, some 4 million metric tons of methane has been released from hydrate decomposition off Washington. That's an amount each year equal to the methane from natural gas released in the 2010 Deepwater Horizon blowout off the coast of Louisiana and 500 times the rate at which methane is naturally released from the seafloor.

Co-author Una Miller, a UW oceanography undergraduate, first collected thousands of historic temperature measurements in a region off the Washington coast as part of a separate research project in the lab of co-author Paul Johnson, a UW professor of oceanography. The data revealed the unexpected sub-surface ocean warming signal.

"Even though the data was raw and pretty messy, we could see a trend," Miller said. "It just popped out."

The four decades of data show deeper water has, perhaps surprisingly, been warming the most due to climate change.

For more information, visit http://www.washington.edu.

Robert Cannata / UW

Baby reef-builders cope with acidifying oceans

While the threat of coral bleaching as a result of climate change poses a serious risk to the future of coral reefs world wide, new research has found that some baby corals may be able to cope with the negative effects of ocean acidification.

Ocean acidification, which is a direct consequence of increased atmospheric carbon dioxide levels, is expected to have a deleterious effect on many marine species over the next century.

An international team examining the impact of ocean acidification on coral has found that a key reef-building coral can, over a relatively short period of time, acclimate to a doubling of atmospheric carbon dioxide levels.

"Our aim was to explore the effect of a more acidic ocean on every gene in the coral genome," says study lead author Dr. Aurelie Moya, a molecular ecologist with the ARC Centre of Excellence for Coral Reef Studies at James Cook University.

The researchers exposed baby corals from the Great Barrier Reef to acidified seawater for varying lengths of time and investigated how they responded at a molecular level.

"We found that, whereas 3 days of exposure to high CO_2 disrupts formation of the coral skeleton, within 9 days the baby corals had re-adjusted their gene expression to pre-exposure levels. Longer exposure seems to be less detrimental to coral health than we had assumed based on shorter-term studies," Dr. Aurelie Moya says.

"These findings suggest that baby corals have the capacity to acclimate to elevated carbon dioxide."

"We saw that within a few days juvenile coral adapted to CO_2 levels double those experienced today with no obvious disruption to its life processes," says study co-author, Professor David Miller, who leads the molecular biology group in the Coral CoE.

Professor Miller says the findings are particularly significant as they centred on staghorn coral.

"Staghorn corals are the key reef-building corals throughout the Pacific and Indian oceans. These are traditionally considered to have poor stress tolerance. So this work provides a glimmer of hope that coral reefs can attenuate the effects of ocean acidification."

The research team examined tens of thousands of coral genes and was able to identify those responsible for enabling acclimation to high carbon dioxide.

Dr. Moya says the study is an essential first step to better understand how reef-building corals adapt to environmental stress.

However both Dr. Moya and Professor Miller remain cautious about the ability of corals to tolerate the combination of increased carbon dioxide and climate change.

"This study focused on one single stressor, ocean acidification, but we must keep in mind that the combination of several stressors, such as ocean acidification and warming could lead to larger impacts on baby corals," Dr. Moya says.

"The next step is to investigate the effect of combined stressors on corals' gene expression."

For more information, visit www.coralcoe.org.au.

Ancient creature discovered in the depths of the Arctic Ocean

In the depths of the Arctic Ocean, buried deep in the sediment, an ancient creature waited for over a million years to be discovered. Paul Valentich-Scott, from the Santa Barbara Museum of Natural History (California), and three scientists from the U.S. Geological Survey (USGS, Menlo Park, California), Charles L. Powell, Brian D. Edwards, and Thomas D. Lorenson, were up to the challenge. Each with different expertise, they were able to collect, analyze, and identify a new genus and new species of bivalve mollusk.

The path to discovery is seldom simple or easy. This discovery is no exception. Brian Edwards was the chief scientist on a joint U.S.-Canadian ice breaker expedition aboard the U.S. Coast Guard Cutter Healy in the summer of 2010. The primary purpose of the expedition was to map the Arctic seafloor and the sediments beneath. Dr. Edwards took deep sediment core samples to further understand the geology of the region including the unusual seafloor mound where these samples were collected. In several of these cores he uncovered bivalve seashells buried nearly 15 ft (4.5 m) below the seafloor surface.

Upon returning to his USGS laboratory in Menlo Park, California, Brian worked with Tom Lorenson on sampling the cores and extracting the shells. The recovered shells were then taken to USGS paleontologist Chuck Powell, for identification. While Chuck was able to ascertain the higher level classification of the clam shells (Family *Thyasiridae*), he was unable to determine the genus or species. Chuck contacted Paul Valentich-Scott, a clam specialist from the Santa Barbara Museum of Natural History in California.

When examining these ancient shell specimens, Paul was fairly certain that they were new to science. The hunt to validate the potential new species was on.

Paul contacted a number of thyasirid bivalve specialists around the world and all gave it a thumbs up as a new species. Further, several scientists felt it also might be a new genus (the level above species).

Then the painstaking work began. Paul contacted museums around the globe and requested to borrow specimens that were potentially related to the new species. While he found many species that shared some characteristics, none matched the new Arctic specimens.

While many of the specimens collected were definitely fossils, the scientists can't discount the new animal might still be alive today. One of the team members, Tom Lorenson, summarized it this way, "The likely collection of living specimens of this species awaits expeditions to come." Who knows what other new creatures might be found in those expeditions?

For more information, visit www.pensoft.net.

New model helps boost fishery profits, sustainability

By identifying the most efficient fishing practices and behaviors, a new model developed by economists at Duke University and the University of Connecticut could help fishermen land larger paychecks while reducing the risk of fishery depletion.

"We're not talking about a trivial improvement. In some cases, we found that identifying the most efficient practices led to a 20% annual increase in total revenues if the fishery is managed differently," said Martin D. Smith, professor of environmental economics at Duke's Nicholas School of the Environment. "Under perfect conditions, you could see up to a 49% increase in profits on average," he said.

The empirical bioeconomic model developed by Smith and Ling Huang, assistant professor of economics at the University of Connecticut, is the first of its kind. It was created using 6 years of previously unavailable fine-scale fishing data from the North Carolina shrimp fishery, provided to the researchers by the North Carolina Division of Marine Fisheries.

"Every single vessel that went out was tracked–what it caught, when it fished, what price it sold its catch for, and what equipment was used," Smith said. "We also tracked daily weather conditions, fuel prices, fishery closures and other external factors that affect fishermen's decisions of whether to fish or not."

Smith and Huang analyzed the flood of data using recently developed econometric modeling techniques to identify which individual fishing practices and decisions led to profitable and sustainable catches and which led to low returns and overexploitation.

Smith and Huang's study focused primarily on the open-access North Carolina shrimp fishery, but insights from it could help improve how other fisheries are managed as well.

"We're leaving substantial profits on the table due to the way we're managing many fisheries," Smith said. "The standard one-size-fits-all management approach of allocating sustainable catch limits to individual fishermen on an annual basis is not universally efficient. In some cases, it's actually counterproductive because it forces fishermen into a 'race to fish' early in the season that leads to falling profits, overexploitation and, eventually, tragedy of the commons."

For more information, visit http://today.duke.edu

ABS group evaluating best practices for offshore wind farm inspections
The U.S. government recently contracted ABS Group to assist in developing inspection procedures that will ensure safe and efficient operation of these facilities. ABS Group was contracted by the Department of Interior's Bureau of Safety and Environmental Enforcement (BSEE) to support the development of inspection procedures for offshore wind farms. The project will include a review of the domestic and international offshore wind farm inspection regulations, standards, and best practices for the inspection of the assets. Based on this review, ABS Group will develop recommendations for the types of inspections that should be conducted, the inspection procedures that should be followed, and the components that should be included in the inspections. In addition, ABS Group will identify training that should be delivered to inspectors, with particular consideration given to basic safety training.

BOEM achieves milestone for Virginia Offshore Wind Research Project
The Bureau of Ocean Energy Management (BOEM) announced the publication of its environmental assessment (EA) of proposed wind energy-related research activities offshore Virginia. The Virginia Department of Mines, Minerals and Energy (DMME) has submitted a research activities plan that describes the proposed construction, operation, maintenance, and eventual decommissioning of the Virginia Offshore Wind Technology Advancement Project (VOWTAP). DMME's proposed project would consist of the installation and operation of two 6-MW wind turbine generators and cable to shore. The proposed project would be located 24 nmi off the coast of Virginia Beach adjacent to the Virginia commercial lease area. BOEM's EA considers reasonably foreseeable environmental and socioeconomic consequences associated with the approval of the offshore wind research activities.

Interior to auction more than 742,000 acres offshore Massachusetts for wind energy development
Secretary of the Interior Sally Jewell, Massachusetts Governor Deval Patrick and BOEM acting director Walter Cruickshank announced that more than 742,000 acres offshore Massachusetts will be offered for commercial wind energy development in a January 29, 2015, competitive lease sale. According to an analysis prepared by the U.S. Department of Energy's National Renewable Energy Laboratory, if fully developed, the area being offered could support between 4 and 5 GW of commercial wind generation, enough electricity to power over 1.4 million homes. Twelve companies have qualified to participate in the auction for the Massachusetts Wind Energy Area. The announcement builds on Interior's work to stand up a sustainable offshore wind program through BOEM's renewable energy program. To date, BOEM has awarded seven commercial wind energy leases off the Atlantic coast: two noncompetitive leases (Cape Wind in Nantucket Sound off Massachusetts and an area off Delaware) and five competitive leases (two offshore Massachusetts-Rhode Island, two offshore Maryland and another offshore Virginia). Competitive lease sales have generated more than $14 million in high bids for more than 357,500 acres in federal waters. BOEM is expected to hold another competitive offshore wind auction offshore New Jersey in 2015.

Siemens to sell tidal business
Siemens has announced its intention to sell Marine Current Turbines (MCT), the tidal energy firm it bought in 2012. Siemens stated that the decision was based on the slow pace of development in the industry. The German firm said a strategic review had concluded that it should divest its ocean power generation business, in particular MCT, in a move that would affect 45 employees in the Hydro & Ocean unit in the company's Wind Power & Renewables division. The divestment is expected to take several months. Siemens said it would prioritize redeployment of employees within the company if a buyer is not found.

Sustainable Marine Energy completes first sea trials

Sustainable Marine Energy (SME) has successfully completed its first round of sea trials with its tidal energy platform, PLAT-O.

The tidal energy industry has struggled with high costs for installation and maintenance, but SME is demonstrating that, by using its innovative platform that is moored under the surface of the water, these costs can be significantly reduced.

PLAT-O was launched from the company's facility in Venture Quays, East Cowes, Isle of Wight and towed to the test site at Yarmouth. Once at the site PLAT-O was submerged to installation depth and a series of tests were run. PLAT-O was then successfully resurfaced and towed back to East Cowes, where it will be prepared for its next series of trials.

The marine operations were run using small vessels, demonstrating that a step change reduction in the cost of installing tidal energy devices can be achieved. The results of the sea trials provide increasing confidence in the potential for tidal streams to provide a commercially viable source of renewable energy.

Jason Hayman, Managing Director of SME, says, "We have reached a huge milestone in the development of our solution to address the costs associated with delivering tidal energy. Over a short period of time we have achieved a great deal thanks to our capable and passionate team. After this operation I am confident that PLAT-O provides the industry with a new approach which reduces the costs and risks associated with delivering tidal energy considerably. Over the next few months, we will be ramping up the time that PLAT-O spends at site and running a series of tests which will culminate in the installation of PLAT-O at a more aggressive tidal site and generating power to the grid."

For more information, visit www.sustainablemarine.com.

Pelamis Wave Power Ltd. to be put into administration

The directors of Pelamis regret to announce that they have been unable to secure the additional funding required for further development of the company's market leading wave energy technology. As a result, the board has reluctantly moved to appoint an administrator to assess the options for securing the future for the business and employees of Pelamis.

Pelamis is the world's most advanced wave energy technology and company. It recently received a strong endorsement of this leading position from independent consultants following a series of due diligence exercises. This work

included detailed assessments of the onward commercial viability of the technology and designs. The combination of over 350 man-years of experience in the team, some 15,000 hours of real grid connected test data and intensive parallel R&D work gives Pelamis a unique platform from which to develop and demonstrate the viability of its technology for commercial deployment at scale.

The directors and employees of Pelamis are dedicated to the success of this revolutionary technology and are committed to working with the administrator when appointed, the Scottish and UK Governments and any future partners to ensure its success.

For more information, visit www.pelamiswave.com.

Aquamarine Power announces plans to downsize business

Wave energy company Aquamarine Power has announced plans to downsize its business. Commenting on the news, Aquamarine Power chief executive officer John Malcolm said, "Following a strategic review the Board of Aquamarine Power has decided to significantly downsize the business."

"This will involve retaining a core operational and management team to run the business and continue maintaining our Oyster 800 wave machine at the European Marine Energy Centre in Orkney."

"We have entered into a consultation process with all of our employees on how we will take forward the restructuring and redundancy program. This is obviously taking place at a difficult time of year and we will be working very closely with every employee to achieve the best outcome for all. None of this is a reflection on the extraordinary dedication and hard work of every single member of the Aquamarine Power team; rather it is a consequence of the considerable financial, regulatory and technical challenges faced by the ocean energy sector as a whole."

"In a relatively short number of years our business has significantly advanced the goal of generating electricity from waves and this has relied wholly upon the bright ideas, innovation and talent of the people who work here. We remain confident that Oyster technology offers the best route to a commercial near shore wave energy machine."

For more information, visit www.aquamarinepower.com.

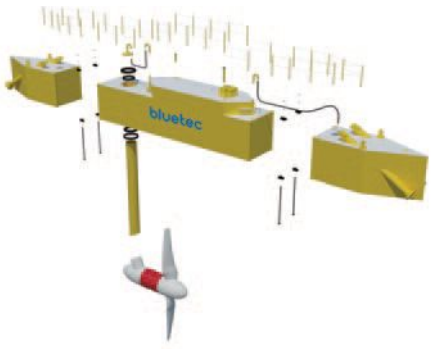
Partners sign agreement to install a floating tidal energy platform near Texel

A group of leading offshore companies including Bluewater, Damen and Van Oord have joined to realize a unique floating tidal energy platform that will be moored near Texel in the Waddenzee and generate clean electricity from the tides. The platform is a trial for remote locations worldwide, such as islands in Indonesia, Philippines or the Pacific. It is of an innovative modular design and uses a new type of permanent mooring lines. It will be the first time that a floating tidal platform is used for electricity production into the Dutch grid. It will be operational in the first half of 2015.

The unique cooperation between Bluewater, Damen, Van Oord, Tocardo, TKF, Vryhof, NIOZ, Nylacast and TTC bundles extensive experience in the maritime and offshore industry, in the field of design and operation of mooring platforms, shipbuilding, offshore dredging and installation, tidal turbines, power cables, anchors, research at sea, and synthetic materials.

The BlueTEC platform is developed for cost effective installation, operations & maintenance of tidal turbines. BlueTEC floats and can be towed to location without heavy lifting at sea. It accommodates all vulnerable electronics equipment inside the unit, where it is dry and protected, yet allowing for easy access for inspection, maintenance and repair. The platform can be disconnected from the moored location and taken to a local port for heavy repair when needed. With this modular, flexible floating platform the global tidal energy industry reached a new state of the art.

The Texel platform is the small, simple and robust version of BlueTEC. Aimed at remote locations, it consists of container size modules, can be assembled locally and installed without sophisticated equipment. It holds a 200 KW turbine that can power local villages, cooling facilities and provide lighting at schools, which will change local economies. It will be the first time that electricity generated from free flowing tidal currents will be supplied to the island of Texel.



For more information, visit www.damen.com.

Open Ocean and Aquatera join forces in the French marine energy market

French company, Open Ocean SAS and Orkney-based Aquatera Ltd. have committed to working together to support the acceleration of marine renewable energy developments in France. Jérôme Cuny (CEO, Open Ocean) and Gareth Davies (MD, Aquatera) signed a Memorandum of Understanding at the recent International Conference on Ocean Energy (ICOE) in Halifax, Nova Scotia. This strong alliance provides a robust offer to the French market with a package of quality services, high level expertise and a proven track record in marine energy project development and consultation.

The MoU will facilitate further cooperation in the field of marine renewable energy as the two companies will combine complementary strengths in resource and environmental assessment, but also in program development and planning.

For more information, visit www.openocean.fr.

Scottish Government funds innovative tidal turbine

Renewable Devices Marine Ltd has secured a private funding package, as well as securing £100,000 worth of innovation funding from the Scottish Government, toward the development of the Capricorn Marine Turbine.

The UK Government's technology Strategy Board has made the reduction of manufacture, installation and operation costs of the next generation of tidal device a priority, with an emphasis on reducing the environmental impact, reducing cost of manufacture, and increasing the lifespan of tidal stream generation.

The Capricorn Marine Turbine generates electricity from the high efficiency extraction of energy from tidal marine flows. The current variant–Capricorn 125–generates 1.25 MW of clean energy. The turbine has a horizontal axis, contra-rotating, twin rotor architecture. Each rotor has three blades, designed to be bi-directional in operation, thus negating the need for a yaw mechanism. The Bk97 buoyancy

control system allows for extremely simple and low cost deployment. Accurate and reliable buoyancy control allows the turbine to be floated out to its deployment site, while providing a controllable means of sinking the turbine onto its foundations and raising it for maintenance, with minimal sub-sea intervention from divers or underwater vehicles.

Much of the cost of deployment and maintenance of tidal stream turbines concerns the lifting and retrieval of the units. The Bk97 buoyancy system allows the Capricorn Turbine to be towed to site as a barge and then sunk and lifted using small and medium-sized vessels. This reduces the cost of maintenance and eliminates the risks associated with lifting at sea. At full buoyancy, the turbine floats and can be serviced at the deployment site or towed to dock for replacement.

For more information, visit www.capricornmarine.com.

Tocardo acquires IHC Tidal Energy

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

IHC Tidal Energy has developed a tidal turbine with a vertical ax, which after several test trials is nearing readiness for the commercial market. For several years Tocardo has been manufacturing tidal turbines with a horizontal ax. This technology has been sold to Nepal to generate electricity in the country's fast-flowing rivers.

The take-over will accelerate the expansion of Tocardo's Dutch and international tidal energy business. In some off shore locations, vertical-ax turbine technology provides better results than horizontal-ax turbine technology. By offering both options, Tocardo enhances its clients' capability to fully exploit the energy potential of fast-flowing sea currents.

For more information, visit www.tocardo.com.

ANALOX Sensor Technology

By: Simon Lunt – Director Sales & Marketing Commercial

Clean breathing air – something that most people take for granted. But should we do this when working offshore?

Air pollution is never out of the news but in such articles the author is usually discussing huge amounts of carbon dioxide being emitted into the atmosphere causing irrevocable damage to the planet. But did you know that as little as 500ml/m^3 of CO_2 in your compressed breathing air would mean not only non-compliance with the EN12021 breathing air standard but more importantly the health effects of seemingly minor exposure can be very serious.

EN12021 attempts to guide employers who's staff use compressed breathing air to keep the air as clear of contaminants as is reasonable. It has been common practice for many years to conduct periodic checking of the compressor and take an air sample using a colorimetric tube. This is of course better than not doing anything at all – but if such checks only take place every 3 or even 1 month, how do we know what is happening in the interim? Would you be happy if the smoke alarm in your home only detected smoke for 10 minutes every quarter? I sleep sounder knowing that it is continually working.

The ACG+ from Analox Sensor Technology offers users of compressed breathing air offshore the ability to either continually monitor of periodically test the purity of the delivered air. It uses state of the art sensor technology to monitor for carbon monoxide, oxygen, volatile organic compounds, carbon dioxide and water vapour. 90 days of data can easily be downloaded with a USB connection for trend analysis and a periodic oil mist test can be conducted with the unit.

"Challenging a long standing industry paradigm is usually an uphill battle" comments Analox's Director of Sales and Marketing, Simon Lunt. "But the response from industries including commercial diving, hyperbaric oxygen therapy, fire and rescue, onshore petrochemical and scuba has been remarkable. There is a growing hunger to exceed minimum requirements with a better solution – and this is what we believe the ACG+ offers"

The use of compressed air is commonplace offshore. Anecdotal evidence of "bad air" from users is almost as common. Users talk of "tasting" a problem or of having "a headache for 2 days". Why? Usually we don't know but it could be something as simple as a badly cited compressor inlet, a filter failure or even a change in the wind direction.

"With the exceptional safety standards in the offshore industry we are hopeful that the ACG+ will be of interest to the many users of compressed breathing air offshore carrying out vital shot-blasting, vessel entry, diving, emergency response and other jobs".

For further information on this unique and comprehensive safety product please visit www.analoxsensortechnology.com and contact Analox directly for a trial.

Sonatech awarded $34M for transducer sets
Sonatech Inc., doing business as Channel Technologies Group, Santa Barbara, California, is being awarded a $34,384,013 firm-fixed-price, indefinite-delivery/indefinite-quantity contract for the production of TR-343 sonar transducer ship sets. The TR-343 transducer is part of the AN/SQS-53 hull-mounted sonar array assembly, which is a component of AN/SQQ-89(V) acoustic sonar weapons system. The AN/SQQ-89(V) is a fully integrated surface ship undersea warfare combat system with the capability to search, detect, classify, localize, and attack submarine targets. The contract will provide fabrication, assembly, inspection, test and delivery of TR-343 sonar transducer ship sets. The contract will support the new construction of DDG Arleigh Burke class Navy destroyer ships. This contract combines purchases for the U.S. Navy (85%) and the government of Japan (15%). Work will be performed in Santa Barbara, California, and is expected to be completed by December 2019. This contract was competitively procured via the Federal Business Opportunities website, with two offers received. The Naval Surface Warfare Center, Crane, Indiana, is the contracting activity (N00164-15-D-GP71).

Electric Boat awarded $44M
General Dynamics, Electric Boat Corp., Groton, Connecticut, is being awarded a $44,547,142 modification to a previously awarded contract (N00024-13-C-4308) for non-nuclear submarine repair work on Groton-based submarines under the New England Maintenance Manpower Initiative (NEMMI). Under the terms of the contract, Electric Boat will continue to provide staff and operate the NEMMI at the Naval Submarine Base, New London, in support of returning mission-ready submarines to the fleet. Work will be performed in Groton, Connecticut, and is expected to be completed by September 2015. Fiscal 2015 operations and maintenance (Navy) funding in the amount of $6,000,000 will be obligated at time of award and will expire at the end of the current fiscal year. The Naval Sea Systems Command, Washington, District of Columbia, is the contracting activity.

Huntington Ingalls Industries awarded nealry $8M for work on USS Harry S. Truman
Huntington Ingalls Industries-Newport News Shipbuilding, Newport News, Virginia, is being awarded a $7,997,357 cost-plus-fixed-fee contract for nuclear propulsion and complex modernization work on USS Harry S. Truman (CVN 75) continuous incremental availability. Work will be performed in Portsmouth, Virginia, and is expected to be completed by March 2015. Fiscal 2015 operations and maintenance (Navy) contract funds in the amount of $7,997,357 will be obligated at time of award and will expire at the end of the current fiscal year. This contract was not competitively procured in accordance with FAR 6.302-1(a)(2)(iii)–only one responsible source and no other supplies or services will satisfy agency requirements. The Naval Sea Systems Command, Washington, District of Columbia, is the contracting activity (N00024-15-C-4303).

BAE to supply towed decoys
BAE Systems Information and Electronics Systems Integration, Inc., Nashua, New Hampshire, is being awarded a $19,862,638 firm-fixed-price contract to procure 283 AN/ALE-55 fiber optic towed decoys for the Integrated Defense Electronic Countermeasures Radio Frequency Countermeasure program. Work will be performed in Nashua, New Hampshire, and is expected to be completed in November 2016. Fiscal 2015 procurement of ammunition (Navy and Marine Corps) funds in the amount of $19,862,638 will be obligated at the time of award, none of which will expire at the end of the current fiscal year. This contract was not competitively procured pursuant to FAR 6.302-1. The Naval Air Systems Command, Patuxent River, Maryland is the contracting activity (N00019-15-C-0018).

Bollinger delivers the CGC William Trump

Bollinger Shipyards, Inc. has delivered the William Trump, the 11th Fast Response Cutter (FRC) to the U.S. Coast Guard.

The announcement was made by Bollinger chief operating officer, Ben Bordelon. "We are extremely happy to announce the delivery of the latest FRC built by Bollinger, the William Trump, to the 7th Coast Guard District in Key West, Florida. We are looking forward to honoring and celebrating the heroic acts of William Trump at the vessel's commissioning."

The 154-ft patrol craft is the 11th vessel in the Coast Guard's Sentinel-class FRC program. To build the FRC, Bollinger used a proven, in-service parent craft design based on the Damen Stan Patrol Boat 4708. It has a flank speed of 28 kts, state-of-the-art command, control, communications and computer technology, and a stern launch system for the vessels 26-ft cutter boat. The FRC has been described as an operational "game changer" by senior Coast Guard officials. The Coast Guard took delivery on 25 November 2014 in Key West, Florida.

Each FRC is named for an enlisted Coast Guard hero who distinguished him or herself in the line of duty. This vessel is named after Coast Guard Hero, Motor Machinist's Mate First Class William Trump. Because of his valor in action in the assault phase of the landing at Normandy, William Trump was awarded a Silver Star.

For more information, visit www.bollingershipyards.com.

Baumann relieves Matthews as SUPSALV director

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

Baumann reports to SUPSALV after serving as program manager for the International Fleet Support Program Office. He also served as chief of staff for the Deputy Assistant Secretary of the Navy for Ship Programs, executive assistant to the Assistant Secretary of the Navy for Research Development and Acquisition and DDG 51 program manager representative. He also completed a SUPSALV tour, serving as the assistant for salvage.

"Earlier in my career, I was fortunate to have served with the professional men and women of SUPSALV," said Baumann. "Now, I'm truly honored and humbled to be selected as the director of Ocean Engineering, Supervisor of Salvage and Diving to lead this world class team."

Matthews served as SUPSALV Director since February 2012 and has been selected as program manager for the Advanced Undersea Systems Program Office.

The Office of the director of Ocean Engineering, Supervisor of Salvage, directs development and maintenance of the Navy's salvage, underwater ship husbandry, diving and certification program for the U.S. Navy.

Leidos completes at-sea testing of prototype maritime autonomy system

Leidos, a national security, health, and engineering solutions company, completed a total of 42 days of at-sea demonstrations of the prototype maritime autonomy system designed to control all of the maneuvering and mission functions of the Defense Advanced Research Projects Agency's (DARPA's) Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUV). Using a 32-ft work boat as a surrogate vessel, Leidos installed autonomy software and sensors to mimic the configuration intended for an eventual full-size ACTUV prototype.

Manned vessels are obliged to obey a set of navigation rules published by the International Maritime Organization. Generally referred to as COLREGS (collision regulations), those rules determine in the event of an encounter between vessels which vessel has the right of way (the "stand on" vessel) and the appropriate behavior for both the "stand on" and "give way" vessel to avoid a collision.

The Leidos strategy to evaluate the prototype ACTUV autonomy system for COLREGS compliance includes both simulation and at-sea testing. The team has completed approximately 26,000 simulation runs of the system. Testing of COLREGS involves the ACTUV surrogate and one interfering vessel in a variety of meeting, crossing, overtaking and transit scenarios in both simulation and on the water test events.

During a recent on-the-water test event, the surrogate boat autonomously navigated through narrow channels avoiding navigation aids and submerged hazards. The boat safely avoided surface ships it encountered along the route, satisfying COLREGS requirements in completely unscripted events.

During 42 days of at-sea testing that included 101 individual scenarios, the autonomy system directed course and speed changes of the surrogate vessel to stay safely outside a 1-km standoff distance from the interfering vessel. The test program demonstrated the ability of the ACTUV autonomy system to successfully maneuver and avoid collision with another vessel and paves the way for follow-on testing involving multiple interfering contacts and adversarial behaviors of interfering vessels.

While continuing to use the surrogate vessel to test ACTUV software and sensors, construction of Sea Hunter, the first ACTUV vessel, continues at Christensen Shipyard in Clackamas, Oregon. Sea Hunter is scheduled to launch in late summer 2015 and begin testing in the Columbia River shortly thereafter.

For more information, visit www.Leidos.com.

USS Fort Worth arrives in U.S. 7th Fleet

Littoral combat ship (LCS) USS Fort Worth (LCS 3) arrived in the U.S. 7th Fleet area of operations 4 December, marking a key initial milestone in its 16-month rotational deployment in support of the Indo-Asia-Pacific rebalance.

Building on USS Freedom's (LCS 1) inaugural 10-month deployment from March to December 2013, Fort Worth will expand LCS operations while in 7th Fleet to include visiting more ports, engaging more regional navies during exercises like Cooperation Afloat Readiness and Training (CARAT) and expanding LCS capabilities with tools like the MQ-8B Fire Scout unmanned autonomous helicopter.

In addition to presence in nearly every phase of CARAT 2015 in South and Southeast Asia, Fort Worth will train with the Republic of Korea Navy in exercise Foal Eagle and is scheduled to join multinational ships at Singapore's Changi Naval Base for the International Maritime Defence Exhibition. Fort Worth will also expand LCS regional presence by using additional expeditionary maintenance locations in Northeast Asia.

Fort Worth is the first LCS to deploy under the "3-2-1" manning concept, swapping fully trained crews roughly every 4 months. This concept will allow Fort Worth to deploy 6 months longer than Freedom and twice as long as typical U.S. Navy ship deployments, extending LCS forward presence and reducing crew fatigue for the 16-month deployment. It is named 3-2-1 because three rotational crews will support two LCS ships and maintain one deployed ship.

QinetiQ to provide support for Royal Navy's Artful testing and acceptance trials

QinetiQ has secured a contract to provide support for the testing and acceptance trials for Artful, the third and latest Astute-class nuclear-powered submarine of the Royal Navy.

QinetiQ will support four separate work packages addressing a variety of trials to support acoustic, magnetic signatures, weapon discharge and electronic warfare calibration which will be conducted on QinetiQ managed ranges and in the open sea.

The acceptance and testing trials will cover static and underway acoustic signature measurements, magnetic signature measurements and optimization, weapon discharge and electronic warfare calibration.

QinetiQ will manage the range infrastructures and all aspects of range safety while coordinating the required skilled personnel and facilities including those of its subcontractors. QinetiQ will also gather information throughout the program to produce comprehensive reports at the end of each trial to support both the acceptance and the operational handover of the submarine to the Royal Navy. QinetiQ will work closely with the submarine and provide specific knowledge and expertise in areas such as acoustics and magnetics as necessary.

For more information, visit www.qinetiq.com.

New atmosphere monitoring technology for future submarines

BAE Systems and scientists from The Open University have worked together to design new atmosphere monitoring technology for the UK's future submarine program, based on lessons learned from the European Space Agency's Rosetta Mission.

The analyzer continuously monitors the precarious environmental atmospheres found on-board submarines and is capable of analyzing dozens of gas species simultaneously with a response time of less than a minute. This new atmosphere analyzer far exceeds the capabilities of the current system and shares many of the attributes of the instrument that recently landed on a comet. It needed to be much smaller and lighter than the current system and work in extreme environments, yet remain robust and operate for long periods with minimal human interaction.

For more information, visit www.baesystems.com.

FREE VEHICLES: Lander Technologies Mature

By: Kevin Hardy,
Global Ocean Design,
San Diego, CA

The author and DOV Karen, a free vehicle carrying a modified Moore corer, on deployment in the Philippine Sea, 2011. Sediments with active biota were recovered from 5.7 km.

Deep ocean free vehicles — untethered unmanned craft designed for deep ocean research and observation — were first proposed in 1938 by Maurice Ewing, Lamont Observatory, and Allyn Vine, Woods Hole Oceanographic Institution, in their paper "Deep Sea Measurements Without Wires or Cables" published by the American Geophysical Union. Free vehicles are released from a surface vessel and weighted to descend straight down. They may be ballasted to float at some mid-water depth or continue to the seafloor as far as 11 km away. At the conclusion of the mission, a drop weight is released and the free vehicle floats back to the surface. Ewing and Vine understood the numerous advantages of such a vehicle, many of which remain true today. With that paper, free vehicles became a topic of interest that continues to this day.

We have learned a few things since 1938, and literally thousands of free vehicles have been placed into operation, generally optimized for a specific task.

Free vehicles are unmanned underwater vehicles in every sense of the word. Expanding uses include exploration, science, research, and environmental monitoring.

DOV Patty, suspended over Agana Harbor, Guam, prior to deployment in the Sirena Deep of the Mariana Trench in 2011. In this scalable design, the upper sphere contains the acoustic command/control system plus surface recovery beacons. A second sphere is added to offset the weight of the lower payload pod. Side panels provide mounting surfaces for sensors and an external back-up timer.

Free vehicles are the most cost-effective way to get to mid-water or benthic locations. They can carry traps, samplers, and sensors. They can travel to any depth and remain for short periods of time or up to multiple years. They can be released with countdown timers, acoustic command, galvanic time releases (GTR), or by a pre-programmed event trigger. Operations may be conducted on smaller charter vessels from ports close to the site of interest, freeing explorers from the significant cost and scheduling issues of dedicated oceanographic vessels. Some are small enough to be lifted with one hand from the ocean, but strong enough to journey to the bottom of any ocean trench. Small free vehicles with no HazMat have been flown overnight on passenger aircraft to remote destinations. The deepest places in the Atlantic and Pacific are close to American Trust Territories, Puerto Rico, and Guam, respectively, simplifying U.S. Customs approval. Free ascent vehicles may be integrated into larger bottom platforms, providing the option of interval recovery of a back-up data recorder without disturbing the primary science platform.

Free vehicles complement the other classes of undersea vehicles: remotely operated vehicles (ROVs), gliders, autonomous undersea vehicles (AUVS), mid-water floats, towed platforms, and manned submersibles. Each has a distinct suite of strengths and weaknesses. Component technologies such as batteries, glass spheres, syntactic, cameras, and lights may be tested prior to installation on the other classes of undersea craft using a robust, cost-effective free vehicle. Some samplers, such as drop arms with baited traps, sediment samplers, time-lapse photography, or stitched panoramic views of a site are best done with a lander. Sitting stationary on the seafloor, landers are absolutely quiet, allowing recording of ambient sound fields. Long-term monitoring of the environment is possible with low-cost systems that are cost-effectively deployed. Ocean engineers and marine technicians gain valuable experience, confidence, and competence in training with deployments of free vehicles.

Thanks to generations of engineers, technicians, scientists, government leaders, and commercial enterprise, free vehicle technologies have come a long way. Today, project leaders have many options in vehicle design unimagined even a decade ago.

Though not exhaustive, some of the most important advancements made include those described below. Frames can be made from many new materials, such as pultruded FRP, structural 6061 Al shapes, and several new engineering plastics such as water jet cut Polyethylene and HDPE. Pyrex glass spheres provide both buoyancy and housing while large portions of the EM spectrum pass right through the glass. Flotation was once limited to bags of kerosene, but today includes large glass spheres and cylinders, syntactic foam, and even large styrene trawl floats for continental shelf depths. Commercially available underwater cables and connectors provide convenient interoperability of many subsystems.

Battery power in the form of Lithium and Lithium Ion in its many forms have immense energy density with none of the temperature sensitivity. Even Alkaline cell chemistries have been improved, providing higher energy densities and lower operating temperatures than in the past. Acoustic command and control systems are readily available that provide high-level commands for ranging, release, or a suite of system control and interrogation commands using a subset of ascii character codes. Sensors are evolving and shrinking rapidly, as are microcontrollers, microcomputers, and data storage units.

Today, the list of advantages to free vehicles, first assembled by Ewing and Vine, includes some newer additions:

1. Less specialized equipment is required on the ship.

2. A less specialized ship-of-opportunity may be found in a smaller harbor closer to the point of interest, during a more advantageous time, at a more modest cost, making a larger pool of ships available.

3. A long, undisturbed placement of recording instruments on the bottom can be done for basic research or environmental monitoring.

4. Bottom contact, an on-board countdown timer, an acoustic signal from the surface, or a galvanic time release (GTR), can be used to trigger the anchor release.

5. Once a free vehicle is deployed, the ship is free to move to another position to deploy another free vehicle, allowing the survey of a large area in the shortest period of time, using any vessel to best advantage.

6. Instruments or samplers can be placed at nominal horizontal separations or heights off the bottom. In the future, the adaptation of "smart bomb" guidance techniques will improve targeting.

7. Free vehicles can operate to the maximum ocean depths.

8. Shipboard operators can follow the vehicle's transit down or on return using sound ranging.

9. The anchor ballast is hung below the free vehicle and left behind, minimizing the danger of being stuck in the mud or rocky clefts.

10. A basic lander design can be modular and scalable, configured to whatever ship-of-opportunity that presents itself: small vessel – small lander; large vessel with deck machinery – larger lander.

11. Like a pick-up truck in the deep sea, landers can carry interchangeable or multiple payloads. If the payload fits within defined physical, weight, electrical, and control parameters, it can be confidently delivered to anywhere in the ocean, controlled, and recovered.

12. Free vehicles may be used as test beds to validate operation of components or subsystems for other vehicles or for future use on landers.

13. A lander has persistence and can remain on the seafloor for an entire year or longer if needed. The lander can be used to lure animals towards it using bait. Scavengers come for the bait, while predators come for the scavengers. Low-light cameras using red LEDs can image animal behavior without disturbance or await the arrival of an ROV or manned submersible.

14. Landers can precede a manned submersible or ROV operation to initially survey a specific area of interest, perhaps finding a "hot spot" among many potential dive sites.

15. A shipment of lander components can fly from point-of-origin to point-of-operation, often on commercial passenger craft, then be assembled pier-side or in a warehouse.

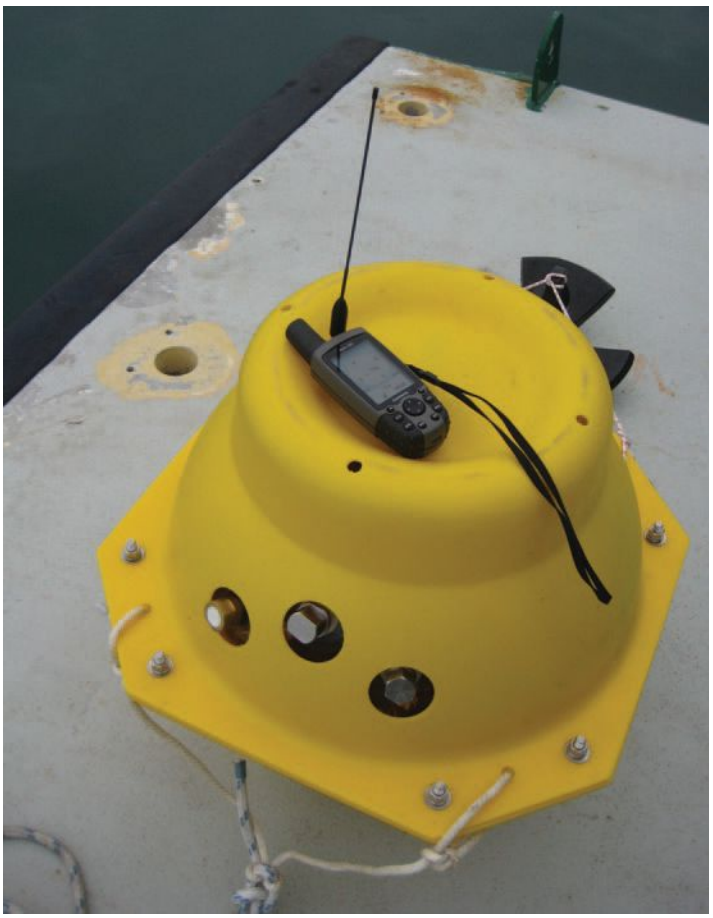
16. Only scrap iron is needed for anchors, so the ballast weight may be purchased in the port of operation, paying scrap prices and saving the cost of shipment.

17. Landers represent disruptive ocean technology in that they are simple and robust enough to be used by any size institution. Their use in the ocean at any depth provides long-term observational or sampling capability. Institutions can assign the maintenance and operation of landers to their marine technicians, developing a ready field crew capability.

18. Student projects are readily adapted to Landers, providing new ideas to principal investigators while training a new generation of scientists and engineers.

19. An educated hunch may lead to a lander deployment in an unsurveyed area. A first-time visit often provides new observations that lead to new hypotheses. Challenging new deployments, say in the South Sandwich Trench, bring focus to opportunities for incremental improvement in technology.

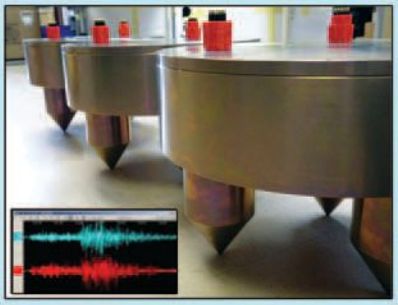
Imaging systems are riding the consumer wave and providing very capable high-definition, low power, low light sensitivity, high-capacity still and video cameras. Samplers retain their familiar look. Surface recovery beacons include the tried and true RDF transmitter and light strobe, while Iridium and Argos provide limited two-way communication with a vehicle on the surface while sitting at a desk. A new Beacon Board (Global Ocean Design) provides a hybrid system where the free vehicle finds its surface position from a satellite, then radios that position omni-directionally on a VHF frequency for the ship to receive up to 8 mi away. The captain is provided a precise range and bearing to the lander, appreciated in all weather conditions.



A through-hull underwater switch, seen on the left, activates a Beacon Board inside the 17-in. sphere as the free vehicle approaches the surface. The handheld unit on top of the hardhat receives the transmitted location from the Beacon Board and computes the range and bearing to the free vehicle, rain or shine, light or dark.

There remain lifetimes of advances still to be made. Global Ocean Design (San Diego, California), makers of free vehicle component technologies, and Nautilus Marine Service (Buxtehude, Germany), makers of deep ocean 10-in. and 17-in. hollow glass spheres are collaborating to create a commercial line of landers expected out in spring of 2015. It is believed a worldwide open-source user group, similar to Arduino, will push the rate of development and adaptation faster.

A selection of important and historic reprints on free vehicles, some of them cited in this article, can be found on the Global Ocean Design website www.globaloceandesign.com/reference-library.html.



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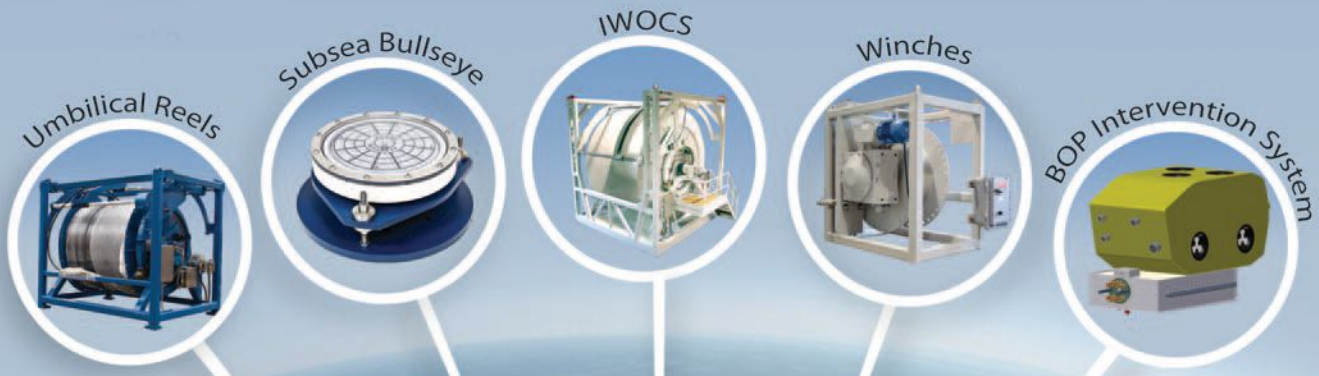

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OFFSHORE INDUSTRY

in this section

Offshore Industry Headlines	35
Upstream Oil & Gas	40
Underwater Intervention	54
Maritime Communications	60
Subsea Cables	64

Abigail Ross Hopper named new director of BOEM

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

Ms. Hopper currently serves as the director of the Maryland Energy Administration and will assume her new position on 5 January 2015, as the second

Hopper has led the Maryland Energy Administration since 2012, first as acting director and then as director in June 2013. She also served concurrently as energy advisor to Maryland Gov. Martin O'Malley since 2010. The Maryland Energy Administration coordinates and directs energy planning for Maryland State agencies, and helps local governments implement programs to reduce energy consumption. It also helps businesses become more competitive by introducing new technologies and developing strategies for emerging competitive energy markets.

As director, Hopper was pivotal in ensuring the passage of the Maryland Offshore Wind Energy Act of 2013. She oversaw programs designed to achieve Maryland's strategic energy goals, including increasing renewable energy production, reducing energy consumption and reducing greenhouse gas emissions. She presided over the launch of new programs, including Smart Energy Communities, which provides funding to local governments that adopt cutting-edge clean energy policies. Hopper has also focused significant resources on improving the resiliency of the State's electric utilities in the face of major storms.

Deepwater GoM production expected to set new daily record at 1.9 mmboe

New developments and the expansion of older oil fields are expected to lift deepwater Gulf of Mexico production of 1.9 mmboe per day in 2016, the first new production peak seen since 2009, according to Wood Mackenzie's latest outlook on the deepwater U.S. Gulf.

However, production is expected to plateau for the remainder of the decade following the 2016 peak due to the depletion of legacy fields and a limited number of new projects coming onstream.

Wood Mackenzie expects deepwater Gulf production to rise 18% per year from 2014 to 2016. In 2015, production is expected to rise 2% from 2014's production level, and the start of production from the Heidelberg field and ramp-up of the Jack-St. Malo project will intensify the rise in production. Heidelberg and Jack-St. Malo will produce 115,000 boe per day in 2016, Wood Mackenzie said.

Deepwater Gulf production growth also will be augmented by the redevelopment and extension of older fields, Wood Mackenzie noted.

Fifteen field development projects are expected to come online between 2014 and 2016, while only eight developments will come online from 2017 to 2020. But the fields scheduled to come onstream at the end of the decade are important–including Lower Tertiary discoveries such as Stones, Shenandoah and North Platte–and will define the long-term success of the region. To meet Wood Mackenzie's production outlook, $17 billion in capital expenditures will be required, 30% higher than 2013.

U.S. to exchange crude oil with Mexico as exports climb: Citi

The United States is expected to export more than 1 mmbbl a day of crude oil and condensates by early next year, including roughly 200,000 bbl per day in light-for-heavy crude exchanges with Mexico, analysts with Citi said in a recent report.

Moreover, Citi estimates that U.S. crude oil exports to Eastern Canada will grow 500,000 bbl per day, exports from Alaska will climb to 100,000 bbl per day, exports of processed condensate will hit 200,000 bbl per day and exports to Mexico will grow to 200,000 bbl per day from zero. Those Mexican exports will likely be done, at least initially, under exchanges in which the U.S. Commerce Department allows a barrel-for-barrel trade of light crude exports for heavy crude imports, analysts said.

"In the case of Mexico, there is a good fit between the heavy crude exported from Mexico to the U.S. versus the light crude that could be sent back to Mexico in exchange," the analysts wrote.

U.S. oil reserves rise to their highest levels since 1975, EIA report says

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

Reserves increased 3.1 Bbbl to 36.5 Bbbl, the Energy Information Administration said in its annual U.S. Crude Oil and Natural Gas Proved Reserves report. It was the fifth year in a row that proved reserves increased. Crude and condensate reserves have grown 78% since 2008, EIA reported. They also exceeded 36 Bbbl for the first time since 1975.

Proved reserves, or resources that can be recovered under existing economic and operating conditions, grew after U.S. oil output surged to the highest level in 31 years. Companies used horizontal drilling and hydraulic fracturing to extract oil from underground shale rock layers that sat untouched a decade ago.

The government's annual estimates of proved reserves are based on survey responses from 480 domestic

operators of oil and gas wells, according to the EIA. Companies discovered 5.5 Bbbl of newly recoverable oil in 2013. Revisions and other adjustments added another 300 mmbbl to the reserve tally.

More than 95% of new reserves in 2013 came from shale formations like the Bakken in North Dakota and the Eagle Ford in Texas. About 28% of all U.S. reserves are now made up of oil from such areas.

North Dakota had the largest increase in proved reserves last year, about 1.9 Bbbl, which accounted for 61% of the nation's total net increase in 2013. The state's reserves surpassed those of the offshore federal waters of the Gulf of Mexico, ranking it second only to Texas among U.S. states.

NOIA and API studies list benefits of additional federal OCS leasing

Offshore oil and gas leasing in the eastern Gulf of Mexico and on the U.S. Atlantic and Pacific coasts could create more than 838,000 American jobs and raise more than $200 billion in revenue for the government, according to recent studies released jointly by the National Ocean Industries Association and the American Petroleum Institute.

"The U.S. oil and gas industry is already a major source of jobs, economic activity, revenue to state and federal governments, and affordable and reliable American energy for American consumers," NOIA president Randall B. Luthi told reporters during a November conference. "We can do much more of the same with more access to the OCS."

"Polling shows that 70% of voters in this year's midterm elections support offshore drilling, and 57% do not think the federal government does enough to encourage domestic oil and gas production," said API upstream group director Erik Milito, who also participated. "The next offshore leasing program is an opportunity for the Obama administration to let those voters know their voices are being heard."

Quest Offshore Inc. conducted the studies. It did one of the Atlantic OCS that NOIA and API jointly released last year. All three areas are almost entirely off-limits now to oil and gas development, but could be included in the government's next 5-year OCS program that the U.S. Bureau of Ocean Energy Management has started to develop.

If federal leasing began in these areas in 2018, the studies show that by 2035:

• Pacific OCS development could create more than 330,000 jobs, spur nearly $140 billion in private sector spending, generate $81 billion in revenue to the government, contribute more than $28 billion a year to the U.S. economy, and add more than 1.2 mmboe per day in U.S. energy production.

• Eastern Gulf of Mexico development could create nearly 230,000 jobs, spur $114.5 billion in private sector spending, generate $69.7 billion in revenue for the government, contribute over $18 billion a year to the U.S. economy, and add nearly 1 mmboe per day to U.S. energy production.

• Atlantic OCS development could create nearly 280,000 jobs, spur $195 billion in private sector spending, generate $51 billion in revenue for the government, contribute up to $24 billion/year to the U.S. economy, and add 1.3 mmboe per day to U.S. energy production.

In all three study areas, the studies

said development by 2035 from leasing beginning in 2018 could spur nearly $449 billion in new private sector spending and add more than 3.5 mmboe per day to U.S. energy production in addition to creating more than 838,000 jobs and raising more than $200 billion in revenue for the government.

"None of the benefits shown in the studies can be realized without actual sales," Luthi noted. "The key to tapping this amazing economic and energy potential is including lease sales in these areas in the 2017-22 OCS oil and gas leasing program."

Lloyd's Register unveils guidelines for avoiding offshore collisions

Lloyd's Register's new Guidance Notes for Collision Analysis assist owners, operators, and designers of offshore units with identifying potential collision scenarios, assessing the relative risks and conducting numerical analysis, establishing representative collision loads, and measuring the impact of these loads on the structural integrity of offshore units.

A collision may occur as a result of a vessel losing its positioning or navigational abilities due to structural, mechanical, or electrical failure; human error; and environmental conditions.

"Assessing the impact of potential collisions is critical to the longevity of any offshore unit not only from a design perspective, but also to help ensure a safe operating environment," said Phil Rushton, senior engineer for offshore structures, and one of the primary authors steering the development of this latest guidance from Lloyd's Register.

A primary goal for the launch of these new Guidance Notes is to provide the direction and criteria to help industry increase the level of protection against collisions at sea. The Guidance Notes cover everything from vessel groundings to collisions with merchant, naval, and support vessels.

"Collisions at sea represent one of the top safety hazards for any operator," Rushton noted. "Mitigating collision risks is vital to the protection of our environment, the safety of industry's people working offshore, and the longevity of offshore energy infrastructure."

Its suite of guidance notes support the Rules for Offshore Units issued in July. The Rules set the requirements for the classification elements of Lloyd's Register's services and are supported by a library of unit- or subject-specific guidance notes that either expand upon the Rules with suggested methodologies or give information on related non-classification services.

This latest publication provides in-depth technical guidance for collision mechanics and class-leading developments in risk assessment methodologies. The new Guidance Notes can be downloaded from the Lloyd's Register website at http://www.lr.org/en/.

Industry veteran Clarence Cazalot Jr. receives API's highest honor

The American Petroleum Institute (API) awarded its highest honor, the Gold Medal for Distinguished Achievement, to Clarence P. Cazalot Jr. in recognition of his outstanding leadership and service to the oil and natural gas industry, his community, and the nation.

"For more than four decades, Clarence Cazalot's steady leadership, vision and personal integrity have guided the management strategies and innovations that helped drive the 21st century American energy renaissance," said Jack Gerard, API president and chief executive officer.


Clarence Cazalot

"He has been a pioneer of the U.S. oil and natural gas industry and an outstanding leader for two of America's most storied and iconic energy companies: Marathon and Texaco."

Under 14 years of leadership as chairman, president and chief executive officer of Marathon Oil Corp., Cazalot guided the success of one of the world's largest oil and natural gas companies. Prior to taking the helm at Marathon, he served in multiple senior executive positions at Texaco, Inc.

He also holds positions on the boards of directors of leading energy companies, including Baker Hughes, FMC Technologies, and Spectra Energy. As API Chairman, Cazalot shared his unique and invaluable expertise and knowledge across all sectors of the oil and natural gas industry, according to Gerard.

Lower Tertiary giant Jack-St. Malo is online, with first stage oil target of 94,000 bbl/day

Crude oil and natural gas are now flowing from the Jack-St. Malo project in the Lower Tertiary trend of deepwater U.S. Gulf of Mexico. The Jack and St. Malo fields are among the largest and deepest in the U.S. Gulf.

They were discovered in 2004 and 2003, respectively, and production from the first development stage is expected to ramp up over the next several years to a total daily rate of 94,000 bbl of oil and 21 mcf of gas, according to project operator Chevron Corp. With a planned production life of more than 30 years, current technologies are anticipated to recover in excess of 500 mmboe. Successive development phases, which could employ enhanced recovery technologies, may enable substantially increased recovery at the fields.

The Jack and St. Malo field reservoirs are located in a geological formation known as the Lower Tertiary trend. The formation, among the deepest productive zones, was deposited more than 65 million years ago about 20,000 ft below the seabed.

"This milestone demonstrates Chevron's capital stewardship and technology capabilities, featuring a number of advances in technology that simply didn't exist when the fields were discovered," said Jay Johnson, senior vice president of Chevron's upstream division. "These learnings can now be transferred to other deepwater projects in our portfolio."

The Jack and St. Malo fields are located within 25 mi of each other in about 7,000 ft of water in the Walker Ridge area, roughly 280 mi south of New Orleans, Louisiana. The fields were co-developed with subsea completions flowing back to a single host, semi-submersible floating production unit located between the fields.

"Jack-St. Malo is the result of the collaboration of hundreds of suppliers and contractors and many thousands of people across nine countries over a 10-year period," said Jeff Shellebarger, president of Chevron's North America exploration and production company.

Crude oil from the facility will be transported about 140 mi to the Green Canyon 19 Platform via the Jack-St. Malo Oil Export Pipeline, and then onto refineries along the Gulf Coast. The pipeline is the first large-diameter, ultra-deepwater pipeline in the Walker Ridge area of the Lower Tertiary trend. The combination of extreme water depths, large diameter, high-pressure design, and pipeline structures have set new milestones for the Gulf of Mexico, Chevron said.

The Jack-St. Malo semi-submersible floating production unit is the largest of its kind in the Gulf of Mexico and has a production capacity of 170,000 bbl of oil per day and 42 mcf of natural gas per day, with the potential for future expansion.

The project was sanctioned in 2010 with an anticipated investment of $7.5 billion for the initial development phase. It has delivered new technology applications, including the industry's largest seafloor boosting system and Chevron's first application of deepwater ocean bottom node seismic technology in the Gulf of Mexico, providing images of subsurface layers nearly 30,000 ft below the ocean floor.

Chevron has a 50% working interest in Jack, with co-owners Statoil (25%) and Maersk Oil (25%). Chevron and subsidiary Union Oil, also holds a 51% working interest in St. Malo, with co-owners Petrobras (25%), Statoil (21.5%), ExxonMobil (1.25%) and Eni (1.25%); and a 40.6% ownership interest in the host facility, with co-owners Statoil (27.9%), Petrobras (15%), Maersk Oil (5%), ExxonMobil (10.75%) and Eni (0.75%).

Increasing deepwater exploration could help Trinidad and Tobago

Exploring deep and ultra-deepwater areas could boost Trinidad and Tobago's oil and gas industry, which has US$6.2 billion of investment planned over the next 2 years. This may help to offset the government's apparent move away from an energy-dependent economy, according to an analyst GlobalData.

According to Effuah Alleyne, senior analyst for GlobalData, Trinidad and Tobago's budget statement for the fiscal year 2015 revealed that the energy industry accounted for a 35% share of the country's anticipated revenue. This represents a significant decline since 2006, when the sector represented almost 53% of the budget.

While this move may imply trouble for Trinidad and Tobago's oil and gas industry, Alleyne states that the emerging trend of deepwater exploration could help to revive the sector in a country where the majority of exploration and production (E&P) activity occurs in shallow waters of up to 250 m deep.

Alleyne explained: "Trinidad and Tobago's competitive deepwater bidding round ended in March this year, with two of six blocks awarded to a consortium consisting of BHP Billiton and BG Group. These blocks are located in water deeper than 1,500 m.

"As deep and ultra-deepwater is yet to be fully explored in Trinidad and Tobagos, these areas could represent vast potential, especially as there are over 15 open blocks. These lie in the Columbus Basin, an extension of the prolific Eastern Venezuelan Basin, where one of the world's largest reserves of 1 trillion barrels of heavy oil-in-place is located."

In addition to deepwater exploration, Alleyne notes that reassessing mature assets is another developing trend in Trinidad and Tobagos, with numerous recent discoveries being made in some of its established reserves.

Alleyne concluded that Trinidad and Tobago's planned oil and gas sector investment of US$6.2 billion over the next 2 years reflects the confidence that untapped potential, both in existing fields and in under-explored deepwater and ultra-deepwater areas, could significantly boost the country's capital expenditure.

Offshore Oil – Riding the Waves

By John Westwood, Chairman Douglas-Westwood

We are, in the words of the ancient Chinese curse, "living in interesting times." Since early 2011, Brent crude oil had maintained a price above $100, and then in June 2014 it crashed, diving from $115 to $65 by mid-December. So why did this happen and what are the implications for the offshore oil & gas industry?

Sheiks v Shale

From the mid-1990s, the increasing use of a combination of two technologies — horizontal drilling and fracking — began to bring supplies of shale gas to the U.S. market. Over the period from 1995 to 2009, the number of U.S. onshore rigs targeting natural gas grew from 400 to 1,600, with the result that eventually over-production caused natural gas prices to dive from $8 to $3 and by 2013 gas rig numbers had returned to 400. In the meantime, 2009 saw the beginning of the big move to drilling for "tight" (shale) oil. Two hundred rigs targeting oil in 2009 grew to 1,400 by 2013, and U.S. oil production surged by 2 million barrels per day (bpd).

So far so good. But then some production began to return to the market from Iraq and Libya, while at the same time a slowing Chinese demand and a lack-lustre European economic recovery reduced growth of demand.

The expected answer to the building-oversupply of oil was, of course, quite simple. As in previous periods of oversupply, Saudi Arabia would just cut its production and so drive up prices – wouldn't it? But this time around, it did not, deciding to play for market share, and oil prices collapsed. And so began the great stand-off between two of the world's largest producers, the United States and Saudi Arabia—or as the cartoon on the Economist's December 6 issue front cover pictured it, "Sheiks v Shale."

Challenging Times

Approximately 70% of the additional oil production in recent years is unconventional. Much of this is from U.S. shale and is not very cheap oil, mostly needing prices of $50 to $70 to be commercially viable. By comparison, most deepwater production needs about $80. What is more, shale well decline rates are rapid, typically up to 60% in year one, compared with the 7% to 10% decline rates of a conventional well. So without ongoing drilling, the current production capacity will be quickly eroded.

Maintaining the world's oil production of more than 90 million bpd requires ongoing drilling on a massive scale, even without oil demand growth — which is extremely unlikely. At Douglas-Westwood, we reckon that more than 80,000 development wells were drilled onshore in 2014 and some 2,500 offshore. Looking ahead, even greater numbers will be needed as present low oil prices begin to drive growing oil & gas consumption and major producers output declines. We believe that the annual total will need to grow to exceed 100,000 by 2020.

A Perfect Storm

But oil prices are only one side of the equation — the other is industry costs. In the 13 years to the turn of the century, oil & gas exploration and production expenditure grew by 48%; between 2000 and 2013, expenditure growth was 287% as the industry supply chain was unable to meet demand for products and services. However, so far spending had tracked with oil prices (up 281%), but in 2011, they disconnected as oil prices stopped rising and then fell dramatically in June 2014.

While E&P spend grew by 287%, the increase in oil & gas production was a mere 24%, a situation that was clearly unsustainable even before the fall in oil prices.

We are now in a situation where two things are needed: a cut in oil production and a reduction in costs.

Cutting Costs

The reasons for the historical cost increases are many, but perhaps the most significant are as follows:

• Increasing technical challenges – as the availability of so-called "easy oil" (low-cost oil) has declined, the only options for the major are in technically challenging (high-cost) areas such as deepwater and unconventionals.

• Over engineering – a lack of a modularized "industrial approach" to offshore field developments is cited by many as a major cost issue.

• Project management – some of the major cost and time overruns we see seem to be down to project management (PM) issues, examples include FPSO topsides' module integration issues.

• Skills shortages – perhaps the PM issues are to an extent a symptom of this. But overall, we need to recruit and train, and, in light of present industry cutbacks, retain skilled staff through these cyclical downturns.

• Local content – a laudable ambition and Norway shows what can be

achieved. But for many countries, building local content has to be a steady process that avoids the 50% cost increases seen in some places.

• Governments increasing their take – politicians need to recognize that excessive tax grabs don't work in an international industry; big players can go play elsewhere.

• Macondo – as one senior oil company executive commented to me, "Macondo has increased our deepwater well costs by 20%."

A number of these points are being actively addressed, and results are beginning to show through. In April, Total cut the cost of its Kaombo project off Angola by about a fifth to $16 billion.

Drilling Costs

Drilling takes a major part of offshore development budgets, as one oil company exec said, "High drilling costs are the killer." However, great strides are being made in increasing the efficiency of drilling operations, which can form half the cost of many field developments. Baker Hughes, for example, has reported that by focussing on non-productive time they saved some $10.4 million on a four-well project on the Terra Nova field offshore Newfoundland.

Adoption of new technology also has a huge part to play in drilling cost reduction. Work by DNV GL suggests that a move to hybrid power generation could save 40% of rig fuel costs and reduce emissions.

So yes, progress is being made on a number of fronts and for some players this could also be a period of great opportunity.

Rig Oversupply

For the past 2 years, we have been warning about the potential for speculative building to result in oversupply in the mobile offshore rig market. In the case of drillships, unprecedented investment and supply additions will create a difficult market for the next 5 years. The current "order book to fleet ratio" is 61%. Of this, 44% is un-contracted!

New state-of-the-art rigs are needed for drilling the deepwater pre-salt discoveries off Brazil and West Africa, and many units are coming into the market. These will eventually be able to win contracts — but with growing oversupply, at what day rate and will we now see old units long past their sell-by date being retired?

Offshore Impact

In any oil price downturn, and we have had a lot of them since the 1970s, operators start cutting back — ConocoPhillips, for example, has said its 2015 capital budget would be 20% down and BP said it was suspending some projects and would be implementing staff cuts.

The thing that gets hit is exploration spend. Having suffered a 21% share price fall, Schlumberger's WesternGeco marine seismic business is reported to be taking a $800 million write-down on the value of its fleet, cutting its activity from 23 vessels to 15 and retiring or converting some of the older higher cost boats.

But big oil needs big projects and with the Middle-Eastern NOCs dominating onshore production, deepwater remains one of the few places the IOCs can make major finds. Also, the largest offshore projects are not greatly influenced by today's oil prices, but views of prices in the decades ahead and many expect oil prices to again average $100 in the medium long term. Considering the lead times of large offshore projects, there is less potential to revise near-term development plans, and, as a result, Capex tends to be less subject to short-term hits than, for example, spend on U.S. onshore drilling.

Yes, there will be significant spending cut-backs as higher cost, more economically marginal offshore projects are postponed and exploration spend will also be reduced if E&P companies decide to wait for rig rates to fall further. However, it is likely that deepwater, despite its costs, is one area that will suffer less than others such as exploration drilling. So we feel confident about the long-term prospects for associated areas such as subsea production, floating production, etc.

Another example of long-term thinking is FLNG — the scale of Shell's investment in its huge Prelude project clearly shows this. Over the next 5 years, we expect to see capital expenditure of $41 billion on such units and a further $21 billion on regasification vessels.

At this time, with the oil price in a state of flux, it is too early to give firm expenditure forecasts. As a result of the global recession of 2008, total industry spend fell by 14% and took over 2 years to recover — but recover it did.

In total, we estimate that some $212 billion was spent on offshore E&P in 2013 and that 2014 will have been up on that. Looking beyond 2015, key spending sectors will likely be offshore drilling at 31%, subsea 15%, and engineering and construction at 15%. The other major sector is "life of field" expenditure at 39%.

M&A Opportunity?

As evidenced with past cycles, the present downturn could be a great buying opportunity. In global E&P, the NOCs rule and they will continue to invest; China has been the high spender and India's ONGC now plans a huge $180 billion foreign production acquisition spree. Likewise in oilfield services — if history repeats itself, acquisition opportunities are likely to present themselves for both trade buyers and private equity buyers.

Both high and low oil prices present opportunities for well-managed, well-financed companies that have hoarded cash during the up cycle and have a long-term view — the oil & gas industry is not a short-term game. But the window of M&A opportunity may well be shorter than some think before the next cycle begins.

John Westwood *is chairman of Douglas-Westwood, the international energy business research & consulting firm he founded in 1990. The firm recently completed its 1,000th project. In addition to oil companies, contractors, and financial organizations, Westwood has acted as an advisor to government agencies and presidential offices in six countries.*

GE to supply equipment and technology to FLNG facility
GE Oil & Gas will supply its gas turbine-driven compressor train and mechanical drive technology to Petronas for a second FLNG facility being developed offshore East Malaysia. The latest project marks another major order with Petronas under a global frame agreement for equipment supply between the two companies. As part of its contract, GE will supply four of its PGT25+G4 gas turbine generator systems and two nitrogen trains featuring two LM6000-PF+ 2BCL907 aero derivative gas turbines in mechanical-drive mode. Commercial operation is expected to begin in the third quarter of 2017. For the first time ever, an LM6000 gas turbine is being applied to an FLNG project. The LM6000 gas turbine model is already used for offshore mechanical drive applications. GE's equipment will be manufactured at the company's assembly facilities in Florence and Massa, Italy.

BMT awarded maintenance contract for Kizomba TLPs
BMT Scientific Marine Services (BMT), a subsidiary of the BMT Group, an international maritime design, engineering and risk management consultancy, has been selected by Esso Angola to provide maintenance services for systems installed on the two Kizomba Tension Leg Platforms (TLP) offshore Angola. BMT previously installed integrated marine monitoring systems (IMMS) on the TLP and floating production storage and offloading (FPSO) facilities on both developments, as well as subsea riser tension monitoring systems. This contract allows BMT to provide servicing and maintenance on system instrumentation exposed to offshore conditions and ensure continued function and accurate data. BMT's client support services plan will include twice-yearly service visits with calibration checks, software maintenance and updates, and remote technical support.

Aveon Offshore Ltd. lands buoy fabrication contract
Aveon Offshore Ltd., a Nigerian oil and gas engineering and fabrication company, has been awarded a contract by National Oilwell Varco (NOV) Nigeria for the fabrication of Egina offloading buoy as part of the package for the Egina OLT contract for Total Upstream Nigeria. The contract that was awarded in March 2014 for the fabrication of a 900-ton offloading buoy includes the fabrication of the 700-ton buoy hull, installation and integration of a 200-ton turret and the launching and pre-commissioning of the completed buoy. Capital expenditure for the construction of a slipway for the launching of the buoy is also included in the contract. The project will be executed at the Aveon Offshore's fabrication yard in Rumuolumeni near Port Harcourt. The sail away of the buoy is scheduled for the second quarter of 2017.

Deep Casing Tools wins contract to support Statoil on NCS
Deep Casing Tools has signed a frame agreement with Statoil Petroleum covering the supply of drillable casing and reaming technology for the energy firm's activities on the Norwegian Continental Shelf. The 2-year contract, with extension options, requires Deep Casing Tools to supply drillable casing and liner reamer technology, including the high-speed drillable reaming system Turbocaser Express, which Statoil has already installed. Deep Casing Tools CEO Lance Davis said: "This very significant multi-year agreement cements the foundation of our Norwegian and North Sea business as we continue to build our track record. The opportunity in Norway, as in other arenas, is to provide solutions to some key industry drivers: risk reduction when running tubulars to total depth, reducing flat time and trouble zone costs, and improving well bore conditions for cement placement and integrity."

Tubular Bells ramping up to 50,000 boe/day

The Gulfstar FPS will handle Tubular Bell production.

Production has begun from the deepwater Tubular Bells field in the Gulf of Mexico. Operator Hess Corp. said that following a ramp-up Tubular Bells should produce about 50,000 boe per day from three wells by year-end 2014.

The Tubular Bells field was discovered in 2003 and sanctioned in October 2011. It is in 4,300 ft of water, 135 mi southeast of New Orleans. Hess holds a 57.14% interest in Tubular Bells, and Chevron USA. Inc. has a 42.86% interest.

The development uses Williams Partners spar-based Gulfstar FPS, which is the first such facility with the major components built on the U.S. Gulf Coast. It serves as a hub that aggregates production and then combines production handling services with oil and gas export pipeline services, which feed Williams' downstream oil and gas gathering and processing services on the Gulf Coast.

Gulfstar's base capacity is capable of processing up to 60,000 bbl of oil per day and 132 mmcf of gas per day with additional potential tieback capacity.

In addition to anchor commitments from Hess and Chevron for Tubular Bells, in December 2013 Gulfstar One LLC executed agreements with Gunflint field owners Noble Energy, Inc., Ecopetrol America Inc., Marathon Oil Co. and Samson Offshore Mapleleaf LLC. The Gunflint tieback is designed and engineered with modifications expected to be completed after the Gulfstar project is completed.

Gulf Marine Fabricators built the Gulf Star hull in Ingleside, Texas, and Gulf Island Fabrication, Inc. constructed the topsides in Houma, Louisiana. Williams Partners developed the project and it has a 51% ownership interest in Gulfstar One LLC and Marubeni Corp. has a 49% interest. Williams owns controlling interests in and is the general partner of Williams Partners.

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The ultra-deepwater Deepsea Aberdeen.

Odfjell takes delivery of Deepsea Aberdeen semi-submersible rig

Odfjell Drilling has taken delivery of its latest ultra-deepwater semi-submersible rig, which is set for a 7-year contract with BP in the West of Shetland region. The Norwegian contractor took delivery of the Deepsea Aberdeen from South Korea-based Daewoo Shipbuilding & Marine Engineering (DSME).

Deepsea Aberdeen adds to Odfjell Drilling's fleet of harsh environment and ultra-deepwater drilling units. The semi-submersible rig is an enhanced GVA7500 harsh environment design and will be a sister rig to the Deepsea Atlantic and Deepsea Stavanger, which were earlier delivered by DSME.

The semi-submersible rig has a drilling system that features a dual derrick with a main and a work center to undertake multiple simultaneous operations. The unit, which features full conventional mooring, is designed to operate in harsh environments and at water depths of about 3,000 m.

"The rig is an important contribution to our fleet and operations, and we are well prepared to ensure a safe and efficient commencement of operations for BP West of Shetland," said Simen Lieungh, Odfjell Drilling's chief executive officer. Dilling operations were expected to start later in the first quarter of 2015.

The West of Shetland area is located in the northern-Atlantic Ocean, where there are presently three developed offshore fields: Schiehallion, Foinaven and Clair. Several hydrocarbon discoveries have also been made in the area, but they are not currently considered to be economical because of the high development costs.

Lamprell to build more high-spec jack-up rigs for National Drilling

Lamprell has received a contract award from the National Drilling Co. (NDC) for the construction and delivery of two high-specification jack-up drilling rigs. The contract is valued at $365 million. The rigs will be completely outfitted, LeTourneau-designed, of Super 116E class self-elevating mobile offshore drilling units with a rated drilling depth of 30,000 ft. The rigs will be constructed at Lamprell's facility in Hamriyah, United Arab Emirates, with planned delivery dates in fourth quarter of 2016 and the second quarter of 2017.

Lamprell previously received contracts by NDC for a series of six identical rigs and are on schedule to complete construction of the final two jack-up rigs, with the first four being delivered on time and on budget.

Under the terms of the contract, NDC also has the right to exercise options for Lamprell to build up to an additional three jack-up rigs of the same design.

Aibel hired to commission Goliat FPSO in Norwegian Barents Sea

Aibel has won a contract to hook-up and commission the floating production, storage and offloading (FPSO) vessel for Eni's Goliat field in the Barents Sea, offshore Norway. Goliat, which is currently under construction at the Hyundai yard in South Korea, will be the first cylindrical, floating production platform on the Norwegian Continental Shelf. The Goliat facility will be installed at the Goliat field, 85 km northwest of Hammerfest.

"The Goliat project is particularly important for us because we will gain useful experience with facilities operating in the Barents Sea," said Jan Skogseth, Aibel's chief executive officer.

Eni Norge operates the Goliat field with a 65% stake, while Statoil owns the remaining interest. The Goliat field is located in production licence 229 in the Barents Sea, north of Russia and Norway.

The licence was originally awarded in the Barents Sea in 1997, which was initiated in order to increase interest in the area as an oil and gas region.

Goliat will be the first cylindrical, floating production platform on the Norwegian Continental Shelf.

Goliat has two separate main reservoirs, the Kobbe and Realgrunnen, and features oil with an overlying gas cap. The Realgrunnen reservoir is located 1,000 m below sea level, while the Kobbe reservoir is 1,800 m below sea level. The field is expected to be in production for about 15 years, though its life may be extended with new discoveries. The Goliat will be equipped with tied-in subsea templates with the ability to process, store and offload oil. The field contains gas and about 174 mmbbl oil.

Semi-submersible drilling rig 'COSLProspector' arrives in China

CIMC Raffles has delivered in Yantai, Shandong, China, the fourth deepwater semi-submersible drilling rig built for COSL, the COSLProspector.

The rig is a DP-3 vessel with length of 343 ft, width of 231 ft, height of 123 ft, an operating depth of 4,921 ft, a drilling depth

COSLProspector drilling rig unveiled.

of 24,934 ft, and a designed operating temperature as low as 4° F. A maximum variable deck load of 5,511 tons, the multifunction platform is also able to accommodate 130 personnel. It is classed by DNV and CCS and satisfies the strictest standards of PSA and NORSOK. Equipped with 10,000 controllers and alerts, the remote monitoring can be achieved in this highly automatic unit.

On the base of GM-4000 series, COSLProspector was designed jointly by Agility Group, COSL, and CIMC Raffles. CIMC Raffles was responsible for all detailed design, construction, and commissioning work.

It adopts the most advanced power management and environmentally friendly design concepts and facilities with DP-3 close bus-tie, variable frequency drive, escape chute system, and automatic ice-cleaning technology.

The COSLProspector was specifically designed for work in cold climate with class notation ICE-T and Winterized Basic with covers of working areas and lifeboat stations. Additional ventilation, heat tracing and heating will be included to satisfy rules and regulations for cold climate. The complete package is designed according to DNV Drill N and delivered by National Oilwell Varco/NYMO, Norway.

Bourbon expanding horizon with newbuild vessel 'Bourbon Arctic'

The Bourbon Arctic, scheduled for delivery in early 2016 from the Vard shipyard, will be in a position to perform anchor handling and towing operations for oil rigs located even in remote oil fields, the company said, noting that the vessel was specially designed for operations in polar waters, and more specifically in Arctic zones.

Because the company believes there is a huge potential for development in the far north, its commitment to build the vessel represents a major adjustment of services to meet the requirements of its clients and a changing offshore market.

With a length of 93.60 m, a bollard pull of 280 tons and deck equipment supplied by Rolls-Royce, along with its design suited to extreme weather conditions and a reinforced hull classed Ice-1A, the Bourbon Arctic will be set to operate in even the most demanding situations, the company said. Upon delivery, the vessel will be ranked as the most powerful vessel in the Bourbon fleet.

"The development of our fleet has always been closely tied to our anchor handling services," said Rodolphe Bouchet, a company vice president. "As a generalist, we need to have very large capacity vessels in our fleet for operations of a very complex type. With its technical specifications suited to the deep offshore market, the Bourbon Arctic will allow us to complement our range of services."

Artist's rendition of the Bourbon Arctic.

The ship manager of this new-generation AHTS will be Bourbon Offshore Norway, which is already responsible for the two most powerful AHTS in the group's fleet, the Bourbon Surf and the Bourbon Borgstein.

Crowley Maritime sells two Jones Act tankers to Kinder Morgan

Crowley Maritime Corp.'s petroleum services group said that it sold two Jones Act tankers, the Pennsylvania and Florida, to Kinder Morgan Energy Partners, LP. Crowley will continue to manage the vessels with no changes in crewing or operations. The tankers have been under long-term charter transporting gasoline, jet fuel, diesel and crude oil since being placed into service in 2012 and 2013, respectively.

"This transaction helps Crowley maintain a healthy balance in our capital program," said Tom Crowley, company chairman and chief executive officer. "We have invested more than $1.5 billion in new, U.S.-built tank vessels in recent years, giving us a fleet of 17 articulated tug barges (ATBs) and four new 330,000 barrel tankers being delivered in 2015 and 2016. We are committed to continuing to provide safe and reliable petroleum transportation to our customers."

Under the new ship management agreement with Kinder Morgan for the Pennsylvania and Florida, Crowley will continue to utilize sailors from the American Maritime Officers Union and Seafarers International Union, who have safely operated these tankers since their inception. The company's ship management group provides worldwide technical management, operating ships for others as if they belonged to Crowley.

"Kinder Morgan's continued expansion into the Jones Act tanker market demonstrates our commitment to provide customers with a variety of safe and efficient means to store and transport crude, petroleum products and chemicals," said John Schlosser, president of KMP's terminals segment. "We are delighted to expand our relationship with Crowley, a premier provider of marine transportation services."

Overcapacity leads Statoil to suspend rigs offshore Norway

Statoil has opted to suspend use of two contracted rigs offshore Norway for the remainder of this year, due to overcapacity in the operator's rig portfolio.

The suspension may be extended, although the company said it is trying to line up drilling assignments for both rigs during 2015.

Transocean Spitsbergen is about to conclude an exploration program for Statoil in the Barents Sea. After it has finished the Saturn exploration well, it will cut and retrieve a wellhead in the Mercury exploration well, probably finishing in mid-November.

The semi-submersible was then to begin a planned yard stay from 1 January, 2015. It remains under contract to Statoil until the start of the third quarter of 2015.

Songa Trym was expected to finish plugging a well on the Oseberg field in the North Sea, after which it was to go on a 75% suspension rate ($279,000 per day) expected until the end of 2014.

The semi-submersible rig Songa Trym.

Songa Offshore will use the suspension to speed up planned maintenance work on the rig. Following the suspension, Statoil will have 15 rigs operating actively on the Norwegian shelf.

Sevan conducting floater studies for North Sea, offshore Falklands

Sevan Marine said it is working on studies for cylindrical-shaped floating systems for five development projects.

One is pre-front-end engineering and design (pre-FEED) for Shell's Penguins field in the UK northern North Sea. Another is for the FEED phase for the Premier-operated Bream field in the Norwegian North Sea.

The other studies are for potential FSOs for the Bentley and Culzean fields in the UK northern and central North Sea, and an FPSO for Premier's Sea Lion in the offshore North Falkland basin. Premier and partner Rockhopper had previously considered a TLP and FSO for Sea Lion.

Meanwhile, ABS has granted approval in principle (AIP) for the Sevan cylindrical floating LNG (FLNG) production unit concept for offshore production, storage, and transfer of LNG, LPG, and condensate.

The next-generation FLNG design concept is based on the proven circular and geostationary Sevan FPSO design, which is being used offshore Brazil, as well as in the Norwegian and central UK North Sea.

The full scope of design review for the FLNG concept includes an assessment of the feasibility of the structural strength of the equipped FLNG hull and process topsides structure as well as a global performance and safety analysis conducted in accordance with the ABS rules and guides for floating LNG units.

The FPSO Cidade de Ilhabela can produce 150,000 bbl a day.

Brazil's Petrobras starts-up FPSO Cidade de Ilhabela

Petrobras has started production through the FPSO Cidade de Ilhabela from the Sapinhoá field in the Santos basin presalt offshore Brazil.

The vessel is anchored at a water depth of 7,020 ft, 193 mi off the coast of São Paulo state. It is designed to produce up to 150,000 bbl per day, compress up to 212 mmcf per day of natural gas, and store 1.6 mmbbl of oil. It also will be able to inject 180,000 bbl per day of water.

Well 3-SPS-69, the first to go into operation, has a production potential of 32,000 bbl per day. The oil produced in Sapinhoá field is 29 degrees API on average and is to be offloaded by tankers. The portion of the gas not used for reinjection into the field will flow through the Sapinhoá-Lula-Mexilhão gas pipeline to the Monteiro Lobato Gas Treatment Unit in Caraguatatuba, on the coast of São Paulo state. FPSO Cidade de Ilhabela will be connected to nine production wells and seven injection wells. Peak production is expected in the second half of 2015.

Production started from Sapinhoá field in January 2013 by interconnecting well 1-SPS-55 to FPSO Cidade de São Paulo (Sapinhoá Pilot), with a production capacity of up to 120,000 bbl per day. Sapinhoá field is operated by Petrobras (45%), in partnership with BG E&P Brasil Ltd. (30%) and Repsol Sinopec S.A. (25%).

Woodside to proceed with $1B Persephone gas project

Woodside Petroleum will go ahead with the US$1 billion Persephone gas project, offshore northwest Australia, after North West Shelf (NWS) participants approved the development. The project, which is expected to start operations in early 2018, will feature a two-well, 7-km subsea tieback from the Persephone field to the existing North Rankin complex.

The two proposed wells will be drilled from a common drill center using a semi-submersible drill rig. The proposed subsea system features a manifold at the drill center location, with two slots to tie-in the wells.

The Persephone gas field is situated in offshore petroleum production licence WA-1-L, located 135 km northwest of Karratha, Western Australia, in water a depth of about 126 m. The field was discovered in 2006 by the exploration well Persephone-1, about 8 km northeast of the NWS project's North Rankin complex.

Woodside operates and owns a 16.67% stake in the project. Other shareholders are BHP, BP, Chevron and Shell. It's the third major gas development for the NWS in the last 6 years.

Britain awards 134 licenses on 252 parcels in Seaward Round

Britain's government has awarded 134 licenses covering 252 blocks and partial blocks under the 28th Seaward Licensing Round. While the number of licenses is less than the record number of applications in the 27th licensing round, this news is a good sign that investors continue to show interest in the basin. More than 60 companies submitted applications.

"Perhaps what is most telling is the nature of the work programs that companies have committed to, with only five firm wells and four contingent wells being included," Oonagh Werngren, Oil & Gas UK's operations manager, said, adding that most licenses were awarded on the basis of obtaining or reprocessing 2D and 3D seismic data.

Werngren said it was encouraging to see companies beginning to look seriously at frontier areas, stepping away from the known basins and into deeper water. Ninety-four blocks in the licensing round are in, or close to, areas under special protection and conservation.

"We would encourage the government to carry out environmental assessments urgently so that these additional areas…can contribute to boosting activity in the basin," he added.

Among the companies to comment on their awards so far, Statoil gained interests in 12 licenses, nine as operator. Eleven of the licenses are in the North Sea and the remaining one is west of Hebrides offshore northwest Scotland.

Additionally, the company has taken positions in the northern UK North Sea, near its heavy-oil Mariner and Bressay projects, and in largely untested plays such as its new acreage on the northern margin of the Mid North Sea High (quadrants 37 and 38) and in the Halibut Horst area (quadrants 13 and 14).

Statoil is planing two exploration wells next year on its 27th round acreage and sees potential to mature several more drilling prospects on its new concessions.

Maersk Oil UK picked up five licenses, three as operator.

Northern Alaska oil and gas lease sales net nearly $60M in high bids

The State of Alaska received $59.7 million in apparent high bids for its annual Northern Alaska oil and gas lease sales, the third highest amount received in state history. The state Division of Oil and Gas said the 19 November sale drew a total of 356 bids from 12 different bidding groups on 298 tracts encompassing approximately 641,696 acres.

Offshore the Beaufort Sea Areawide sale alone received 57 bids from five bidding groups on 42 tracts encompassing 107,189 acres. Winning bids totaled nearly $5 million, making this the third largest Beaufort sale by dollar amount since areawide leasing began in 2000.

The onshore North Slope Areawide lease sale netted 297 bids from nine bidding groups on 254 tracts encompassing 524,387 acres. The winning bonus bids totaled $54.6 million, making this the largest North Slope lease sale since areawide leasing began in 1998.

The North Slope Foothills Areawide sale, also onshore, received two bids from one bidding group on two tracts encompassing 10,120 acres. This sale, which did not receive any bids last year, netted $147,014.

"This is one of the most competitive lease sales we've seen in many years, and it shows what can happen when we have a competitive investment climate," said Joe Balash, commissioner of the Alaska Department of Natural Resources.

Maersk Innovator at work in Norwegian North Sea.

Drilling under way at new Eldfisk 2/7 S platform

The Mærsk Innovator has started drilling at the new Eldfisk 2/7 S platform for ConocoPhillips Norge's Eldfisk II project in the southern Norwegian North Sea. There are 40 well slots on the platform, five of which have been pre-drilled. Development drilling is to continue for several years.

The new platform was installed earlier this year and will be mechanically completed before year-end. ConocoPhillips aims to start production in 2015.

Goals of the Eldfisk II project include increasing recovery and maintaining service from the remotely operated Embla field, which is tied into Eldfisk via a pipeline. Eldfisk, an oil field which also contains gas, is the second largest field in the Greater Ekofisk Area and is around 12.4 mi southwest of Ekofisk.

At the Ekofisk complex, ConocoPhillips has awarded Stavanger-based Rosenberg WorleyParsons an engineering, procurement, construction, and installation contract to increase capacity. Contract value is around $144 million.

Cairn confirms deepwater oil play offshore Senegal

Cairn Energy said it has a second deepwater oil discovery offshore Senegal. The SNE-1 well, which was still drilling, is in 3,609 ft of water in the Sangomar Offshore block, around 62 mi offshore. Logging confirmed hydrocarbons in the Cretaceous clastics target, of a similar age to oil-bearing sands 15 mi away in the earlier FAN-1 discovery.

Cairn's initial analysis of SNE-1 suggests the well has intersected a 311-ft gross oil-bearing column with a gas cap, with net pay of 118 ft of 32 degree API crude. Contingent resources reportedly could range from 150 to 670 mmbbl recoverable.

The well had not reached the deeper target of karstified and fractured lower Cretaceous shelf carbonates. Analysis of results from both discoveries were to be used to determine locations for follow-up wells targeted for 2015 onward.

"This is a significant oil find for Cairn and Senegal and based on preliminary estimates is a commercial discovery and opens a new basin on the Atlantic Margin," said Simon Thomson, Cairn Energy's chief executive officer.

Cairn has a 40% operated interest in the Sangomar Deep, Sangomar Offshore and Rufisque blocks offshore Senegal, in partnership with ConocoPhillips, FAR Ltd., and Petrosen.

ConocoPhillips starts production from Kebabangan off Malaysia

ConocoPhillips has begun production from the Kebabangan gas field, located 60 mi offshore Malaysia. Production is to ramp up as pipeline capacity becomes available.

"This is the third major project startup planned in Malaysia this year, with Siakap North-Petai brought onstream in the first quarter and the Gumusut-Kakap floating production facility starting up in October," said Matt Fox, ConocoPhillips' executive vice president of exploration and production.

Project startups in Malaysia are expected to add 60,000 boe per day to the company's production volumes by 2017.

The Kebabangan integrated drilling and production platform is in a water depth of 450 ft. Production from the field will initially come from six wells, with gas exported via pipeline to the Sabah Oil and Gas Terminal in Kimanis.

The field is operated by Kebabangan Production Oil Co., a joint operated company with ConocoPhillips Sabah Ltd. and Shell Energy Asia Ltd., each holding a 30% interest, and Petronas Carigali Sdn Bhd holding a 40% interest.

Nexen launches production at Golden Eagle in UK North Sea

CNOOC subsidiary Nexen Petroleum has started production from the Golden Eagle Area Development (GEAD) in the UK central North Sea. GEAD takes in the Golden Eagle, Peregrine and Solitaire fields in blocks 20/1S, 20/1N and 14/26a, and in water depths from 292 to 456 ft.

Development involved installation of separate production and wellhead platforms and two subsea production systems. Eventually 15 production wells and six water injection wells will be drilled from the facilities.

Currently two Golden Eagle wells are producing around 18,000 bbl per day of oil. At peak the project is expected to deliver 70,000 bbl per day.

Nexen has a 36.54% interest. Other partners are Maersk Oil North Sea UK (31.56%), Suncor Energy UK (26.69%), and Edinburgh Oil and Gas (5.21%).

Manora oil field comes onstream, to peak at 15,000 bbl per day

Mubadala Petroleum has started oil production from the Manora field in the northern Gulf of Thailand. Production is expected to peak at 15,000 bbl per day from 10 planned production wells with the support of five injection wells.

The field is within the G1/48 concession, about 50 mi offshore in 144 ft of water. Discovered in 2009, Manora opened up a new oil play in the northern Gulf of Thailand. The field was further appraised by drilling three wells, and field development was sanctioned in July 2012. First oil from Manora follows the hook-up and commissioning phase and drilling of the first four of as many as 10 production wells. All platform facilities were constructed in Thai fabrication yards. The facilities include a wellhead processing platform, with water injection facilities to maximize oil recovery, connected via subsea pipelines to an FSO vessel. The commercial life of the field is projected to exceed 10 years. Proved and probable reserves contained in Manora's primary reservoir, and recoverable by natural depletion,are estimated to be 20 mmbbl (gross). Mubadala said water injection will be implemented from start-up and, once its effectiveness has been confirmed by enhanced production performance, more reserves will be added. Mubadala Petroleum holds a 60% stake; Tap Energy holds 30%; and Northern Gulf Petroleum holds 10%.

McDermott delivers riser support structure for Ichthys LNG Project

McDermott International, Inc. has successfully delivered the riser support structure (RSS) for the INPEX-operated Ichthys LNG Project's subsea umbilical, riser, flowline development. Through smart engineering, McDermott said it was able to optimize the design and constructibility of the structure that translated into cost savings in both time and materials for the customer.

The innovative design concept of the structure was brought to reality by the combined expertise of McDermott's in-house Singapore-based engineering team and its fabrication facility located on Batam Island, Indonesia.

The 7,200-ton RSS connects the field's subsea infrastructure to a semi-submersible central processing facility. The RSS structure is comprised of a tower, more than 328 ft tall,

Riser support structure for the INPEX-operated Ichthys LNG Project's subsea umbilical, riser, flowline development.

with an arch 410-ft long, also designed and fabricated by McDermott to be installed at a later date, to support 25 large-diameter flexible risers and dynamic umbilicals.

"The RSS accounts for more than 25% of the total 28,700 tons of subsea structures we are fabricating for Ichthys," explained said Tony Duncan, executive vice president Subsea. "It is an integral piece of the subsea field architecture as all other subsea structures will be installed and oriented relative to its location."

In addition to the RSS, the facility is undertaking the fabrication of subsea structures including the flow line end terminations, in line tees, manifolds and riser bases.

The Ichthys project awarded to McDermott in 2012 includes EPCI and pre-commissioning of product flowline systems, a mono ethylene glycol injection system, start-up condensate transfer and fuel gas transfer flowline systems, control systems and other associated SURF elements in waters up to 900 ft. McDermott will also install mooring systems for the floating production, storage and offtake vessel and central processing facility as well as engineering for future flowlines, risers and umbilicals.

The Ichthys LNG Project is a joint venture between INPEX group companies (the operator), major partner Total and the Australian subsidiaries of Tokyo Gas, Osaka Gas, Toho Gas and Chubu Electric Power. Gas from the Ichthys field, in the Browse Basin approximately 124 mi offshore Western Australia, will undergo preliminary processing offshore to remove water and raw liquids, including condensate. The gas will then be exported to onshore processing facilities in Darwin via a 552 mi pipeline.

Eni, Sonangol to jointly develop oil and gas projects

Eni and Sonangol have signed an agreement to jointly develop oil and gas projects offshore Angola. The deal will see both firms establish a joint team to study the potential of the non-associated gas present in the Lower Congo Basin, a hydrocarbon production area located offshore Angola.

The companies will analyze several gas valorization options both internationally and in the domestic market. Both firms will also develop projects on the mid-downstream business, which will be undertaken in Angola.

Eni, which has been operating in Angola since 1980, presently has an equity production of about 80,000 boe per day. The company will also work as operator of the start-up of the deepwater Block 15/06 West Hub project, which is expected to commence by the end of this year.

Eni operates the Block 15/06 with a 35% interest, while Sonangol P&P and SSI Fifteen hold 30% and 25% stakes, respectively. Falcon Oil Holding Angola and Statoil Angola each hold 5% stakes in the block.

Studies maximizing field potential offshore Vietnam

SOCO International said the H5 development project in block 16/1 offshore southern Vietnam is on course for first oil in September or October 2015. This past September, fabrication and installation were completed of the H5-WHP (wellhead platform) 22 days ahead of schedule.

The jack-up Naga-2 started development drilling from the platform last month. It has already completed the TGT-22P well and is batch-drilling the TGT-23P and -24P wells.

TGT-22P was drilled in a manner designed to more accurately determine the distribution of gas and oil evidenced during testing of the Miocene sands on the Te Giac Trang (TGT-10X) discovery well. However, initial analysis suggests a higher distribution of oil in the upper portion of the Miocene reservoir and a more limited gas section.

Naga-2 will drill up to six H5 wells before leaving the platform in April to allow for the topsides and production pipelines to be installed and for hook-up and commissioning to proceed ahead of start-up later in the year.

Two more South Pars phases near completion off Iran

Phases 17 and 18 of the South Pars field development in the Persian Gulf are nearing first gas production. According to news service Shana, the Phase 17 platform was in its pre-commissioning stage and set to deliver sour gas by January 2015.

The two phases combined are expected to produce 50 mmcm per day of natural gas, 80,000 bbl per day of gas condensate, and 400 tons per day of sulfur. Both are operated by a consortium of Industrial Development and Renovation Organization, Iranian Offshore Engineering and Construction Co., Oil Industries Engineering and Construction Co. and SADRA Co.

Hyundai lands $1.8B EPC contract offshore UAE

ADMA-OPCO has awarded Hyundai Heavy Industries (HHI) a $1.84 billion contract for the second package of the Nasr full field development project 81 mi offshore Abu Dhabi. HHI will perform engineering, procurement, construction, installation, and commissioning for the complex that will comprise a gas treatment platform, separation platform, and accommodation platform. It also will install 89 mi of subsea power cables and 34 mi of infield cables, modify an existing manifold tower and two wellhead towers on the Nasr oil field, and implement work for power distribution facilities from DAS Island to the new complex. All tasks are to be completed in 2019. The new facilities will almost triple the field's oil production capacity to 65,000 bbl per day.

BPZ Energy commissions drilling platforms on Block Z-1 off Peru

BPZ Energy has contracted T-Rex Engineering and Construction to build two drilling platforms for the Delfin and Piedra Redonda prospects in Block Z-1 offshore Peru. Water depths at the prospects are 200 and 250 ft, respectively. Construction of the decks is under way at the T-Rex facilities in Texas, with jacket and pile construction in Louisiana. Installation of both platforms is scheduled for mid-2015.

At Delfin, BPZ is targeting oil in the Zorritos formation, which produced in the adjacent offshore Corvina field and at the Albacora field. A previous operator did test oil in the Zorritos formation. The first well will be drilled down to the Heath formation targeting additional oil reserves, according to the company.

At Piedra Redonda, the company looks to appraise gas in the Mancora formation, again discovered by a prior operator. The potentially multi-tcf formation extends onshore into block XXIII where BPZ recently tested gas.

The Piedra Redonda platform will also explore for oil in the deeper Eocene formations that the company has mapped from seismic acquired over block Z-1.

Statoil sees $200B in sales from Norway's Sverdrup field

Statoil said the Johan Sverdrup deposit will generate U.S. $200 billion in revenue over 50 years after it starts pumping oil in 2019 as the company released an environmental impact assessment.

The assessment is the first step of the development and operation plan that's expected to be handled by parliament next year, Stavanger-based Statoil said in a statement. The plan is expected to be prepared and agreed on by the partners at the start of February, Statoil said.

The Johan Sverdrup project will be developed with several platforms.

The field holds 1.8 to 2.9 boe and is one of the five largest discoveries offshore Norway, according to Statoil. Statoil said the first development phase will need investments of about $16.8 billion to $20.2 billion and produce 315,000 bbl a day to 380,000 bbl a day. Fully developed the field may reach output of 550,000 bbl a day to 650,000 bbl a day.

The field, discovered in two parts by Lundin Petroleum AB and Statoil in 2010 and 2011, is located in a mature area that has been thoroughly studied, according to Statoil. The central environmental aspects are that the field receives its power from land, that water will be purified and re-injected and that cuttings drilled with oil-based liquid will be brought ashore, or purified and discharged offshore, Statoil said.

StormGeo, Deep Sea Mooring to collaborate on weather movements

StormGeo and Deep Sea Mooring have signed an agreement to provide notifications of weather-related movements of floating offshore units and vessels undertaking complex marine operations. This innovative service will help customers save money and time, while enhancing planning and safety standards.

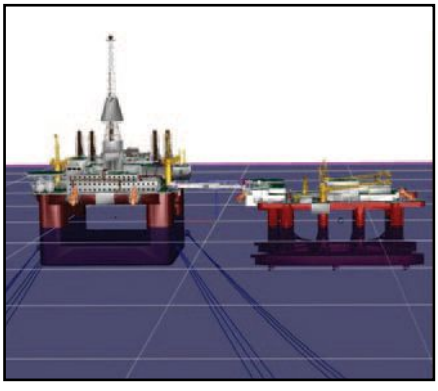
"We are delighted to sign this agreement with StormGeo," commented Åge Straume, chief executive officer of Deep Sea Mooring. "It means that together we can offer an excellent planning tool, enabling users to make early decisions regarding forthcoming marine operations and thus minimize the movement of vessels and helicopter decks. This will result in significant savings for our customers."

The notifications are made possible through the combination of detailed weather forecasts and advanced hydrodynamic models, which can identify critical movements on floating offshore units. By doing so, recipients can be alerted to the actual consequence of the forecasted weather on vessels, rather than just the weather itself.

"This agreement with Deep Sea Mooring complements and supports our ambition to deliver high quality services that facilitate optimum decision-making on weather-sensitive operations. In a time when the focus on cost saving and efficiencies is so great, it's more important than ever to combine detailed weather information with optimal planning capabilities to execute critical offshore work," noted Hogne Folkestad, vice president of offshore in StormGeo.

StormGeo will publish and support the notifications, while Deep Sea Mooring will be responsible for the hydrodynamic models and all calculations of motion resulting from the expected weather.

In principle, this high-tech approach can be used for all marine operations.



As an example, it is now possible to forecast movements and wind speeds on helicopter decks several days in advance. By doing so, it is possible to determine whether the conditions-movements are within the set landing criteria for helicopter traffic. As a result, the efficiency of planning and coordinating helicopter traffic could be significantly enhanced.

A further example is illustrated by floatels that utilize DP (dynamic positioning). Here the direction the floatel should have to minimize walkway movement can be calculated, thus increasing availability before disconnection. In addition, information regarding disconnection windows is delivered in advance, meaning the process can be undertaken in safety during calm weather, rather than, in worst case scenarios, waiting for automatic disconnection.

Other applications for the service encompass drilling operations and offshore lifting operations on floating units.

Folkestad and Straume conclude that customers will experience increased availability through the use of their technology and have a better basis for planning, decision-making and performing secure operations. This, they stress, will be important in reducing operational expenditure.

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DNV GL to study corrosion and integrity issues of aging wells

DNV GL has established a joint industry project (JIP) to develop guidelines for a decision support framework for corrosion assessment and integrity management of aging wells.

Many wells are reaching an age of 30 or 40 years, and operators are facing a growing challenge to predict output, mitigate against risk, and ultimately decide whether to retire or rejuvenate aging wells. Life extension of aging wells is moving up the agenda for oil and gas operators in many regions. Factors driving this include high oil prices, technology advances, and regulatory requirements.

"As well as dealing with the operational changes in the well's lifetime, such as long-term degradation effects, there can also be difficulties caused by uncertainty over the integrity of the well and access to design documentation; corrosion, in particular, poses a major threat to these wells," said Shamik Chowdhury, project manager at DNV GL.

He said the JIP aims to close the existing gap in well integrity management and introduce proper corrosion assessments as well as provide estimates on the remaining life of individual wells. The outcome will help operators squeeze the remaining life out of their wells safely and cost effectively, as well as to plan for decommissioning.

"The proposed guideline resulting from the JIP will provide a clear method to evaluate and manage corrosion for wells. This can be used on a field- or company-wide level to ensure that health, safety, and environment (HSE) and economical performances are balanced and that corrosion risks are sufficiently managed," Chowdhury added.

DNV GL is inviting participants to take part in the JIP, which will deliver a corrosion threat and integrity well screening assessment method, along with guidelines for a decision-making tool on corrosion evaluation, monitoring, maintenance, and inspection.

The JIP will kick off later this year and will begin through to the end of 2015 with the development of a guideline for corrosion management in wells.

Saipem awards riser monitoring system for Egina development

BMT Scientific Marine Services (BMT), a subsidiary of BMT Group Ltd., was selected by Saipem to supply the riser integrity monitoring systems for the Total Egina development located 150 km off the coast of Nigeria. Riser integrity monitoring systems measure bending moments and tensile forces in risers in order to provide end users with an understanding of the risers' condition. Data from these systems are then used to verify riser design models, ultimately leading to long-term improvements in riser design. The Egina project will feature systems that incorporate BMT's ROV-Serviceable Subsea Strain Sensor Assembly, allowing for continuous monitoring and data collection, preserving the absolute bending and tension measurement while a single sensor is removed and replaced.

BMT provides integrated marine monitoring systems (IMMS) for a wide range of floating offshore oil facilities.

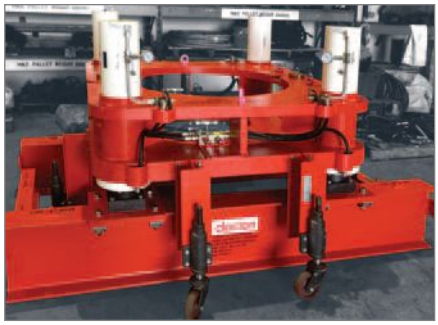
Conductor cementing support system delivers rig time savings

Claxton Engineering Services Ltd., an Acteon company, has developed a new conductor cementing support system (CCSS) that has typically saved 12 to 18 hours of rig time per conductor waiting for cement to cure.

Recently, it has become increasingly common for operators to install a jacket and batch set the platform conductors so that the topsides can be installed at a later date. The operator brings a rig over the jacket and uses it to run a conductor and then to hold the conductor in place while the cement cures: a process that typically takes 12 to 18 hours.

The Claxton CCSS secures the conductor with a hydraulic jack-and-clamp mechanism that holds the weight of the conductor while the cement cures. This means that the rig no longer has to hold each conductor, and can therefore move to the next slot and begin running another conductor.

"The CCSS has a holding capacity of 135 to 160 tons and is suitable for conductor diameters of 24 to 30 in. However, we can scale the design to any conductor size on request and tailor the footprint and weight handling capacity to specific slot or jacket configurations. The new system has a compact design and can be repositioned easily without a crane. In addition, it offers schedule flexibility because it splits in half, thereby enabling operators to run the conductor before, or after, the CCSS is in place," said Dannie Claxton, technical director.



Claxton's new tool is field proven.

"We know that every job can present new challenges and every platform installation is different, so we offer a custom design-and-build service to meet specific customer needs. The CCSS has already been used successfully in the field on projects for two major North Sea operators. We expect further interest due to the system's huge cost-saving potential."

ExxonMobil awards Alternate Path completion license to Delta Screens

ExxonMobil Upstream Research Co. has awarded Delta Screens & Filtration LLC a limited international license to ExxonMobil's Alternate Path technology patent portfolio for gravel packing cased and openhole completion wells.

Alternate Path is a patented technology developed by ExxonMobil to improve the reliability of wells completed in sand-prone reservoirs. The technology provides alternate flow paths called shunt tubes in the downhole tool used for packing gravel in the producing sections of a well.

The shunt tubes enable the Alternate Path packing operation to continue when sand prematurely blocks the well annulus, which would stop a conventional packing operation. The shunt tubes divert the gravel slurry around sand blockages and through distributed portholes to fill voids in the annulus until a complete pack is in place.

"Alternate Path technology gives us a more reliable way to gravel pack wells where we need sand control," said Delta Screens president Richard Grifno. "Alternate Path is field proven and we're very pleased to be approved as a licensee for ExxonMobil."

INDUSTRY DEALS

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

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

CGG, a Paris-listed specialist in exploration equipment and services, said it has rejected the offer. "Conditions to pursue (the approach) weren't met," the company said in a written statement.

Technip indicated that it would break up CGG, selling its underground data-collection unit that accounted for roughly 60% of the company's $3.77 billion in revenue last year.

The announcement of Technip's approach to CGG came in November, just days after Halliburton Co. of the U.S. unveiled plans to buy smaller rival Baker Hughes Inc. in a deal valued at $34.6 billion, prompting speculation that more deals in the sector were in the offing.

The industry's main competitors are rushing to buy smaller rivals to offset the effects of falling oil prices on their business. Oil-services companies typically provide equipment such as rigs, drill parts and tools, but can also undertake the engineering and construction for pipelines and projects.

BP and Hilcorp close sale of BP assets on Alaska's North Slope

Energy giant BP has closed the sale of assets related to four oil fields it operates on Alaska's North Slope, in a deal with small independent Hilcorp Energy previously announced at up to $1.5 billion.

"With the approval of state and federal regulators, Hilcorp is now the operator of the Milne Point, Endicott and the Northstar oil fields and associated pipelines," said Janet Weiss, president of BP Alaska, in a recent presentation to the Resource Development Council in Anchorage.

Houston-based Hilcorp has a history of increasing production at existing fields and expects to do so at the Milne Point field, where BP retained 50% ownership, said Weiss. "Hilcorp has indicated to us plans to increase activity and investment in Milne Point," as the company has already done after acquiring aging oil and natural gas fields in Alaska's Cook Inlet, Weiss said.

The deal with the independent included the sale of all BP's interest in the Northstar and Endicott fields. The three fields recently brought BP a total of about 20,000 net bbl of oil daily, representing about 15% of overall BP production. BP also retained 50% of the offshore Liberty oil field, a challenging play where BP has not yet achieved production.

The deal with Hilcorp was announced last spring. In mid-November 2014, BP and Hilcorp filed a request with federal regulators to make Hilcorp the operator of the field, Weiss said. BP will work

The Alaska offshore Northstar field is included in the BP-Hilcorp Energy deal.

with Hilcorp to submit a development and production plan at that field by the end of this year.

Weiss said 200 people who work for BP and support the sold assets either moved to Hilcorp with no break in employment or chose early retirement. Another 275 people will no longer be working with BP because the sale reduced the company's footprint in Alaska, Weiss said.

The changes will allow BP to remain competitive and continue to attract capital, Weiss said, as well as focus on increasing production in the giant Prudhoe Bay oil field in the Arctic and developing the Alaska LNG project, in which the state is a partner with BP and other energy companies.

Kinsale Energy to buy 80% stake in SEL 4/07 license offshore Ireland

Kinsale Energy, a subsidiary of Malaysian oil company Petronas, has agreed to acquire an 80% interest in the SEL 4/07 Celtic Sea license, offshore Ireland, from Lansdowne Oil & Gas. The deal, which was yet to be approved by the Irish government, would see Kinsale Energy appointed as the operator of the license. Kinsale Energy will fund 100% of the well-drilling costs at the Midleton prospect, with Lansdowne's share of the costs of any testing program to $2.5 million.

"We are delighted to welcome Kinsale Energy to Licence 4/07 and look forward to drilling the Midleton gas prospect," Lansdowne chief executive Steve Boldy said. "Securing a farm-in partner for Midleton is a critical first step to delivering our objective of a multi-well program in the Celtic Sea, which, in addition to exploration wells, we expect to also include further appraisal-pre-development drilling on the Barryroe oil field."

Kinsale Energy has been producing natural gas from its offshore facilities, located 50 km south of the Old Head of Kinsale in the Celtic Sea, since 1978.

Lansdowne acreage in the North Celtic Sea Basin includes a 20% stake in the Barryroe field and two exploration licenses, 5/07 (Rosscarbery) and 5/08 (Amergin). The company said the farm-out process for the other licenses is continuing to identify partners for a drilling program.

Woodside finalizes Tilapia PSC farm-in deal offshore Cameroon

Woodside has finalized an agreement with Noble Energy and Glencore to farm in to the Tilapia production sharing contract (PSC) off the coast of Cameroon.

The 3.875-sq-km (1,496-sq-mi) block is located within the Douala basin, offshore southwest Cameroon in water depths ranging from the shoreline to 1,100 m (3,609 ft).

Under the agreement, Woodside will acquire a 30% non-operating interest. Noble Energy will retain a 46.67% interest and will continue to operate the PSC. Glencore will retain a 23.33% interest.

Apache unloads south Louisiana oil and gas fields in $1.4B sale

Apache Corp. has agreed to sell its interest in about 90,000 acres of oil and gas fields in south Louisiana, part of a sale valued at $1.4 billion total, the Houston-based oil and gas exploration company said. The company did not disclose the buyer. The deal is one of several large sales Apache has announced in recent quarters as it faces investor pressure to consolidate its interests in North America.

Apache said the Louisiana acreage is primarily older fields with declining oil and gas production and a limited number of reserves to tap. The properties were producing about 21,000 boe per day, mostly natural gas and natural gas liquids such as butane, propane and ethane.

Apache said it would retain oil and gas rights for some 275,000 acres in south Louisiana. In a second transaction under the $1.4 billion deal, the company has also agreed to sell a combined 115,000 net acres in parts of its Stiles Ranch oil and gas field in Wheeler County, Texas, and in two of its western Oklahoma fields.

Both transactions were expected to close during the fourth quarter 2014.

Kongsberg Maritime launches new bathymetric image competition
Kongsberg Maritime has announced that its latest bathymetric image competition is open and will run through 1 March 2015. All Kongsberg Maritime bathymetric echosounder system users are invited to find out more and upload their images at http://kongsberg.webprosjekt.com/contest/. The best three images chosen by a Kongsberg Maritime panel of judges will win an iPad Mini. Additionally, the top 12 images will be used in the 2016 edition of the Kongsberg Maritime Subsea calendar. Kongsberg Maritime products eligible to be used for the competition include EM 102, EM 302, EM 710, EM 20140, EM 2040C and Geoswath Plus, though Kongsberg Maritime will accept images created using any of its bathymetric products. Users are positively encouraged to submit multiple entries.

Phoenix continues search for MH370
Phoenix International Holdings, Inc. (Phoenix) is under contract to DRB-HICOM Defence Technologies Sdn Bhd (DEFTECH) on behalf of the Government of Malaysia to search for Malaysia Airlines Flight 370 (MH370) in the Southern Indian Ocean, approximately 1,500 mi west of Perth, Australia. Working aboard the GO Phoenix, a DP2 offshore operations vessel owned by GO Marine Group PTY, LTD, Phoenix and Hydrospheric Solutions, LLC (Hydrospheric) conducted seafloor search operations from 5 to 16 October using the ProSAS-60 synthetic aperture sonar (SAS) system. The ProSAS-60 is a 6,000 m depth rated system owned and operated by Hydrospheric. During this 11-day search period, Phoenix and Hydrospheric personnel used the ProSAS-60 to successfully search over 1,405 sq. km (542 sq. mi) of seafloor at water depths averaging 4,100 msw. Following this search period, GO Phoenix transited to Fremantle, Western Australia, for provisioning, arriving on 21 October. Datuk Seri Hishammuddin bin Tun Hussein, the Malaysian Minister of Defence, visited the GO Phoenix while the ship was in Fremantle. GO Phoenix departed Fremantle on 27 October and resumed search operations.

Chesapeake Technology, Inc.'s SonarWiz selected for Malaysian MH370 flight search
Chesapeake Technology, Inc., (CTI) is proud to announce its flagship product SonarWiz has been selected to aid in the search for flight MH370. The team at Chesapeake Tech was encouraged to hear search efforts by the Joint Agency Coordination Centre, Australian Transport Safety Bureau and Malaysia's Department of Civil Aviation for the flight are still running strong as announced by Malaysian Deputy Prime Minister Tan Sri Muhyiddin Yassin and his Australian counterpart Warren Truss this past Friday. "It's an honor to know something our team built is a resource in the efforts to provide closure for the families of victims on the flight. Our 24/7 support team is always ready to handle whatever comes our way for this job as well as those from our other clients," said John Gann, vice president of software development at Chesapeake Technology.

Teledyne Marine Systems welcomes SeaBotix
Teledyne Marine Systems group, leading providers of undersea vehicles and subsea infrastructure, has announced that SeaBotix, part of the recent Bolt Technology Corporation acquisition by parent company Teledyne Technologies Incorporated, will join the Marine Systems group of companies. SeaBotix is a world leading manufacturer of innovative and diverse underwater observation class MiniROVs designed to perform a multitude of tasks that include maritime security, search and recovery, hull, pipeline and infrastructure inspection, hazardous environment intervention, aquaculture, sensor deployment, oceanographic research, nuclear applications and more. SeaBotix continues to deliver revolutionary advancements to its diverse portfolio of MiniROV systems that are responsive to demanding professional applications.

ROPOS installs cabled observatory off U.S. west coast

The 5,000 m rated, 40 hp Remotely Operated Platform for Ocean Sciences (ROPOS) operated by the Canadian Scientific Submersible Facility (CSSF) has completed the installation of the U.S. Regional Scale Nodes (RSN) Cabled Observatory, located off the coast of Washington and Oregon. The RSN is funded by the U.S. National Science Foundation as part of the Ocean Observatories Initiative. The cabled observatory will provide interactive real-time data from the seafloor and throughout the water column with state-of-the-art moorings that reach nearly 2,900 m above the seafloor. Data flowing from this system will dramatically increase students, researchers and policy-makers' discovery and understanding of oceanic behavior.

2014's 83-day deployment aboard the RV Thomas G. Thompson saw the installation and testing of secondary infrastructure including installation of over 30,000 lbs of equipment on the seafloor and 15,701 m of cable laid and tested by the ROPOS' Remotely Operated Cable Laying System (ROCLS), and approximately 140 diverse instruments (more than 98% of which are now sending data to shore).

With extension cables, junction boxes, instruments and deep/shallow profiler moorings operational, the observatory will very soon be providing data for the scientific community.

"The efficiency of this year's operations were unparalleled," said Keith Shepherd, General Manager of the Canadian Scientific Submersible Facility. "We had a 97.8% up-time, which enabled us to complete over 650 hours of dives and get all of the installations completed in a tight window."

The full installation of the Observatory is a testament to the successful collaboration between the University of Washington and the Canadian Scientific Submersible Facility, which has spanned almost 4 years on this project. About 900 km of electro-optical telecommunications cable installed in 2011 and seven primary nodes deployed in 2012 provide real-time two-way communication to the Internet via extension cables, which total more than 56 km in length.

For more information, visit ropos.com.

Ten Saab Seaeye Falon ROVs for the Swedish Navy
FMV, the Swedish Defence Material Administration, has ordered 10 Falcon ROVs, the biggest single order placed for an already top selling model from Saab Seaeye.

It was chosen by FMV for the Swedish Navy as the best underwater vehicle of its class for performance and price.

The contract follows orders from several other navies around the world this year.

Defence and security forces in many countries deploy the Falcon, which is also used extensively in the energy and hydro industries and in marine science.

The Falcon's winning formula comes from combining intelligent control, thruster power and precise maneuverability into a small vehicle so it can operate sensors, tooling and complex systems typically found on much larger ROVs. Easily manhandled into the water, it has five powerful thrusters that can operate in strong currents with precise control.

Its intelligent architecture means each device on the vehicle can have its own microprocessor for individual control and systems can be easily changed or added.

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

The Swedish Navy's model will have an enhanced surface control system for advanced operator control.

For more information, visit www.seaeye.com.

ATOM Work Class ROV delivered to Sistac, Brazil

The Atom light Work ROV manufactured by SMD, UK is unique in the market place. Embodying SMD's no nonsense robust approach to WROVs, Atom is similar in size to a large electric ROV, packing features normally found in much larger Work Class systems. It is capable of utilizing full size manipulators including a Titan 4 and is equipped with a suite of instruments, giving it advanced ROV dynamic positioning system. It is ultra tough and constructed from materials to withstand an arduous operational life. Its powerful hydraulic propulsion system gives it class leading in current performance

and the ability to work in high currents.

The same power train can also be used for demanding power-hungry tooling applications. Reliability and ease of maintenance is also high on the agenda. Atom's Curvetech components are designed to last but should maintenance be required, all are easily accessible with many mounted on quick release brackets for fast change out. Atom's capabilities are unmatched in this sector and for its size it packs a mighty punch.

Brazil-based Sistac has taken delivery of a 100 hp 2,000 m rated Atom system. The ROV system will be mobilized during the fourth quarter of this year and will be used initially for survey and inspection duties and provide Sistac with the capability to expand services in the future as a fully integrated tooling platform. The system is suitable for drill support, IRM, survey and construction duties, especially vessels and rigs with limited deck space. Sistac requires the latest technology on its ROVs to provide the market with efficient and high performance operations. Its vehicle has been supplied with SMD's Dynamic Positioning Control System DVECS-S, the most advanced DP system on the market. The DVECS-S is mated to a Multi-Beam Imaging Sonar and other acoustic sensors to allow a choice of object relative positioning.

"We are delighted to have delivered a new Atom to Sistac," said Michael Atkinson, SMD's sales manager. "Sistac are a new customer for SMD, and although we have had many systems operating in Brazil for a number of years, this is the first contract award from a Brazilian customer. We have also received very good feedback from operators using the Atom, which has proven to be a reliable, robust and flexible work platform."

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

Ocean Installer's Normand Vision ready for SURF job in the GoM

Ocean Installer has been awarded a contract for an umbilical installation project with Oceaneering for LLOG on the Delta House project. The location of the project is in the Mississippi Canyon Area. This marks the highly advanced construction support vessel (CSV) Normand Vision's first SURF contract in the Gulf of Mexico (GoM).

"We are very pleased that we are able to present Normand Vision to the region and demonstrate her capabilities on an interesting project," says Mike Newbury, President of Ocean Installer in the U.S.

The scope of work includes umbilical transpooling, pre-lay survey, installation of umbilical with dynamic and static sections and umbilical pull-in to the semisubmersible.

Normand Vision will use the 1800te carousel on the back deck of the vessel to install the umbilical for the Son of Bluto 2 discovery in approximately 2,000 m water depth.

The offshore installation will commence approximately 15 January 2015. The project management and engineering is located in Ocean Installer's Houston Office.

This is Normand Vision's first SURF project in the GoM after taking on several comprehensive projects on the Norwegian Continental Shelf, including for Statoil and Norske Shell where she has installed a number of flexible flowlines and umbilicals.

For more information, visit www.oceaninstaller.com.

Ennsub wins major contract to build bespoke launch and recovery system

Ennsub, the independent subsea design, engineering and technology company, has been awarded a contract worth £2 million by Benthic to build a newly enhanced and portable Launch and Recovery System to complement the latest addition to its seabed drilling and geotechnical drill fleet.

The Launch and Recovery System (LARS4) features Active Heave Compensation and 3,000 m deployment capability. It has been designed to provide Benthic and its clients with an enhanced deployment capability in deep and ultra-deepwater conditions and harsh environments. It has been configured to allow mobilization of Benthic's Portable Remotely Operated Drills (PRODs) on a wider range of vessels than was previously possible.

The contract includes the detailed design, manufacture and testing of a fully integrated launch and recovery solution, comprising a high-speed electric winch with active heave compensation, bespoke deployment system and all associated power and control systems. The work will be undertaken at Ennsub's new production facility in Teesside, UK.

The equipment, which is estimated to take around 8 months to design and build, will undergo detailed commissioning during Q2 2015 and will commence operations later that year.

Scott Macknocher, managing director of Ennsub, said: "This award reinforces our belief that an explicit understanding of end-user needs - coupled with creative thinking and technical competence - can result in industry-leading deployment solutions for our customers."

"The Benthic LARS4 aims to deliver enhanced operating capabilities over comparable units and complements Benthic's ambition as a leader in geotechnical seabed investigation."

Steve Pywell, chief executive officer, Benthic added: "Benthic is very pleased with how the LARS4 design has been developed - to provide an enhanced deployment capability over a wide range of weather conditions yet fit within a relatively small on-deck footprint. We anticipate that LARS4 will enable Benthic to deliver services to our clients more efficiently and more reliably."

For more information, visit www.ennsub.com.

OceanWorks Intl. to upgrade 3rd ADS 1000' for Italian Navy

OceanWorks International is pleased to announce that the 3rd of the Italian Navy's three Atmospheric Diving Systems (ADS), commonly referred to as HARD SUIT™ has been received at OceanWorks International's Burnaby facility. The suit is undergoing major systems upgrade bringing it to the same standards as the previous suits that were upgraded and delivered in 2012 and 2013. The improvement to the ADS is expected to be completed in March of 2015 with delivery to the Italian Navy shortly thereafter.

Taking advantage of thruster improvements and upgraded electronic systems, the engineering team at OceanWorks is enhancing the ADS in the areas of thruster and buoyancy systems, and electronics and communications systems thus returning to the Italian Navy a HARDSUIT with increased performance, improved reliability, and a decrease in the amount of technician training required.

OceanWorks is an internationally recognized subsea technology company specializing in the design and manufacture of manned / unmanned subsea systems and specialized equipment for military, oil and gas, scientific, and other marine markets. OceanWorks has been at the cutting edge of deep submergence and diving technology, operations, and support for over 20 years. We look forward to providing subsea engineering solutions to our customers for years to come.

For more information, visit www.oceanworks.com.

Tiburon Subsea takes delivery of Ocean Server AUV rental system

Tiburon Subsea takes delivery of Ocean Server IVER3-580 Autonomous Underwater Vehicle (AUV). This is the first of multiple vehicles being offered for rent to third party operators. Tiburon Subsea is implementing extensive vehicle specific AUV training programs and offering full operator support services with all their AUV rentals. "By certifying qualified operators from established companies we are enabling these companies to not only access the latest technology but to also utilize their own qualified personnel in the process. Our survey AUVs will offer cost and time effective methods to obtain superior data for small and large scale projects." states Tim Taylor CEO of Tiburon Subsea.

Tiburon Subsea provides global underwater technology rental, training and support services with a focus on Autonomous Underwater Vehicles. The IVER3-580 is equipped with L3 Klein 3500 bathymetric/side scan and Marine Magnetics-Explorer magnetometer. Tiburon Subsea is committed to servicing the growing market segments of inshore and offshore marine benthic engineering, energy, environmental as well as search and recovery sectors.

Tiburon Subsea provides turnkey fully integrated 60 to 200 m AUVs, data post-processing with industry standard software solutions, comprehensive training programs and field support. These rental AUV systems are equipped with a dependable suite of stable payload options that include integrated bathymetric sonar systems, proven navigation solutions, photo, video, magnetometers, environmental monitoring and side scan sonar.

Tiburon Subsea believes AUV rental survey packages are the future of the benthic, energy and ocean survey industries. Tiburon Subsea's mission is to support their affiliates and clients with rapidly deployable and reliable technology that is simple to operate and delivers the highest quality data.

For more information, visit www.tiburonsubsea.com.

Robot fleet successfully completes pioneering mission

The second phase of an ambitious project to gather valuable information on ocean processes and marine life using a fleet of innovative marine robots has just reached its conclusion. Co-ordinated by the National Oceanography Centre (NOC), the Exploring Ocean Fronts project took place off southwest England and saw the largest deployment of robotic vehicles ever attempted in UK waters.

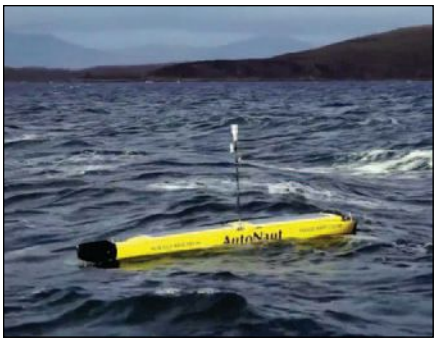
The marine robots, which are powered by a combination of wave, wind and solar power, are controlled by satellite communications and can cover hundreds of kilometers in a single mission.

In the latest phase of the project, three unmanned surface vehicles were used to track fish carrying acoustic 'pingers' off the Devon coast. About 85 fish, including rays, sole and plaice, were tagged and released by scientists from the Marine Biological Association (MBA), with the aim of understanding how these fish use Marine Protected Areas. The roaming robotic vehicles carried acoustic receivers and worked alongside a series of fixed receivers on the seabed in order to track fish movements inside and outside of the protected sites.

Commenting on the fish-tracking trial, Professor David Sims of the MBA said: "The patrolling robots successfully located tagged fish, and also tracked the movements of individual fish over several days by re-locating them. This demonstrates the potential of ocean robots for monitoring dynamic changes in distributions of commercially important fish, which will underpin effective management and understanding of climate change impacts."

The surface vehicles were also carrying camera systems that successfully imaged a variety of marine wildlife, including porpoises and gannets. It is the first time images of marine life have been captured by NOC's robotic vehicles operating far from land and demonstrates huge potential for surveying parts of the ocean that are rarely visited by research ships.

Phase one of the project saw the robot fleet head up to 150 km offshore from the Isles of Scilly over a 2-week period. Despite having to cope with a series of autumn storms, the fleet continued to collect high-quality data that have provided valuable insights into the



effect that stormy weather has on ocean processes and marine life. Head of NOC's Marine Autonomous Robotics Systems group, Dr. Maaten Furlong said: "These missions have demonstrated the ability of these new vehicles to travel hundreds of kilometers in very demanding conditions. Although some of the vehicles were impacted by the bad weather, it provided us with the opportunity to gain experience of piloting in harsh conditions".

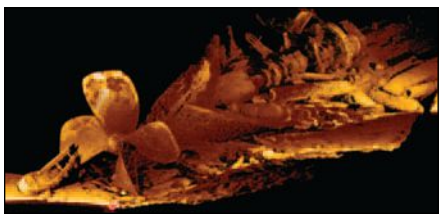
The pioneering trials were coordinated by the National Oceanography Centre, in partnership with 20 other organizations representing the marine robotics industry, research organizations, and marine data users such as the UK Met Office and the Royal Navy. Dr. Russell Wynn of NOC, who was the scientific coordinator of the project, said: "Overall the project has been hugely successful and we have collected a huge amount of valuable scientific and engineering data. By working in partnership and sharing our resources and expertise we have developed a strong UK community in marine robotic operations, and we are already planning further joint missions in the near future."

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

Monohansett shipwreck 3D scan

Obtaining detailed information of shipwreck sites is critical for generating accurate historical records.

Photography and videography can capture imagery of underwater archaeological sites, but the imagery does not provide any dimensional information. With underwater laser scanning, accurate dimensional information of archaeological sites can be captured for the creation of highly detailed historical records.



The Monohansett was a wooden freighter built in 1872. In November 1907, she succumbed to an engine room fire and sunk to the bottom of Lake Huron.

In early 2014, the National Oceanic and Atmospheric Administration (NOAA) used the 2G Robotics ULS 500 Underwater Laser Scanner to explore the Monohansett shipwreck site at the Thunder Bay National Marine Sanctuary. The scans generated by the ULS 500 provided 3D archaeological records of the site in its current condition and enabled a more detailed understanding of the wreck to be attained.

For more information, visit www.2grobotics.com.

Iceberg warning for rigs

Rigs at risk from drifting icebergs can expect an early warning following research by the Memorial University of Newfoundland.

The Autonomous Ocean Systems Laboratory (AOSL) at the University is undertaking a long-term study into modeling the behaviour of icebergs that includes acquiring real-world data that will increase the accuracy of predicting the rate and direction of their drift.

They are also finding ways to identify exceptionally deep icebergs that might drag across the seabed in shallow water and damage pipelines.

Specially designed autonomous vehicles are being developed for the role. Fitted with ice profiling sonar they will stay with an iceberg for 28 days at a time gathering data on ice thickness and volume as well as direction and drift.

To help evaluate systems planned for use on the unmanned autonomous vehicles, AOSL is using a Saab Seaeye Falcon ROV as a development platform.

Neil Riggs, senior project manager at AOSL, says the Falcon is a valuable development tool for helping understand how various payloads will behave when attached to autonomous vehicle systems.

"It was recognized at an early stage that in order to be effective in performing R&D for autonomous systems we needed an ROV tool. The acquisition of the Falcon resulted from a careful examination of the available alternatives. It was judged the Falcon suited our needs extremely well. It is a very good R&D support system for us."

The University already deploys the

Falcon for a range of tasks that include utility search and recovery and for training pilots in ROV operating.

The largest selling ROV in Saab Seaeye's range of underwater vehicles, the Falcon's winning formula comes from its intelligent control concept and from being small enough to be manhandled into the water, yet having five powerful thrusters that can handle strong currents with precise control.

This combination of intelligence, power and maneuverability means it can operate sensors, tooling and complex systems typically found on much larger ROVs.

The AOSL project has an historical perspective that started with the sinking of the Titanic, which highlighted the need for detailed tracking of icebergs. They are now monitored worldwide by the US National Iceberg Center, and the University's work will add to this resource by significantly advancing knowledge and safety concerning the predictability of their movement.

The current AOSL project will significantly increase observational capabilities of the underwater environment in harsh ice-covered and iceberg infested environments offshore eastern Canada and in the Arctic. The range of real-time data gathered will be extensive as it identifies above and below water shapes of icebergs; maximum keel shape, depth and ocean surface current field; surface to bottom current profiles; and weather in the vicinity of icebergs.

For more information, visit www.seaeye.com.

SpeedCast appointed as Inmarsat distribution partner
Inmarsat has appointed SpeedCast International Limited as a distribution partner for flagship maritime service FleetBroadband and Fleet One, its new voice and broadband data service for leisure yachts and near shore fishing boats. As part of the agreement signed, the global network and satellite communications service provider has also been appointed as a Value Added Reseller (VAR) for Fleet Xpress, Inmarsat's high-speed broadband maritime service, delivered over the new Global Xpress (GX) constellation. "SpeedCast is a valuable addition to our partner channel and strengthens Inmarsat's capabilities across Asia Pacific during a period of unprecedented investment and service development in our maritime business," said Ronald Spithout, president, Inmarsat Maritime. "Given their many years of experience in satellite communications and commitment to serving the maritime industry, including strong links into the leisure market, SpeedCast is perfectly positioned to support end-users seeking the most effective communications solutions to drive operational efficiencies and enhance crew welfare." Pierre-Jean Beylier, CEO of SpeedCast, commented, "We are very pleased to solidify our partnership with Inmarsat via this appointment; it is an extension of our existing relationship and a testament to SpeedCast's strong market position in maritime satellite services, providing communications and IT solutions to meet the unique requirements of our customers. Inmarsat's portfolio of satcom solutions, including the much anticipated Global Xpress service, will be a valuable addition to our comprehensive suite of maritime solutions." SpeedCast's maritime unit has continued its growth momentum in the marketplace across all segments of the maritime industry, including merchant shipping, offshore services, and the leisure market. SpeedCast successfully acquired SatComms Australia, an existing Inmarsat service provider, earlier this year, and has for many years provided VSAT services to Globe Wireless, which was acquired by Inmarsat in January.

Radant awarded contract for radomes and reflectors
The Radant Technologies Division of Communications & Power Industries LLC (CPI) has been awarded follow-on orders in excess of $6 million for the continued production of shipboard satellite communications radomes and reflectors. CPI Radant Technologies Division provides advanced composite radomes in several different sizes and frequency configurations for this military satcom program. These radomes and reflectors are part of a larger advanced satcom system that provides reliable maritime communications in frequencies ranging from X-band to Q-band. "CPI Radant Technologies has been the sole provider of radomes for this shipboard satcom system since its inception, and has delivered hundreds of units for this program. These additional orders signify continued confidence in CPI Radant Technologies' ability to satisfy the end users' needs and the requirements of this complex maritime program with our various product configurations," said Dr. Jean-Claude Sureau, president of CPI Radant Technologies Division. With these most recent orders, CPI Radant Technologies has booked more than $45 million to date to support this program. Production for this multi-year order will be performed at the CPI Radant Technologies Division facilities in Stow and Clinton, Massachusetts.

Synertone to offer services to yachts in HK
Following its acquisition of satellite communication resources from Thaicom Plc, Synertone Communication Corporation plans to offer a 4G mobile satellite service for the yacht market. The resources acquired by Synertone from Thaicom subsidiary Ipstar Company Ltd. cover Hong Kong and Macau. "Even though the yacht market is not as big as the marine fishery communications market in mainland China, its customers consist of high net worth individuals," Synertone said in a statement. "Up to now, there are more than 20,000 registered yachts [in Hong Kong], and the demand of the mobile satellite bandwidth will reach 2 Gbps. If the fee for each yacht is at least HK$2,500 per month, the annual income in this satellite communication market of yachts will be over HK$600 million." After acquired the "Synertone 1"- IPSTAR satellite communication resources from Thaicom, the largest satellite communication operator in Asia Pacific, Synertone has become the largest satellite resource operator in China.

MSC Cruises upgrades shipboard communications

MSC Cruises has started a fleet-wide optimization enabled by Marlink to improve shipboard VSAT (Very Small Aperture Terminal) connectivity. MSC Cruises is the first cruise line in the world to benefit from the iDX 3.2 software and X7 modem from iDirect and will receive enhanced service delivery and performance, resulting in higher throughput and richer end-user functionality for both ship management, passengers and crew.

Following successful tests of the new iDirect X7 modem in August 2014, Marlink began the complete rollout across the 12 ships of the MSC Cruises fleet in October 2014. The higher bandwidth that the new technology offers boosts data rates to create an online experience for MSC Cruises' guests that is comparable to terrestrial wireless broadband.

"Staying connected is increasingly important to our guests, so MSC Cruises wanted to enhance the onboard Wi-Fi experience by ensuring that more guests can get online at the same time," said Emilio La Scala, General Manager, MSC Cruises Technical Department. "The iDirect X7 and Marlink C-band VSAT solution secures the bandwidth and performance to provide stable services for both guests and crew."

The Marlink Global C-band iDirect service has been operational since spring 2014 on the new generation iDirect software, iDX 3.2, which is a precondition for introducing the new and more powerful X7 modem.

All MSC services using Marlink C-band, such as company headquarters and public telephony, GSM voice and data, and ship management LAN communications, are now routed over the X7 modem. iDirect's latest technology features Adaptive TDMA (Time Division Multiple Access), which enhances return channel performance and increases network availability on vessels under rain fade and satellite link degradation. X7 improves link performance significantly, enabling high-quality multi-user data connections for vessel management on C-band, and for passengers if the vessel's Ku-band services need to be switched to the Marlink C-band service.

For more information, visit www.marlink.com.

KVH triples mini-VSAT capacity in South America

KVH Industries, Inc., announced major capacity increases for its mini-VSAT Broadband network. The capacity upgrades on key South American beams have resulted in as much as three times the forward and return link capacity for KVH's maritime VSAT customers in the area.

One upgrade has boosted coverage and performance for several key markets in Brazil: the oil and gas industry, whose major production and exploration activities are centered offshore; tug-

boat and push boat traffic along the Amazon River, transporting everything from oil barges to fish, cattle, and more; and the growing international tourism industry along the Amazon River. An additional upgrade has boosted coverage and performance for markets in other parts of South America, including the salmon fishing industry in southern Chile; global merchant vessels in major ports on the Pacific coast of South America; and the mining industry throughout the continent.

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

The mini-VSAT Broadband network covers 100% of the global maritime market through a combination of 19 Ku-band transponders and three C-band beams. KVH has built this global infrastructure by leasing available commercial satellite capacity, rather than investing in its own satellites, leading to lower costs and better prices for customers. Designed exclusively for the mini-VSAT Broadband network, KVH's unique TracPhone V-IP satellite communications antenna systems are built 85% smaller than typical VSAT antennas to install more easily in all vessels. Antenna sizes range from the 37 cm (14.5 in.) diameter TracPhone V3-IP to the 60 cm (24 in.) diameter TracPhone V7-IP, and the 1.1 m (42.5 in.) diameter TracPhone V11-IP.

The expansion of the mini-VSAT Broadband network in South America follows network upgrades in other parts of the globe and supports KVH's recently introduced IP-MobileCast content delivery service. This multicasting service uses the mini-VSAT Broadband network already streaming into more than 4,000 onboard terminals worldwide to deliver a separate data stream of commercially licensed news, sports, entertainment, and training content – improving quality of life for crews aboard commercial vessels – as well as operational data such as electronic chart updates and weather information.

KVH is continually improving and enhancing the mini-VSAT Broadband network, and has a coverage expansion planned for Canada.

For more information, visit www.kvh.com.

TSBc approves Intellian v-series antennas for Thor 7

Telenor Satellite Broadcasting (TSBc) announced that Intellian's v-series antennas have been approved for use on its forthcoming satellite, THOR 7. The satellite, expected to start commercial service in 2015, is equipped with an HTS/Ka-band payload, which has been specifically designed for the mobility VSAT market, offering high-powered regional coverage with a favorable look angle over the main European shipping lanes.

The Intellian v-series antennas already support Ku-band services on the existing THOR satellite fleet, providing TSBc customers with exceptional performance and redundancy. Moreover, with its simple conversion from Ku-band to Ka-band services, the v100 antenna systems provide an easy upgrade path for THOR 7, which will offer 6 to 9 Gbps throughput with up to 25 simultaneously active spot beams and also deliver reliable download speeds in the tens of Mbps on its HTS (High Throughput Satellite) Ka-band payload. In addition to the v100, TSBc plans to work with Intellian to approve more antenna systems.

"Over the years, we have developed a good working partnership with Intellian," said Julian Crudge, TSBc's divisional director, network and data services. "The v-series antenna system was chosen as it provides a viable solution for our customers, with easy upgrade capability, ensuring that we are well prepared once THOR 7 commences service."

"Intellian has played a pivotal role in changing the industry's perception of VSAT as a viable and convenient communications solution, said Jon Harrison, Intellian's VP of global sales. "From intuitive user interfaces to ease of operation, our v-series antenna system delivers superior performance and reliability for maritime satellite-communications systems, both in Ku-band today and upgraded for next-generation Ka-band capability. Intellian is delighted to be chosen by Telenor Satellite Broadcasting as one of their approved antenna suppliers for its THOR 7 HTS Ka-band services."

TSBc's THOR 7 HTS satellite adds vital growth capacity for long-standing maritime and offshore customers, offering highly concentrated and high-powered coverage over the North Sea, Red Sea, Baltic Sea, North Atlantic, Persian Gulf and the Mediterranean.

For more information, visit www.intelliantech.com.

ARRIS SecureMedia® protects multicast entertainment service

ARRIS Group, Inc. is providing its SecureMedia® advanced content protection technology to KVH Industries, securing the company's unique IP-MobileCast satellite-based entertainment-on-demand service for ships at sea. ARRIS SecureMedia ensures that the content provided by IP-MobileCast, including popular television shows, blockbuster movies, and premier televised sport events, is only available to subscribers and is safeguarded against unauthorized access.

KVH's IP-MobileCast content delivery service is the first maritime industry service to provide an efficient and affordable way for ships at sea to receive the latest news and entertainment choices anywhere in the world. KVH's IP-MobileCast content delivery service is designed so that news and entertainment programming can be made available to every television, computer and personal device onboard a ship.

ARRIS's award-winning SecureMedia solution streamlines content processing and protection while meeting or exceeding the most stringent Hollywood studio security requirements. KVH's on-demand IP-based content is protected at all times as it is distributed via satellite to and stored on the ship's media server and then delivered to set-tops, onboard computers, tablets and smartphones.

"Our customers don't want to lose the programming they enjoy at home when they go to sea," said Jim Dodez, senior vice president for marketing and strategic planning, KVH Industries. "With ARRIS SecureMedia, our IP-MobileCast platform delivers that protected content to the device of the customer's choice, while ensuring access is restricted to appropriate parties. We began using SecureMedia earlier this year, and we are extremely happy with the quick development cycle and ease of deployment of the technology that has ensured a successful launch."

"Smartphones, tablets, connected TVs and other IP-enabled devices have fueled the 'TV Everywhere' phenomenon, changing our viewing habits and expectations," said Fred Ellis, senior director, content protection solutions, ARRIS. "KVH is addressing consumer demand with its innovative IP-MobileCast service, reaching ships at sea wherever they may be. The design and flexibility of the ARRIS SecureMedia solution allows our technology to be easily integrated and deliver the end-to-end security that is crucial to the success of any entertainment service, at land or at sea."

ARRIS SecureMedia supports a wide range of today's most popular devices and platforms, including Android smartphones and tablets, Apple iPad/iPhone/iPod devices, PC and Mac (OS X), game consoles, Internet-connected TVs, Blu-Ray Disc™ players, set-tops, and media players.

For more information, visit www.arrisi.com.

BlueTide Communications launches iOS App

BlueTide Communications Corporation announced the launch of BlueVision® — a proprietary app developed for use by BlueTide customers to monitor and manage their vessels.

From video streaming and deck snapshots to instant contact with individual vessels, the BlueVision app serves as a central touch point for fleet communication. Users can access 24/7 live video or request recorded video history of the deck, take screenshots of any potential concerns and e-mail the images directly from their iPhone, iPad or iPod touch device. Customers can use BlueVision to contact their bridge and engine rooms or call BlueTide's global Network Operating Center for additional support.

The video and camera features increase safety, augment security and reduce liability with reliable and accurate recordings of the vessel's back deck. Customers are able to keep visual logs of load size, safety strapping and personnel and make real-time adjustments if necessary. Management can also share vessel information and specs with customers and vendors directly from the app.

Offering maximum flexibility, BlueVision enhances customers' ability to maintain contact anywhere, anytime. BlueTide managing director Emil Regard says, "Our goal was to provide as much interactivity with the vessel as possible and to enable the user to share information across corporate functions as well as with their customers. BlueVision is targeted to our customers who are primarily in the office but who need to easily manage and view their fleet remotely."

For more information, visit www.bluetidecomm.com.

MTN builds Houston team to expand on O&G sector growth

MTN Communications announced it is building a business development and technical team in Houston in response to 20% year-over-year growth in oil & gas vessels served.

MTN serves the most demanding and bandwidth-intensive customers, delivering high quality communications and content solutions to the oil & gas sector for 10+ years. The company's unmatched network, experienced team, value-driven innovation and high bandwidth-level commitments are paying off. Commercial oil & gas organizations represent 32% of MTN's customer base.

"Building our Houston team is one more investment in the oil & gas sector as we serve an unprecedented number of the most data-intensive customers in the industry," said Errol Olivier, MTN CEO and oil & gas industry veteran. "Our customers tell us they sought out MTN for our extreme reliability, technology innovation and leading customer service. Thanks to that, we are proud to serve offshore sites around the world and have 100+ employees supporting them. With our recent award of the global Technip fleet, our customer confidence levels affirm our investment in Houston. We are pleased to provide the highest quality solutions to world-class organizations that operate in some of the most remote locations around the world."

Santos Venegas, general manager, and Keith Morgan, senior sales engineer, have joined the MTN oil & gas business unit from Harris CapRock. Ty Garner, business development executive, has joined from Telemar.

MTN solutions have become longstanding tools in sectors such as commercial shipping, cruise, government, ferries and megayachts. The company's global network is unmatched, meshed and redundant, enabling services ideal for global fleets and individual vessels, such as remote operated/semi-submersibles, research vessels, pipelay and derricks, and supply and multipurpose offshore ships as well as rigs and platforms. The team brings a proven ability to nimbly and flexibly anticipate, customize solutions for, and quickly address customer challenges. Oil & gas customers have schedules that constantly shift and network demands that regularly vary. The MTN Lean Six Sigma approach to

issues resolution enables quick recovery, safety, operational excellence and continuous improvement.

In addition, the MTN Network Operations Center is responsive, flexible and manned 24/7/365 with knowledgeable, experienced technical support staff. Organizations needing communications and content in some of the most far-reaching locations around the world rely on MTN for End-User Products (Internet, voice, live global TV and events streaming and mobile apps), Enterprise Solutions (crew welfare tools, Web portals and video conferencing), and Technical Solutions (network management, ship tracking, onboard diagnostic tools and bandwidth optimization).

For more information, visit www.mtnsat.com.

Airbus expands its Field Service Alliance network

Airbus Defence and Space has expanded its Field Service Alliance (FSA) with the recent appointment of five new certified partners. Launched in March 2014 to ensure fast, professional and cost-effective VSAT (Very Small Aperture Terminal) installation and service support for maritime VSAT satellite service providers, the FSA now has 10 strategically positioned member companies worldwide.

Recently joining the Airbus Defence and Space owned Marlink and the initial FSA partners Pro Nautas Marine Electronics (Germany), Livewire Connections (UK) and SRH Marine (Greece) is Mackay (eight locations in the USA), Arion Communication (South Korea & Japan), Waldo System (South Korea), Jason Electronics (Singapore), Aage Hempel (Spain, The Netherlands) and Radiomar (Brazil).

The recent expansion of Alliance partners means the FSA has achieved a truly global reach covering most shipping HUBs worldwide. With close to 40% growth in the number of Airbus Defence and Space VSAT installations in 2014 compared to 2013 and continued growth forecast for 2015, the FSA supports Airbus Defence and Space's service provider partners to deliver highly reliable VSAT services across the globe.

Engineers from all FSA members have received or are in the process of receiving in-depth training on the hardware solutions and technical solutions used by Airbus Defence and Space and its Pharostar maritime VSAT services. The company also provides a "train the trainer" program so members can expand their base of FSA certified engineers across locations in their home countries or international offices. Aage Hempel is the first member to take advantage of this program.

FSA certified partners will provide the complete range of installation and technical service to ensure uninterrupted operation of Airbus Defence and Space's VSAT services. This includes installation, demobilization, repair, upgrade, replacement and maintenance of VSAT equipment. The FSA is a core aspect of the Airbus Defence and Space AuroraGlobal portfolio, which offers a multi-band service approach to maritime VSAT, with significant flexibility for operation on Ku, Ka and C-band networks.

For more information, visit www.airbusdefenceandspace.com.

Cobham Satcom sells 40,000th SAILOR FleetBroadband Unit

Cobham satcom has sold its 40,000th SAILOR FleetBroadband system to Chinese partner CTTIC. With the focus on new Fleet Xpress Packages at the recent Inmarsat Conference in Malta, Cobham SATCOM's de facto industry standard SAILOR FleetBroadband range will continue to be an essential component for efficient, reliable global connectivity for merchant and offshore vessels.

With over 40,000 SAILOR FleetBroadband terminals sold so far, many will be used as vessels upgrade to Fleet Xpress, but Inmarsat's new generation services are also expected to drive demand still further for Cobham SATCOM's leading L-band product line.

For Inmarsat's forthcoming HTS service, Cobham SATCOM's new SAILOR Global Xpress antennas take the lessons learned from developing, building and delivering 40,000 SAILOR FleetBroadband systems and the unique SAILOR 900 VSAT Ku-band platform, resulting in a sophisticated, reliable and easy-to-install and manage solution for Inmarsat's forthcoming Ka-band service.

For more information, visit www.cobham.com.

Tekmar wins Westermeerwind contract
Market-leading cable protection specialist, Tekmar Energy, has been awarded a major contract by VBMS to supply its latest innovation, TekTube®, to the prestigious Westermeerwind near shore windfarm project in the Netherlands. The contract award comes less than 3 months after the company demonstrated TekTube at the Offshore Renewable Energy Catapult's (ORE Catapult) National Renewable Energy Centre in Blyth, Northumberland. Tekmar will be supplying cable installation contractor, VBMS (formerly VSMC), with 92 of its systems next summer to protect the cables into the 48 j-tubeless monopile foundations for the Siemens' EPC (engineering, procurement and construction) project. TekTube is the latest in subsea cable protection systems and was specifically designed as a solution for future projects to continue to help drive down cost reduction, improve offshore installation rates and ensure cable integrity for the service life typically 25 years. James Ritchie, chief executive officer at Tekmar, said: "We are most pleased to be working closely with VBMS on our 16th contract together. The project also marks a key business milestone as it will be the first time we supply our new patented technology TekTube and it will be assembled within our new facility in the north east of England which was launched earlier this year." Westermeerwind represents the 32nd offshore wind project that Tekmar has worked on to date, supplying its patented solutions to the market since 2008, and follows a string of recent wins on the UK's Dudgeon wind farm, Cape Wind in the U.S. and Luchterduinen in the Netherlands. With more than 28 years' experience, Tekmar is a market leader in the design, manufacture and supply of subsea cables, umbilicals and flexible protection systems for the renewable energy and oil & gas industry. TekTube has been designed for installation onshore rather than offshore. The system is then transported to the offshore wind farm site to be secured to the turbine foundation, sealed and prepared to be received by the cable installation vessel. The work before TekTube is deployed offshore offers significant savings on installation vessel time and, ultimately, costs.

JDR wins hybrid power steel umbilical contract
JDR has won a contract for the design and manufacture of a hybrid power steel umbilical from Wintershall Noordzee B.V. This umbilical will be deployed to the Ravn field development in the North Sea. JDR's scope of work includes delivery of an 18.2 km umbilical that will provide power and control, connecting a new platform to an existing platform for long-term well testing off the Danish coast. The composite umbilical is composed of hydraulic hoses, super duplex steel tubes, MV power cores, and fiber optic cables. Additionally, JDR will provide the subsea hardware as well as life-cycle support through their Global Service division. The umbilical will be manufactured and loaded out at JDR's deep-water, quayside Hartlepool facility and will be delivered to the Ravn field in the North Sea. Delivery is scheduled for the third quarter of 2015. Carl Pilmer, EMEA Umbilical Sales Director for JDR, comments: "We are extremely proud to be working with Wintershall on this Ravn project. We have a long history of umbilical and cable delivery to North Sea developments. This project is yet another testament to JDR's design and manufacture expertise."

Environmental study begins for Canary Island cable
Red Eléctrica de España has begun environmental and geophysical research in the Bocaina Strait, between the islands of Lanzarote and Fuerteventura, for a new submarine electricity interconnection between the towns of Playa Blanca and Corralejo. There is currently a 66 kV submarine cable between Lanzarote and Fuerteventura, which was put into service in 2005. It is 14.5 km in length and transports electricity in alternating current at a voltage of 66 kV. The strengthening of the interconnection with a new 132 kV link was approved by the Council of Ministers on 6 June and is essential for achieving a more stable and robust electricity system, moreover it promotes the sustainability of the electricity system that connects the islands. The aim of these environmental and geophysical survey works is to study a section of coastline that is approximately 90 sq. km as well as the corresponding land areas up to the connecting substations, to detect areas of greater environmental quality and thus design a cable route that minimizes the effects on the terrestrial and marine environment. This new link will also favor the integration of renewable energy into the electricity system of the islands.

Isles of Scilly cable completed

Superfast fiber optic broadband has arrived on the Isles of Scilly making them "some of the best connected islands in the world."

The multi million pound project, one of the most ambitious ever undertaken in the UK to bring superfast broadband to a remote community, has just been completed with the first customers already using the high-speed technology. Isles of Scilly households and businesses now have access to broadband speeds up to 80 Mbps, which is 10 times faster than the previous maximum of up to 8 Mbps.

A 939-km cable between Porthcurno, Cornwall, and Santander, Spain, which had remained unused on the seabed of the Atlantic Ocean since 2006, was diverted to the Isles of Scilly during a month-long operation involving the 12,184-ton cable ship Resolute.

The Resolute cut the cable at two points in the Atlantic–about 100 km and 15 km off Lands End–and diverted a section to the Isles of Scilly. The cable was pulled ashore at Porthcressa Beach on the main island, St Mary's, during the summer. The cable, which is in very good condition, had been used to carry high-speed international communications for 11 years until it was taken out of service in 2006.

The laying of the cable from the mainland was just part of the ambitious project. Engineers from BT's local network business, Openreach, have also been busy installing a new network on the isles and building new links between the five inhabited islands. New fiber optic cables have been laid from the main island, St Mary's, to Tresco and between Tresco and Bryher, whilst new microwave radio links have been used to provide the same fiber broadband services for St. Agnes and St. Martins.

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

For more information, visit www.btplc.com.

Cables installed in the Bay of Fundy for power project

The Fundy Ocean Research Center for Energy (FORCE) has laid four submarine power cables along the seafloor of the Minas Passage, in the Bay of Fundy, giving FORCE the largest transmission capacity for tidal power in the world.

The four cables, with a combined length of 11 km, have a

total capacity of 64 MW, equivalent to the power needs of 20,000 homes at peak tidal flows.

"We are incredibly proud of this accomplishment–it puts Nova Scotia at the front of the line globally for in-stream tidal energy capacity," said Tony Wright, general manager of FORCE.

The operation lasted almost 4 weeks, from mobilization through sea trials and finally cable deployment. The final cable was deployed 28 October. Each 34.5 kV cable, together with its reel, weighed over 100 tons.

"Our team has planned and prepared this operation for 2 years," said FORCE chair John Woods. "It's extraordinarily gratifying to have the final piece of the puzzle in place."

"Our Government is investing in clean technologies that build the economy while also protecting our environment," said the Hon. Greg Rickford, Canada's Minister of Natural Resources. "This project will harness power from the world's highest tides, providing clean energy and high-quality jobs for people in Nova Scotia. We are proud to have contributed to its success."

"This is an exciting step that international tidal developers have been waiting for," said Nova Scotia Energy Minister Andrew Younger. "There is a tremendous amount of expertise and precision required to lay a subsea cable in the challenging conditions of the Bay of Fundy. Nova Scotia companies have been involved in this work every step of the way, and have gained the skills and knowledge to help them reach global markets. Our tidal resources, particularly in the Bay of Fundy, will make a significant contribution to the province, as a growing economic generator with export potential and as a new power source."

Over 25 personnel were directly involved in planning, mobilizing, surveying, and installing the cables. The project used expertise from Nova Scotia, the Maritimes and abroad. R.J. MacIsaac Construction acted as lead contractor for marine and onshore activity. The other companies involved in the cable installation include Seaforth Geosurveys (survey support), Strum Engineering (electrical engineering support), ETA (subsea cable specialists), Hughes Offshore and Shipping Services, Irving Equipment Ltd. (cable loading), Northumberland Electric, and Rafes Construction.

For more information, visit www.fundyforce.ca.

Prysmian to strengthen submarine cables production capabilities

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

The investments follow the initial €40 million already invested in Finland in 2012 for the start-up of the submarine cables production unit in Pikkala. In particular, the plant started producing transmission cables for HVDC (High Voltage Direct Current) power systems that allow large amounts of energy to be transmitted over long distances and the expansion of production capacity. In

Arco Felice an additional €50 million was invested in the period 2012/2014 to increase capacity for the production of mass impregnated cables (both paper and PPL).

These new investments have been driven by a contract worth approximately up to €730 million, awarded to the company by 50Hertz Offshore GmbH in May 2014 to design, produce and install the power cable systems for the offshore wind park cluster West of Adlergrund in the German Baltic Sea.

"The realization of major renewable energy development projects in Northern Europe, involves also the development of suitable new power transmission connections, especially for offshore wind farms," explained Massimo Battaini, Prysmian Group's senior vice president energy projects. "Prysmian is world leader in this field and in order to support the demands of this growing industry it is engaged in a major investment program to strengthen its production capabilities and maintain its technological leadership."

Over the years, the Group has increasingly broadened the range of products and services offered in the fields of renewable energy and power interconnectors and now it can rely on three production facilities dedicated to submarine cables: Arco Felice (near Naples) in Italy, Pikkala in Finland and Drammen in Norway. Prysmian also owns and operates two installation vessels, Giulio Verne and Cable Enterprise, as well as well-proven in-house cable protection equipment. With this extended footprint, the Group is able to serve the market as the reference partner for the interconnection of offshore wind parks to mainland grids with a full offer of products ranging from medium voltage inter-array cables, to HVAC and HVDC export cables and turn-key EPC installation services.

Within its portfolio, Prysmian Group has an ever increasing track record of offshore wind power connections, with projects either completed or on-going in Denmark, Holland and the UK as well as the HVDC connections to shore for the BorWin2, BorWin3, HelWin1, HelWin2, DolWin3 and SylWin1 mega wind farm hubs in Germany, forming part of the most important program for the development of renewable energy in Europe.

For more information, visit www.prysmiangroup.com.

Angola Cables to host DGM at PTC '15

Angola Cables will be hosting an exclusive Data Gathering Meeting (DGM) from Pacific Telecommunications Council's signature annual event, PTC '15 on Tuesday, January 20 from 8:00 to 10:00 AM HST, in the Nautilus 2 Room at the Hilton Hawaiian Village.

The DGM will focus on updating and educating the audience – many of whom are carrier and cable operators, content providers, capacity buyers, and other submarine cable and telecom industry executives – on Angola Cables' South Atlantic Cable System (SACS) and Monet submarine cable networks.

Angola Cables previously hosted a DGM at PTC '13 when the SACS network was first announced, which received an overwhelmingly positive response from the dozens of telecom industry executives in attendance.

The SACS network is being constructed between Angola on the West Coast of Africa across the South Atlantic to Fortaleza, Brazil. SACS has come to be recognized as one of the most innovative and unique routes in the subsea cable industry. It is the first fiber optic D-WDM submarine cable system directly linking Africa and Latin America and will help to spur international trade and economic growth in both continents.

The network provides unique, secure low latency routing avoiding current bottleneck locations by routing via Africa and Asia to the United States and Europe. Upon completion, this new route will provide the global carrier community, content players, and low latency sensitive customers security through a diverse route via the Southern Hemisphere.

The Monet network, which connects Brazil to Florida via Miami, Fortaleza and Sao Paulo, was designed specifically to accommodate the growing demand for low latency routing in the Latin American market.

"Since we first announced our intention to build the SACS and Monet networks, we have been working diligently to make the routes fully operational and efficient for the global carrier and content community," said Antonio Nunes, CEO of Angola Cables. "We look forward to providing all of the guests in attendance at our DGM with a first look at the latest market trends, pricing insights, and demand analysis surrounding these routes."

The event will be co-produced by APTelecom, the official International Sales Manager and Pre-Sales agency of record for Angola Cables.

The event will feature a range of special content, informational exchanges, insights from industry executives as well as open Q&A sessions with attendees. All guests will receive breakfast compliments of Angola Cables.

For more information, visit www.angolacables.co.ao.

GBI, SAMENA launch submarine working group

A new working group aims to foster the dialogue between telecom industry peers and to raise awareness about issues related to the subsea cable industry inter-regional connectivity as well as domestic and international infrastructure convergence.

SAMENA Telecommunications Council and GBI, a leading service provider that owns and operates a major subsea cables system with a carrier neutral global network connecting the world to the Middle East, jointly launched the reformed Submarine Cable Working Group (SSCWG) during the CMO summit held in Dubai in the presence of SAMENA Council members, industry experts and guests. SAMENA Telecommunications Council is the region's sole operator-driven industry association that represents telecommunications service providers from around the region, and beyond.

Ahmed Mekky, CEO and board member of GBI who is also the chairman of the SSCWG, said, "We are pleased to be part of the dialogue that promotes growth of the subsea industry and focuses on the latest technology trends, best practices and challenges. Being part of a forum that raises awareness about the role of the subsea industry within the larger ecosystem is a step forward to the establishment of a greater platform for knowledge exchange between all industry stakeholders."

On his part, Mr. Bocar A. BA, CEO of SAMENA, said, "The role of SSCWG in providing expertise on key marine communication issues will be of great value to all industry peers. We welcome the reformed working group and the SAMENA members who will forge synergies and enhance the subsea cable industry dialogue by contributing ideas, knowledge and a diversity of experiences."

The role of SSCWG will be to promote and foster regular communication and dialogue between SAMENA

Council's membership and regulators, policy-makers and other governmental bodies throughout the SAMENA (South Asia - Middle East - North Africa) region. The SSCWG will address practical issues and focus on serving the stakeholders, including cable owners and operators, as well as the SAMENA community, by actively working the issues of the day.

The group will provide subject matter expertise and a forum to deal with issues particular to the region and provide ideas that serve operators individually and collectively.

For more information, visit www.gbiinc.com.

Nexans' cable ship refitted for record installation job

Nexans has refitted its cable ship Nexans Skagerrak to deploy a record-breaking submarine power cable in Spain. The cable will create a new 100 MW power connection between Ibiza and Mallorca. At 119 km, it is the world's longest 3-phase XLPE submarine cable, weighing almost 7,000 tons.

REE, Red Eléctrica de España, which operates the Spanish power system and owns the power grid, ordered the 90 million Euro cable link between Ibiza and Mallorca for the latest phase in a project to link the Balearic Islands to the mainland grid on the Iberian Peninsula. This will provide the islands with a more reliable, energy efficient and lower emission power supply.

The 119 km cable, designed, manufactured and installed by Nexans, features state-of-the-art XLPE insulation. It will set two world records for both the longest 3-core high-voltage (132 kV) AC connection and the deepest at 800 m. The cable was spooled from Nexans' specialized submarine cable in Halden, Norway, and over onto the vessel's turntable to a height of 7 m and a diameter of 29 m. It is now heading for the Mediterranean where it will be installed ready for commissioning in 2015, according to the project schedule.

During 1 year of manufacturing, Nexans' high voltage laboratory at Halden conducted almost 100 tests of various cable lengths and end samples. The cable design has also been tested to an output sufficient to provide 60,000 households with electricity, equivalent to twice the consumption of a small town. The huge length of the cable made a number of the processes involved more demanding, as seemingly minor variations result in major fluctuations over a long continuous length.

"The record breaking single length of cable involved has made this a very challenging project for Nexans, said Dirk Steinbrink, senior executive vice president high voltage &

underwater cable business group. "So far everything has run to schedule with the cable passing its final test, the Factory Acceptance Test (FAT), and we are delighted to be starting the delivery and installation phase."

For more information, visit www.nexans.com.

Xtera pushes subsea innovation

Xtera Communications, Inc. will further push the technical limits of undersea telecommunication systems by awarding a research contract to Fraunhofer HHI, a world leading research center for telecommunications in Berlin, Germany.

Xtera and HHI have developed a long-standing relationship over the last 10 years that has led to multiple advances for the subsea cable system industry. One example of this is the 2007 development of 20G QPSK modulation format for increasing channel rate beyond 10G, which was the standard for subsea cable systems. Xtera and HHI are planning to further explore how telecommunications systems – and in particular long-haul submarine cable systems – can carry more capacity to meet the ever growing demand for bandwidth at minimal cost per transmitted bit. The work will be based on Xtera's latest innovative submerged repeater, which utilizes Raman optical amplification technology to offer extended spectrum and longer spacing between repeaters.

"With this foundation, there are numerous opportunities to materialize on other recently developed transmission and coding technologies," said Ronald Freund, head of photonic systems development at HHI. "These technologies have been mastered by HHI for many years for different applications and the project aims at supporting Xtera in developing advanced system designs for future submarine networks at channel data rates of 400 Gbps or 1 Tbps, and beyond. The research activity will combine numerical and experimental works, which will include lab and field work to optimize and validate transponder designs, modulation formats, fibers, or coding schemes."

"The successful relationship with HHI is a perfect complement to our in-house research teams and facilities in the US and UK," said Stuart Barnes, senior vice president of Xtera and general manager of Xtera submarine business. "It fits extremely well with our company's lean and efficient business model and allows us to maintain a leading edge as an innovator in this industry."

Backed by 15 years of experience in long-haul optical transmission and subsea cable project management, Xtera offers complete turnkey solutions for the construction of new submarine cable systems, including the supply and installation of submerged infrastructure. This turnkey offering also includes the recovery and redeployment of existing submarine cable systems. With deployments across five continents, Xtera helps its customers expand and accelerate their market reach with new deployments and extend the life of existing network assets with cost-effective upgrades.

For more information, visit www.xtera.com.

PGASCOM selects Coriant to expand capacity

Coriant announced that PGASCOM has chosen the Coriant™ hiT 7300 Multi-Haul Transport Platform to expand the capacity of its long haul submarine cable network that links Jakarta and Singapore. The hiT 7300 is a high-performance optical transport platform optimized for reliable and efficient transport in regional, long haul and ultra-long haul terrestrial and subsea networks. PGASCOM selected the future-proof hiT 7300 platform based on its ability to seamlessly increase network capacity, support flexible network configurations, and deliver unmatched reliability.

Widely deployed in the most demanding transport networks in the world, the hiT 7300 delivers superior density and reach, photonic mesh for enhanced resiliency and agility, and cost-effective scalability to 100G and beyond. The hiT 7300 will help PGASCOM improve optical performance in its Jakarta to Singapore long haul link and reliably expand network capacity in a pay-as-you-grow fashion to meet the evolving service demands of its end-user carrier customers. Key benefits of the Coriant solution include reduced latency, simpler operations due to a reduction of equipment at cable landing sites, and higher availability due to advanced optical layer management and mesh restoration.

The hiT 7300 is also a key component of the Coriant Dynamic Optical Cloud™ solution, which combines a flexible transport infrastructure, dynamic network control based on the Coriant Transcend™ SDN Solution, and integrated network planning to ensure that our customers are maximizing their network revenue by supporting differentiated services over an efficient transport network both today and long into the future.

For more information, visit www.coriant.com.

EIG completes first phase of 100G upgrade with Ciena

With demand for increased data services between Europe and Asia expected to grow at an average of 38% per year in the next six years, the Europe India Gateway (EIG) consortium is multiplying the capacity on its international submarine cable system. Ciena® is providing EIG an end-to-end multi-Terabit upgrade that will enable a flexible supply of network capacity. Ciena's intelligent control plane and switching technologies will also ensure that the EIG network is equipped with the programmability to scale on-demand in the future. As the first direct, high-bandwidth optical fiber submarine cable system from the UK to India, the EIG upgrade, with OTN and Mesh capabilities, ensures service reliability and enables transparent, data friendly services to support the growing demand for Internet connectivity and bandwidth-intensive applications such as e-commerce, data, video and voice services.

The EIG cable system, spanning approximately 15,000 km, connects 12 countries across three continents, enhancing capacity and providing much needed diversity for broadband traffic connecting Western Europe with the Mediterranean, Middle East, Africa and India. Given the strategic importance of this network corridor this network upgrade allows EIG's consortium members to satisfy their immediate needs for redundancy and resiliency in their network architectures. The first phase of the EIG cable upgrade - from the UK to Djibouti - is complete, with phase two - enhancing the cable capability to India - underway.

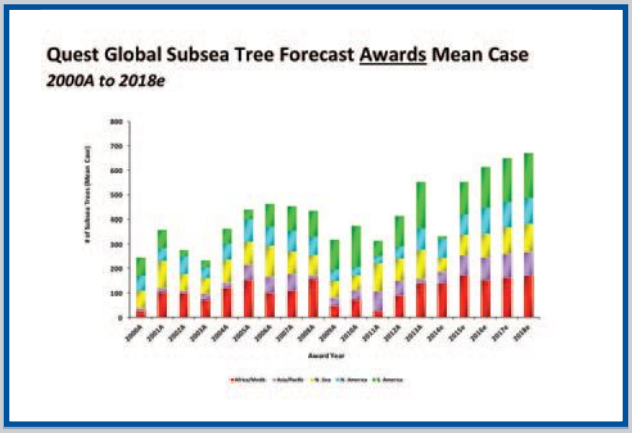
Ciena's GeoMesh submarine solution, using the OneControl Unified Management System, combined with the 6500 Packet-Optical Platform and optical bypass, gives EIG an end-to-end view of both its terrestrial and submarine networks. The 100G wavelengths installed for EIG will be able to seamlessly offer 10G and 100G services.

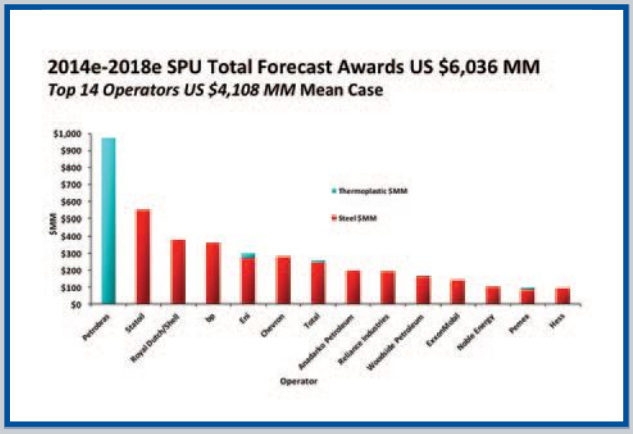
For more information, visit www.ciena.com.

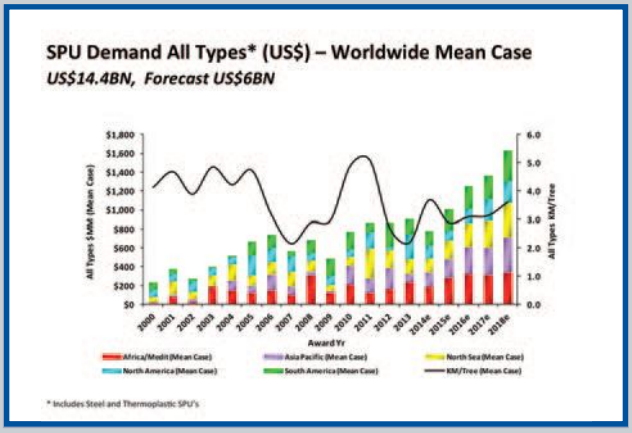
OFFSHORE STATS & DATA

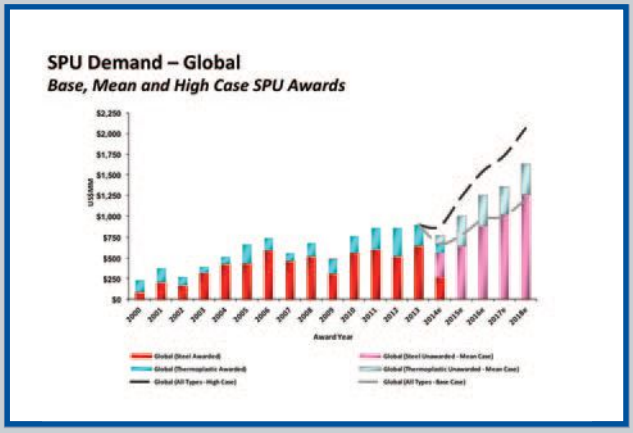
Offshore At-A-Glance

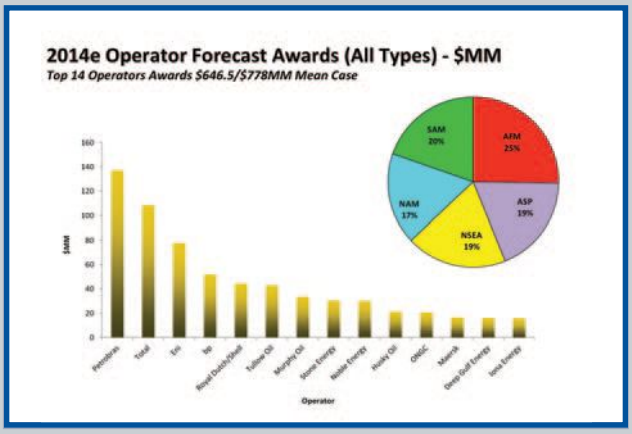
Quest Offshore Activity Report

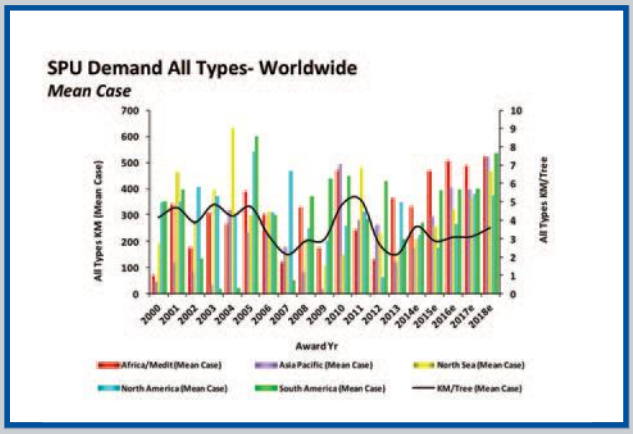












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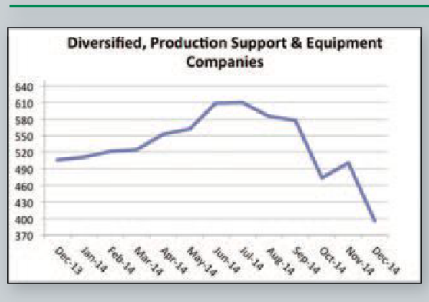
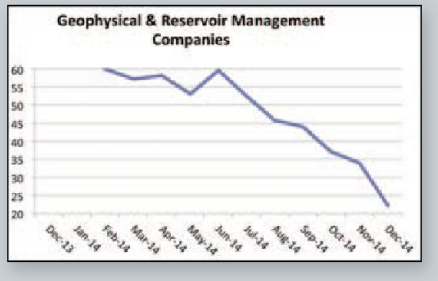
www.QuestOffshore.com • www.SubseaZone.com • www.FloatingProductionZone.com

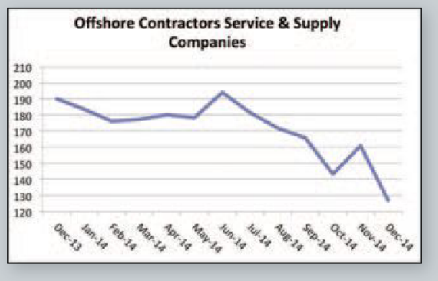
Monthly Stock Figures & Composite Index

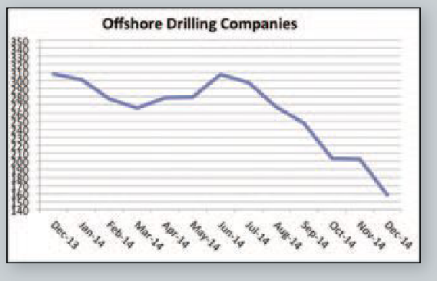
Industry Company Name	Symbol	Close(*Mid*) *December*	Close(*Mid*) *November*	Change	Change %	High 52 week	Low 52 week
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	54.93	66.25	-11.32	-17.1%	75.64	47.51
Cameron Intl. Corp.	CAM	45.33	57.87	-12.54	-21.7%	74.89	45.29
Drill-Quip, Inc.	DRQ	70.00	86.45	-16.45	-19.0%	116.53	69.67
Halliburton Company	HAL	37.82	49.78	-11.96	-24.0%	74.33	37.46
Tenaris SA	TS	28.18	36.37	-8.19	-22.5%	48.45	28.17
Newpark Resources, Inc.	NR	8.41	11.95	-3.54	-29.6%	13.60	8.38
Schlumberger Ltd.	SLB	79.90	96.34	-16.44	-17.1%	118.76	79.73
Superior Energy Services, Inc.	SPN	17.19	24.01	-6.82	-28.4%	37.05	17.12
Weatherford International, Inc.	WFT	10.32	16.38	-6.06	-37.0%	24.88	10.12
Deep Down, Inc.	DPDW	0.75	1.05	-0.30	-28.6%	2.25	0.72
FMC Technologies	FTI	42.75	54.60	-11.85	-21.7%	63.92	42.70
Total Diversified, Production, Support and Equipment		**395.58**	**501.05**	**-105.47**	**-21.0%**	**650.30**	**386.87**
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	10.49	15.89	-5.40	-34.0%	34.90	10.46
Mitcham Industries, Inc.	MIND	5.69	9.50	-3.81	-40.1%	17.82	5.59
Compagnie Gnrale de Gophysique-Veritas	CGV	6.11	8.52	-2.41	4.50%	20.09	5.50
Total Geophysical / Reservoir Management		**22.29**	**33.91**	**-11.62**	**-34.3%**	**72.81**	**21.55**
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	26.76	36.50	-9.74	-26.7%	53.90	26.48
Diamond Offshore Drilling, Inc.	DO	35.27	36.35	-1.08	-3.0%	58.82	26.25
ENSCO International, Inc.	ESV	26.41	39.08	-12.67	-32.4%	62.08	35.96
Nabors Industries, Inc.	NBR	10.28	16.55	-6.27	-37.9%	30.24	15.32
Noble Drilling Corp.	NE	20.67	20.67	0.00	0.0%	30.24	9.91
Parker Drilling Company	PKD	2.62	3.98	-1.36	-34.2%	8.67	2.58
Rowan Companies, Inc.	RDC	20.10	23.76	-3.66	-15.4%	35.38	19.50
Transocean Offshore, Inc.	RIG	16.25	26.00	-9.75	-37.5%	49.58	16.19
Total Offshore Drilling		**158.36**	**202.89**	**-44.53**	**-21.9%**	**328.91**	**152.19**
Offshore Contractors, Services, and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	20.21	26.91	-6.70	-24.9%	28.00	19.44
Gulf Island Frabrication	GIFI	18.76	22.23	-3.47	-15.6%	24.87	16.43
McDermott International, Inc.	MDR	2.31	4.23	-1.92	-45.4%	9.36	2.28
Oceaneering International	OII	57.49	68.82	-11.33	-16.5%	79.75	57.48
Subsea 7 SA	SUBCY.PK	8.86	11.74	-2.88	-24.5%	21.10	8.82
Technip ADS	TKPPY.PK	14.44	18.92	-4.48	-23.7%	28.75	14.25
Tetra Technologies, Inc.	TTI	5.02	8.14	-3.12	-38.3%	13.43	4.90
Total Offshore Contractors, Service, and Support		**127.09**	**160.99**	**-33.90**	**-21.1%**	**205.26**	**123.60**
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	69.27	74.90	-5.63	-7.5%	92.36	68.98
Gulfmark Offshore, Inc.	GLF	20.12	29.61	-9.49	-32.0%	50.70	19.66
Bristow Group	BRS	58.58	70.20	-11.62	-16.6%	81.60	58.52
PHI, Inc.	PHII	36.00	40.70	-4.70	-11.5%	52.98	33.50
Tidewater, Inc.	TDW	28.71	37.52	-8.81	-23.5%	60.47	28.60
Trico Marine Services, Inc.	TRMAQ.PK	12.80	13.50	-0.70	-5.2%	10.39	13.77
Hornbeck Offshore	HOS	19.53	30.63	-11.10	-36.2%	53.51	19.32
Total Offshore Transportation and Boat		**245.01**	**297.06**	**-52.05**	**-17.5%**	**402.01**	**242.35**

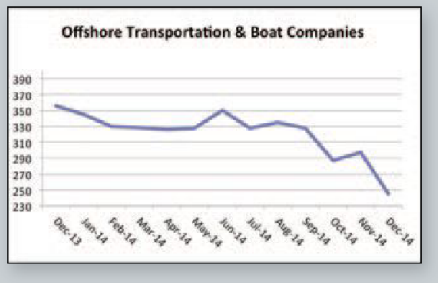
Monthly Stock Figures & Composite Index

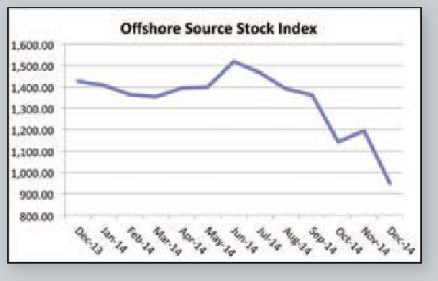












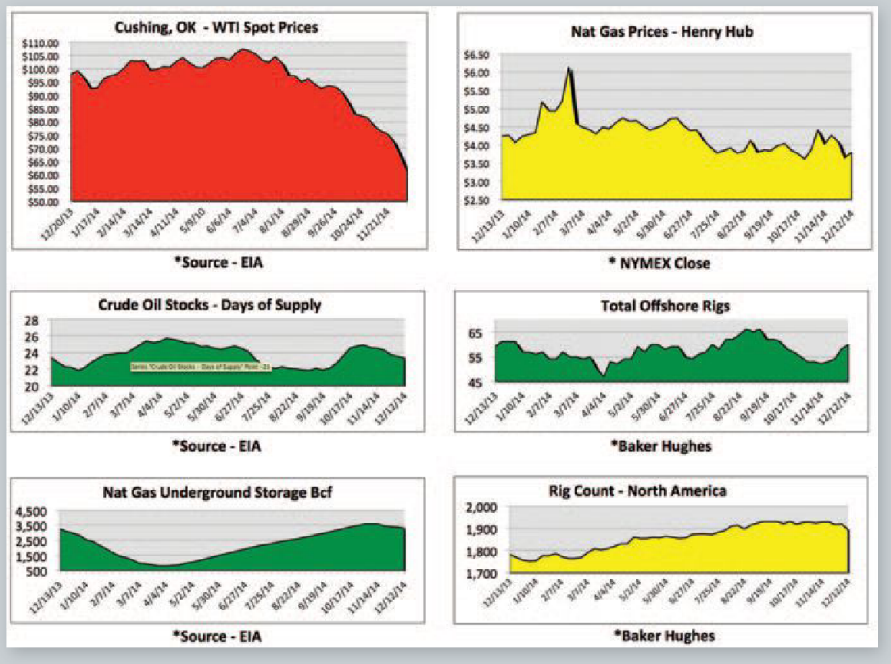
Industry	Close(*Mid*) *December*	Close(*Mid*) *November*	Change	Change %	High 52 week	Low 52 week
Total Diversified, Production, Support and Equipment	395.58	501.05	-105.47	-21.0%	650.30	386.87
Total Geophysical / Reservoir Management	22.29	33.91	-11.62	-34.3%	72.81	21.55
Total Offshore Drilling	158.36	202.89	-44.53	-21.9%	328.91	152.19
Total Offshore Contractors, Service and Support	127.09	160.99	-33.90	-21.1%	205.26	123.60
Total Offshore Transportation and Boat	245.01	297.06	-52.05	-17.5%	402.01	242.35
Total Offshore Source Index	948.33	1,195.90	-247.57	-20.7%	1,659.29	926.56

DISCLAIMER

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

Oil & Gas Industry Trends

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



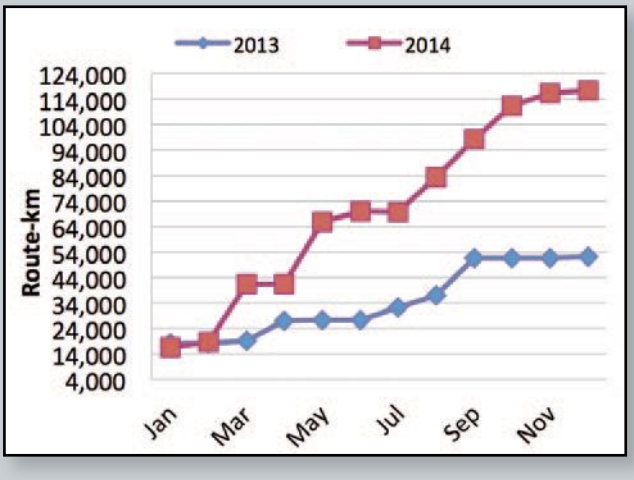
Positive trend, at least 3 weeks

Changing trend, less than 3 weeks

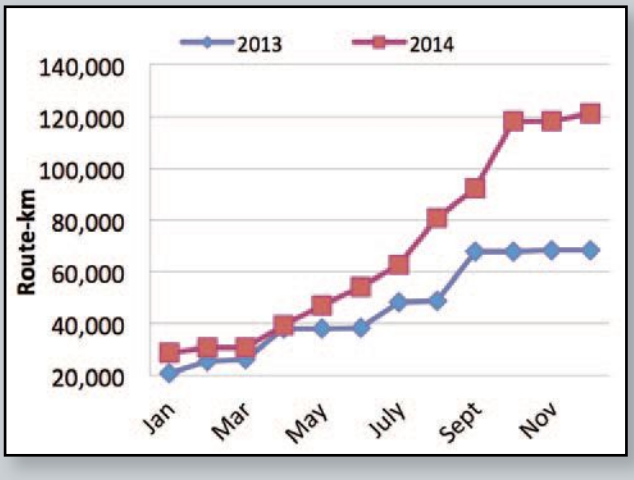
Negative trend, at least 3 weeks

Subsea Telecom & Power Cable Data

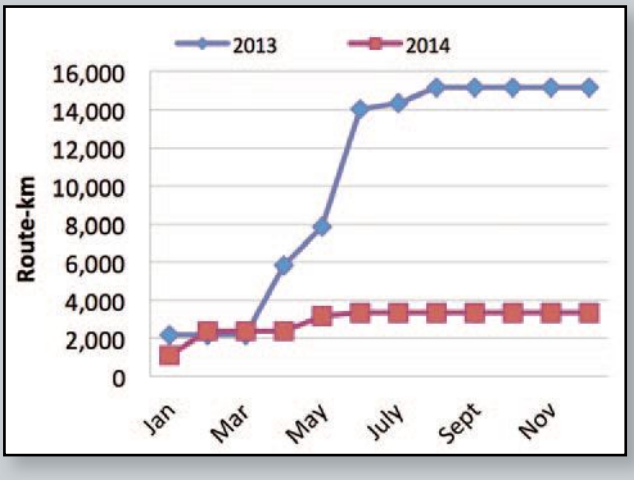
FO Cable Awards by Month



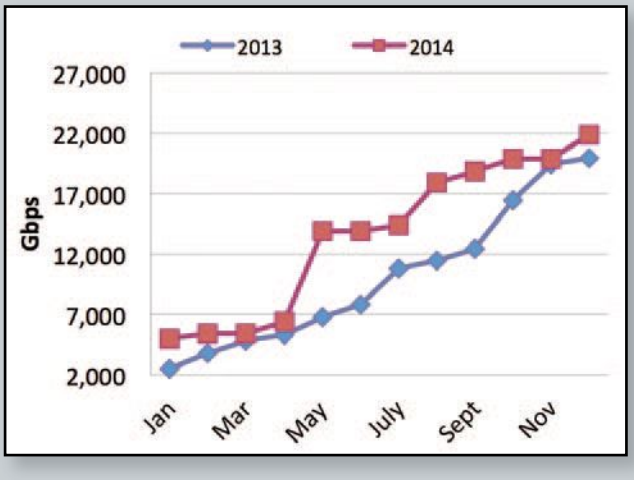
FO Cable Announcements



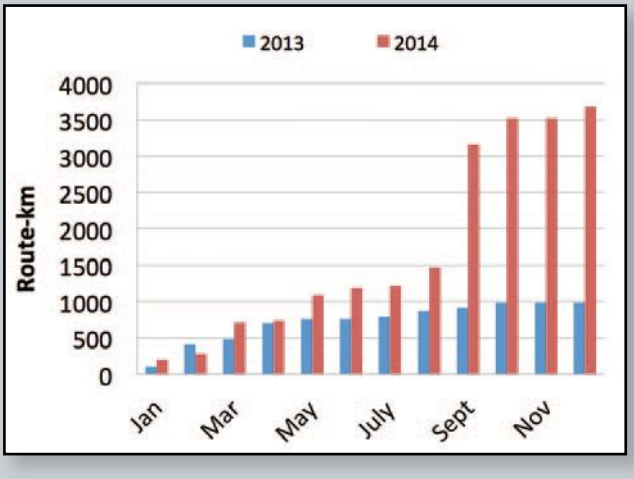
Submarine FO Cables Entering Service in Route-km



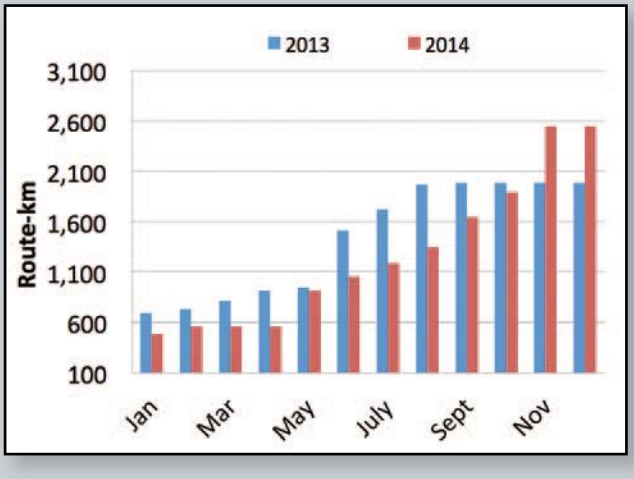
Upgrades of Existing Cable Systems in Gbps



Submarine Power Cable Awards in Route-km



Submarine Power Cable Announcements in Route-km



www.seabed.nl

Seabed Portable Lightweight Multibeam Set (SPLMS)

Seabed is introducing the first lightweight multibeam set in the world that can be transported as check-in luggage with any airline with no extra charge. The SPLMS is ideal for projects where rapid mobilization is required and where logistical challenges are taken into account due to the simple deployment.

SGR6-D S GNSS Intertial system

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SEABED

Getting to the bottom of things

Petrobras adopts Reflex Marine's FROG-6

Reflex Marine, a global leader in safe marine transfer solutions to the offshore, marine and renewables industries, has supplied two six-person FROGs to Brazil's national operator Petrobras.

The sale follows Reflex Marine's certification by Brazil's Directoria de Portos e Costas (DPC) and will place Petrobras as leading the way in improving the safety of offshore operations in the region.

The FROGs will come into service in North-East Brazil in early 2015. Petrobras personnel will be fully trained using the six person FROG-6 devices by Reflex Marine's Brazilian partner Sparrows BSM in Macaé. Local operational support will also be provided, including the supply of spare parts as well as well as inspection and maintenance.

Carol Richards, Reflex Marine's sales manager for Brazil, said: "We believe that this sale is a significant step for Brazil's offshore oil and gas industry. Petrobras will use the same system for the safe crane transfer of personnel as other operators working in deep and ultra-deep waters worldwide. Reflex Marine and our Brazilian partners SparrowsBSM are committed to supporting Petrobras in adoption of the safest personnel transfer device on the market."

The FROG-6 has been developed to provide extensive protection from all the major risks of personnel transfer. Tests witnessed by the DPC confirmed that the product met all legal and safety requirements. The tests included:

• Immersion to demonstrate that when a fully loaded unit is in water, passengers heads will remain above the surface; secondly, that the unit will not lose its floating capability for a period of at least 5 minutes; and thirdly, if a unit is completely inverted, it will self-right.

• A load test was conducted to demonstrate that no permanent deformations would occur as a result of the overloading.

• A vertical impact test consisted of impacting a fully loaded unit into the ground at a speed of four ms-1 in order to demonstrate that no harm will be imparted to its occupants and that the unit will not undergo deformations that will prevent it being hoisted for five minutes after the impact.

• A side impact test consisted of impacting a fully loaded unit at a speed of two ms-1 into an object in order to demonstrate that no harm was imparted to its occupants and that the unit did not undergo deformations that prevented it from being hoisted for five minutes after the impact.

• An audit of the Quality Management System (QMS) was carried out according to the standard ISO 9001:2008.

Reflex Marine's immaculate safety record is maintained with more than 800 units performing more than one million crew transfers annually in 54 countries.

For more information, visit www.reflexmarine.com.

DeepSea Power & Light introduces SeaLite Sphere® 6150

DeepSea Power & Light, a U.S. company with 30 years of experience manufacturing underwater lights, cameras, batteries, and lasers, introduces the SeaLite Sphere 6150. The iconic SeaLite Sphere has evolved and now delivers 11,000 lumens with a wide beam angle of 85°.

With intelligent flicker-free dimming, the SeaLite Sphere delivers the ability to dial in the desired light output for a wide variety of depth applications.

Its sleek new 6,000 m (anodized aluminum) or 11,000 m (titanium) depth rated design provides field-serviceable connector replacement, for quick and easy repair in the field, and all without the need for any specialized tools.

A unique 10,000-psi, pressure-resistant compartment separates the connector and the rest of the light, minimizing the potential for flooding due to connector failure.

The SeaLite Sphere delivers best-in-class lumens per water weight, at 33 lumens per gram, while its sapphire crystal port and close cluster LEDs deliver the ultimate in optical performance and durability.

For more information visit www.deepsea.com.

New Bowtech multipurpose underwater camera

Bowtech Products Ltd, a global market leader in subsea vision systems, is delighted to release the Pioneer multipurpose underwater camera with LEDs.

The Bowtech Products Pioneer is a high-resolution underwater color CCD camera with six integral high-intensity LEDs. It provides a cost effective solution to general underwater viewing observation, down to 4,000 m ocean depth.

Measuring only 53 mm diameter and 78.8 mm in length (excl. connector), the camera is ideally suited to observation of tooling and manipulator tasks. The fully controllable integral LEDs remove the requirement for separate lights where space is restricted.

Lighting control is factory set as either Analogue 0-5V, Analogue 0-10V, Tristate, RS-485, or Power cycle.

The camera is enclosed within a high-quality titanium housing, rated to 4,000 m operating depth. The camera is fitted with a fixed-focus wide-angle lens, giving a 57o diagonal angle of view in water through a sapphire window, which is highly scratch resistant and 99.8% optically pure. The camera features in-built reverse polarity protection.

The miniature, high-specification 1/3" sensor offers 720TVL high resolution and excellent low light level sensitivity.

The Pioneer is also available as a monochrome version with improved low light level sensitivity.

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

iXBlue delivers two OCEANO heavy duty acoustic releases to Saipem

iXBlue has delivered two OCEANO HD55 Heavy Duty Acoustic Releases (HDAR) rated up to 55 tones to Saipem for pipeline installations in West Africa. Saipem is an EPIC (Engineering, Procurement, Installation, Commissioning) contractor delivering turnkey projects in the oil & gas sector.

At the initiation stage of a pipelay operation, the pipeline initiation head is connected to a DMA (Dead Man Anchor) and held under tension. The final disconnection from the pipelay vessel is usually achieved with a hydraulic cutter installed on the end of the pipe. The cutter is activated from a separate ship. A sacrificial part of the connection sling is cut to release the pipe.

In order to simplify the operations and allow deeper and safer installation, the hydraulic cutter is replaced by the HDAR (OCEANO HD55). The HDAR is activated directly from the laying barge using a surface Telecommand system.

For more information, visit www.ixblue.com.

New acoustic subsea receiver introduced

RJE International has released the STI-350 Surface Acoustic Receiver. Self-contained, the STI-350 uses a staff mounted directional hydrophone to track and relocate underwater sound sources. Designed for the rigorous marine environment, the STI-350 allows an operator to locate underwater pingers that operate between 25 and 45Khz. In addition, the STI-350 can be used with a custom line of underwater transponders that provide an operator range and bearing to a marked subsea target. Battery operated, the STI-350 uses a LCD to display range/signal strength and bearing to the target beacon. Sealed switches allow the operator to access the many functions of the STI-350. A rugged aluminum anodized staff assembly allows easy deployment of the highly directional hydrophone.

Already, RJE International, Inc has been awarded a contact by USCG in Boston to supply customized STI-350 Surface Acoustic Receivers for ensuring proper operation of gillnet pingers used on fishing gear. These devices are mounted on gillnets to prevent bycatch of harbor porpoises by emitting low frequency acoustic noise. The customized STI-350 allows USGC personnel to check for proper operation of the pingers from a small craft when the nets are deployed in the water. Since the implementation of gillnet pingers, the numbers of bycatch have dropped dramatically over the past few years.

For more information, visit www.rjeint.com.

ECOLOCK® long-lasting protection for offshore hulls now available

Ecolock is a new product from the makers of Ecospeed and Ecoshield. It is designed to protect offshore vessels for decades without the need for drydocking. Increasingly, offshore vessels such as FPSOs, FSOs, FLRSUs and others used for offshore oil and gas exploration, drilling, storage and transport need to stay out of drydock for 15, 25, even 40 years. The challenge has been to protect the underwater hull from corrosion and to provide a cleanable surface so that the biofouling that accumulates can be removed successfully and safely for UWILD and to reduce weight. Ecolock is the answer to that challenge.

For decades it has been known that glassflake-reinforced hard coatings last longer, are tougher and more resilient, and need less repair and replacement than any other type of hull coating. Soft coatings such as biocidal antifouling and foul-release coatings do not hold up well. They need to be repaired or replaced often, which is not good news for shipowners and operators and particularly offshore operators who need to keep their ships out of drydock. Their antifouling or foul release properties require that the ship move through the water at relatively high speed. On stationary vessels, the fouling simply builds up.

Since the early 2000s a hard, cleanable, non-toxic, glassflake-reinforced coating has been available, Ecospeed. Ecospeed is actually a coating system that combines a hard coating with routine in-water cleaning. The coating holds up for a remarkably long time, even in the ice or other harsh conditions. It can be cleaned as often as needed and becomes smoother not rougher with each cleaning. It has been used in offshore applications.

It was found over time that a tougher version of Ecospeed, Ecoshield, is an even more effective protection against the forces of cavitation and corrosion that constantly impinge on the rudder and other running gear of a ship. Now Ecospeed and Ecoshield have acquired a cousin, also a glassflake-reinforced coating, but this one intended specifically to meet the hull protection requirements of offshore vessels: Ecolock.

Ecolock is an extremely tough and durable coating designed to remain in excellent condition for 15 to 25 years without drydocking, repair or replacement. Ecolock can be cleaned underwater as often as needed to meet the UWILD and weight requirements of FPSOs, drill ships and other offshore vessels. Ecolock is the result of continual R&D on offshore hull coatings since the 1990s.

Ecolock is completely non-toxic. It is a hard, impermeable coating that even the toughest barnacle will not penetrate. This is in direct contrast to antifouling or foul-release coatings. Barnacles and other fouling organisms attach and penetrate those coatings right through to the steel permitting the start and spread of corrosion. In the case of Ecolock the barnacles, coral and other fouling organisms can be removed completely by divers using special equipment, leaving no trace and restoring the coating to its original condition. And because it is non-toxic, it is safe to clean the Ecolock coated hull when needed for UWILD or simply to reduce the weight when too much fouling has accumulated. This can be done even in sensitive waters.

For more information, visit www.ecospeed.be.

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Hercules Offshore, Inc. has promoted **Troy L. Carson** to senior vice president and chief financial officer. Carson replaces **Stephen M. Butz**, who resigned as the company's executive vice president and CFO to join Rowan Companies plc as executive vice president, CFO and treasurer. Carson is currently serving as senior vice president and chief accounting officer. He joined the company as vice president and corporate controller in March 2007, was appointed to principal accounting officer in July 2008, and was named chief accounting officer in May 2010. At the same time, **Craig M. Muirhead**, currently serving as vice president and treasurer, has been appointed to vice president of investor relations and planning, while **Son P. Vann**, currently serving as vice president of investor relations and planning, will assume the role of vice president corporate development and treasurer.

Applus RTD, a leader in the provision of integrity technology services, has appointed **Phillip Morrison** as its new regional director for the United States. He will be responsible for all Applus RTD operations in the country and brings a wealth of experience to the company, having over 30 years' experience working in the oil and gas industry. Working with well-known companies such as TD Williamson and Cameron International, Morrison has completed international assignments and held global responsibility for a strategic pipeline integrity business unit securing sustainable market positions for the business in each role. "Joining Applus RTD is an exciting opportunity for me professionally and personally," Morrison said. "I am honored to be joining the company in its pursuit of generational market opportunities within the oil and gas, aerospace and other major sectors in the United States."


Morrison

FMC Technologies, Inc. appointed new member **Peter Oosterveer** to its board of directors. He is chief operating officer of Fluor Corp. Fluor delivers engineering, procurement, construction, maintenance, and project management to governments and clients in diverse industries around the world. A 25-year Fluor veteran, Oosterveer previously served as the group president of the company's energy and chemicals business segment, and senior vice president of its global chemicals and petrochemicals business. Oosterveer has previous executive stints managing Fluor's chemicals operations for Europe, Africa, and the Middle East. Prior to that, he was managing director of the Dutch operations of Fluor, including the Haarlem office. He also previously managed Fluor's operations center in Bergen op Zoom, The Netherlands.

Mike Wheeler has joined Fluor Corp. as the company's chief procurement officer. Wheeler is responsible for procurement, contract management, material management, sourcing, travel services, logistics and export control for all of Fluor's business lines globally. He also has oversight of Fluor's supply chain entity dedicated to selling quality, cost-effective, stand-alone procurement services to midstream-market clients. This includes sourcing services centered on Fluor's strategic supply relationships in Asia and other emerging markets. He has 35 years of industry experience and 17 years as an executive in management consulting for the exploration and production, refining, petrochemical and construction industries. Most recently, Wheeler served as senior vice president at Reliance Industries Limited in Mumbai, India.

Guildford and Aberdeen-based Kongsberg Oil & Gas Technologies has appointed **Mike Branchflower** as global sales manager – flow assurance to assist with the firm's growth and development plans for its LedaFlow multi-phase flow simulator. Prior to joining Kongsberg Oil & Gas Technologies, Branchflower was instrumental in growing SPT Group's (and then Schlumberger's) OLGA and OLGA online business in Europe from 2002, where he worked as an account manager and business development manager. He has also held commercial and technical roles with IHS Energy, Petroconsultants-MAI and Alfa Laval. Branchflower is a chemical engineering graduate and has worked in upstream oil and gas for all but the first 2 years of his career.


Branchflower

SeaRobotics Corp. announced that **Scott Olson** has been hired as a project engineer in the company's Stuart, Florida office. Olson joins SeaRobotics after serving as chief engineer for Chariot Robotics. He is a project and systems engineer with over 28 years of experience in ocean engineering, project management and marine operations including the design, operation, fabrication and maintenance of marine systems for oil & gas, salvage and scientific applications. He is qualified as a pilot of both manned and un-manned underwater vehicles. Previously Mr. Olson served as a project engineer at Perry Slingsby Systems. Prior to that he was with Phoenix International as well as a systems engineer/pilot with Harbor Branch Oceanographic Institution from 1988 to 2002. He graduated with a Bachelor of Science degree from Florida Institute of Technology and has also completed numerous graduate courses at the University of Maryland.

U.S. based Teledyne Odom Hydrographic welcomes **Richard C. Dentzman** to its organization and is confident that the expertise he brings will add substantial value to the hydrographic and geophysical solutions they provide. Dentzman has worked in numerous offshore research diving and mapping programs and has over 18 years of seafloor surveying and mapping experience. He was educated at the University of Illinois, receiving a B.S. in Geology and an M.S. degree from North Carolina State in Geological Oceanography. He previously held positions as owner and CEO of AquaMap, at Triton Elics as manager of its East Coast Office, iXSea Inc. as its U.S. sales manager, Teledyne Benthos as its business development manager for acoustics & communications, and with Sonardyne, Inc. as its business development manager for defense and maritime security.


Dentzman

BMT Group, a leading international engineering, maritime and risk management consultancy, has announced the sale of BMT Syntek Technologies Inc to Fulcrum Corporation. Fulcrum Corporation is an award-winning woman-owned small business (WOSB) based in Arlington, Virginia providing customized services and solutions to organizations within the Department of Defense, the Department of Transportation, and various private sector companies.

MacArtney UK Ltd is delighted to announce the acquisition of Callidus Subsea Ltd, an industrious cable moulding and assembly company based in Ellon, Aberdeenshire. The acquisition of Callidus follows a sustained spell of growth and record breaking results for the Aberdeen based MacArtney operation who continues to take full advantage of the good UK business climate.

2H Offshore, an Acteon company, has invested in improved office facilities in Malaysia and Australia to support ongoing growth in the Asia Pacific region. Both offices have improved facilities, additional meeting rooms and enhanced conference facilities and maintain a close proximity to a large number of 2H's major clients to underpin ongoing progress in the Asia Pacific region.

FoundOcean, the experts in subsea grouting for the offshore energy construction industry, have signed a strategic agreement with chemicals company BASF. Marrying BASF's world-leading chemical manufacturing capabilities and FoundOcean's extensive offshore grouting experience means that foundation installers and wind farm developers can be confident in the integrity of the grouted connection.

Septentrio has announced that it has signed MBT GmbH as a new dealer for its GNSS marine receivers in Germany. MBT GmbH, a joint venture between Meerestechnisches Büro Turla and the MacArtney Group based in Kiel, Germany, will provide sales and support for the Septentrio marine product line and the Altus APS-U GNSS receivers to customers in the marine and dredging sectors. The APS-U powered by a Septentrio board is designed primarily for machine control and marine construction applications. It provides multi-frequency GNSS capability together with GNSS Heading, L-Band positioning and wireless communications within a rugged MILSTD-810 housing for the broadest range of applications.

As part of an expanded investment programme in the Australasian offshore industry, **Sonardyne Asia Pte Ltd.** in Singapore has appointed Scope Engineering (WA) Pty Ltd. as its agent for Australia, New Zealand and the surrounding territories. Based in Perth, Western Australia, Scope Engineering delivers a range of marine engineering and fabrication services as well as providing third party technology solutions for offshore monitoring and inspection surveys. Now as Sonardyne's agent, Scope Engineering will collaborate with the company on commercial opportunities within subsea asset monitoring, exploration and reservoir surveillance, ocean science, vessel positioning and offshore drilling.

Tritech International Limited has relocated its design and production operations to a new site within the Cumbrian town of Ulverston. The company has been operating in Ulverston since 1986 and in July 2013 began ground works on a new purpose-built building. The new facilities will enhance Tritech's production capabilities providing larger and more modern work areas to support its increasing operations. Significant investment has been made in test facilities including two test tanks and a new high-pressure test chamber; both critical to ensure equipment reliability in the harsh subsea conditions in which Tritech's customers operate.

James Fisher Defence, the leading global subsea operations and engineering company, today announced the opening of a new facility in Vaxholm, Sweden, JFD's international base for the manufacture and maintenance of the company's SEAL Pod range of Swimmer Delivery Vehicles (SDVs). The new facility is the headquarters of JFD Sweden and includes over 800 sq. m of manufacturing space, providing the scale and infrastructure required for the simultaneous assembly of multiple SDVs. With a fully integrated design and manufacturing capability, designers and engineers are able to operate more effectively and efficiently throughout the manufacturing process, ensuring the highest safety and quality standards.

CALENDAR & EVENTS

February 3-5, 2015
Euromaritime
Paris, France
www.euromaritime.fr

February 4-5, 2015
Naval Future Forces
Washington, D.C.
www.navalengineers.org/events

February 10-11, 2015
Deepwater Decommissioning Workshop
Houston, TX
decommissioninggom.offsnetevents.com

February 10-12, 2015
Underwater Intervention
New Orleans, LA
www.underwaterintervention.com

February 11-13, 2015
Subsea Expo 2015
Aberdeen, UK
www.subseaexpo.com

February 16-19, 2015
GOM Oil Spill & Ecosytem Science
Houston, TX
www.gulfofmexicoconference.org

February 22-27, 2015
ASLO Ocean Sciences Meeting
Grenada, Spain
www.aslo.org/meetings

March 2-6, 2015
IEE/OES CWTM Workshop
St. Petersburg, FL
www.cwtmc2015.org

March 3-5, 2015
Subsea Tiback
New Orleans, LA
www.subseatiebackforum.com

March 15-19, 2015
NACE Corrosion
Dallas, TX
www.nace.org

March 16-19, 2015
U.S. Hydro
National Harbor, MD
www.hypack.com/ushydro/2015

March 17-19, 2015
DECOM Summit
Houston, TX
www.decomworld.com

April 14-16, 2015
Ocean Business
Southampton, UK
www.oceanbusiness.com

May 4-7, 2015
AUVSI
Atlanta, GA
www.auvsishow.org

May 31 - June 5, 2015
OMAE
St. John's, Newfoundland
www.asmeconferences.org/omae2015

June 2-4, 2015
Energy Ocean
Portland, ME
www.energyocean.com

June 3-5, 2015
UDT
Rotterdam, Netherlands
www.udt-global.com

June 16-18, 2015
Seawork International
Southhampton, UK
www.seawork.com

OCEAN NEWS & TECHNOLOGY 2015 EDITORIAL CALENDAR

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

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

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

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

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

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

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

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

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

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

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

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

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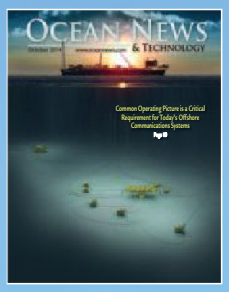

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Toll free: +1 800 786 5824 (7-VOLTAGE)
Email: sales@tinitron.com
Website: www.tinitron.com
Contact: Tinny Srinivasan, President & CEO,
David Fulton, Director of Bus. Dev. x234

Tinitron Marine designs and manufactures high-voltage systems and subsea components, transformers, Power Distribution Units, high-quality inverters, energy storage systems, optically-controlled subsea transformers, Insulation Leakage Monitors (for umbilicals), rotary switches for grounding and tap selection, and solenoids for ROVs and other subsea tools. Since 1962, over 5,000 designs. www.tinitron.com.

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Tel: +1 603 893 6131
Fax: +1 603 893 8807
Email: Klein.Mail@L-3com.com
Web: www.L-3Klein.com
Contact: Deborah Durgin, Supervisor, Marketing & Sales

L-3 Klein is the world's leading sensor technology provider that manufactures and designs high-resolution side scan and multi-beam sonar equipment, and radar-based security and surveillance systems. L-3 Klein has developed a worldwide reputation of excellence in the industry by providing quality products and excellent customer service. Please feel free to check out our product offerings at www.L-3Klein.com.

Marine Sonic Technology
120 Newsome Dr. Suite H, PO Box 1309
Yorktown VA 23692-1309
Toll Free: +1 800 447 4804
E-mail: jdemille@marinesonic.com
Website: www.marinesonic.us

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E-mail: info@saivas.no
Website: www.saivas.no
Contact: Gunnar Sagstad

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New Industries
6032 Railroad Avenue
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E-mail: bill.new@newindustries.com
Website: www.newindustries.com
Contact: Bill New

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SUBSEA TOOLING

Seanic Ocean Systems
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Houston, TX 77064
Tel: +1 713 934 3100
E-mail: info@seanicusa.com
Website: www.seanicusa.com
Contact: Karen North

Seanic was formed to address the growing demand for simple, rugged and reliable subsea tooling for remote intervention. Along with engineered solutions, Seanic also offers experience in the design, manufacturing, storage, repair & maintenance of subsea products. Seanic provides a worldwide standard product line of ROV tooling such as torque tools, FLOT's, hot stabs, manifolds, buckets and ROV interface panels.

Subsea Americas
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E-mail: charles@subseaamerica.com
Website: www.subseaamericas.com
Contact: Charles Mayea

Subsea Americas (SSA) is a leading provider of rental ROV tooling equipment on a worldwide basis. SSA is a 24 hr. / 7 days a week service provider of a comprehensive range of standard subsea tooling equipment. From torque tools and flying lead orientation tools to 15k isolated hydraulic intensifiers and wire rope cable cutters - SSA can fully support the client's needs with quality service, and reliable equipment at a most competitive cost.

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Bellville, TX 77418 USA.
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Fax: +1 979 865 8859
E-mail: sales@seacon-ap.com
Website: www.seacon-ap.com

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UNDERWATER VEHICLES/AUVS

Hydroid, Inc.
a subsidiary of Kongsberg Maritime
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Fax: +1 508 563 3445
E-mail: glester@hydroid.com
Website: www.hydroid.com
Contact: Graham Lester

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E-mail: sales@ocean-server.com
Website: www.iver-auv.com
Contact: Jim Kirk

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UNDERWATER VEHICLES/ROVS

Deep Ocean Engineering Inc.
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Website: www.deepocean.com
Contact: Bill Charbonneau

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E-mail: Katarina.Tehlirian@Subsea7.com
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Contact: Peter MacInnes
E-mail: peter.macinnes@fmcti.com
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Fax: +1 619 450 4001
Contact: Alasdair Murrie
E-mail: Info@SeaBotix.com
Website: www.SeaBotix.com

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Tel: +44 (0) 1224 798660
Fax: +44 (0) 1224 798661

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E-mail: subsea.sales@f-e-t.com
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UNDERWATER VIDEO EQUIPMENT

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Contact: Mark Esslemont

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CSA Ocean Sciences Inc.	4	www.csaocean.com
CSnet International, Inc.	33	www.csnetinternational.com
Decomissioning & Abandonment Summit	78	www.decomworld.com/decommissioning
Deepwater Decommissioning Workshop	80	http://decommissioninggom.offsnetevents.com
EvoLogics GmbH	91	www.evologics.de
FORUM Energy Technologies, Inc. (F.E.T.)	9	www.f-e-t.com
GJ Land & Marine Distribution, Inc.	46	www.gjfood.com
Global Ocean Design	63	www.globaloceandesign.com
Hawboldt Industries	92	www.hawboldt.ca.
Hydroid, Inc.	17	www.hydroid.com
IEEE/OES CWTM	51	www.cwtmc2015.org
JW Fishers Manufacturing, Inc.	44	www.jwfishers.com
L-3 Communications Klein Associates	23	www.L-3Klein.com
Marine Sonic Technology	67	www.marinesonic.com
New Industries	41	www.newindustries.com
Ocean Business	77	www.oceanbusiness.com
Ocean News	50, 81, 82	www.oceannews.com
Ocean Specialists, Inc.	65	www.oceanspecialists.com
OceanServer Technology	61	www.ocean-server.com
Ohmsett	55	www.ohmsett.com
Okeanus Science & Technology	47	www.okeanus.com
Radar Screen Report	69	www.subcableworld.com
Radoil	34	www.radoil.com
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ROVSCO, Inc.	59	www.rovsco.com.
Saab Seaeye Ltd	7	www.seaeye.com
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Seacon	45	www.seaconworldwide.com
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Shark Marine Technologies, Inc.	52	www.sharkmarine.com
Sonardyne International Limited	19	www.sonardyne.com
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