

Ocean News & Technology

News for the Ocean Industry

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August 2013

Roadmap for the Subsea Connector Market

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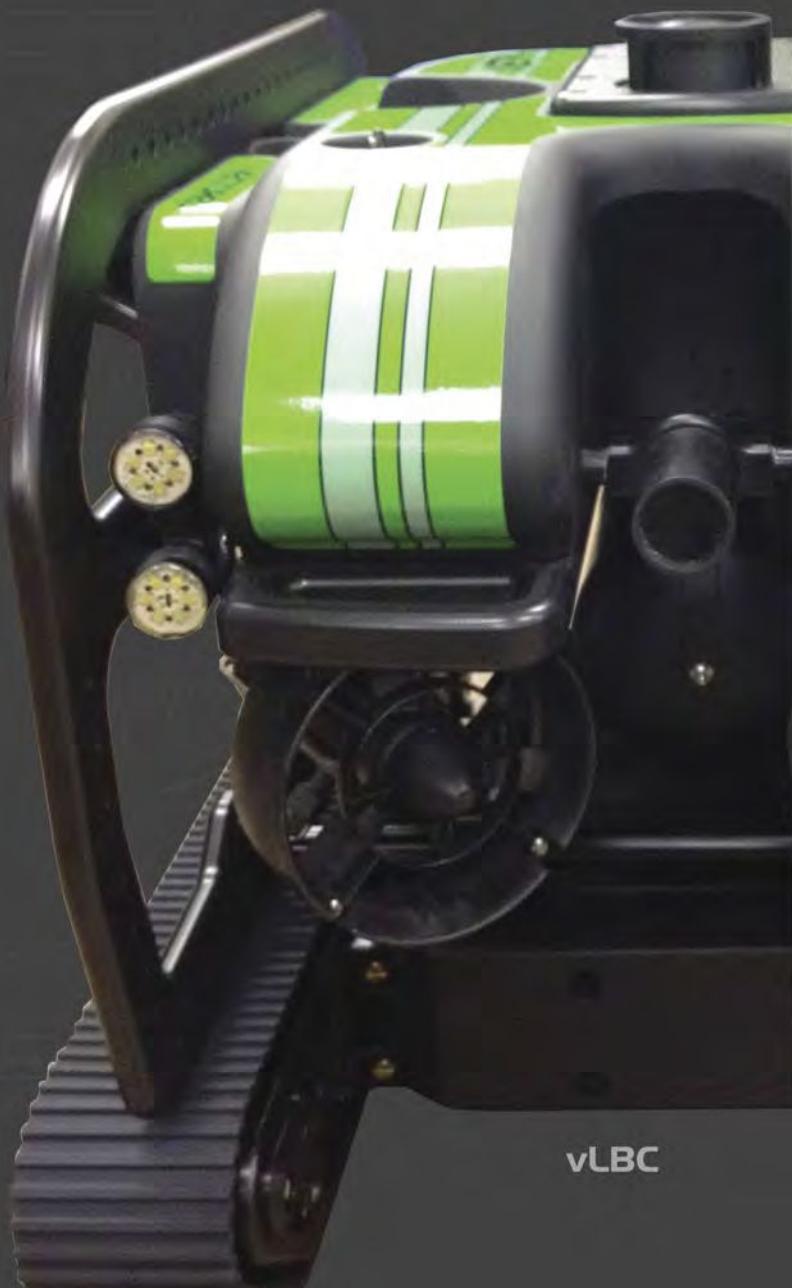
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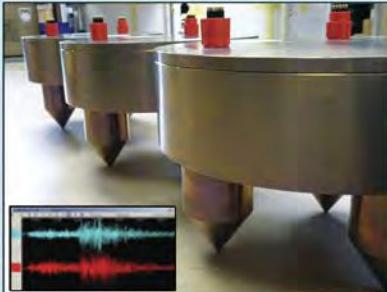
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Offshore Industry



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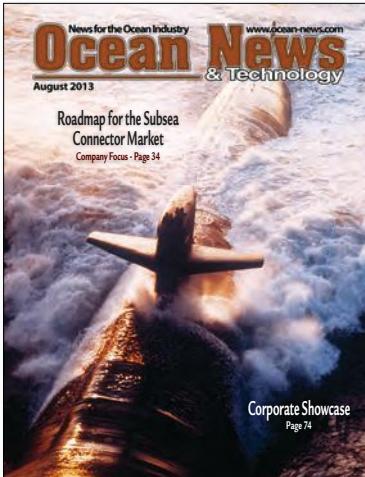
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Technology Systems Corp.

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EDITORIAL

By John Manock



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Public pressure in favor of offshore wind? Maybe it's coming.

I am a relative newcomer to the offshore renewable business, having come from the submarine cable industry. When I recently covered the Energy Ocean International Conference for Ocean News & Technology, I wasn't quite sure what to expect. I hoped that I knew enough about the technologies involved in offshore wind and tidal to at least not look stupid and at most sound somewhat intelligent when I talked to people who were devoting their careers to these fields.

To prepare myself, I made sure that I was up to date on the most recent technological developments. Just writing that is a joke, as the technology is moving so quickly that I was out of date as soon as I finished the sentence. What is far more important when trying to look intelligent at any conference is to become fluent in the language of the industry — which means know what all the acronyms stand for. Good luck on that one, too.

In the end, I made it through the conference without too much embarrassment. What really struck me, however, was how enthusiastic and optimistic the people in the offshore renewable industry are. It would be easy to be cynical and ask "why?" Although I am new to the industry professionally, I live in New England, the center of the offshore wind industry in the United States. Being so centrally located, I have been following the travails of Cape Wind and Deepwater Wind for years as they try to build wind farms off the coasts of Massachusetts and Rhode Island, respectively. It has been such a long and difficult journey for these and so many other companies that I would completely understand if the people behind them said "I've had enough" and changed careers to something easy, like quantum mechanics.

To emphasize what the journey has been like, one presenter at the conference had the all-time greatest conference slide in the history of conferences. It was a strip from the Calvin and Hobbs comics. In it, the two are playing "calvinball" in which the rules are literally made up as they go along with the ultimate goal of making it impossible for anyone to accomplish anything.

For all of the complicated regulatory issues and amazing new technologies, my most surprising discovery was that there

was still so much public resistance to offshore renewable projects in the United States. Both Cape Wind and Deepwater Wind have been taken all the way to their respective state's Supreme Courts, which in both cases ruled in favor of the developers, yet there are still ads being taken out against the projects. In one case, a developer was accused by a local town of "hiding" a piece of information, even though that information had been on the town's own website for months.

The usual reason given for opposing offshore wind is the high cost of the electricity that is to be generated. Curiously, I learned at the conference that many small-scale solar projects in the region produce electricity that is more expensive than the power that will be produced by the early offshore wind projects, yet, as it was pointed out, there is no public outcry against these projects. When it comes to offshore wind, however, business users are leading the resistance, afraid that the expensive projects will mean higher rates.

This may be changing. A recent study carried out by Deloitte's alternative energy group shows that more and more businesses in the United States are embracing alternative energy because it is good for business. Many businesses are listening to their customers' demands that they explore "green" alternatives.

The study pointed to several high-end brands that believe their customers expect the brand to be sensitive to environmental issues and be open to using power produced by green technologies. The study also cited peer pressure as one of the most important drivers of people's views on using green electricity. This is true for both businesses and individuals.

Offshore wind and all of the other green alternatives can only provide a small percentage of the planet's power needs. Making them work on an efficient scale will require the support of entire communities. Perhaps the driving force will come from the bottom up rather than top down — not from government mandates but from individuals first taking steps within their homes and then making their views known to businesses by favoring those that are green. How ironic if after all of the struggles, the ultimate success for offshore wind comes from public demand for green electricity.

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AUV Modularity Enables New Capabilities for Offshore Survey

Bluefin Robotics Upgrades Phoenix International's Bluefin-21 for Extended Depth Rating

By: Joshua Elvander, Program Manager, Bluefin Robotics Corporation and Christopher Moore, AUV Manager, Phoenix International Holdings, Inc.

Subsea survey and data collection opportunities are increasingly emerging in deeper and deeper water as exploration and development of new oil and gas fields continue the inexorable push towards the outer boundaries of the exclusive economic zones. Additional market drivers such as deep-water searches for sunken vessels or downed aircraft and the hunt for seafloor mineral deposits contribute to an overarching need for survey capabilities and tools that function reliably at the high pressures found in very deep operations. Autonomous Underwater Vehicles (AUVs) are at the forefront of this technology, making reliable search and survey efforts in a variety of conditions possible especially if the technology is modular and flexible enough to grow along with the demands of the market.

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Ocean News & Technology

AUVs for Deepwater Surveys

Historically, deepwater surveys aimed at collecting sonar or optical data have been performed using towed arrays and ship-mounted and/or Remotely Operated Vehicle (ROV) systems. In these cases, operational expenses stemming from the cost of the crew and vessel and the logistical demands of the system tend to be very high. In recent years, AUVs have offered a better solution — they can be launched and recovered from a single point and, in many cases, can operate for hours without a ship remaining on station. In addition, an AUV can maintain sensor positioning at altitude, is unaffected by surface sea states while underway, has a very small turning radius, and can follow a variable terrain — all to produce the best possible data.

AUV survey payloads are traditionally either acoustic or optical, with a majority of the sensors collecting acoustic data. Optical sensors are predominantly color or black and white still cameras. Side-scan sonars (SSSs) are the most common acoustic sensor in use today and provide detailed images that are a function of range and frequency. Sub-bottom profiling sonars are also commonly used, as they provide information about the constitution of the seafloor up to approximately 50 m into the seabed depending on the geologic makeup. Multibeam echosounder (MBES) sonars can be mounted in the bottom of the AUV to provide detailed, hydrographic-quality bathymetric data. These devices are often used in parallel because they have different features and characteristics and provide complementary datasets. The example shown (Figures 1 and 2) presents a pipeline end manifold surveyed with both an MBES and a high frequency SSS.

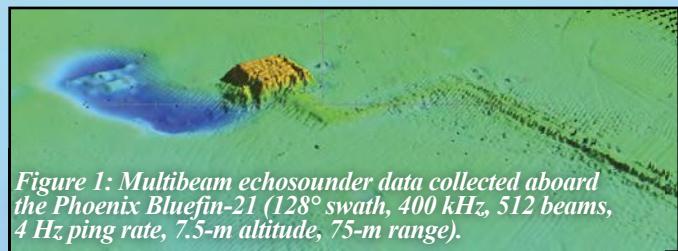


Figure 1: Multibeam echosounder data collected aboard the Phoenix Bluefin-21 (128° swath, 400 kHz, 512 beams, 4 Hz ping rate, 7.5-m altitude, 75-m range).



Figure 2: Side-scan sonar data of same image as Figure 1, collected aboard the Phoenix Bluefin-21 (410 kHz, 7.5-m altitude, 75-m range).

Bluefin AUV Modularity Allows Depth Upgrade

There are two different architectures primarily used in AUVs: a sealed vessel in which the entire exterior of AUV shape is the pressure vessel or a free-flooded architecture in which individual components are sealed in individual pressure vessels, allowing pressure-tolerant systems to be implemented. There are also hybrids between the two approaches in which a portion of the AUV is flooded and a portion is sealed.

Bluefin Robotics has been providing AUV solutions to the marketplace since 1997. Bluefin uses a free-flooded architecture that allows individual components to be rapidly replaced for easy operational turnaround and, if necessary, field maintenance and upgrade. For example, Bluefin AUVs use pressure-tolerant rechargeable batteries that can be easily and quickly replaced with fully-charged units when they have been depleted to get the AUV back in the water and continue the survey. While the survey is running, the depleted units can be recharged and ready for replacement once the AUV surfaces. Another example is the tailcone. Should the tailcone be damaged during a rough recovery, for example, a spare tailcone can be installed on the AUV and it's the mission resumed while the faulty unit is repaired.

In 2011, Phoenix International Holdings, Inc, a marine services provider headquartered in Largo, Maryland, began to investigate adding an AUV to its equipment portfolio. In the meantime, Bluefin was manufacturing a commercial sur-

vey Bluefin-21 AUV for stock. The 1,500-m AUV was equipped with a Teledyne RESON 7125 MBES, an EdgeTech 2200M integrated dual-frequency SSS, and a sub-bottom profiler. In May 2012, Phoenix purchased the system to immediately support a project for The International Group for Historic Aircraft Recovery (TIGHAR) in a remote area in the South Pacific. The AUV was used along with an ROV to search for the remains of the Lockheed Electra aircraft flown by Amelia Earhart on her failed circumnavigation attempt in 1937. A photograph of the AUV used during the survey is shown in Figure 3.



Figure 3: Phoenix International Holdings' Bluefin-21 AUV being deployed in the South Pacific.

After completing the project, Phoenix understood that its typical customer would demand even more capability in an AUV, but purchasing a second system was not an option at that time as it would mean twice as much cost, a second crew to train, and unexpected assets on the books. Instead, Phoenix opted to send the Bluefin-21 back to the manufacturer to extend its depth rating 200% to a final operational depth of 4,500 m. In addition, Bluefin was also contracted to build a swappable, high-quality camera payload to supplement the survey sensor suite.

The primary upgrade effort involved replacing the main electronics housing. The original configuration utilized an electronics housing consisting of two mating aluminum hemispheres where the main vehicle computer and all primary electronics reside, including navigation, power control and management, communications, emergency systems, and data storage. Communication and power to auxiliary systems is achieved through wet connections to either pressure-balanced oil-filled (PBOF) or molded cables. The aluminum hemispheres were replaced with titanium, allowing the internal volume of the sphere to remain the same and the reuse of the prior electronics.

Similarly, the original configuration had its payload electronics integrated into a single, 1,500-m rated pressure vessel. Bluefin took advantage of the technological advancements made by the individual sonar vendors since the original build: both EdgeTech and RESON now offer 4,500-m rated pressure vessels with compact form factors as a result of electronics miniaturization. When used together, the pressure vessels occupied less total volume than the original integrated vessel and would allow Phoenix to replace or upgrade the payloads in the future.

Integrating the camera into the existing payload section would have pushed the AUV length beyond the dynamic control boundaries of the current form factor. This is not a significant issue because optical and acoustic surveys are executed at different altitudes to collect optimal data, so they

are not operated simultaneously. Bluefin built a separate payload section with a Seabed Technologies camera system utilizing a Prosilica GE1900 high-resolution black-and-white still camera. The payload is designed to be swapped on the deck by two people while at sea. The payload swap typically takes 30 min. and can be completed alongside an already scheduled battery swap.

The modular architecture of the Bluefin AUV design allowed Phoenix to avoid purchasing a second system and extend its current system without completely reworking the AUV. With the exception of the new camera payload, all the original exterior components were reused, along with the AUV electronics and a large amount of the auxiliary systems. The end result is a reliable, capable vehicle ready for survey at any depth up to 4,500 m (Figures 4 and 5).



Figure 4: Phoenix's Bluefin-21 AUV.

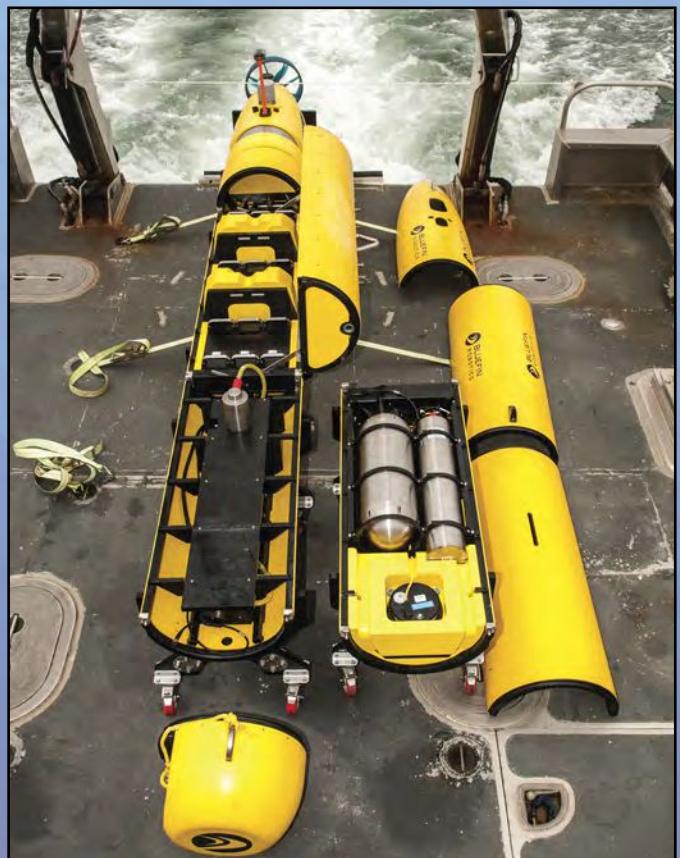


Figure 5: Phoenix's AUV with swappable payloads (the camera is on the left and the acoustic payload is alongside on the right).

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First-ever National Forum to shape a U.S. national ocean exploration program

Ocean Exploration 2020: A National Forum, brought together more than 100 ocean explorers and representatives from federal agencies, state governments, non-government organizations, universities, ocean institutions, and leading industries to shape a U.S. national ocean exploration program. The Forum, held at the Aquarium of the Pacific in Long Beach 19–21 July, gathered experts with the aim of developing a national program that will be fully implemented by 2020.

Forum participants included ocean explorers and ocean resource managers as well as educators, project managers, technologists, information managers, and entrepreneurs who shared their ideas for taking the nation's ocean exploration program where it should be in 2020.

The first two days of the Forum were by invitation and involved presentations, panel discussions, and breakout sessions covering themes such as exploration priorities, technology, platforms, data and information management and sharing, citizen science and exploration, ocean exploration, and public engagement.



NOAA ShipOkeanos Explorer pierside in Pascagoula
(Image courtesy of NOAA Okeanos Explorer Program)

Explorers Day also featured demonstrations, workshops, and live interactive engagements with explorers at sea on “America’s ship for ocean exploration,” NOAA Ship Okeanos Explorer, with explorers on the Schmidt Ocean Institute’s Research Vessel Falkor, and with Dr. Robert Ballard’s team on the Ocean Exploration Trust’s Exploration Vessel Nautilus.

Forum partners included NOAA, the Aquarium of the Pacific, the Global Foundation for Ocean Exploration, the Schmidt Ocean Institute, Google, Inc., the Bureau of Ocean Energy Management, Esri, NASA, the National Geographic Society, the National Research Foundation, the Ocean Exploration Trust, The Roddenberry Foundation, the U.S. Geological Survey, and the U.S. Department of State. Others from government and non-government organizations participated, and, during the first two days, members of the public participated as “citizen explorers” online, adding their voices in shaping the nation’s ocean exploration program.

Five breakout sessions were conducted with the same assignment: outline a 10- to 15-step plan to create a distinctive, distinguished, and inclusive National Ocean Exploration Program in 2020 that considers all ocean exploration stakeholders. Forum participants then worked to reduce and combine elements of the five plans into an ocean exploration vision and plan for a national program, including a strategy for meeting plan goals.

For more information, visit <http://oceanexplorer.noaa.gov/oceanexploration2020>.

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Offshore At-A-Glance and Stock Watch now always available online

Although we strive to keep the Offshore At-A-Glance and Stock Watch sections in the print magazine, sometimes space considerations require them to be removed. However, we realize that they are an important resource for many and so they will always be posted on our website in PDF form for easy viewing and/or printing. Simply go to www.ocean-news.com and click on “Offshore At-A-Glance” in the main menu. We will also have a link to them in our Table of Contents for those of you reading the digital version of this magazine.

Capitol Hill Ocean Week: Attendees call for action

From how to invest the billions of dollars slated for Gulf Coast restoration to the effects of climate change and how the media covers ocean issues, attendees at the 13th annual Capitol Hill Ocean Week (CHOW) had a lot to say about offshore and coastal ecology.

The 3-day (4 to 6 June) annual gathering in Washington, D.C. was sponsored by the National Marine Sanctuary Foundation, co-hosted by the Pew Charitable Trusts, and underwritten by national and international foundations, marine research facilities, and the oil and gas exploration industry. Keynote speaker, Dr. Kathryn D. Sullivan, the acting Under Secretary of Commerce for Oceans and Atmosphere, U.S. Department of Commerce, addressed lessons learned from Superstorm Sandy and other coastal disasters and emphasized the role of healthy coasts and oceans as the protector of people, communities, and economies.

Ocean acidification was a hot topic at the conference. Presenters on a panel focusing on local responses to global challenges explained that the world’s oceans are becoming more acidic, a condition that destroys coral reefs and inhibits shell formation in oyster larvae, and the effects are already being felt in the American northwest where, as scientist Julia Robertson of the Ocean Conservancy explained, the shellfish industry is at risk. One panelist on the Leadership Roundtable, U.S. Sen. Sheldon Whitehouse, D-Rhode Island, called for President Barack Obama to work for tougher regulations for carbon dioxide emissions and called for a “cap and trade” system to regulate industry. The Senator emphasized that the effects of carbon dioxide reach from the Arctic to the Tropics and impact the entire marine food chain.

International Student Underwater Robotics Competition results



Photo by Erin Moore

High schools from California won both top prizes in the Marine Advanced Technology Education (MATE) Center's 12th annual student underwater robotics competition held last month in Federal Way, Washington. Participants included more than 50 student teams representing middle schools, high schools, home schools, community colleges, universities, after-school clubs, and outreach programs from the U.S., Canada, Venezuela, China, Hong Kong, Singapore, Macao, Taiwan, Saudi Arabia, the UK, Russia, and Egypt.

At the MATE Center's International Student ROV Competition held at the Weyerhaeuser King County Aquatic Center, student teams competed with underwater robots that they designed and built to handle underwater tasks associated with the operation and maintenance of ocean observing systems. Teams competed in either the RANGER or EXPLORER class, depending on the sophistication of their ROVs and the mission requirements.

In the EXPLORER class, the overall first place winner was Jesuit High School of Carmichael, California. The team also won an award for being safety conscious. Memorial University of St. John's, Newfoundland, Canada took the second place prize. Third place was captured by SeaTech 4-H Club of Mt. Vernon, Washington, which also had the highest overall mission score.

Aptos High School of Aptos, California won overall first place in the RANGER class. With 310 out of 320 possible points, the team had the highest mission score, and they also won an award for best technical report. Second place went to Heritage Collegiate of Lethbridge, Newfoundland, Canada. Third place went to Greater New Bedford Voc-Tech of New Bedford, Massachusetts, which also won an award for top poster display.

This year's contest emphasized the

role played by ROVs in the installation, operation, and maintenance of ocean observing systems — collections of high-tech instruments above and below the waves that provide around-the-clock information about what's happening in the ocean.

For more information, visit www.marinetech.org.

NOAA seeks public input on nomination for potential new marine sanctuaries

NOAA is seeking public input on a proposed process and associated criteria to evaluate potential new national marine sanctuaries in the nation's marine and Great Lakes environments.

NOAA will finalize the proposed process and criteria upon receiving public comment. NOAA will then consider whether to begin accepting nominations for new sanctuaries.

The Office of National Marine Sanctuaries serves as trustee for a system of 14 marine protected areas, encompassing more than 170,000 sq. mi of America's ocean and Great Lakes waters. Through active research, management, and public engagement, national marine sanctuaries sustain healthy environments that are the foundation for thriving communities and stable economies.

All comments must be received by 27 August and can be submitted electronically via the Federal eRulemaking Portal, <http://www.regulations.gov>. Under Keyword or ID, type in NOAA-NOS-2013-0091. Click the "Comment Now!" icon, complete the required fields, and enter or attach your comments. To read the full Federal Register notice, visit <http://sanctuaries.noaa.gov>.

World Ocean Council launches program to engage industry in marine spatial planning

The World Ocean Council (WOC) effort to improve ocean business community engagement in marine spatial planning (MSP) and ocean policy in the U.S. shifts into high gear with the appointment of Leslie-Ann McGee as WOC programs director.

Although these WOC efforts initially focus on the U.S., the outputs will be of importance to the ocean business community in other areas where ocean policy and MSP are actively being developed (e.g., Europe, Canada, Australia and elsewhere).

Ms. McGee will lead WOC Program efforts, which include the following:

- Ensuring that national ocean poli-

cy and planning in the U.S. has the coordinated, proactive involvement of a well-informed multi-industry leadership group.

- Developing a comprehensive understanding of the industry stakeholders in each of the nine National Ocean Policy regions in the U.S.

- Establishing a regional ocean business council in three of the U.S. national ocean policy regions.

- Organizing a national ocean policy conference for industry.

In her role as programs director, Ms. McGee will support the development and implementation of the WOC Work Program. As such, her major focus will be to work with the CEO and WOC members to coordinate collaborative efforts to develop science-based solutions to the priority-shared marine environmental issues that have been identified and included in the WOC Work Program.

For more information, visit www.oceanCouncil.org.

C & C Technologies' team locates two missing aircraft near Los Roques, Venezuela

C & C Technologies, Inc., (C & C) in co-operation with SEA Corporation, the Italian and Venezuelan authorities, and Mr. Luca Missoni, confirm that two aircraft lost off the archipelago of Los Roques, Venezuela have been located and positively identified.

The missing LET L-410 aircraft (registration number YV-2081) was located by the crew of C & C's research vessel Sea Scout. The LET L-410 was lost south of the island on 4 January 2008 carrying 14 passengers and crew from Caracas, Venezuela to Los Roques.

The missing BN2 Islander aircraft (registration number YV-2615) was located on 27 June 2013 and was initially lost north of the island on 4 January 2013 carrying six passengers and crew, including fashion design CEO Vittoio Missoni and his wife Maurizia Castiglioni.

Search operations were conducted by the R/V Sea Scout, C & C's purpose-designed, 134-ft aluminum hulled oceanographic catamaran vessel equipped with an AUV. The AUV's sensor suite includes a dual-frequency chirp side-scan sonar, chirp subbottom profiler, multibeam bathymetry and imagery system, and a camera mosaicking system.

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China boosts maritime law enforcement capabilities

According to an official document posted on China's central government website, the maritime authority has increased its law enforcement capabilities to protect the country's ocean rights and interests. The document specifies the duties and functions of the State Oceanic Administration (SOA). Earlier this year, the SOA, along with other government departments, was restructured. One rule appearing in the document that was recently approved by the State Council, highlights the SOA's expanded duties concerning law enforcement and the protection of maritime rights. The SOA and maritime police command, under the SOA, is tasked with deploying and commanding marine police officers. The maritime police have three branches — the North Sea Branch, the East Sea Branch, and the South Sea Branch, with 11 corps across China's coastal provinces, autonomous regions, and municipalities. Among the SOA's other duties are safeguarding maritime boundaries, stopping criminal activities on the water, guarding the safety of key maritime areas, and coping with emergencies.

Cargotec's MacGregor acquires Hatlapa Group

Cargotec's MacGregor has entered into an agreement to acquire privately owned Hatlapa Group, merchant ship and offshore deck equipment provider, for an enterprise value of EUR 160 million. Hatlapa's main products are a wide range of winches, steering gears, compressors, multi-deck-handler cranes, and other winch-related handling equipment. The company's service business includes spare parts, maintenance, refurbishment, and training. By acquiring Hatlapa, Cargotec will strengthen MacGregor's portfolio and market position and become a global leader in winches. Hatlapa was founded in 1919 and is headquartered in Uetersen, Germany. The company has 585 employees, the majority of which are located in Germany, Norway, and Asia. Its sales are expected to be around EUR 120 million in 2013. The company has production facilities in Germany and Norway for manufacturing strategically important components and products, but approximately two thirds of the production is outsourced to third parties. Hatlapa Group's three shareholders will continue to have an active role in the business after the transaction. This commitment is reinforced through their participation to a Cargotec level capital loan of EUR 35 million, which, in part consideration of the purchase price, can be transferred to MacGregor equity prior to planned IPO. This arrangement supports planned IPO and MacGregor's growth plans.

New west and central Africa piracy and maritime law enforcement code

IMO Secretary-General Koji Sekimizu has welcomed the signature by 22 States of the Code of Conduct concerning the prevention of piracy, armed robbery against ships, and illicit maritime activity in west and central Africa. The Code was adopted formally by the Heads of State meeting in Yaoundé, Cameroon on Tuesday (25 June), attended by 13 Heads of State from west and central African countries. The Code was signed in Yaoundé by Ministers of Foreign Affairs or other delegates, bringing it into effect for the 22 signatory States: Angola, Benin, Cameroon, Cape Verde, Chad, the Congo, Côte d'Ivoire, the Democratic Republic of the Congo, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, São Tome and Príncipe, and Togo. The new Code was developed by the Economic Community of West African States (ECOWAS), the Economic Community of Central African States (ECCAS), and the Gulf of Guinea Commission, pursuant to United Nations Security Council resolutions 2018(2011) and 2039(2012), which expressed concern about the threat that piracy and armed robbery at sea in the Gulf of Guinea pose to international navigation, security, and the economic development of states in the region. These resolutions encouraged the States of ECOWAS, ECCAS, and the Gulf of Guinea Commission to develop a comprehensive regional strategy and framework to counter piracy and armed robbery, including information sharing and operational coordination mechanisms in the region, and to build on existing initiatives, such as those under the auspices of IMO.

Damen delivers first-ever purpose-built offshore chasers



The delivery of the Aquarius-G and her sister ship Astra-G to offshore services company Rederij Groen (Scheveningen, The Netherlands) marked a milestone in offshore support vessel construction. Never before have such Chasers been purpose-built. The vessels have been designed by Saltwater Engineering in close cooperation with both Rederij Groen and Maaskant Shipyards Stellendam. Both seismic research support (SRS) vessels were constructed by Maaskant Shipyards Stellendam, part of Damen Shipyards Group.

"Indeed, all our other SRS Chaser vessels so far involve converted fishing trawlers," Henk Groen, director and proprietor of offshore company Rederij Groen proudly notes about his new twins. "Having designed them to our specific needs right from the drawing board significantly enhances the vessels' deployability and performance. Their sharply reduced sway and maneuverability are just two examples," Mr Groen adds.

The Aquarius-G and sistership Astra-G are so-called Guard Vessels or Chasers. One major task is to ensure that other shipping, mainly fishing ships, will keep distance from seismic survey vessels engaged in offshore exploration to literally chase-off. The trawlers' nets might otherwise damage the costly seismic streamers trailing behind the survey vessels.

A further key activity for the SRS vessels are the alongside operations, featuring a variety of services to the seismic survey mothership. While sailing alongside, such assistance includes the board-to-board transhipment of goods and equipment. The two new SRS vessels have a 2-tonne at a 10.5-m reach of free space at the aft deck, which provides sufficient storage capacity to include several ISO maritime containers. An aggregate 16 cu. m of temperature controlled cells cater for other auxiliary services.

As a significant improvement, the two purpose-built Chasers feature superior nautical capabilities over the converted fishing trawlers. Their sharply lesser sway benefits both the alongside operations and the crew's comfort.

The two novel seismic research support Chasers have a 40-m length over all, 9.30 m width, 3.30 m draught, with accommodation for a complement of 14. Top speed is 14 kts.

For more information, visit www.damen.com.

Caterpillar ships first MaK™ dual-fuel engine

Caterpillar Marine Power Systems is pleased to announce the shipment of the first MaK™ M 46 DF dual-fuel marine engine. The M 46 DF, Caterpillar's first marine dual-fuel solution, will power a newbuild ordered by Germany's AIDA cruises. Three 12 M 43 C marine engines will also power the cruise liner. The engine left the MaK™ Rostock, Germany facility en route to Mitsubishi Heavy Industries in Japan. Upon arrival, it will immediately be placed in the ship's hull.

Able to alternate from gas to diesel mode during operation, the M 46 DF offers the flexibility to operate vessels reliably in all geographical areas, whether the fuel in use is gas, marine diesel oil (MDO), or heavy fuel oil (HFO). In gas mode, the M 46 DF features industry-leading fuel consumption and will comply with IMO III as well as EPA Tier 4 regulations. The engine has been designed to allow retrofitting of current M 43 C engines.

With a bore of 460 mm and stroke of 610, the engine was designed for electric drive propulsion systems as well as mechanical propulsion systems.



Although designed for unlimited operation on LNG, marine diesel oil, and heavy fuel oil, the M 46 DF will reach industry-leading efficiency in gas mode.

For more information, visit www.marine.cat.com.

AXYS buoy to keep mariners safe and reduce operational costs

AXYS Technologies Inc. (AXYS) is pleased to be part of a funding announcement from the Canadian Government for the supply of a weather buoy off Herring Cove, Nova Scotia. AXYS will supply a 3-m metocean buoy to be delivered in early fall 2013.

The buoy will measure and report real-time meteorological and oceanographic conditions for the Halifax Port Authority to enhance local maritime safety for both commercial and recreational

vessel operators. The information from this buoy will also be distributed and used for education, scientific research, and the general public.

"Helping shippers with precise weather and wave conditions will help keep mariners safe while increasing productivity, reducing costs, and moving goods through Atlantic ports more effectively," said Keith Ashfield, Minister of Fisheries and Oceans, Minister for the Atlantic Gateway, and Regional Minister for New Brunswick. "Our government remains committed to our ongoing work with provincial and private-sector partners to implement the Atlantic Gateway and Trade Corridor Strategy, which will help position Atlantic Canada as a key entry point into North America."

The 3-m buoy for Herring Cove will be equipped with sensors to measure waves, currents, winds, air temperature, and atmospheric air pressure. Information will be available through HRMI and direct transmission from the buoy by the use of an AIS radio to any AIS instrumented vessel capable of decoding met-hydro data.

For more information, visit www.axystechnologies.com.

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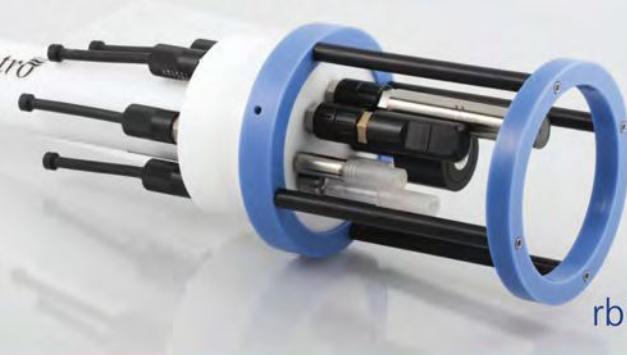


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Edison Chouest Offshore announces new vessels, port facilities expansion

The Edison Chouest Offshore (ECO) global family of companies, one of the industry's largest, most diverse, and dynamic marine transportation solution providers, announced plans to enlarge its sizeable fleet and expand its terminal facilities in support of its customer base.

The Chouest newbuild order book contains over 40 vessels, a vast majority to be constructed at its four U.S.-affiliate shipyards: North American Shipbuilding (Larose, Louisiana), LaShip (Houma, Louisiana), Gulf Ship (Gulfport, Mississippi), and Tampa Ship (Tampa, Florida) as well as its Brazilian shipyard, Navship.

ECO's worldwide fleet now approaches 250 highly specialized offshore service and support vessels. The largest portion of the newbuild program contains 17 vessels, with options for an additional 20 in a new class of 312-ft x 66-ft x 26-ft new generation, clean design, diesel-electric platform supply vessels (PSV).

This class features a new hull form that was designed to maximize deadweight while significantly reducing hydrodynam-

ic resistance, thereby improving fuel efficiency. The result is a vessel that offers a deadweight tonnage in excess of 6,000 LT, the capacity for over 22,000 barrels of liquid mud, over 2,000 barrels of methanol, and 14,450 cu. ft of dry bulk. Carrying the new class moniker of NA312E CD VE (Very Efficient), these vessels offer a cargo-delivered-to-fuel-used ratio that is significantly better than other PSVs operating in the Gulf of Mexico.

These vessels provide accommodations for 51 as well as class notations for firefighting, dynamic positioning, unmanned engine room operation, special purpose ship safety, workboat habitability, and storage and discharge of recovered oil. The vessels also comply with the new International Labour Organization standards for vessel design and crew standards.

For more information, visit www.chouest.com.

U.S. Merchant Marine Academy welcomes incoming class of 2017

The U.S. Merchant Marine Academy welcomed its incoming Class of 2017, consisting of 238 plebe candidates from across the country. Upon arrival, the Congressionally nominated

future Midshipmen began a rigorous, 18-day regimen of academic, military, and physical training known as Indoctrination (INDOC), their first step toward becoming future leaders and licensed maritime officers.

"The new plebe candidates make up one of the most diverse classes in Academy history," said Rear Admiral James A. Helis, Ph.D., superintendent at the U.S. Merchant Marine Academy. "I look forward to seeing entire class of 2017 learn, grow, and serve their country."

During their first day of INDOC, plebe candidates received their first berthing assignments, were issued uniforms, received their first military haircut, and learned to salute in their first official formation.

Upon graduation, Midshipmen receive a Bachelor of Science Degree and government-issued merchant marine officer license that will help ensure a steady stream of U.S. merchant marine officers to support the nation's economic and security interests. Kings Point graduates must serve five years on active-duty in the military or work in the maritime industry for five years, as well as eight years in the reserves.

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SEEING WITH SOUND:

Why Sonar Resolution Matters for Seabed Mapping

By: Dr. Jeremy Dillon, Senior Sonar Scientist
 Kraken Sonar Systems Inc.

August 2013

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Ocean News & Technology

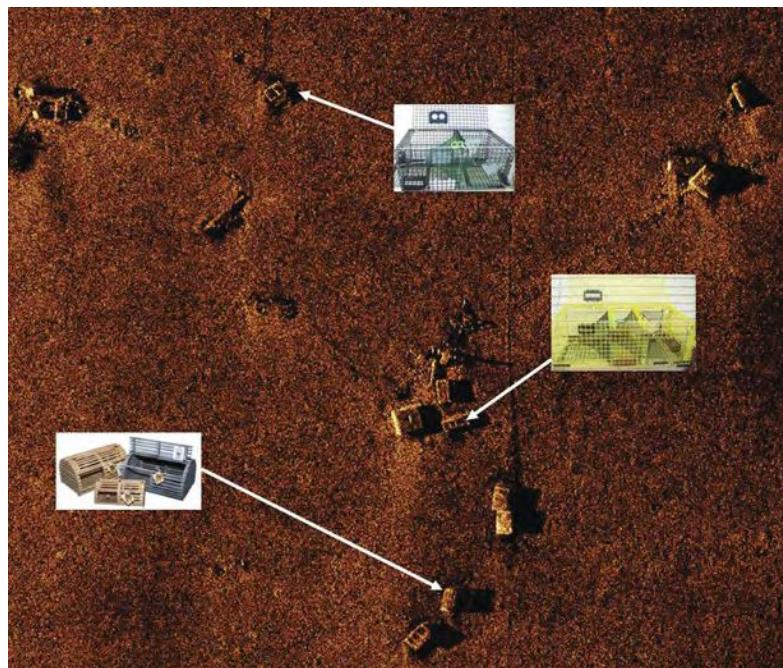
Seabed mapping is a key activity for many underwater applications such as offshore oil and gas exploration, pipeline surveying, ocean science, mine warfare, and hydrography. For each application, an increasing demand for high-resolution imagery arises from our desire to literally see beneath the ocean surface into a medium where light and radio signals cannot propagate effectively. Historically, side-scan sonars have been used to make reflectivity images whereas multibeam echo sounders have been the tool of choice for creating bathymetric charts. As technology evolves, many sensors integrate the capability to perform imaging and topographic mapping simultaneously. However, each design involves trade-offs between resolution, maximum range, size, power consumption, and cost that must be balanced to select the best sensor for a particular application.

The resolution of a sonar image is the size of the smallest object that can be detected. Minimizing this length is important because the information that can be extracted from a survey is determined by the size of the smallest details that can be observed. When the resolution is too coarse, small but potentially important details are unrecognizable or may be missed altogether. Sonar images often have different properties in the direction of the acoustic beam (across track) versus the direction of motion (along track). For example, side-scan sonar forms an image by sampling the received echo in time to form pixels in distinct range bins. The bandwidth of the transmit pulse determines the across-track resolution of a side-scan image. With modern wideband transducer technologies, centimeter-scale, across-track resolution can be achieved using chirp pulses with bandwidths on the order of 10 to 50 kHz.

However, along-track resolution is most often the limiting factor because the beamwidth is set by the ratio of the array length to the acoustic wavelength. Although the along-track resolution can be improved by increasing the frequency, this leads to a reduction of the achievable range due to increased attenuation of the acoustic signal (i.e., high frequencies are absorbed more readily than low frequencies). The same limitation applies to seabed reflectivity images formed with multibeam echo sounders. Multibeam sensors beamform the signals received from a multi-element array. The array

dimensions, therefore, limit the resolution of a multibeam image in both the along- and across-track directions. Furthermore, the resolution of both side-scan and multibeam sonar degrades with range because the acoustic beams diverge as they propagate.

Seabed mapping for naval mine countermeasures provides an illustrative example of a survey requirement. If the resolution is too low, objects of interest appear as single pixels that could represent a variety of objects such as rocks, mines, or other man-made objects like lobster pots and debris. Also, a low-resolution survey averages the reflectivity over a large area, which reduces the image contrast. For mine-like targets, the objects of interest have a length scale on the order of 1 m, and recognition is only possible once the resolution is significantly smaller than the size of the target. Experimentally, it has been found that 5-cm resolution or less is required to achieve an oper-



Synthetic Aperture Sonar (SAS) image of lobster pots at a range of approximately 100 m.

tionally effective balance between maximizing the probability of detection while minimizing the false alarm rate.

The array length is typically constrained by the available space on a towed body or an underwater vehicle and by the mechanical distortion that results from subjecting a long array to pressure loads that vary with depth. A quick calculation illustrates the range versus resolution trade-off. Achieving 5-cm resolution at a stand-off range of 100 m requires an array length on the order of 2,000 wavelengths. If we use 2 m as a practical limit for the array length, a wavelength of 1 mm corresponds to an operating frequency of 1.5 MHz, which causes sound waves to be severely attenuated by absorption in seawater. For conventional side-scan sonar, high-resolution imagery requires a short operating range, which reduces the coverage rate and increases the survey time and cost.

A new technology called Synthetic Aperture Sonar (SAS) creates high-resolution imagery for accurate seabed imaging and mapping using a technique similar to Synthetic Aperture Radar (SAR). SAS was initially developed for military applications such as naval mine detection and classification, and it uses signal processing to circumvent the usual trade-off between range, array length, and wavelength in conventional sonar. The forward motion of the sonar platform is used to synthesize an array that is much longer than the physical length by combining multiple pings in software. The result is an along-track resolution proportional to the transmitter length and independent of both range and frequency. Therefore, 5-cm resolution can be achieved across the entire swath using a wide transmission beam with relatively low frequencies for long range to maximize the area coverage rate.

Although SAS signal processing is more intensive than side-scan and multibeam processing, advances in parallel computing technology and algorithm design make real-time processing possible using embedded processors with low power requirements. As SAS technology becomes more affordable, it is expected to find widespread use in civilian markets and become a valuable supplement to and, in some cases, a replacement for existing sonar technology.

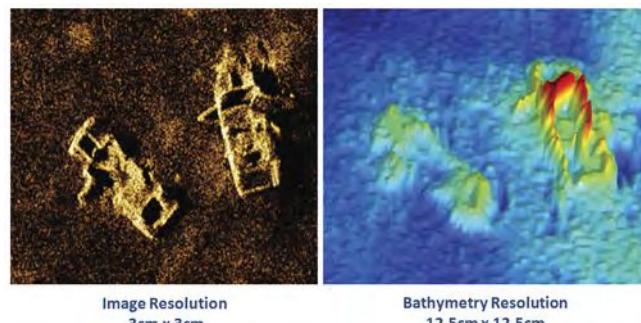
In addition to reflectivity images, sonar can produce topographic maps of the seafloor by detecting the angle of arrival of seabed echoes coming from a given range bin. A multibeam echo sounder beamforms the echoes received from a multi-element array to separate signals into discrete, angular bins. As with side-scan sonar, resolution degrades with range and the resolution of each beam is limited by the ratio of the array length to the acoustic wavelength. Also, multibeam sonars are inherently downward-looking devices that suffer from low area coverage rate in shallow water.

An alternative approach is found in phase-differencing bathymetric sonar (also known as swath bathymetry systems or interferometric side-scan sonar), where side-looking geometry is used to increase the coverage rate in shallow water.

Like side-scan sonar, satisfactory across-track resolution is possible using wide bandwidth pulses. However, all side-scan design constraints apply, namely the trade-off between along-track resolution and range, which manifests in a variety of high-frequency, low-frequency, and dual-frequency systems — all of which require a compromise between image

quality and area coverage rate.

The combination of synthetic aperture processing and interferometric processing solves the problems associated with limited resolution and coverage rates encountered with conventional swath bathymetric sonars and multibeam echo sounders. Such Interferometric Synthetic Aperture Sonar (InSAS) maps have range-independent and frequency-independent resolution and can achieve high resolution and high area coverage rates simultaneously. Two vertically separated sonar receiver arrays enable the production of bathymetric maps that are exactly co-registered with the SAS imagery because the bathymetry is derived by cross-correlating SAS images from each array. This allows bathymetric measurement out to the full imaging range, leading to significantly faster mapping operations with an ultra-high bathymetric resolution (on the order of 10 cm) that approaches the resolution of the corresponding reflectivity image. It then becomes pos-



Example of ultra high-resolution Interferometric SAS showing reflectivity image (L) and bathymetry (R); Targets were surveyed at 85 m from sonar broadside in 65 m depth.

sible to overlay the reflectivity and topographic datasets to create a true 3D picture of objects on the seabed. The capability of generating centimeter-scale resolution in all three spatial dimensions has the potential to provide significant improvements in the detection, classification, and identification of small seabed objects.

Choosing a type of sonar is much like selecting a tool from a toolbox. Each design involves many trade-offs to balance the constraints imposed by available technologies for electronics and transducers as well as the fundamental physics of underwater acoustic propagation. Side-scan, multibeam, and swath bathymetry sonars have proven to be effective for creating seabed images and for mapping the seafloor. However, conventional sonar technology has advanced to the point where resolution and range are determined by physical constraints such as array size and frequency-dependent acoustic absorption. Further evolution of seabed mapping technology will require more advanced signal processing to circumvent the traditional range-resolution trade-off, for example, by creating long arrays from multiple pings using synthetic aperture processing. High resolution in both across- and along-track directions is essential to truly see — and map — with sound.

New South Korean fisheries law a good first step to curb illegal fishing

A new amendment to South Korea's Water Fisheries Act, recently passed by the Korean National Assembly, increases penalties for illegal fishing to a maximum of three times the value of the fish caught, up from the current fine of US\$5,000. It also includes provisions for imprisonment, while industries involved in illegal, unreported, and unregulated (IUU) fishing or mistreating their fishing crews will lose their government subsidies under the new legislation. In response, Greenpeace East Asia oceans campaigner Jiehyun Park made the following statement, "These new provisions finally start addressing the huge and embarrassing problem of illegal fishing by South Korea's fleets. But South Korea still has a long way to go, and we will be keeping a close watch to ensure more progressive legislation is introduced without delay to address both illegal fishing and the need to manage fisheries sustainably. South Korea must ensure sustainable fisheries management both at home and abroad, where it participates in regional fisheries negotiations. Its track record is at odds with conservation measures and science and precautionary principles. Changes are desperately needed to ensure sufficient fish for all, including South Korea's fishing fleets." Greenpeace urges the Seoul government to ensure its regulations are in line with international requirements and best practices. Further legislation needs to be introduced and strictly implemented to ensure there is transparent traceability and chain-of-custody on products from all South Korean vessels to the markets.

Record-breaking "dead zone" predicted in the Gulf of Mexico this summer

The Gulf of Mexico may be far from the corn fields of the Midwest, but it's those fields that are causing a big problem for the Gulf coast water this year. The National Oceanic and Atmospheric Administration (NOAA) predicts a record-size "dead zone" in the Gulf this summer, stretching from South Texas all the way to Alabama. Dr. Paul Montagna, chair and professor for the Harte Research Institute for Gulf of Mexico Studies (HRI), has studied these "dead zones," also known as hypoxia zones, for more than 20 years. "The zone sets up in late spring and lasts throughout the summer," said Montagna. The "dead zone" is caused when nitrogen-based fertilizer washes off farm fields, in the Midwest corn-belt and ends up in the Mississippi River, which flows into the Gulf. Just as nitrogen-based fertilizer makes corn grow, it also stimulates the growth of plants in the water, mainly algae. The algae bloom and eventually die and decay. This process removes oxygen from the water, resulting in oxygen-depleted water where marine life can't live. This year's "dead zone" is expected to be as large as 8,561 sq. mi along the Gulf coast, which is a rich breeding ground for fish, shrimp, oysters, and crab. It's an area that accounts for about 18% of the total commercial seafood sold in the United States. Shrimp and oyster supplies, in particular, are heavily concentrated in the Gulf, making the seafood industry an important component of the Gulf Coast economy. "The hypoxia zones are not dangerous to fish, but cannot support bottom-dwelling life such as clams, crabs, and shrimp," said Montagna. "Because fish avoid these areas, commercial shrimp boats and recreational fisherman must go further out to open water to make their catch." Dr. Larry McKinney, executive director of HRI, says this yearly threat to the Gulf is caused by one thing, ethanol. So what does the large size of this year's hypoxia zone in the Gulf of Mexico have to do with ethanol made from corn grown in the Midwest? Corn prices are high right now, so farmers are planting more of it. While you can grow many crops without fertilizer, corn requires it. The USDA estimates as much as 40% of last year's corn crop was used to make ethanol. Last summer was one of the smallest "dead zones" on record at 2,889 sq. mi. Experts with NOAA say the drought in the Midwest last year kept runoff out of the Mississippi River. This year will be just the opposite. Heavy rainfall in the Midwest this spring led to flood conditions, with states like Minnesota and Illinois experiencing one of the wettest springs on record. All of that flooding, along with bigger corn crops, means more fertilizer flowing into the Gulf. "Dead zones" normally peak in July and August and start to break-up in the fall. The only thing that would fix the situation sooner is a tropical storm or a hurricane to stir up the water and re-oxygenate the area.

Major changes needed for coral reef survival



Photo by Florida Keys National Marine Sanctuary staff, provided courtesy of NOAA

To prevent coral reefs around the world from dying off, deep cuts in carbon dioxide emissions are required, says a new study from Carnegie's Katharine Ricke and Ken Caldeira. They find that all existing coral reefs will be engulfed in inhospitable ocean chemistry conditions by the end of the century if civilization continues along its current emissions trajectory. Their work was published 3 July by *Environmental Research Letters*.

Coral reefs are havens for marine biodiversity and underpin the economies of many coastal communities. But they are very sensitive to changes in ocean chemistry resulting from greenhouse gas emissions as well as to coastal pollution, warming waters, overdevelopment, and overfishing.

Ricke and Caldeira, along with colleagues from Institut Pierre Simon Laplace and Stanford University, focused on the acidification of open ocean water surrounding coral reefs and how it affects a reef's ability to survive.

Coral reefs use a mineral called aragonite to make their skeletons. It is a naturally occurring form of calcium carbonate, CaCO_3 . When carbon dioxide, CO_2 , from the atmosphere is absorbed by the ocean, it forms carbonic acid (the same thing that makes soda fizz), making the ocean more acidic and decreasing the ocean's pH. This increase in acidity makes it more difficult for many marine organisms to grow their shells and skeletons and threatens coral reefs the world over.

Using results from simulations conducted using an ensemble of sophisticated models, Ricke, Caldeira, and their co-authors calculated ocean chemical conditions that would occur under different future scenarios and determined whether these chemical conditions could sustain coral reef growth.

Deep cuts in emissions are necessary in order to save even a fraction of existing reefs, according to the team's results. Chemical conditions that can support coral reef growth can be sustained only with very aggressive cuts in carbon dioxide emissions.

"To save coral reefs, we need to transform our energy system into one that does not use the atmosphere and oceans as waste dumps for carbon dioxide pollution. The decisions we make in the next years and decades are likely to determine whether or not coral reefs survive the rest of this century," Caldeira said.

For more information, visit www.carnegiescience.edu.

Lionfish expedition off Florida: bigger and deeper than expected

The first expedition to use a deep-diving submersible to study the Atlantic Ocean lionfish invasion found something very disturbing — at 300 ft deep, there were still significant populations of these predatory fish, and they were big.

Big fish in many species can reproduce much more efficiently than their younger, smaller counterparts, and lionfish are known to travel considerable distances and move to various depths. This raises significant new concerns in the effort to control this invasive species that is devastating native fish populations on the Atlantic Coast and in the Caribbean Sea.

"We expected some populations of lionfish at that depth, but their numbers and size were a surprise," said Stephanie Green, the David H. Smith Conservation Research Fellow in the College of Science at Oregon State University, who participated in the dives. OSU has been one of the early leaders in the study of the lionfish invasion.

"This was kind of an 'Ah hah!' moment," she said. "It was immediately clear that this is a new frontier in the



lionfish crisis, and that something is going to have to be done about it. Seeing it up-close really brought home the nature of the problem."

OSU participated in this expedition with researchers from a number of other universities in work supported by Nova Southeastern University, the Guy Harvey Foundation, NOAA, and other agencies. The five-person submersible Antipodes was provided by OceanGate, Inc.

Whatever is keeping them in check in the Pacific — and researchers around the world are trying to find out what that is — is missing here. In the Caribbean, they are found at different depths and in various terrain, are largely ignored by other local predators and parasites, and are rapidly eating their way through entire ecosystems. They will attack many other species and appear to eat constantly.

For more information, visit www.oregonstate.edu.

Discovery of the Plastisphere, a new marine ecological community

The masses of plastic debris that float over large areas of the world's oceans have become new ecological communities that scientists have named the Plastisphere. Their report in the ACS journal Environmental Science & Technology suggests that these novel habitats in the North Atlantic Ocean may harbor potential disease-causing microbes.

Erik Zettler of the Sea Education Association, Tracy Mincer of the Woods Hole Oceanographic Institution, and Linda Amaral-Zettler of the Marine Biological Laboratory explain that plastic has become the No. 1 form of ocean debris, causing serious concerns about its impact on the health of ocean communities. The damaging effects that plastic in the oceans have on fish, birds, and other seafaring animals have previously been described in detail by other researchers. But scientists had yet to explore what plastic does to some of the smallest ocean inhabitants. Zettler, Mincer, and Amaral-Zettler decided to find out.



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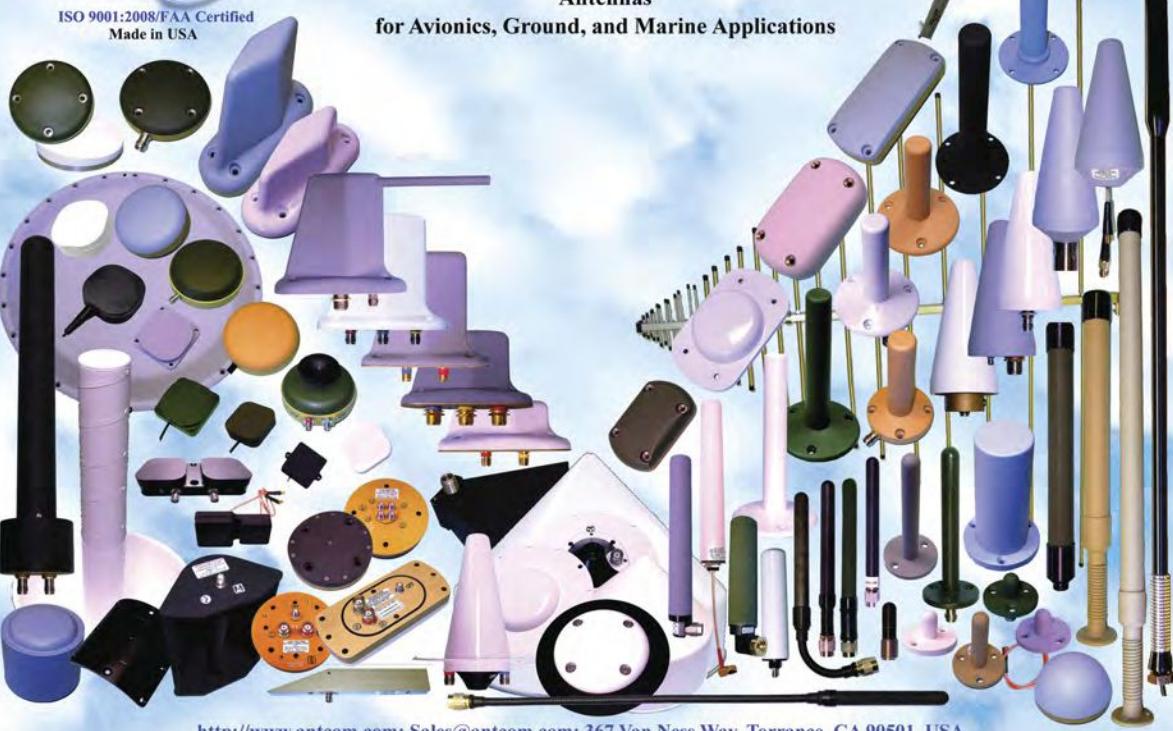
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They discovered that tiny organisms, from algae to bacteria, thrive on plastic debris, transforming it into rich “microbial reefs” that are distinct from communities in surrounding water. Though some inhabitants may be degrading the plastic, it still provides a relatively stable home for microbes. Apparently a good home for its little residents, plastic debris might pose a health risk for invertebrates, fish, or possibly humans. The Plastisphere harbors a group of bacteria called Vibrio. Some Vibrio species can cause illnesses, such as cholera, when they come in contact with humans.

For more information, visit www.acs.org.

Largest survey of marine protected species on east coast begins 4th year

How are the various species of whales, dolphins, and porpoise distributed along the Atlantic coast? How many are there? How many species of sea birds and sea turtles co-exist with them and where are they generally found? What is important to their survival?

That's what teams of marine scientists will try to learn when they head out to sea this summer on the largest survey of Atlantic marine protected species on the east coast. From July through September, they will be studying whales, porpoise, dolphins, turtles, seals and seabirds from Maine to Florida to learn more about their population sizes and migratory patterns.

The research is part of a 5-year study developed and funded by the Bureau of Ocean Energy Management (BOEM), the U.S. Fish and Wildlife Service (USFWS), and NOAA. Additional support for the marine mammal research comes from the Navy while the sea scallop fishing industry is lending support for the sea turtle work through their research set aside program.

Called the Atlantic Marine Assessment Program for Protected Species (AMAPPS), a key objective of the study is to help fill critical data gaps on the population size, behavior and spatial distribution of protected species. In consultation with federal partners, BOEM will use the data to help assess the potential impacts to protected resources in relation to the development of offshore energy projects. The data will also help in the design of avoidance and mitigation measures related to offshore energy operations. In addition, the data will improve the knowledge base of other federal agencies with living marine resource responsibilities, and will assist

with multiple ocean use planning activities under the National Ocean Policy.

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

Live subsea sound sensing from an autonomous vehicle

CSA Ocean Sciences Inc. (CSA) successfully deployed a real-time automated system that immediately displays the continuous spectrogram of a live audio stream to an interactive website. In addition to the acoustic data stream, various sound monitoring analyses are readily available on the website.



Together, CSA, SeaRobotics Corporation, and members of the Technical University of Catalonia, BarcelonaTech (Spain) have linked the autonomous platform onboard automated acoustic monitoring system to the Internet from the SeaRobotics facility in Stuart, Florida, thus creating a live connection between subsea data acquisition and a user's desktop via an un-cabled, unmanned observatory. The resulting data can be monitored online via CSA's website www.oceansound.com.

Oceansound.com is a unique web-based real-time PAM application available for the offshore industry, anticipating the future broad use of acoustic data at large spatial and temporal scales. This unique approach provides the opportunity for a significant impact on how applied acoustic-based research is currently conducted. Oceansound.com

is designed for ease of operation (non-expert) and provides a monitoring system that operates 24/7 continuously, automatically, and without the need for post processing.

CSA's vision is to provide solutions that far exceed current acoustic monitoring technology, increase and highlight the benefit of acoustic measurements, and demonstrate industries' concern for the marine environment.

For more information visit www.csaocean.com.

Study identifies source of oil sheens near Deepwater Horizon

A chemical analysis indicates that the source of oil sheens recently found floating at the ocean's surface near the site of the Gulf of Mexico Deepwater Horizon oil spill is pockets of oil trapped within the wreckage of the sunken rig.

First reported to the U.S. Coast Guard by multinational oil and gas company BP in September 2012, the oil sheens raised public concern that the Macondo well, which was capped in July 2010, might be leaking.

However, both the Macondo well and the natural oil seeps common to the Gulf of Mexico were confidently ruled out, according to researchers from the University of California Santa Barbara (UCSB) and the Woods Hole Oceanographic Institution (WHOI).

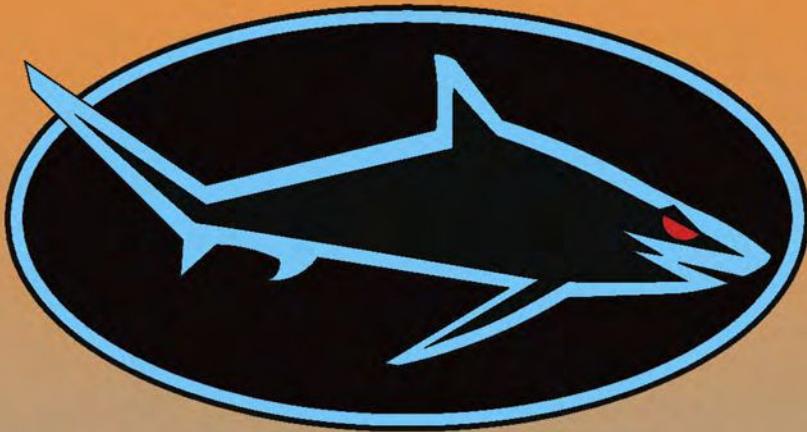
For more information, visit www.nsf.gov.

Mesoscale ocean eddies impact weather, too

Ocean currents have a big impact on weather and climate. Without the Gulf Stream, the climate of Northern and Western Europe would be cooler. Scientists at ETH Zurich now uncovered that also relatively small swirling motions in the ocean, so called eddies, impact weather. A large number of such eddies exists in all oceans at any time, featuring diameters of about 100 km.

Surface water in anticyclonic eddies is warmer than in their surroundings, for cyclonic eddies it is the opposite. These temperature differences mainly reflect the origin of the eddies, meaning they originate from either warmer or cooler waters relative to their current position. Investigators computed that wind speed increases by roughly 5%, cloud cover by 3%, and rain probability by 8% for each degree Celsius that an eddy is warmer than its ambient water.

For more information, visit www.ethz.ch.



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Interior announces second offshore wind energy lease sale
Secretary of the Interior Sally Jewell and Bureau of Ocean Energy Management (BOEM) Director Tommy P. Beaudreau announced that BOEM will hold its second competitive lease sale for renewable energy on the U.S. Outer Continental Shelf (OCS). The auction will offer nearly 112,800 acres offshore Virginia for commercial wind energy leasing. "The competitive lease sale offshore Virginia will mark an important transition from planning to action when it comes to capturing the enormous clean energy potential offered by Atlantic wind," said Jewell. "Responsible commercial wind energy development has the potential to create jobs, increase our energy security, and strengthen our nation's competitiveness." Under the terms of the Final Sale Notice, the wind energy area offshore Virginia will be auctioned as a single lease. The area is located 23.5 nmi from the Virginia Beach coastline and has the potential to support more than 2,000 MW of wind generation – enough electricity to power approximately 700,000 homes. As part of President Obama's comprehensive climate action plan, he challenged Interior to re-double efforts on the renewable energy program by approving an additional 10,000 MW of renewable energy production on public lands and waters by 2020. The area, composed of 19 full OCS blocks and 13 sub-blocks, was selected after intensive work with the Commonwealth and stakeholders to avoid existing uses of the OCS offshore Virginia, including sensitive ecological habitat and shoals along the coast north of the mouth of the Chesapeake Bay, military training areas, marine vessel traffic, a dredge disposal site, and areas of concern specified by the National Aeronautics and Space Administration Goddard Space Flight Center's Wallops Flight Facility.

Joint Ocean Commission Initiative calls on Obama Administration to promote use of offshore wind

The bi-partisan Joint Ocean Commission Initiative is calling on the Obama Administration and Congress to make a "national investment" in offshore wind "through adequate and stable financial and tax incentives" to "position us as leaders in an emerging global industry." Their new report, "Charting The Course, Securing the Future of America's Oceans," states: "The Administration's principles guiding domestic energy development include creating clean energy jobs and technologies, making America more energy independent, and reducing carbon emissions. Renewable energy -- particularly offshore wind energy -- has great potential for pursuing expansion." The context for this policy recommendation the report focuses on is the significant stresses now placed on the ocean ecosystem by pollution, especially climate change, and the urgent need to mitigate those threats. Established in 2005, the Joint Ocean Commission Initiative promotes and maintains the important work of the U.S. Commission on Ocean Policy and the Pew Oceans Commission. The Joint Ocean Commission Initiative Leadership Council is composed of former members of the two commissions and other experienced individuals from a variety of sectors, including industry, government, academia, and national security at the national, state, local and regional levels. It is co-chaired by William Ruckelshaus, former EPA Administrator in the Reagan Administration, and Norman Mineta, former Secretary of Transportation in the George W. Bush Administration and former Secretary of Commerce in the Clinton Administration.

Tocardo and Clifford Chance enter strategic partnership supporting tidal energy projects worldwide

Tocardo Tidal Turbines, producer of tidal and free-flow water turbines, and leading international law firm Clifford Chance have entered a strategic business partnership. The deal will enable Tocardo to access specialist legal and administrative support for tidal energy projects worldwide. Clifford Chance will provide legal expertise in sustainable energy and unlock its global network, coordinated by its Amsterdam office, to support Tocardo in establishing SPVs (special purpose vehicles) for tidal energy projects around the world. The partnership with Clifford Chance is another major step for Tocardo in the development of its tidal energy business. Tocardo recently secured investment from Spanish energy company Repsol and the Dutch-based offshore specialist, Huisman. Tocardo is now set to scale up its turbine production. Tocardo recently also announced a partnership with Climex, the trading platform for renewable energy and carbon credits, to sell energy generated by Tocardo's turbines through Climex's green energy trading platform.

First offshore wind turbine installed in Spain commissioned



The first offshore wind turbine installed in Spain has been commissioned by Gamesa. It is also Gamesa's first offshore prototype, with 5 MW of nominal power and installed at the Arinaga Quay in Gran Canaria (Canary Islands).

This turbine, with a rotor diameter of 128 m and a total height of 154 m, will generate enough energy to power 7,500 households a year.

The commissioning of the turbine is a key step in its certification, foreseen in the upcoming months.

Gamesa began the installation of the tower, the nacelle and three blades of the wind turbine in mid-April, with the assembly of the tower, with a total height of 90 m and manufactured by Windar (joint venture between Gamesa and Daniel Alonso). The nacelle, manufactured at the Tauste (Zaragoza) factory, is 12.5 m long, 4 m tall and wide and weighs 72 tons.

The Gamesa 5 MW offshore platform is equipped with the technology Gamesa has proven and validated in its 4.5 MW system, plus the know-how and experience acquired during the 4.5 MW's rollout. The first turbine of this new platform, Gamesa G128-5.0 MW has a modular and redundant design, which ensures reliability and maximises energy output, optimizing the cost of energy.

Gamesa in late 2012 obtained design certification for its offshore turbine from independent organisation DNV. The DNV endorsement heralded a major leap forward in the system's development, as a guarantee of the turbine's launch, commercial rollout and manufacture in coming years.

For more information, visit www.gamesacorp.com.

Cape Wind signs \$15M contract with Cape Cod Construction contractor, Lawrence-Lynch Corp.

Cape Wind has signed a \$15 million contract with Falmouth-based Lawrence-Lynch Corp. to provide the upland construction work required to bury Cape Wind's electric cables. Lawrence-Lynch Corp. will also be responsible for providing a conduit for connecting the buried electric cables on land to the submerged ocean submarine cables by using a directional drill from the landfall point in West Yarmouth out to a temporary cofferdam they will construct in Lewis Bay.

Cape Wind's announcement comes less than a week following President Obama's announcement of a major new initiative to mitigate climate change. Cape Wind will offset over 770,000 tons of the greenhouse gas carbon dioxide (CO₂) pollution annually, an amount equivalent to taking 175,000 cars off the road each year.

For more information, visit www.capewind.org.

World's largest offshore windfarm opened by David Cameron

The London Array, the world's largest offshore wind farm, was officially opened today. Over 300 guests attended the VIP morning event in Margate, Kent, UK, where the wind farm is visible and already in full operation. DONG Energy owns a 50% share of the project and will provide the operations and maintenance service for the project.

The ceremony was attended by the UK Prime Minister, David Cameron, who took a boat trip to the project earlier in the day. Mr Cameron gave a speech and said, "This is a great day for Kent and a great day for Britain. London Array has been built by some of the bravest seamen, the most talented engineers and hardest workers. It will bring benefits to Kent for years to come."

London Array is located around 20 km off the coasts of Kent and Essex on a 100 km² site. Its 175 Siemens 3.6 MW turbines have a combined capacity of 630 MW and are expected to produce enough electricity to power over half a million UK homes each year.

For more information, visit www.dongenergy.com.

DNV KEMA releases floating offshore wind turbine structures standard

In response to the fast-expanding offshore wind market, DNV KEMA, the energy arm of DNV, has developed a new standard that will help accelerate the development of a new generation of floating offshore wind turbines by establishing design requirements for the floating structure and related systems.

According to Johan Sandberg, head of renewable energy at DNV KEMA, Norway and project sponsor, the standard covers a broad range of issues, including safety philosophy and design principles; site conditions, loads and response; materials and corrosion protection; structural design; design of anchor foundations; floating stability; station keeping; control and mechanical systems; transport and installation; in-service inspection; and cable design.

"As demand for wind energy increases, we predict offshore deployments will continue to move into deeper waters and, consequently, there's a need to establish design standards that will help ensure safety, reliability, and confidence in future wind turbines," he says. "To that end, the new standard, developed as a Joint Industry Project (JIP) with 10 participating companies, aims

to spur progress in floating offshore wind through a framework for best practices and technical requirements, plus producing guidance for design, construction, and in-service inspection."

The new standard for floating wind structures, devised under DNV KEMA's leadership through project manager Anne Lene Hopstad and technical specialist Knut Ronold supplements the developed DNV Guideline for Offshore Floating Wind Turbine

Structures, the existing standard DNV-OS-J101 Design of Offshore Wind Turbine Structures.

The 10 participants in the JIP study are Statoil, Nippon Steel & Sumitomo Metal Corporation, Sasebo Heavy Industries, STX Offshore & Shipbuilding, Navantia, Gamesa, Iberdrola, Alstom Wind, Glosten Associates, and Principle Power.

For more information, visit www.dnv.com.

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Offshore wind spending set to average almost €15 B per year over the next 10 years

Douglas-Westwood (DW) forecast offshore wind installations averaging 3.2 GW per year over the next 10 years with capital expenditure hitting a peak of €18 billion in 2016. The fifth edition of DW's World Offshore Wind Market Forecast presents a new longer-term forecast and examines the key commercial developments since the last publication to provide detailed insight to established players and new entrant alike.

"For many countries, including the UK and Germany, offshore wind is a key component in the future electricity generation mix," commented report author Dmitry Dovgan. "To date, the UK market has been the main driver of growth, with many important lessons learned along the way. At the current time, we see increasing activity in Germany with a large amount of new capacity set to come online in the near future."

The DW approach to market modeling takes a conservative view, with particular sensitivity to the more specula-

tive projects. "Historically, growth has been slower than expected, and many uncertainties are yet to be resolved. However, there is a positive upward trend, with significant expenditure expected, which has attracted many of the largest industrial players from Areva to Samsung Heavy Industries," commented DW manager Frank Wright.

For more information, visit www.douglas-westwood.com.

OPT reports loss of \$14.8 M

Ocean Power Technologies (OPT) reported a net decrease in cash and investments of \$11.4 million for the twelve months ended 30 April 2013 versus a net decrease of \$15.2 million for the 12 months ended 30 April 2012.

The company's net loss for Fiscal 2013 declined to \$14.8 million from \$15.2 million in Fiscal 2012.

OPT reported that further progress was made in Australia, where OPT and Lockheed Martin are working together on a planned 62.5 MW peak generator rated wave power project off Portland, Victoria, which would be one of the

largest wave projects in the world. Professional Diving Services was engaged to conduct a seabed survey in connection with this project. In addition, OPT is working with the Australian Renewable Energy Agency (ARENA), the entity that manages the Commonwealth's A\$66.5 million grant for the project, on certain variations to the funding deed that governs the grant. This funding deed for the project sets out the terms of the grant, including the requirement to obtain significant additional funding.

Also reported was a contract worth ¥70 million (approximately US\$0.7 million) was received from Mitsui Engineering & Shipbuilding Co. Ltd. for further work on PowerBuoy enhancements that, under Japanese wave conditions, provide for improved power capture. The analysis and design work are now complete, and a decision is expected to be made on next steps toward ocean trials of a demonstration PowerBuoy.

For more information, visit www.oceanpowertechnologies.com.

A NEW DIMENSION IN SEAFLOOR MAPPING



Sonar Image of Shipwreck



L-3 Klein's System 5000 V2 Multi-Beam Side Scan Sonar creates a new dimension in seafloor mapping with interferometric bathymetry. The Klein 5000 V2 has everything you would expect in a top-of-the-line side scan sonar. Operating at peak performance and with extended range capability, no single-beam side scan sonar can match its resolution. For more on how L-3 Klein is making oceans transparent, call (603) 893-6131 or visit us at L-3com.com/Klein.

Minesto develops world's first simulator for anchored flying underwater vehicles

Nordic marine energy technology leader Minesto has developed a simulator to aid the development of its Deep Green marine power plant. Deep Green is the only marine power plant that is able to cost efficiently produce electricity from low-velocity tidal and ocean currents.

The simulator has been developed in-house by Minesto's own research and development department and is in essence based on two existing open source programs: one for commercial flight simulation and one for marine vehicle simulation.

The end result is an analysis and simulation tool called HAMoS (Hydrodynamic Analysis and Motion Simulation), believed to be the first in the world to simulate the movements of a flying tethered underwater vehicle. It will be used to predict how Minesto's marine power plant, Deep Green, moves subsea in various ocean environments.

Depending on the plant's design, Minesto's research, development and testing staff can change a number of



variables in the power plant's design to simulate and optimize its performance. The simulator can be used to predict Deep Green's behavior and power performance in different real-life site conditions (i.e., the strength and direction of the currents).

For more information, visit www.minesto.com.

Offshore wind floating TLP model tests complete

U.S.-based Glosten Associates announced that the 3-week scale-model testing of the PelaStar tension-leg platform (TLP) has been completed.

The 3-week test program was conducted in support of the Offshore Wind Floating Platform Demonstration Project

FEED Study awarded to Glosten by Energy Technologies Institute (ETI). The test results are being used to further demonstrate PelaStar's technical feasibility and to calibrate state-of-the-art software used to design, analyze, and optimize the floating wind turbine system.

The 1:50-scale floating wind turbine model was tested in the world-class offshore basin at the Maritime Research Institute Netherlands (MARIN). For this test, the PelaStar TLP was optimized for MARIN's in-house test turbine, which models a 5-MW turbine with a 126-m rotor diameter.

The test model design was based on a full-scale platform designed in accordance with the new DNV standard for floating wind turbine structures (DNV-OS-J103) and optimized for the MARIN turbine. The simulated full-scale offshore conditions are representative of UK Round 3 conditions, and are characterized by a 55-m water depth, a 7.5-m tide range, and an extreme significant wave height of 8.2 m.

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

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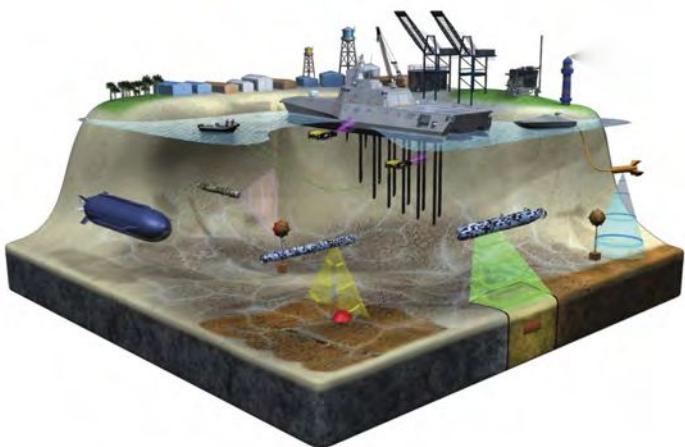
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Northrop to provide services for U.S. Navy's LCS mission packages

Northrop Grumman Corporation has received a \$28 million contract from the U.S. Navy for engineering and production planning services for surface warfare and mine countermeasures mission module components that will deploy from, and integrate with, the littoral combat ship (LCS). With this award, Northrop Grumman continues its role as the mission package integrator with expanding roles in systems engineering, mission module production, and mission package fleet sustainment, including distance support for the currently deployed USS Freedom (LCS 1). Each mission package comprises a specific set of subsystems such as data processing equipment, vehicles and sensors, and others. These mission packages integrate specialized manned and unmanned systems that must operate in a combination of air, surface, and subsurface domains. The capabilities contained in each mission package focus on mine countermeasures, littoral anti-submarine warfare, or littoral surface warfare operations. Working closely with the Navy program office, Northrop Grumman utilizes a disciplined systems engineering process to ensure that the mission package components, selected by the Navy and produced by numerous companies across the United States, successfully operate together. The company also works to ensure that the components are integrated seamlessly with other LCS systems, as well as the Navy networks in which the LCS functions. To date, Northrop Grumman has delivered two surface warfare mission modules and is nearing completion of delivering its first mine countermeasures mission module for LCS. The second Northrop Grumman-produced mine countermeasures mission module is currently in production as well.

ERAPSCO to supply AN/SSQ-53F and AN/SSQ-57 sonobuoys to U.S. Navy

Sparton and Ultra Electronics (ULE) subsidiary USSI joint venture, ERAPSCO has been awarded a contract for supply of sonobuoys to the U.S. Navy. Under the \$5.8 million contract, the company will manufacture and supply unspecified units of its AN/SSQ-53F directional frequency analysis and recording (DIFAR) and the AN/SSQ-62E directional command active sonobuoy system (DICASS) sonobuoys to the Navy. Around \$2.8 million of the total sum will be awarded to Sparton Electronics Florida, while USSI will receive the remaining \$3 million. Sonobuoys are primarily designed for detection of acoustic emissions or reflections from enemy submarines and subsequent transmission of the signals to U.S. Navy's airborne antisubmarine warfare forces. Combining capabilities of both AN/SSQ-53D and AN/SSQ-57 sonobuoys, AN/SSQ-53F is a passive acoustic sensor used for detection, classification, and localization of enemy submarines during peacetime and combat operations. Capable of operating in three available acoustic sensor modes, the multi-functional Nato A-size sonobuoy augments the underwater acoustics, in addition to offering directional data necessary for establishment of bearing to the source of the acoustic energy. An A-size, expendable, non-repairable, command activated sonobuoy, the AN/SSQ-62E DICASS is widely used for the final localization and attack phase of submarine prosecutions. An upgraded version of AN/SSQ-62D DICASS, the sonobuoy features command function select (CFS), which enables transmission of ultra-high-frequency (UHF) radio commands to the sonobuoy, modifications to RF channel frequency and associated sonar channel frequency amongst others, offering improvements for both deepwater and littoral ASW environments. Both Q53F and Q62E sonobuoys are used to support U.S. Naval Antisubmarine Forces. Manufacturing work will be carried out at both Sparton's facility in DeLeon Springs, Florida, and USSI's Columbia City facility in U.S., and is expected to be complete by January 2015.

Navy to award sole source contract to Bluefin for AUVs

The Naval Research Laboratory intends to enter into sole source negotiations with Bluefin Robotics Corporation, Bluefin Robotics, a leader in the design and manufacturing of Unmanned Underwater Vehicles (UUVs).

Market research was previously conducted and it has been determined that this is a sole source requirement. No other AUV manufacturer has the combined unique capabilities, experience, and facilities that will meet the needs of the current Black Pearl AUV requirement. NRL has made a significant investment in the Reliant class of 21 in. diameter AUVs. Significant resources have been expended to date in the development of payloads and the associated software for this vehicle architecture. The mechanical, electrical, and logical interfaces are very specific to this vehicle architecture, as it is for all AUV architectures and manufacturers. The control software between the payloads and the main vehicle computer, that controls the overall mission, is also unique. NRL has designed and built significant hardware and software over several years that works effectively with the Bluefin 21 architecture.

Bluefin will provide NRL a state-of-the-art generation Autonomous Underwater Vehicles (AUV) capability that is needed for a number of the Divisions programs, and will significantly impact research in the Anti-Submarine Warfare (ASW) and Mine Countermeasure (MCM) missions of the division. The areas enhanced by acquisition of the required AUVs will include research in long range and multi-static mine hunting and ASW programs, as well as new distributed sensing programs.

The top-level requirements for the vehicle are a 3-to-5-nmi/hr operating speed, a 400 m depth capability, a minimum of 18 kW-hr energy storage, and a real-time GPS-aided fiber optic gyro (IXSEA PHINS III), inertial navigation system (INS) integrated with Doppler velocity log instrument capable of measuring the vehicle's horizontal position, velocity, and attitude.

Bluefin Robotics designs, manufactures and operates Autonomous Underwater Vehicle (AUV) systems and related technology. Founded in 1997, the company has grown to become a world leader in AUV products designed for defense, commercial, and scientific applications. Bluefin Robotics is a wholly-owned subsidiary of Battelle.

For more information, visit www.bluefinrobotics.com.

LSC remote minehunting system reaches reliability milestone

The Navy successfully concluded the second and final phase of reliability testing of the littoral combat ship (LCS) remote minehunting system (RMS) off the coast of Palm Beach, Florida, 14 June, enabling the service to progress toward developmental testing.

The remote minehunting system, consisting of a semi-submersible remote multi-mission vehicle (RMMV) operating with the AN/AQS-20A variable depth minehunting sonar, was designed to detect, classify, identify and locate bottom and moored mines in shallow and deep water.

The RMS will provide the Navy the capability to keep ships and sailors out of the minefield, and will be deployed from the littoral combat ship (LCS) as part of the ship's mine countermeasures mission package.

The system completed more than 850 hrs of testing during 47 missions over a 4 month period.

The tests, conducted at the Lockheed Martin facilities at Riviera Beach, Florida, included participation by

sailors from the Littoral Combat Ship Squadron Mine Countermeasures Detachment, who assisted with both mission operations and vehicle maintenance, and engineers from the Naval Surface Warfare Center Panama City Division, who supported all aspects of the testing. The tests validated reliability improvements made to the RMMV design in this increment and demonstrated the required reliability necessary to meet program requirements.

For more information, visit www.navsea.navy.mil.

Sailors demonstrate SeaBotix LBV to Royal Malaysian Navy

Sailors assigned to Mobile Diving and Salvage Unit 1 demonstrated the capabilities of the SeaBotix LBV to the Royal Malaysian divers aboard the diving and salvage vessel USNS Safeguard during a dive and salvage training exercise in support of Cooperation Afloat Readiness and Training (CARAT) Malaysia 2013. CARAT is a series of bilateral military exercises between the U.S. Navy and the armed forces of Bangladesh, Brunei, Cambodia,



*U.S. Navy photo by
MC1 Joy M Kirch-Kelling*

Indonesia, Malaysia, the Philippines, Singapore, Thailand and Timor Leste.

The SeaBotix LBV systems are supplied with the latest Wide Dynamic Range (WDR) color camera technology. Coupled to the color camera is a high intensity LED array providing bright white light throughout the 270° range of view.

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First arrested landing of an unmanned aircraft aboard an aircraft carrier

Northrop Grumman Corporation and the U.S. Navy have completed the first arrested landing of the X-47B Unmanned Combat Air System (UCAS) carrier demonstration aircraft on the deck of the USS George H.W. Bush (CVN 77).

The Northrop Grumman-built aircraft landed while the aircraft carrier was under way off the coast of Virginia, and marks the latest and most significant achievement for the program during carrier sea trials, which began in May.

The X-47B aircraft took off from Naval Air Station (NAS) Patuxent River, Maryland. A mission operator aboard the carrier took control of the aircraft and monitored the flight operations, which included several planned precision approaches in preparation for the first arrested landing.

During testing, the X-47B completed the 35 min journey from Pax River to the carrier and caught the three-wire with the aircraft's tailhook. The arrested landing effectively brought the aircraft from approximately 145 kts to a stop in less than 350 ft.

On 14 May, the X-47B became the first unmanned aircraft to be catapult launched from a Nimitz class aircraft carrier, and on 17 May it performed the first in a series of precision approaches and touch-and-go landings on a carrier by an unmanned system.

For more information, visit www.northropgrumman.com

Somali pirates are biding their time

"Somali pirates are 'sleeping,' they have not gone away," said Mary Harper, BBC Africa editor, who has reported widely on events in the region.

Growing political instability in Somalia and increasing global demands on national navies will continue to be the major contributing factors to on-going piracy activity in the medium-longer term, according to independent experts speaking at a maritime security briefing in Hamburg for representatives from the shipping and maritime industries.

The event, which was organized by Gulf of Aden Group Transits (GoAGT), brought together specialists on the expected development of the maritime security situation with industry delegates with commercial assets exposed to

this potential risk.

Mary Harper said, "The threat from pirates, which over the last few years has seen a number of major vessels seized, remains latent. Somali pirates are waiting for the west to relax its guard. If shipping organisations become complacent, it is likely the pirates will strike again."

She added, "Somalia is becoming more politically fragmented with many different groups seeking to gain dominance over their area, which potentially creates a favorable environment for piracy."

GoAGT Chairman Admiral Philip Wilcocks, said, "Growth in world economic output since the 1990s has driven an exponential expansion in maritime trade and this trend is set to continue."

He added, "However, the main issue is that piracy in the Indian Ocean has not been eradicated, it has just been suppressed. Furthermore, economic pressures and wider global commitments may well constrain the world's navies from their ability to sustain a significant presence in anti-piracy operations in this region."

For more information, visit www.goagt.org.

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The SEA CON® Roadmap for the Subsea Connector Market

By Michael Mulcahy

Michael Mulcahy & Associates, Inc.

Where We've Been

Most people in the subsea industry consider underwater engineering to be the most technically challenging aspect of the offshore petroleum industry. In the unique environment of deepwater operations, subsea engineers must particularly consider extremes in temperature, pressure, and corrosion when choosing equipment and tools, including subsea connectors.

The SEA CON Group has been perfecting underwater connection technology for 45 years. From the introduction of its ALL-WET connector range, which provides the ability to mate electrical connectors "wet" along with the flexibility of connecting multiple instruments, lights, and other equipment into a single interface on a control pod, to the Metal Shell Series (MSS) range, which provides high contact density and a variety of power and signal configurations as well as meeting the requirements of API-16D standards, to being the first to provide a multi-channel (six-channel) wet-mate down-hole fiber optic connector, SEA CON has helped conquer harsh environments with some of the most advanced solutions in the market.

The organization designs, prototypes, tests, manufactures, and services this technology, and this all-inclusive approach means we have the flexibility to offer an extensive range of electrical, optical, and hybrid connectors, cable systems, and complex distribution harness systems for the subsea markets. From our 1968 start as a small San Diego, California electrical connector manufacturer, SEA CON has become a global player with 800 employees in five countries. But perhaps even more importantly, we supply some of the most cutting-edge equipment available to the subsea connector market. This article looks at some of the products and services the company offers in light of the unique challenges and opportunities the subsea industry faces.

The SEA CON Group constantly invests in and refines our manufacturing capabilities, which is how we can produce high-volume connectors in a vast range of specifications and materials. We produce parts in large numbers with exceedingly high levels of accuracy using advanced materials science to make use of everything from highly durable

metals and plastics to the most advanced alloys. For example, we have a specialized facility that allows us to manufacture a wide range of glass-to-metal sealed, MIL-SPEC harsh-environment connectors.

We have also made a significant investment in testing and prototyping, which has built our reputation and ensured confidence in the safety and reliability of our products. It is not enough, though, to just manufacture a product, sell it, and then walk away. Not in this business, where so much is at stake.

That is why SEA CON provides customers with critical field support, all the way from matching specs to providing highly qualified and trained technicians for immediate and professional responses to any service requirement in any location.

SEA CON has the global reach to apply our core values to support systems and solutions that match the needs of our customers, whether that means tailoring an existing connector or developing an entirely new connector to meet a technology gap and providing a durable, specific, and supported solution. We have always done this, from our standard range of products to the constant innovation in response to evolving customer requirements. Each division within SEA CON has a specific product focus, but we also pool resources across the divisions to explore new solutions.

In the design phase of a given connector, SEA CON considers many variables regarding its functionality and anticipated use to eliminate surprises when it becomes operational. The more specifics the customer can provide about the planned use of the product, the more precisely we can match the product to the requirement. In addition to the corporate memory represented by SEA CON staff's decades of professional experience, two additional resources bolster the design of a connector. Since 2008, the company has maintained a database documenting every field service connector and cable termination action by location and platform (e.g., drill rig and drillship). This database is available company-wide, and each entry contains the following information:

- Date/platform/location;
- Connector model/condition photos;
- Cable type/history/condition photos;
- Issues encountered;
- Operational details (drilling history/depth/time connector deployed);
- Spares on rig/parts needed; and
- Training given/needed.

Secondly, senior engineering managers from all SEA CON divisions meet on a regular basis to discuss, share, and document lessons learned in their respective connector specialties. Recent issues identified for further study have included the following:

- Termination durability in view of working conditions;
- Cathodic delamination;
- Corrosion due to dissimilar metals or other causes;
- Consistency of cable construction and the need for components designed for the exact cable being used;
- How temperature extremes affect connectors and terminations;
- Pressure-related issues (e.g., insulation resistance and optical attenuation); and
- Deployment stresses on terminations (e.g., straight, off-angle loading).

This cross-fertilization means that SEA CON invests its connectors with generations of empirical data, augmented with hard

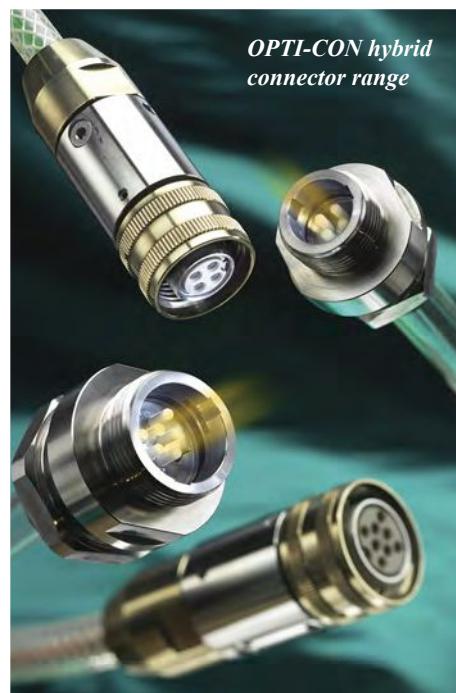


American Petroleum Institute (API) Compliant Connectors

field statistics and customer feedback and supported by field technicians so that the user is considered at every step along the way from design through production and field modification when appropriate.

Where We're Headed

Right now, SEA CON is making major investments in fiber optics. A prime example of this is our commitment to fiber optics within the Oil & Gas industry through the development of dry-mate optical products, including the MINI-CON and OPTI-CON connector series, the underwater mateable HYDRALIGHT connector, and the down-hole, multi-channel fiber-optic G3 connector series.



Speaking of OPTI-CON, with our Precision MKII hose conduit and the development of a Subsea Umbilical Termination Assembly (SUTA), SEA CON now supplies complete systems solutions for the subsea control market. SEA CON is also expanding the capabilities of the HYDRALIGHT connector series, with the release of the APC version, which improves back reflection performance and a high-fiber-count version providing up to 48 fiber optic channels within the same basic envelope of the standard HYDRALIGHT connector.

SEA CON has also introduced numerous high-specification connectors developed to meet the always-expanding technical requirements of OEM manufacturers — one of the challenges being to provide these capabilities within the smallest possible connector diameter.

SEA CON also anticipates a need for high-power connection systems for subsea processing in addition to renewable energy projects utilizing our standard connector series as well as underwater-mateable fiber optics and for high-power applications for which we are already exploring a range of innovative solutions. After all, with a history of being on the leading edge, wouldn't you expect SEA CON to be at the forefront of this new challenge?

Recent SEA CON Advancements

- SEA CON continues to expand its range of options, including the API-compliant Metal Shell Series of dry-mate connectors.
- Historically, SEA CON's optical connectors have used Ultra Polish Contacts (UPC). As use of optical connectors has increased in sensing systems, the need for improved back reflection performance has prompted SEA CON to develop connectors with Angled Polish Contacts (APC), now available in the fiber optic dry-mate series.
- SEA CON is applying V-3 Pressure Balanced Oil-Filled (PBOF) terminations to many products. SEA CON Europe pioneered this development with SEA-MATE and OPTI-CON connectors, and SEA CON has taken advantage of its shared engineering philosophy to enhance both earlier and more recent product lines, including MINI-CON and MSS. This design eliminates the hose clamps in PBOF terminations, enabling connector and termination components to be manufactured from a wider range of subsea materials and decreasing the chances of corrosion.
- The HYDRALIGHT underwater-mateable connector family has expanded.
 - Channels have increased from 1-8 to 1-48.
 - APC contact – Designed for sensing system requiring greater back reflection performance.
 - Hybrid optical and electrical connector, combining qualified and field-proven technologies of the HYDRALIGHT and CM2000.
- Complete product suite for umbilical cables, including optical and electrical umbilical cable termination (breakout of umbilical cable elements to single or multiple wet-mate connectors), umbilical cable abandonment caps (for secure sealing of topside during abandonment), and umbilical optical and electrical repair splices (for repair of damaged umbilical elements).
- Modular field-installable multiplex (MUX) connectors – Resulting from the need to adapt the highly successful and field-proven MUX connectors onto an ever-increasing range of cables, the modular design approach on the MUX connectors enables faster design implementation of alternate cable designs.

Conclusion

Every year marks increased capabilities and new product options across the SEA CON Group's product line that includes dozens of connector products with thousands of variations. Often, a custom-developed variation of a core product spawns a new, unplanned product line as was the case with the AWQ 4/24 ALL-WET connector. Similarly, variations of the basic MSS and MINI-CON contact patterns remain in the product catalog after being developed to meet emerging customer requirements. The company's strong focus on quality, in both products and services, continues to enhance SEA CON's status in the industry. With the California SEA CON factory's February 2012 ISO 9001-2008 certification, all SEA CON factories are now ISO-certified. The company continues to push the technology envelope in many key areas, such as miniaturizing fiber optic connectors with no degradation of performance. SEA CON's four-decade track record of responsiveness to operator feedback and reasonable customer requests has been a significant contributing factor in achieving the company's enviable reputation in the industry and its ultimate staying power.

For further information, visit the SEA CON website at <http://seaconworldwide.com>.

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OFFSHORE INDUSTRY

Wood Mackenzie predicts huge deepwater drilling spend increase

Drilling activity and spending will significantly increase in global deepwater markets over the next decade according to new analysis by Wood Mackenzie. The Future of Global Deepwater Markets study indicates well expenditures are expected to grow from \$43 billion in 2012 to \$114 billion in 2022.

Wood Mackenzie believes the number of exploration, appraisal, and development wells will increase by 150%, rising from 500 to 1,250 wells per year.

"To meet the forecasted well demand the fleet will require 95 additional deepwater rigs to be constructed between 2016 and 2022, representing \$65 billion of investment," said Malcolm Forbes-Cable, senior management consultant at Wood Mackenzie. "This will require the longest period of deepwater rig construction to date, representing a change for the deepwater sector from cyclical to sustained growth."

Existing rig orders and newbuilds required to meet demand suggest that the rig contractors will need an additional 37,000 workers over the next decade to operate the fleet. According to Wood Mackenzie, this cannot be met with existing personnel and the historical rate of recruitment.

U.S. House backs bill to expand coastal oil and gas drilling

Oil and gas exploration off U.S. coasts would be expanded under legislation the U.S. House of Representatives passed over the threat of a presidential veto. The vote on the bill, H.R. 2231, was 235-186. The measure would require the Obama administration to conduct additional sales of oil and gas leases off the coasts of Virginia, South Carolina, southern California and Alaska over the next 5 years.

In addition, it would order the Administration to create a plan that would open up almost all of the nation's coastline for exploration; a draft would be due 15 July 2014, and a final plan approved by 15 July 2015.

"This bill doesn't harm the environment," said Washington State Republican Doc Hastings, chairman of the House Natural Resources Committee. "We want to drill safely and responsibly."

The Senate wasn't expected to take up the legislation.

The White House Office of Management and Budget issued a statement of administration policy warning of a potential veto. The measure "would undermine the targeted, science-based and regionally tailored development strategy that the American people and the states have helped development." The requirement that the Interior Department open new areas for exploration "would be directed without secretarial discretion to determine whether those areas are appropriate for leasing," the agency said.



Doc Hastings

Capital spending jumps despite huge decline in after-tax profits

U.S. oil and gas producers significantly increased exploration, development and acquisition spending in 2012 despite a 58% decline in after-tax profits that was largely driven by low natural gas prices, according to an Ernst & Young U.S. oil and gas reserves study. The study analyses U.S. upstream spending and performance data for the largest 50 companies based on 2012 year-end oil and gas reserve estimates.

Total capital expenditures for the 50 companies reached \$185.6 billion, up 20% from the prior year and the most in the study's history. Largely due to increased tight oil and liquids activity, exploration spending reached \$26.3 billion and development spending soared to \$103.4 billion, the study said.

"The increased exploration and development spend we're seeing in this year's study speaks to the incredible opportunity unfolding in tight oil from shale formations and the high cost of developing these unconventional resources," said Marcela Donadio, Americas Oil & Gas leader for the global Ernst & Young organization. "Everyone wants in and they are paying a premium to play."

Although total U.S. oil and gas production increased 7% in 2012, it could not compensate for the \$26.4 billion in property impairments recorded due to the low natural gas prices. These impairments contributed to the 58% decrease in after-tax profits, according to the study.

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Oil industry demands bring most grueling work weeks: PayScale

Workers in the oil industry have the most grueling work weeks, according to PayScale, an online service that surveys workers with various job titles on wages, salaries and other career data.

In an analysis of jobs in which most workers receive hourly wages, energy-related professions claimed 6 of the top 10 longest work weeks. Roustabouts take the top spot, with a median work week of 61 hours. Drillers are not far behind, with a median of 59 hours per week, according to PayScale.

But the oil industry compensates well for the long hours. Workers in the energy industry also were among the highest paid, with petroleum plant operators earning the highest median wage in the top 10 — \$25.48. Drillers earn a median hourly wage of \$20.13 and roustabouts \$14.11.



Meanwhile, the oil and gas business has been tapping unique groups to address its workforce crunch, turning rocket scientists into petroleum engineers and making high-powered executives out of Gen Xers.

Now another demographic is growing its footprint in the historically male-dominated industry.

Women scored nearly half of all new oil industry jobs during the first quarter of this year, according to Paul Caplan, president of Rigzone. It could signal a major turning point for an industry in which men make up about 80% of the workforce. The sector employs about 193,200 people.

Caplan credited companies' targeted recruiting programs for growing diversity in the energy industry workforce, though a recent report determined that some of Houston's largest energy companies have fallen short in diversity efforts.

OFFSHORE INDUSTRY HEADLINES

Research & Development • Environmental Assessment • Discovery

FPS market to boom from 2013 to 2017 predicts Infield Systems

The FPS market will boom from 2013 to 2017, with spending to grow by 18% and installations by 95% from 2008, predicts Infield Systems in its recently released Floating Production Systems Market Report To 2017.

This growth in both capital expenditures (capex) and number of installations is driven by the increase in developments to monetize gas in remote locations, as well as the increasing focus on optimizing production from ultra-deepwater developments. Africa, Latin America, and Australasia are expected to account for the most significant levels of growth in terms of capex relating to FPS developments.

The deep and ultra-deepwater oil focused developments in Africa and Latin America combined with the shallow water, gas-focused developments in Australasia are expected to account for almost 59% of total FPS capex over the period, according to the report.

Toward the end of the forecast, Infield Systems expects an increase in the number of developments in areas of the world with no prior FPS activity, such as East Africa and the Falklands. Such areas are likely to become increasingly important after 2017, says Infield.

In North America, it is the ultra-deepwater Gulf of Mexico that commands the lion's share of capex, accounting for 69% of total North American FPS capex.

In the Middle East and Caspian Sea region, capex is split between very shallow developments in Kazakhstan and the Persian Gulf and developments in the ultra-deep waters of the eastern Mediterranean for Israel.

Australasian capex is almost entirely dominated by Australia, with relatively minor spending outside of this country.

In Europe, the major producers of Norway and the UK are set to command 80% of capex. Countries outside the two major producers in Europe, such as Ireland and Romania, are expected to account for a larger share of capex towards the end of the forecast.

The FPS market in Latin America remains dominated by Petrobras in Brazil.

Africa capex will be directed primarily towards West Africa, of which 71% is likely to be focused on FPS developments in Angola and Nigeria.

Asia has no overall dominant country with regards to FPS developments, but Malaysia and Indonesia account for the largest market share of spending, with 79% of the capex for the region directed to Southeast Asia.

Looking at FPS developments by water depth shows the increasing domi-



The FPSO Petrojari Foinaven

nance of deepwater and ultra-deepwater over the forecast period. Shallow water capex is likely to peak in 2016, whereas ultra-deepwater spending is expected to remain on an upward trajectory during the period to 2017.

Oil industry agrees to curb seismic surveys to help whales, dolphins

Oil and gas companies working in the Gulf of Mexico have agreed not to use seismic surveys for the next 2.5 years in three areas considered critical to whales and along the coast during the peak calving season for bottlenose dolphins. The agreement among environmental groups, trade groups, and the U.S. Interior Department was filed last June in federal court in New Orleans, Louisiana.

Some believe that surveys in which ships slowly tow arrays of air guns through the water, firing them every 10 to 12 seconds, reduce whales' eating and keep baby dolphins from bonding with their mothers.

Research by the BOEM supposedly found that a moderate amount of "airgun noise" reduced sperm whales' feeding and foraging by an average of 20%, according to one environmental group.



"Whales, dolphins, and other ocean species depend on sound to feed, mate, navigate, maintain social bonds, and undertake other activities essential to their survival," the Natural Resources Development Council said in a news release. "Airgun noise is loud enough to mask whale calls over thousands of miles, destroying their capacity to communicate and breed. It has been shown to drive whales to go silent, abandon their habitat and cease foraging, again over larger areas of ocean; closer in, it can cause hearing loss, injury, and potentially death."

The industry agreed to the measures even though its scientists believe any risk of harm is minor, said Eric Milito, director of upstream and industry operations for the American Petroleum Institute, one of several trade groups that asked to join the government in the suit.

"The sound produced during seismic surveys is comparable in magnitude to many naturally occurring and other man-made ocean sound sources, including wind and wave action, rain, lightning strikes, marine life, and shipping," an API statement said. "Four decades of world-wide seismic surveying activity and scientific research on marine mammals have shown no evidence that sound from seismic activities has resulted in injury to any marine mammal species."

The agreement forbids any seismic surveys in the Mississippi and DeSoto canyons and an area west of the Florida Keys and Tortugas during the moratorium. Between 1 March and 30 April, they cannot be used in the near coastal waters frequented by small groups of bottlenose dolphins. The agreement also adds manatees to the animals whose presence near a survey boat requires silencing or shutting off the airguns.

The 30-month period will give the government time for environmental studies and give the industry time for research into alternatives, both required as part of the agreement.

Unsealed BP report could slash Gulf oil spill penalties by billions

A London petroleum engineering professor hired by BP claims the U.S. government overestimated by 50% the amount of oil that spewed from the company's undersea Gulf of Mexico well in 2010. The finding could cut the maximum Clean Water Act penalties BP faces by up to \$7 billion.

In a report, Martin J. Blunt, a professor in Imperial College's Department of Earth Science and Engineering, said he calculated that 3.26 mmbbl of oil were released from BP's Macondo well. The government estimates that 4.9 mmbbl were discharged.

Both figures include the 800,000 bbl of oil that BP and the U.S. government agree was collected at the wellhead and didn't enter the sea. Earlier this year, the government agreed not to count that oil in calculating the penalties it seeks against BP. By that reckoning, the government estimates that 4.1 mmbbl of oil entered the Gulf, and Blunt's estimate is 2.46 mmbbl.

UK reviews North Sea oil and gas operations future

Britain's Department of Energy and Climate Change (DECC) is conducting an independently led review of oil and gas operations on the UK continental shelf. One focus is to encourage new approaches to address the UK's declining exploration and production rates, aging offshore facilities and declining production efficiency, and the risk of premature decommissioning of key infrastructure. Britain's oil and gas chain also needs sustained investment.

Sir Ian Wood, the recently-retired chairman of oilfield services contractor Wood Group, leads the process. He will work with others in the industry, the UK government, and elsewhere to draw up recommendations.

UK offshore fields have so far produced 41 Bboe, and the government believes a further 20 Bboe could be delivered.

Other priorities include improved collaboration across the industry and maximized use of enhanced oil recovery techniques on UK fields. To this end, the review will examine the current structure, scale, and effectiveness of the UK government's stewardship regime in line with the increased technical and commercial complexity of the mature market. The recommendations could influence future tax policies. Initial conclusions from the review are expected to be published this fall, with the final report and recommendations issued in early 2014.

Oil & Gas UK also has welcomed the EU Council of Ministers' vote to approve the EU Directive on offshore safety. The new regulatory framework targets a reduction of major accidents related to offshore oil and gas operations, or if they do arise, to limit any consequences. It sets out minimum conditions for safe offshore exploration and development and is intended to improve response mechanisms in the event of a major incident. The new law will apply to existing and future installations and operations. Only operators appointed by licensees or licensing authorities will be able to operate European offshore oil and gas operations.

The directive includes provisions designed to maintain the independence and objectivity of the competent authority. To prevent conflicts of interest, member states must ensure a clear separation between regulatory functions related to offshore safety and the environment and regulatory functions related to economic development, including licensing and revenues management.

Additionally, there are rules for transparency and information sharing, cooperation between member states, emergency response plans, and trans-boundary emergency preparedness and response.

Within 3 years of completion of transitional periods, the European Commission will submit a report to the European Parliament and the council to assess implementation of the directive. Member states with offshore waters will have 2 years to transpose the directive into national legislation.

Cyprus aims to be region energy hub by 2020 with LNG terminal

Cyprus has started talks with three energy firms for the development of a liquefied natural gas (LNG) terminal. The terminal, with an estimated cost of \$6 billion, would process the vast natural gas reserves off the east Mediterranean island. Based on its current timeframe, Cyprus hopes to start exports by 2020.

"Completion of this project is an important step towards the realization of our energy strategy, with the ultimate objective the establishment of Cyprus as a regional energy hub," Energy Minister Yiorgos Lakkotrypis said at a ceremony

in late June where a project memorandum of understanding was signed.

Cyprus discovered an average 7 tcf of natural gas in December 2011 in one field offshore, close to where Israel reported major finds within its own maritime boundaries.

U.S. company Noble Energy and Israeli companies Delek Drilling and Avner Oil Exploration, which are the dominant players in both the Cypriot and Israeli projects, will over the next 6 months discuss the technical and commercial details of any eventual deal on an LNG terminal. The sides hope to con-

clude talks by 31 December. Noble launched an appraisal drilling on its Cypriot offshore find last month, while Total and Eni are poised to launch exploratory drills elsewhere off Cyprus by 2015.

Facing an unprecedented austerity-driven recession and record unemployment at 15.6%, the island is clinging to the hope gas discoveries will bring in badly needed revenue and create jobs. Cyprus received a \$13 billion international bailout in March.



Yiorgos Lakkotrypis

Lakkotrypis said there were “multiple ways” to finance the LNG project, including with equity or debt. Cyprus is marketing the venture to Israel, which has also reported natural gas finds, and to Lebanon. Israel’s government has decided it could export about 40% percent of its new reserves.

Obama Administration rejects Alaska's ANWR exploration plan

Alaska's ANWR exploration plan

U.S. Interior Secretary Sally Jewell has rejected a proposal from the State of Alaska to collect seismic data and conduct exploratory drilling on the coastal plain of the Arctic National Wildlife Refuge. In a 28 June letter to Gov. Sean Parnell, Jewell said a provision in ANILCA, the Alaska National Interest Lands Conservation Act, allowing exploration activity had expired in 1987.

"This Administration remains opposed to drilling in the Refuge, and I support that position," Jewell's letter said.

The Parnell administration, however, is not giving up. The governor and the state's natural resources commissioner, Dan Sullivan, has rolled out a new proposal to conduct a 3D seismic survey on the coastal plain. Parnell and Sullivan argued the ANILCA exploration provision never sunset and remains valid.

The state's initial proposal, unveiled in May, was for a 7-year seismic acquisition and drilling campaign, with Parnell pledging to seek up to \$50 million from the Alaska Legislature to help finance the work, which would be done in partnership with the federal government. This new proposal is different in that it involves only seismic work, with the state conducting the project by itself.

Sullivan said a modern seismic survey, conducted in winter with minimal impact to the tundra, would shed new light on what resources might exist under the coastal plain and could change the “fired” ANWR debate.

CHC Helicopter secures flight services in North Sea

Centrica Energy and Centrica Storage Ltd. have signed a \$43.2 million 3-year contract, with options for a 2-year extension, with CHC Helicopter to secure an improved helicopter service to meet its operational needs across key oil and gas fields in the North Sea. In the southern North Sea, CHC will operate an AW139 aircraft out of Humberside Airport, from November 2013 to support Centrica's offshore activities, including the York and Rough platforms, as the operator relocates all flight operations from Yarmouth. In the northern and central North Sea, Centrica Energy has secured the use of aircraft out of Aberdeen, from June 2013, on a part-exclusive basis to improve scheduling and flexibility of flights to its operated Kittiwake platform. A joint team has been established by the operator and CHC, the world's largest offshore helicopter operator, to set up both services, increasing the number of flights, improving the overall efficiency of the service, and securing dedicated flights to each of the installations.

Technip awarded contract for offshore UAE overhaul

ADMA-OPCO has awarded Technip a lump-sum, turnkey contract for an overhaul program offshore Abu Dhabi. Technip will provide engineering, procurement, construction, pre-commissioning, commissioning, and start-up assistance for a flares modification and revamp project on Das Island, 180 mi from the Abu Dhabi coast. The aim of the program is to mitigate hazards arising from existing atmospheric flares on offshore associated gas planned integrated gas development facilities, along with the risk of gas exposure to personnel during operation and maintenance of these facilities. Work scope includes relocation of the South Relief flare to the east of the existing flare F-14 installation of two new ground flares at the existing South Relief flare location; demolition of the F-11 and F-14 flares replacement of a tip for flare and a new electrical substation. Technip's operating center in Abu Dhabi will perform the work, which is due to be completed during the first quarter of 2015.

WorleyParsons to lead Al Shaheen efficiency drive

Maersk Oil Qatar has awarded WorleyParsons Qatar a 4-year general design contract for the Al Shaheen oil production facilities in Block 5 offshore Qatar. WorleyParsons will provide brownfield design engineering services from front-end engineering to detailed design. The purpose is to achieve operation, production, safety, and efficiency improvements for the existing facilities. Design services could be extended to additional production and operational facilities. Estimated value of the contract is around \$90 million. Maersk operates the field under a production-sharing agreement on behalf of Qatar Petroleum.

QGOG begins operations for Papa Terra FPSO (P-63)

Queiroz Galvão Óleo e Gás S.A. (QGOG), together with BW Offshore do Brasil Ltda., has begun providing operational services to the Papa Terra FPSO (P-63). The unit is owned by Papa-Terra BV and was built by a joint venture formed by QUIP and BW Offshore. The FPSO-63 will soon be mobilized to Papa Terra field in the Campos Basin. The field is operated by Petrobras, together with Chevron, and is located 110 km off the Brazilian coast. QGOG's technical staff assisted in the integration and commissioning of the unit. The operation contract will have a duration of 3 years. FPSO-63, which has capacity to process 140,000 b/d of oil and 1 mmcfd of gas, is one of the most modern FPSOs in the world in terms of heavy oil processing.

Moho award marks another major riser delivery for 2H

Illustration of tension leg platform at Moho Nord field

2H Offshore, an Acteon company, was recently awarded a contract by Total for the delivery management of the TLP top tensioned riser (TTR) systems for its Moho Nord field development, offshore Congo.

Located about 75 km from Pointe-Noire and 25 km west of N'Kossa in water depths ranging from 450 m to 1,200 m, the Moho Nord project will target additional reserves in the southern part of the license and new reserves in the northern part.

This is the third and final phase of the project for Total. 2H Offshore will be responsible for the riser delivery management, which includes design finalization, procurement management, and inspection services for 17 production and water injection top tensioned risers and one high-pressure drilling riser. The 2H Offshore Houston office will be responsible for this phase of the project. Previously, the company's London office performed the initial detailed design in the second phase of the project on behalf of Doris Engineering.

"We are delighted to have the opportunity to manage this project on behalf of Total," said 2H's riser delivery manager Yann Helle. "Our knowledge and experience with the delivery management of these

risers enable us to develop an optimized system design with flexibility in hardware supplier options to meet challenging project delivery schedules."

The Moho Nord award follows the Gulf of Mexico Big Foot TLP riser delivery contract that 2H kicked off for Chevron in 2011.

"2H's riser integrator approach has worked very well on Big Foot and is being recognized as a good model for top tensioned riser systems where there are a multitude of interfaces driving riser design and procurement activities," said Ricky Thethi, vice president of 2H Offshore Inc.

First oil on the Moho Nord development is planned for the third quarter of 2016.



Noble Energy confirms deepwater oil at Gunflint in Gulf of Mexico

The second Noble Energy Inc. appraisal well at the Gunflint field in the Gulf of Mexico reportedly found 109 ft of net oil pay. The Mississippi Canyon 992 No.1 well, 1 mi west of the original discovery well, was drilled to a total depth of 32,800 ft in a water depth of 6,100 ft.

Results of drilling, wireline logs, and reservoir data have confirmed an estimated gross resource range of 65 to 90 mmboe in the primary structure. Once operations are completed, the well will be suspended for future use.

"Our appraisal program at Gunflint solidifies our plans for a subsea tieback development, with sanction planned for later this year," said Susan Cunningham, Noble Energy's senior vice president, Deepwater Gulf of Mexico. "Along with our Big Bend discovery, we now have two major projects in the deepwater Gulf of Mexico targeting first production at the end of 2015."

Noble Energy operates Gunflint with a 31.14% working interest. Other partners in the project are Ecopetrol America Inc. with 31.5%, Marathon Oil Co. with 18.23%, and Samson Offshore LLC with 19.13%.

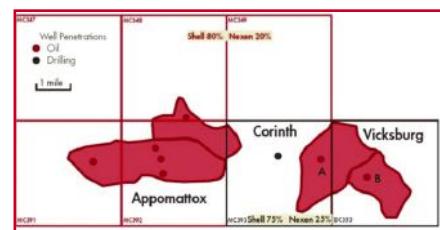
Noble Energy plans to move the drilling rig to Troubadour, a low-risk amplitude prospect offsetting the Big Bend discovery, over the next several weeks. The well is expected to reach total depth late in the third quarter.

Shell-operated Vicksburg "A" well encounters over 500 ft of net pay

Shell said it has a successful exploratory well at Vicksburg prospect in the deepwater Gulf of Mexico. The well is located 75 mi in the De Soto Canyon Block 393 in 7,446 ft of water. It was drilled to a total depth of 26,385 ft and encountered more than 500 ft of net oil pay, the company added.

In total, the Vicksburg "A" discovery is estimated to hold potentially recoverable resources of more than 100 mmboe. It adds to the more than 500 mmboe of potentially recoverable resources that have already been discovered and appraised at the nearby Appomattox discovery. Vicksburg "A" is said to be a separate accumulation from both Appomattox and the 2007 Vicksburg "B" discovery.

Shell, operator with a 75% interest, and Nexen, a wholly-owned subsidiary of CNOOC Ltd. with a 25% stake, are fol-



lowing up the Vicksburg "A" well with a sidetrack well to test the Corinth prospect, a separate fault block from the Vicksburg discovery.

McDermott lands engineering and construction contract for Julia field

McDermott International, Inc. was awarded an engineering, procurement and construction contract by ExxonMobil for its Julia development in deepwater Gulf of Mexico. The Julia Phase I project is a subsea tie-back to a semi-submersible floating production unit, and the scope includes six subsea wells, one six-slot manifold, two umbilicals, six jumpers, two flowlines with two steel catenary risers, two subsea pump modules, and topsides support equipment. Production will flow through two 10-in. production flowlines with subsea single-phase boost pumps. ExxonMobil, the operator, holds a 50% stake in Julia.

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Ensenso orders another newbuild DP-3 ultra-deepwater drillship

Ensenso plc has ordered another new-build DP-3 ultra-deepwater drillship based on the Samsung GF12000 hull design. The ENSCO DS-10 will be built at Samsung Heavy Industries Co. Ltd. in South Korea for delivery in the third quarter of 2015. Including commissioning, systems integration testing, project management and tubulars, the construction cost is expected to be \$625 million.

Measuring 755 ft long by 125 ft wide, ENSCO DS-10 will have a 1,250 ton hoisting system with enhanced offline capability. Like ENSCO DS-8 and ENSCO DS-9, the new unit will be able to operate in water depths of up to 12,000 ft with a true vertical depth of 40,000 ft. It will be initially outfitted to work in water depths up to 10,000 ft.

Features include retractable thrusters; enhanced safety and environmental features; improved dynamic positioning capabilities; and advanced drilling and completion functions, including below-main-deck riser storage, triple fluid systems and offline conditioning capability. The drillship also incorporates enhanced client and third-party facilities with living quarters for up to 200 personnel.



DP-3 ultra-deepwater rig design

A 165-ton active heave compensating construction crane allows for deployment of subsea production equipment without interference with ongoing drilling operations. ENSCO DS-10 includes a 15,000-psi subsea well control system with seven rams and can accommodate a second blowout preventer stack.

Wison secures contract to build 3,000 hp modular drilling rig

Wison Offshore & Marine, the upstream oil and gas division of the Wison Group, has secured a contract from China Oilfield Services (COSL) to

construct a new 3,000 hp modular drilling rig. The rig, which will be installed on the Tsimin-C drilling and production platform in the Mexican Bay of Campeche, will be used on a platform in the Mexican sector of the Gulf of Mexico that is operated by Pemex.

As part of the contract, Wison will provide project management, procurement, production engineering, fabrication, load out, offshore installation and commissioning support for the installation of the rig. Wison will fabricate the approximately 2,500-ton rig at its Nantong facility in China and is expected to deliver it in the second quarter of 2014.

The drilling facility is based on a self-installing design that consists of 97 smaller units, which require significant integration work to strict tolerances during module construction.

In 2010, Wison delivered two modular platform rigs to COSL for operation on China National Offshore Oil (CNOOC) facilities offshore China. In 2007, Wison provided four platform rigs for COSL that are currently operating in offshore Mexico. Wison executes engineering and design activities out of its headquarters in Shanghai, China, as well as in Houston, Texas.

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Maran Gas Maritime takes delivery of LNG carrier Woodside Rogers

Maran Gas Maritime, the gas shipping unit of Angelicouassis Shipping Group, has taken delivery of its first electrical liquefied natural gas (LNG) carrier, The Woodside Rogers, featuring GE's power and propulsion technology.

The LNG carrier, which completed sea trials in late April, was built by South Korea-based Daewoo Shipbuilding &



Marine Engineering (DSME) at its shipyard near Busan. The Woodside Rogers is equipped with a GE system comprising four 9.85 mva generators, main and cargo switchboards, four transformers, two converters, two 13.26 mw motors, and remote control.

The electric drive system for the new LNG carrier is supported by tri-fuel engines that run on natural gas, marine diesel gas, or heavy fuel oil.

GE said the layout of the tri-fuel engine reduces emissions and fuel consumption and offers a high level of redundancy that improves the safety of the carrier. In addition, GE provided project management, system and equipment engineering, commissioning, and assistance for sea and gas trials.

Seadrill Ltd. contracts two high-spec jack-up drilling rigs

Seadrill Ltd. has contracted Dalian Shipbuilding Industry Offshore Co. Ltd. of China to construct two high-specification jack-up drilling rigs. They are scheduled for delivery in 2015 and 2016. The total price per rig is \$230 million, including project management, drilling and handling tools, spares, and operations preparation. The two new units will be based on the F&G JU2000E design, with water depth capacity of 400 ft and drilling depth of 30,000 ft. Seadrill now has eight jack-ups under construction at DSIC Offshore. Samsung is constructing two ultra-deepwater drillships in South Korea for delivery to Seadrill in 2014 and 2015.

SOCAR orders semi-submersible drilling rig for offshore Azerbaijan

Two Keppel Offshore & Marine subsidiaries have won a contract to build a new semi-submersible drilling rig for use offshore Azerbaijan. Caspian Rigbuilders and Caspian Shipyard Co. (CSC) received the \$800 million order from Caspian Drilling Co., owned by the State Oil Co. of Azerbaijan Republic (SOCAR). CSC will perform fabrication, integration, testing, and commissioning

of the rig while its joint-venture yard with SOCAR, Baku Shipyard, will undertake part of the fabrication of the pontoons and columns. Keppel FELS will provide engineering, procurement, and technical support. The DSS 38M rig is designed for a drilling depth of up to 40,000 ft and operations in 3,280 ft water depth.

To withstand high wind speeds in the Caspian Sea, the rig will be outfitted to include a 2,625-ft self-contained eight-point mooring system. Delivery is scheduled for late 2016.

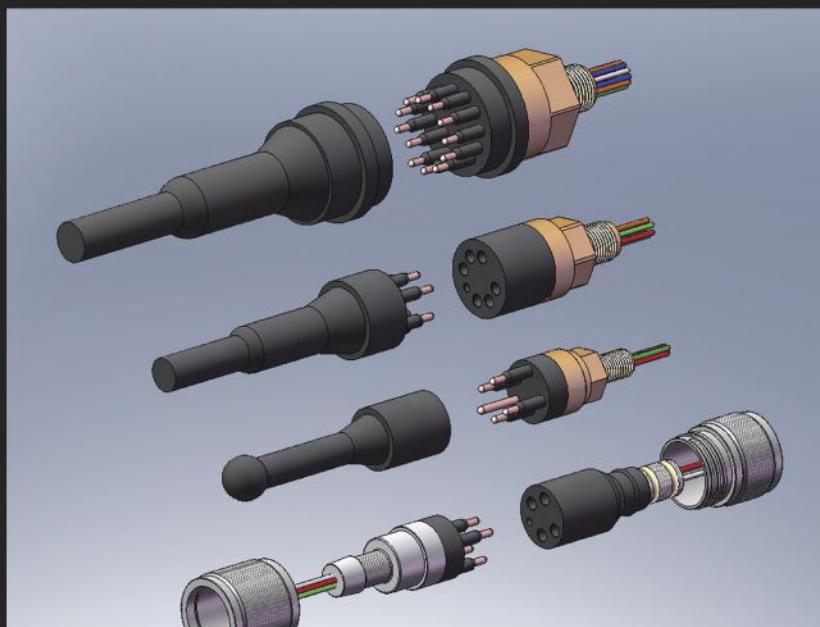


DSS 38 designed semi-submersible



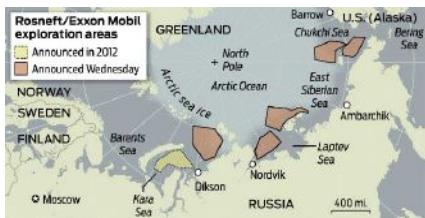
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Offshore regions of the Russian Arctic where Exxon and Rosneft plan to explore

ExxonMobil to spend \$3.2B to explore Black Sea, Arctic regions

ExxonMobil Corp's initial work exploring Russia's Black Sea and Arctic regions will cost about \$3.2 billion. Exxon will finance the majority of the costs for exploration, which it is doing jointly with Russia's Rosneft.

Exxon is leading the effort to explore 180 million acres across Russia's Arctic region. That Arctic territory, available to Exxon through its collaboration with Rosneft, is equivalent to the size of Texas.

The exploration will include at least 14 exploration and appraisal wells and "a significant amount of 2D and 3D seismic will be conducted over the next 10 years," the companies said in an announcement. Exxon holds a one-third

stake in the Black Sea and Arctic efforts, while Rosneft holds two-thirds ownership. Rosneft and Exxon announced earlier that they are continuing to study the possibility of a liquefied natural gas plant in eastern Russia.

Statoil and partners to re-enter Brugdan 2 well off Faroe Islands

Statoil and partners ExxonMobil and Atlantic Petroleum plan to re-enter the Brugdan 2 well in license 006 offshore the Faroe Islands. Drilling operations were suspended in late 2012.

"The timing is good for AP (Atlantic), as the company is currently drilling the potentially very high-impact Dunquin well in Ireland, and we expect to spud the UK Pegasus appraisal well later in 2013, followed by a possible Perth appraisal well late 2013," said Ben Arabo, chief executive officer of Atlantic.

Statoil Færøyene is operator of license 006 with 50% equity. ExxonMobil Exploration and Production Faroe Islands holds 49% and Atlantic 1%. Additionally, ExxonMobil has acquired a 6% interest from Atlantic in license L016, awarded under the third Faroese licensing round in 2008.

Barents Sea appraisal well finds hydrocarbons on Norvarg discovery

Total's appraisal well on the Norvarg discovery in the Barents Sea has encountered hydrocarbons, according to partner Ithaca Energy. The semi-submersible Leiv Eirkisson spudded well 7225/3-2 on license PL535 on 25 April in 1,237 ft of water. The location is 171 mi north of the Hammerfest LNG plant on Melkøya. Wireline logs, formation testing, and cores confirm hydrocarbons in the Kobbe formation. A drillstem test will follow to assess the quality of the Kobbe reservoir and the volume potential in the northeast part of the Norvarg closure. Total E&P Norge is operator with 40% interest in the project.

KrisEnergy encounters gas pay at Tayum-1 well offshore Indonesia

Singapore-based upstream oil and gas producer KrisEnergy completed drilling of the Tayum-1 exploration well in the Kutai production sharing contract offshore Kalimantan in the Makassar Strait, Indonesia. The well, drilled to a total depth of 11,095 ft measured depth, encountered about 49 vertical ft of net gas pay from multiple sandstone intervals, or 8,410 ft total vertical depth subsea.

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The jack-up rig Atwood Mako

Salamander Energy starts multi-well campaign offshore Thailand

The jack-up Atwood Mako has started a multi-well exploration program for Salamander Energy in Block G4/50 in the Gulf of Thailand. Atwood Mako is drilling the Rayong prospect in the northeast area of the block in the Central Kra sub-basin.

The G4/50-4 well targets oil in Miocene sandstones and Permian Ratburi carbonates with potential recoverable oil resources of 20 to 50 mmbbl. Salamander said it sees access to hydrocarbon charge as the main risk.

The well will be drilled to 6,562 ft true vertical depth and was expected to take around 21 days. On completion, the rig was to drill the Surin prospect in the central western sub-basin.

Five more wells are expected to be drilled this year, with more to follow in 2014, the company said.

Block G4/50 surrounds the B8/38 production license containing the producing Bualuang oil field. It covers more than 2,239 sq. mi and includes five sub-basins, four of which have proven oil. Salamander has mapped more than 60 prospects on 3D seismic with mean recoverable resources in the 20 to 150 mmbbl range.

Faroe Petroleum outlines near-field well campaign offshore Norway

Faroe Petroleum expects to participate in six exploration wells offshore northwest Europe, with drilling due to start in the second half of this year.

Snilehorn is a satellite to the Njord field in the Norwegian Sea. The semi-submersible Songa Trym will target oil and gas in the lower Jurassic Tilje and Åre formations, similar to those in the

Njord reservoirs. Statoil will operate the well and subsequent side track 2.5 mi from Njord. A find at Snilehorn could be quickly tied into the new Hyne oil field facilities, with a potential production start in 2015 to 2016, the company said.

Faroe said it will operate a well on the Novus structure on the Halten Terrace in the Norwegian Sea, using the drillship West Navigator. The location is 6.2 mi southwest of the Statoil-operated Heidrun oil field. Main targets are Jurassic reservoirs of the Garn, Ile, and Tilje forma-

tions, the company said. Centrica's Butch East and Butch Southwest wells will be follow-ups to the 2011 Butch discovery. The semi-submersible Borgland Dolphin will drill a well on the Cretaceous Solberg structure on the Halten Terrace in the Norwegian Sea for operator Wintershall. At Hyne, preparations are in hand to start water injection that is expected to enhance field performance. At the Orca field, the platform has been fabricated and is expected to be installed later this summer.

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Statoil submits plan for next-phase Oseberg work offshore Norway

The Norwegian Petroleum Directorate (NPD) has received Statoil's plan for development and operation (PDO) for Oseberg Delta Phase 2 in the North Sea. The Delta structure is 8.7 mi southwest of the Oseberg field center and within the Oseberg area unit, mainly in block 30/9 in production licenses 79 and 104.

Oseberg Delta was first developed with a subsea template tied in to the field center and currently has two production wells. Phase 2 involves adding two new subsea templates, with the reservoir drive mechanism altered from depressurization to partial pressure maintenance based on gas injection. Most of the injected gas will be sold at a later time.

The two new templates will connect to the field center via the existing Delta subsea template. One of the two pipelines that currently transport the gas from Tune to Oseberg will be re-deployed to transport gas for injection from Oseberg to Delta.

NPD estimates investments of just under \$1.3 billion, with production of 4.6 mmcm of oil and 7.7 bcm of gas. Start-up is slated for 2015. Other licensees in Oseberg area unit are Petoro, Total E&P Norge, and ConocoPhillips Skandinavia.

Total gets okay for EPC contracts at Egina field offshore Nigeria

Total Upstream Nigeria Ltd. has received approval from the Nigerian National Petroleum Corp. to award the main engineering, procurement, and construction contracts for development of the Egina field offshore in Block OML 130. Egina is in 5,248 ft of water and 124 mi offshore Port Harcourt.

The development plan calls for 44 wells connected to a 1,082-ft long FPSO. The FPSO will hold 2.3 mmbbl, which includes capacity for future developments in the area. First oil is expected late in 2017. The plateau production is 200,000 b/d of oil.

Total has a 24% interest and is partnered with NNPC, South Atlantic Petroleum of Nigeria, CNOOC Ltd., and Petrobras. The group also operates the Akpo field in the same permit area.

Norpipe subsea bypass system installed around B11 platform

Norwegian gas trunklines operator Gassco said a new bypass system has been installed around the redundant B11 compressor platform in the German North Sea. B11 used to serve the Norpipe gas pipeline, which runs from Norway's Ekofisk field in the southern Norwegian North Sea to the Emden terminal on the German mainland.

DONG cuts first steel for Hejre fields's new platform

Denmark-based petroleum and natural gas producer DONG Energy has launched the cutting of first steel for a new 15,000-ton production platform for the Hejre oil and gas field in the central part of the North Sea. The platform, which is currently under construction in a shipyard on the island of Geoje in South Korea, will be shipped to the Hejre field in 2015.

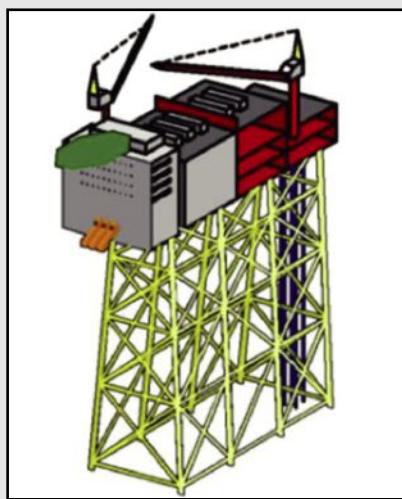
Designed by France-based engineering services firm Technip, the new platform will be built by South Korean shipyard DSME. DONG said its field engineers in Paris and South Korea will oversee the entire process of platform construction.

The Hejre platform, which will be fully operational in 2016, is expected to increase DONG Energy's oil and gas production from the North Sea.

DONG said the field will play a vital role in its aim to double its oil and gas production from 2012 to 2020. Located about 300 km from the Danish coast in License 5/98 at a water depth of 70 m, the Hejre platform is estimated to contain reserves of around 170 mmboe.

The extension of the field, which is estimated to cost \$2 billion, is expected to create about 500 permanent jobs in Esbjerg, Fredericia, and Copenhagen.

"Today's celebration to mark the beginning of the construction of the Hejre platform is the culmination of several years of exploration and thorough analyses," said Søren Gath Hansen, DONG oil and gas business executive vice president. "In a few years from now, this work



The Hejre platform will have a processing capacity of 6,000 m³ a day

will lead to a significant, new Danish oil production," Hansen added.

Hansen said the oil and gas are located in a reservoir at about 6 km depth, where pressure and temperature are extremely high.

"It puts heavy demands on the entire construction to be able to handle the oil and gas under these conditions," he added.

DONG holds a 60% share in the Hejre licence as operator, while Bayerngas owns the remaining 40% as the partner.

Subsea 7 installed the 1,082-ft long bypass over a 3-week period. It comprises six pipe lengths welded together on the seafloor by divers. Ekofisk operator ConocoPhillips Skandinavia had responsibility for the program, on behalf of Gassco.

B11 entered service in 1977 as part of the gas transport system from Ekofisk to Emden. In recent years, the need for gas compression in Norpipe declined — at the same time, the platform faced substantial upgrade costs.

Hence Gassco's recommendation for a bypass to be incorporated in the pipeline so that the platform could be removed, a proposal accepted by the Gassled joint venture in 2010.

AF Gruppen will remove and recycle the platform, with work due to be completed in 2015.

Anadarko selects Subsea 7 for deepwater GoM Heidelberg pipelay

Anadarko Petroleum as operator has awarded Subsea 7 S.A. a contract for work at the deepwater Heidelberg development in the Gulf of Mexico. Subsea 7's scope of work includes engineering, fabrication, and installation of risers, pipelines, and flowlines in water depths of 5,248 ft and more. Project management begins immediately at Subsea 7's Houston, Texas office with offshore operations scheduled for the fourth quarter of 2014 with pipelay by the Seven Borealis.

The Heidelberg development is located in 5,300 ft of water, about 140 mi offshore Louisiana, and consists of Green Canyon blocks 859, 860, 903, 904, and 948. The project is being developed using a truss spar.

Gazprom starts new offshore Sakhalin drilling campaign

Gazprom's semi-submersible drilling rigs Polyarnaya Zvezda (Polar Star) and Severnoye Siyaniye (Northern Lights) have left Kholmsk Port on Sakhalin Island offshore eastern Russia and entered the Sea of Okhotsk. Both rigs were headed to the Kirinsky block on the Sakhalin shelf. Polyarnaya Zvezda was to resume drilling of production wells on the Kirinskoye field, a program that started last year. Severnoye Siyaniye was to drill an exploratory well on the Yuzhno-Kirinskoye field.

The rigs were constructed at the Vyborg Shipbuilding Plant in northern Russia. They are designed for operation in Arctic conditions and can drill exploration and production wells down to 24,606 ft at water depths between 229 and 1,640 ft.

The Kirinskoye gas and condensate field was discovered in 1992, about 17 mi offshore Sakhalin Island in a water depth of 295 ft. Gazprom plans to start production later this year. It estimates reserves at 162.5 bcm of gas and 19.1 million tons of gas condensate.

In September 2010, the company discovered Yuzhno-Kirinskoye, a larger gas and condensate field on the Kirinsky



Gazprom's Polyarnaya Zvezda rig

block. Reserves here could total 2 tcf of gas and 71.7 million tons of gas condensate. In autumn 2011, Gazprom discovered Mynginskoye, another field on the same block, with an estimated 703 bcf of gas and 2.5 million tons of gas condensate.

Aker Solutions delivers frame for first subsea compression facility

Aker Solutions has delivered the steel frame for the world's first subsea gas compression facility to be installed at the Statoil-operated Åsgard field. The installation, set to come on stream in 2015, will enable the recovery of an additional 280 mmboe.

The 1,800-ton steel frame was to be installed on the Åsgard field seabed to

form the base of the world's first subsea gas compression facility. It is the largest template manufactured by Aker Solutions, measuring 74 m in length, 45 m in width, and 26 m in height.

"The Åsgard project is a game changer for the entire industry," said Per Harald Kongelf, regional president for Aker Solutions in Norway. "The technology has the potential to change offshore gas field developments worldwide, and I am very pleased that we have delivered this part of the project on schedule."

Reservoir pressure at gas-producing fields drops over time, reducing output. Gas compressors are used to raise the pressure and extend the life of a field. Such compressors have typically been installed on platforms over sea level. Placing the compressors on the seabed and near the wellheads improves recovery rates while reducing overall capital and operating costs. Subsea gas compression also leaves a smaller environmental footprint and is safer to operate than a platform.

The Åsgard subsea gas compression facility is set to go on stream after two 11.5-MW compressors are installed. The facility will boost declining gas pressures at the Midgard and Mikkel satellite fields in the Norwegian Sea.

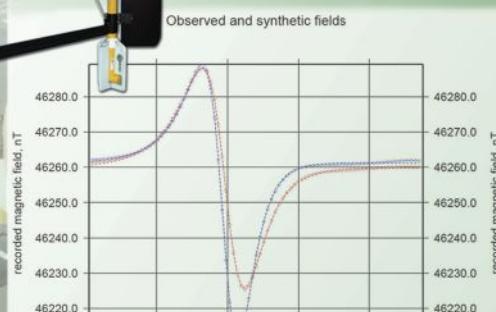
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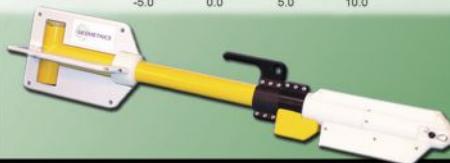
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Ninian Central platform in North Sea

CNR to prolong production from North Sea Ninian complex

CNR International plans to commit \$470 million to extend the life of the Ninian field in the UK northern North Sea. This follows a successful application for the UK government's Brownfield Allowance. This scheme, introduced last year, provides tax incentives for investment in certain North Sea fields already in production, allowing associated projects to proceed that might otherwise be sub-commercial.

CNR expects to drill four new production wells and four new injectors on

the field, perform two well upgrades, and invest in platform upgrades. The work is expected to produce an incremental 27 mmboe. Other investments in other CNR North Sea assets could follow if further Brownfield Allowance applications are approved.

"As a result of this investment, we forecast that the company's North Sea production will increase in the coming years," said James Edens, CNR International's managing director.

Iran stepping up offshore oil and gas development in Persian Gulf

Oil production from Iran's fields in the Persian Gulf will rise by 40% by 2020, according to Mahmoud Zirakchianzadeh, Iranian Offshore Oil Co. managing director. Currently, the company produces oil and gas from 600 offshore wells, Zirakchianzadeh told Iranian news service Shana.

During the current year, the company plans to initiate several new projects, he added, including construction of a 3.5 mmbbl oil storage tank, production of 540 mmcfd of gas from the offshore Salman field, completion of the development plan for the Hengam field, and

boosting gas pressure stations at the Abozar and Hendijan oil fields. Other plans include implementing associated gas-gathering projects at Bahregan, Siri, Lavan, and Kharg and early production from the offshore Kish gas field.

CNOOC starts first production from Beibu Gulf platform off China

CNOOC has completed the 10-well development drilling program on the WZ 6 to 12 field in the Beibu Gulf offshore China. This was designed to optimize the original field development plan and accelerate production reserves discovered through the 2012 exploration campaign. According to partner Roc Oil (China), the work was completed ahead of schedule and within budget.

Production from the developed fields is currently about 10,000 b/d of oil. The jack-up COSL HYSY 931 has transferred to the WZ 12-8 West field and started drilling WZ12-8W-A1H1, the first of five planned development wells.

Plateau production from the overall project is expected to be achieved later this year and average 15,000 b/d.

CNOOC holds a 51% share of the Beibu Gulf Development Project.

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Chevron subsidiary begins LNG production at Angola plant

Cabinda Gulf Oil, a subsidiary of Chevron, has commenced production of liquefied natural gas (LNG) at the \$10 billion LNG project in Angola, Africa. As part of the project, natural gas will be collected and transported from offshore Angola to an onshore liquefaction plant on the coast near the Congo River.

Chevron said the project is expected to cut greenhouse gas emissions and natural gas flaring from offshore producing areas.

The Angola LNG project is estimated to produce 5.2 million metric tons of LNG per annum, apart from producing 63,000 b/d of natural gas liquids for export and 125 mmcfd of natural gas for local requirements.

The project is expected to use associated natural gas produced from Chevron-operated existing crude oil operations and new non-associated gas from other offshore fields.

"First gas at Angola LNG is an important milestone in support of our strategic plan to grow our production," said George Kirkland, Chevron vice chairman. "This project will commercialize natural gas resources in western Africa to meet growing demand in the

region and internationally."

Chevron Africa and Latin America Exploration and Production president Ali Moshiri said, "The project represents the first LNG project in Angola, and it is expected to contribute to the development of Angola's natural gas industry."

Cabinda Gulf Oil holds a 36.4% stake in the joint venture and Sonangol holds a 22.8% stake, while subsidiaries of Total, BP and Eni each hold a 13.6% stake.

Moncla Offshore Operations ships first rig to Alaska's Cook Inlet

Moncla Offshore Operations, LLC said it is transporting its first platform workover rig, the Moncla 301, to Cook Inlet in Alaska for use on a Hilcorp Alaska, LLC project.

The Moncla 301 was contracted by Hilcorp Alaska, a subsidiary of Hilcorp Energy Co., which is a privately held exploration and production company based in Houston, Texas. The unit is one of two workover rigs being built by Louisiana manufacturer, Superior Derrick Services, LLC, at its facility in Parks, Louisiana to be used in the Cook Inlet project. The rigs were specially designed to sustain the harsh conditions of Alaska's winter.



Moncla 301 platform workover rig

The Moncla 301 was to be transported from the Parks facility in several truck-loads beginning in late June, bound for the Cook Inlet site.

The Moncla 301 is scheduled for the Granite Point platform and was to rig up in late June. The other rig, owned by Hilcorp was set to arrive in Alaska in July, and is scheduled for the Graying platform. Moncla will provide the labor force — adding more than 50 employees to the Moncla team — for both rigs.

The workover rigs are used to do maintenance on wells and will be used to rehabilitate aged producing and shut-in wells on platforms acquired by Hilcorp in 2012 from Chevron Corp.

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Antech unveils smallest member of electrical wellhead outlet family

AnTech Ltd., which specializes in permanent monitoring products for the upstream oil and gas industries, has unveiled its new Type C Wellhead Outlet, the smallest model in the company's extensive range of Wellhead Outlets that continuously monitor downhole pressure and temperature in permanent completions.

The Type C Wellhead Outlet uses proven pressure-testable cablehead technology that requires few connections to be made up. All that is required is to swage onto the line, make up the necessary crimp connections, and secure the cable gland and housing.

As with every electrical Wellhead Outlet from AnTech, the Type C is fully ATEX- and IECEx-certified for use in hazardous areas. In addition, it meets

with NACE standards and has been successfully pressure-tested in keeping with API 6A and requirements. It operates at high pressure to 15,000 psi and in temperatures as high as 160°C. The Type C Wellhead Outlet is available in models that are compatible with single, dual, and triple conductors and can be supplied in 1/4 in. configurations for Incoloy or stainless steel downhole cable.

"With the addition of the compact Type C system, AnTech now offers a reliable way to ensure that the cable and seal are safely connected, whether the connection is a flange, clamp or threaded," said Tim Mitchell, sales manager at AnTech. For further technical information about the full range of Wellhead Outlets, visit www.antech.co.uk.

Honeywell's UOP technology tapped by Petrobras for offshore processing

UOP LLC, a Honeywell company, announced that its technology has been contracted by PNBV, a subsidiary of Brazil's Petrobras, to supply UOP Separax™ membrane systems to process natural gas aboard four floating production, storage and offloading (FPSO) vessels.

The vessels will process natural gas extracted from Petrobras' Lula pre-salt

oil reserves, one of the largest and most significant worldwide oil discoveries in recent years.

Honeywell's UOP Separax™ membrane systems will be installed aboard the FPSOs to remove carbon dioxide and water from 7 mmec/d of natural gas. Earlier this year, Honeywell's UOP announced a similar project with Petrobras for eight FPSO units to be operated in Santos basin oil fields.

Honeywell's UOP Separax™ technology upgrades natural gas streams by removing carbon dioxide and water vapor. These contaminants must be removed to meet the quality standards specified by pipeline transmission and distribution companies as well as end users of the natural gas.

Separax™ membranes eliminate the need for solvents, which present challenges in marine applications. Separax™ systems can be used onshore or offshore, at the wellhead or at gathering facilities. To date, more than 130 of Honeywell's UOP membrane systems have been installed worldwide.

UOP is part of Honeywell's performance materials and technologies strategic business group. For more information, visit www.uop.com.

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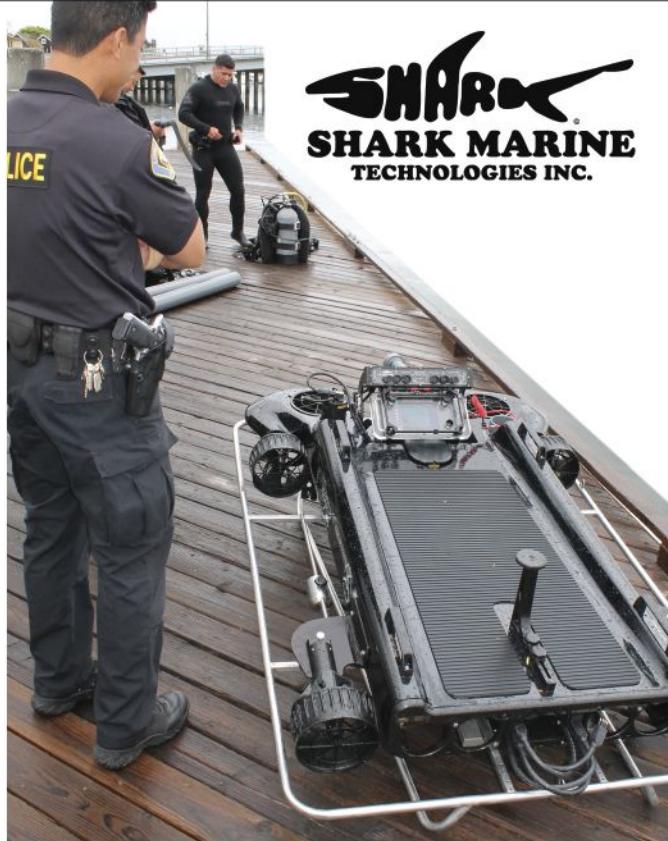
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Parat says oil spill response and hot water do not mix

Tests undertaken by Parat Halvorsen on oil spill response equipment (OSR) for offshore supply vessels reveal significant deficiencies with systems using hot water coils. Norway's leading supplier of steam-based solutions undertook a series of trials after a number of lower cost hot water coil alternatives entered the market.

"We have shown empirically that steam injection is the one viable solution proven to keep heavy oil viscous enough for easy loading and offloading," said Kim Kristensen, Parat Halvorsen's director of marine and offshore.

Any spilled oil is recovered by OSR-equipped vessels and stored in tanks until it can be delivered to recovery stations on land. The recovered oil has to be heated to maintain a sufficient viscosity for offloading. Parat Halvorsen offers a heating solution based on steam injection from a boiler onboard. It has supplied equipment to a significant number of OSVs delivered by yards, including Havyard, STX Norway, Kleven and Ulstein.

To verify whether alternative hot water-based solutions work, Parat installed a compact heating coil and a steam injection nozzle in a test tank at its facilities in Flekkefjord. Watched by representatives from shipbuilders, owners, consultants and the Norwegian Coastal Administration, the tests measured performance of both solutions in water and in heavy oil. The empirical results showed that heat transfer in heavy oil using the hot water coil was just 10% of that achieved by the same coil in water.

"The results from the tests clearly showed that using a heating coil is not a viable option," Kristensen said. "When we started the steam injection system, live temperature logging recorded the way the oil was evenly heated in a matter of minutes. Our advice to shipyards and owners is to exercise caution on OSR equipment selection, basing choices on correct, up-to-date information. We believe that the laws of physics are against hot water coil-based systems, particularly in cold, harsh weather conditions such as those in the North Sea."

Kristensen can be reached at +47 994 85 500, +47 994 85 512. Or visit www.parat.no.

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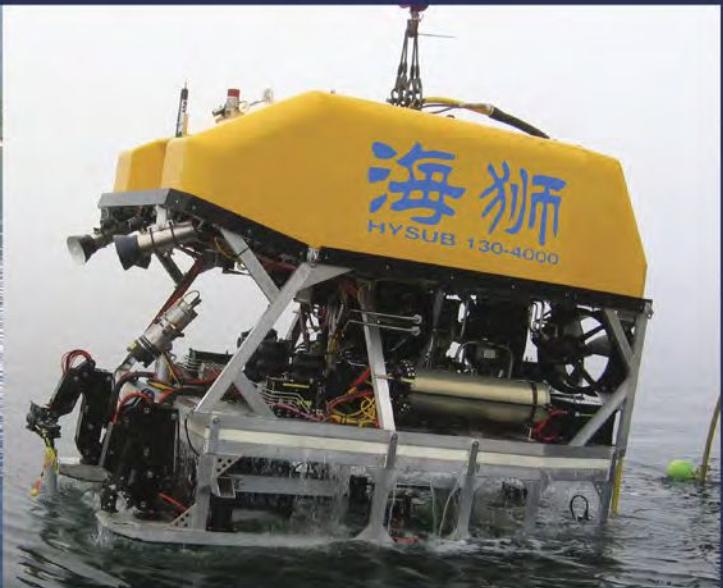
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Bulk Cutter arrives on Tyneside

Subsea vehicle designer and manufacturer SMD was awarded the contract to build the world's first deep sea mining tools for Nautilus Minerals in 2007. The contract included three subsea mining machines with the associated control and launch and recovery systems.

July saw the first major milestone in the production of the mining vehicles with the arrival of the chassis of the Bulk Cutter (BC) at SMD's main production facility in Wallsend.

The chassis, which was fabricated by Davy Markham in Sheffield, was delivered complete with double-ended drive tracks that were manufactured by Caterpillar in Italy.

The BC is the heaviest of the three vehicles, weighing 310 tonnes when fully assembled; the chassis weighs 70 tonnes.

Nautilus intends to use the vehicles at its first project,



known as Solwara 1, off the coast of Papua New Guinea in approximately 1,600 m of water.

Land-based mineral deposits are being depleted at an increasing rate as developing economies grow, creating an undeniable opportunity for subsea mining. Most of the recent land discoveries of copper deposits yield ore grades of less than 2%, while Nautilus' Solwara site offers ore grades up to 7%. In addition to the increased ore grade, seafloor resources lie on or very close to the sea bed, unlike land-based deposits which require removal of large expanses of overburden.

The excavation and collection has been split into three individual tasks that will each be carried out by a different vehicle. The Auxiliary BC is designed as the pioneering machine, which prepares the rugged sea bed for the more powerful BC. These two machines gather the excavated material; the third vehicle, the Collection Machine, will collect the cut material by drawing it in as seawater slurry with internal pumps and pushing it through a flexible pipe to the production ship via a subsea pump and riser system.

The BC has a large traverse excavating drum with just under 1 MW of electrically driven cutting power. As well as the three vehicles, SMD is providing the large launch and recovery A-frame and winch systems to allow deployment from the production ship.

After arrival in SMD's production facility, assembly, commissioning and factory testing of the BC will continue through to November 2013.

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

Unique System completes upgrade to the Ranger Offshore, Inc. HOSS-1, 6-man SAT system

Unique System LLC (USA), a Unique Maritime Group company, has recently completed the upgrade of the Ranger Offshore Inc.'s DNV classed, 6-man 1,000-ft Saturation Diving System to a 12-man system.

Originally built by Unique System in 2010, Ranger Offshore contracted USLLC to perform the upgrade to increase the capacity to a 12-man system. The modular design of the unit allows for this system upgrade to accommodate 12 divers for working in water depths of up to 1,000 fsw. The upgrade was done under the auspices of Det Norske Veritas in order to keep the system classed as DNV for all future work.

Ranger Offshore, Inc. delivers safe, reliable, cost-effective marine and subsea construction support services to the offshore oil and gas industry. Headquartered in Houston, Ranger Offshore manages operations throughout the Gulf of Mexico and in select international waters from their base in New Iberia, Louisiana.

Established in 2005, Unique System LLC (USA) is based in New Iberia, Louisiana and Houston, Texas. The company has achieved significant success over the years, specializing in the supply of equipment for sale and rental to the diving and offshore industries in the Gulf of Mexico region. From New Iberia, Louisiana, the company offers diving equipment rentals and sales, saturation systems, new builds, refurbish-

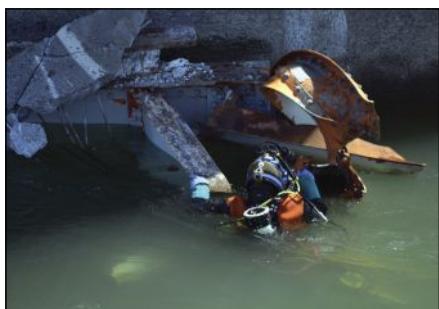
ments, project management, and mining & construction tunnel boring machine airlocks. From Houston, Texas, our specialization embraces hydrographic survey rentals and sales.

For more information, visit www.uniquegroup.com.



Global Diving performs salvage work on collapsed bridge

On 23 May 2013 while traveling in the southbound lane of Interstate 5, a truck hauling a heavy and oversized load struck the support structure of a bridge crossing the Skagit River in Mt. Vernon, Washington. The damage inflicted by the truck caused the 160-ft long four-lane span to collapse into the river below, completely severing the interstate. While the truck cleared the bridge before it collapsed, two passenger vehicles caught up in the failure of the bridge were destroyed with the passengers emerging shocked and scared, but alive. Interstate 5 is the major West coast transportation route between the U.S. and Canada, serving more than 70,000 vehicles per day.



Global Diving & Salvage, Inc., under contract to Atkinson Construction, worked around the clock for 13 days under direction of the Washington Department of Transportation and the National Transportation Safety Board to provide diving and salvage services throughout the investigation and debris recovery phase of the project.

Dive operations in the river were complicated by spring runoff conditions resulting in high river currents. The operations included a detailed underwater survey of the downstream edge of the wreckage to ensure that it was safe to bring demolition equipment alongside, cutting and rigging the bridge wreckage, and an underwater inspection to survey for damage to the bridge piers.

For more information, visit www.gdiving.com.

Panthers picked for Gulf

Zamil Mermaid Offshore Services has chosen three Saab Seaeye Panther XT Plus ROVs for a 7-year inspection and repair contract for Saudi Aramco.

The Panther XT is well known for its reputation as a small but high powered, light work ROV. Zamil Mermaid's operations manager, Neil Howie, says the Panther XT Plus is a versatile vehicle for all types of jobs. He



adds that it has the advantage of a small footprint and an ability to work easily in 2-kts shallow water currents, ideal for the Gulf.

Neil Howie explains that all three vehicles will need to carry out multiple work tasks, including light construction, inspection and surveying.

Each of the three 1,000-m rated Panthers come with its own launch and recovery and tether management systems, along with a split control cabin and workshop — one of which is supplied by Zamil Mermaid.

The Panther XT Plus is a popular vehicle in the Gulf for a number of reasons. First, it can handle 90% of the tasks normally undertaken by an hydraulic work-class ROV bringing major savings to operations in the Gulf. Second, being a smaller system operators can use a smaller ship, if necessary — an advantage in the shallow waters of the region. Finally, an electric vehicle is better suited for the warm waters of the Gulf where hydraulic ROVs have a problem keeping oil cool.

Faced with strong currents, the Panther XT Plus' unique combination of 10 powerful thrusters and twin Schilling manipulators means it can hold station in strong currents of up to 4 kts while working at complex or robust tasks. The Panther XT Plus has 50% more power than any other ROV of its type and can swim 30% faster.

It is also small and agile enough to work inside rig and platform jackets, yet powerful enough to open and close pipeline valves and operate in strong currents. For an operator, its exceptional number of thrusters offers a reassuringly high level of redundancy to keep the vehicle working before bringing it home.

For more information, visit www.seaeye.com.

Seatronics chooses SeeByte's SeeTrack CoPilot for Predator ROV

SeeByte, the global leader in creating smart software for unmanned maritime systems, and Seatronics, the world's largest marine electronic equipment rental company, have announced

that the Predator ROV will now be fully integrated with SeeByte's market-leading SeeTrack CoPilot software. This collaboration will allow Seatronics to offer the advanced applications available through SeeTrack CoPilot as an integrated package and as a rental option for their customers.

David Currie, MD at Seatronics commented, "As the builders and global distributors of the Predator Inspection Class ROV, Seatronics were keen to find a software package to complement the abilities of the vehicle and make handling the ROV more user-friendly for all pilots. The software allows control and flexibility of the vehicle, meaning our customers will have the time and confidence to focus on the job at hand, and not on piloting the ROV."

Bob Black, CEO at SeeByte, added "It is great to be able to welcome Seatronics as a partner company of SeeByte. Through the integration of SeeTrack CoPilot to the Predator, we are confident that Seatronics will now be able to offer an advanced, market-leading product to their customers; opening up the applications for which the Predator could be used."



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

For more information, visit www.seebyte.com.

N-Sea re-introduces the unique and revolutionary TUP Diving System®

The Transfer Under Pressure (TUP) Diving System®, designed and built in house by N-Sea, has an extensive track record with over 10,000 incident-free dives to date. The system has undergone a comprehensive refit and been converted to allow it be used as a mobile system, deployable from most DPO support



vessels and platforms. The system will be online starting August 2013.

The TUP Diving System® is composed of a 3-man bell, launch and recovery system, triple lock decompression chamber, an air/mixed gas dive control and hyperbaric rescue craft.

The TUP Diving System® effectively doubles the workable bottom time when compared with traditional air diving options. This makes the system cost efficient. When compared with saturation systems, the TUP Diving System® can be a cost-competitive alternative for operations between 35 and 50 m water depth.

The most important factor to consid-

er is safety. With divers being transferred under pressure the surface decompression interval is removed.

The TUP Diving System® refit is being carried out to the highest standards and conforms to IMCA guidelines and meets Lloyds classification requirements. The main benefits of this TUP Diving System® are:

- No surface decompression interval;
- Significant increase in workable bottom times; and
- Mobility.

For more information, visit www.n-sea.com.

Caley develops deepwater lowering system for Gorgon Project

Handling systems specialist, Caley Ocean Systems, has been awarded a contract by Subsea 7 to design, manufacture and supply a deepwater lowering system (DLS). The DLS will initially be deployed by Subsea 7 on the Chevron-operated Gorgon project, located off the northwest coast of western Australia, to lower subsea structures weighing up to 950 Te in water depths in excess of 1,300 m.

The DLS comprises two double

drum traction and storage winches and fully redundant controls, all mounted on an integrated grillage structure for rapid mobilization onto the pipelay and heavy lift vessel Sapura 3000. The system will connect to a deepwater lowering beam and connector. Each set of winches has its own dedicated hydraulic power unit for optimum control.

The range of equipment to be handled by the DLS in the Gorgon and Jansz-Io fields will include subsea structures and foundations and heavy lift spools.

Caley has many years of experience with offshore and marine winch systems. "The lifting requirements for oceanographic and offshore are very different," said Gregor McPherson, sales director, Caley Ocean Systems.

The Gorgon project is operated by an Australian subsidiary of Chevron and is a joint venture of the Australian subsidiaries of Chevron (47.3%), ExxonMobil (25%), Shell (25%), Osaka Gas (1.25%), Tokyo Gas (1%), and Chubu Electric Power (0.417%).

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

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Thuraya strengthens its partnership with Astrium Services

Thuraya Telecommunications Company announced a strengthened alliance with its global service partner, Astrium Services, the leading service provider for satellite-based services. The companies have been close partners for over 13 years, whereby Astrium Services was recently recognized for its contribution in delivering end-to-end services and value to Thuraya's end-users by receiving Thuraya's 2013 award for "Most Customer Oriented Model." Astrium Services is connected to the Thuraya network infrastructure to provide its full range of value-added services including messaging, prepaid cards, and interconnection to corporate networks via the Thuraya satellite services. The recent launches of Thuraya IP+, SatSleeve and Maritime Broadband (MBB) will further widen Astrium Services' commercial footprint and reach out to a more diverse set of customers as well as service partners globally.

Chemfleet chooses FleetBroadband to power vessel ops

Chemical tanker company Chemfleet has selected FleetBroadband from Inmarsat to provide critical data and voice communications across 21 of its vessels. The Turkish operator chose the Inmarsat maritime service to deliver its remote vessel operations monitoring solution, Nozzle, which helps drive efficiency across the fleet. The monitoring software, developed by Chemfleet, synchronizes a broad range of onboard data sources with the company's head office in Istanbul. This includes engine readings, fuel readings, and daily vessel reports. FleetBroadband enables Chemfleet to analyze vessel performance, track outstanding maintenance, and identify any defects in real-time, no matter where the vessels are, thus maximizing Chemfleet's investment in Nozzle. It offers the capacity and reliability required, while controlling costs. Inmarsat partner Deckhouse is providing Chemfleet with the maritime service, together with remote IT support and value-added software including virus protection.

Fleet Operators chooses Boatracs for vessel communications solution

Boatracs, Inc., a business of the Orlia Group, has completed a fleet-wide implementation for Fleet Operators, Inc., a Louisiana-based marine transportation company, to manage its vessel communications and tracking as well as logs for billing, HR and maintenance. The solution included the Boatracs Narrowband satellite solution for communications beyond cellular range, Boatracs BTConnect™ for vessel tracking, and Boatracs BTForms™ for electronic logs. Fleet Operators, Inc. decided on Boatracs because it provided a cost effective way to solve its current issues with a clear path to accommodate future growth. The company's customers in the oil and gas industry are demanding an electronic version of its vessel logs, and Fleet Operators needed a way to maintain constant connectivity with its vessels to collect these data that was low cost, easy to use and didn't require the company to maintain its own IT department. Because Boatracs is one of the few maritime software providers that also sells satellite communications hardware, the company's solutions are optimized for the bandwidth and cost limitations of using satellite networks. As a result, Boatracs offers a seamless experience for customers with software that is already fully integrated with the hardware and backed by 24/7/365 live customer service that significantly accelerates the adoption of the system on board.

Smart unveils suite of services for the maritime industry

Philippines' wireless services provider Smart Communications, Inc. has unveiled a set of mobile services designed to address communication needs. Smart Satellite Services offers the newest maritime communication technology to Filipino seafarers and is expected to bring better ways for them to keep in touch with their families and loved ones. Under this, three services will soon be made available: Marino Phonepal, Marino Textmate, and Link Plus. With Marino Phonepal, Filipino seafarers sailing in Australia, Middle East, Africa, Europe, and Asia-Pacific will soon be able to call their families in the Philippines at an affordable rate and enjoy reliable connection and superior call quality. With Marino Textmate, they will be able to send text messages for only P2 per text. Link Plus, an online application that will have both mobile and desktop versions, will enable users to make calls, send text messages, and access the Internet through the app. With the newest and pioneering portfolio of services, Smart offers delivery of wider coverage, outstanding quality, and reliable signal, all within the reach of Filipino seafarers.

KVH outlines new content delivery strategy



In a new effort to position its market-leading mini-VSAT BroadbandSM service as the maritime industry's premier content delivery platform, KVH Industries, Inc. is implementing a detailed four-part strategy that will bring a variety of economical and convenient content services to mariners for the first time.

KVH recognizes that many of the large files needed onboard vessels are not unique, proprietary data files, but common content used by many different customers, like electronic charts, weather forecasts, training courses, digital newspapers, television news and sports clips, music, and movies. In the past, when these large files were transmitted individually to ships, the satellite service costs were too prohibitive to be practical. Even so-called "all-you-can-eat" services usually had fair use policies limiting or blocking transmission of large files. KVH's goal was to introduce a new, more economical way to deliver content to vessels "over the top" of its mini-VSAT BroadbandSM network. The new solution accomplishes this goal by taking advantage of additional network capacity via advanced multicasting technology.

The first step was expansion of the capacity on the mini-VSAT BroadbandSM network. This began in late 2012, almost immediately following deployment of the final satellite transponder that completed the world's widest maritime VSAT coverage area. In all, KVH uses 15 Ku-band transponders overlaid with three global C-band transponders to provide worldwide coverage with its broadband connectivity. The capacity of the network has been effectively doubled over the past 9 months with the deployment of Variable Coding, Spreading and Modulation (VCSTM) technology, a significantly more efficient data delivery protocol than KVH's earlier technology. KVH has a second major upgrade planned for the latter half of 2013 that will provide another major increase in the effective network capacity.

The second major initiative was upgrading the TracPhone® terminals used to deliver the mini-VSAT BroadbandSM service. KVH developed the new Integrated CommBox Modem (ICM),

an integrated belowdecks unit that includes the antenna control unit, CommBox Ship/Shore Network Manager, ArcLight® spread spectrum modem, VoIP, Ethernet switch, and Wi-Fi capabilities in a single 2U enclosure. KVH's new TracPhone® V3-IP, V7-IP, and V11-IP all use the new ICM, allowing all of KVH's mini-VSAT BroadbandSM compatible products to receive and decode multicast content. KVH also offers a stand-alone CommBox™ server, making the IP-MobileCast™ service available to all of KVH's mini-VSAT BroadbandSM subscribers.

To deliver multicast content over the mini-VSAT BroadbandSM network, KVH is introducing its IP-MobileCast™ content delivery service, which is expected to be available later this year. The IP-MobileCast™ service will use proprietary software designed to provide advanced error correction, compression, and validation of data integrity throughout the transmission from shore to ship. Shoreside servers encode files for transmission and queue them for multicast delivery "over the top" of the mini-VSAT BroadbandSM network. The IP-MobileCast™ service's patented Forward Error Correction (FEC) technology will help ensure that CommBox™ servers on ships receive each file in perfect condition the first time it is transmitted. The unique FEC algorithms deliver the highest level of file reliability by accommodating intermittent non-continuous transmission, which might happen when large transmissions are interrupted by prioritized network traffic or in very poor weather conditions.

The final initiative in KVH's strategy is ensuring that a variety of high-quality content is available to send over the new IP-MobileCast™ service. In a major step toward this goal, the company recently acquired Headland Media, the maritime industry's leading provider of rights-approved news, sports, movies, IPTV, IP-radio, and training films. KVH plans to use the IP-MobileCast™ service to deliver much of Headland Media's premium content to subscribers automatically, without additional charge beyond the price of the content, over the mini-VSAT BroadbandSM network. In addition, a major effort is being undertaken to form alliances with application providers to deliver electronic charts, weather forecasts, and other mission-critical content for vessel operations. To that end, a cooperative arrangement was announced with Jeppesen for electronic chart delivery.

For more information, visit www.kvh.com.

OmniAccess goes live on iDirect with iDX 3.2 and X7

VT iDirect, Inc., a company of VT Systems, Inc., announced that OmniAccess S.L., a communications provider to super- and mega-yacht owners, has successfully launched a live satellite communications network built on iDirect's latest iDX 3.2 software and incorporating the high-performance X7 remote. The network, which was tested at Intelsat's Fuchstadt teleport over the IS-902 satellite, reached a data throughput rate of 50 Mbps. OmniAccess now plans a critical upgrade to its BroadBEAM ULTRA satellite service that will deliver higher throughput rates of 50 to 100 Mbps. iDirect is a world leader in satellite-based IP communications technology.

OmniAccess is the first iDirect customer to launch a commercial service based on iDX 3.2 and X7. The satellite service provider is now set to roll out a significantly enhanced high-bandwidth service for the luxury super-yacht market. The upgrade will meet surging demand for bandwidth-intensive applications such as HD IPTV streaming and videoconferencing as well as corporate VPN access and high-quality voice calls.

The X7 remote is the first of iDirect's next-generation family of remotes. Built on an entirely new multi-core hardware platform, the X7 is optimized to deliver best-in-class DVB-S2/ACM and A-TDMA throughput performance. With an embedded 8-port VLAN-aware switch and integrated GQoS, the X7 makes it simple to prioritize and segment traffic. In addition to enabling key mar-

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itime applications with OpenAMIP, mobility support and a rack-mount form factor, the X7 features variant power supply configurations and a second DVB-S2 demodulator ideal for overlay MC traffic.

iDirect's iDX 3.2 software features Adaptive TDMA, which enhances return channel performance and increases network availability under rain fade and satellite link degradation. Adaptive TDMA enables an inroute group to support carriers with different symbol rates and MODCODs. The network dynamically adjusts to changing uplink conditions based on each remote's demand and the system's Quality of Service configuration. iDX 3.2 also improves acquisition, roll-off factor and waveform enhancements to drive greater efficiency and availability.

For more information, visit www.idirect.net.

ORBIT announces Asian launch of new maritime mobile VSAT

ORBIT Communication Systems, Ltd. announced the Asian launch of the OceanTRx™ maritime stabilized mobile VSAT platform. Asia's international mar-

itime industries will benefit from the cutting edge technologies of the OceanTRx™ family, which consists of the OceanTRx-4 and OceanTRx-7 platforms.

OceanTRx-4 supports a variety of 1.15-m stabilized maritime antenna system configurations in multiband frequencies, such as X, Ku and Ka bands, and different BUC power units. Empowering mission and business-critical applications, it features inherent field upgradability, outstanding RF performance, unequalled tracking capabilities and best-in-class dynamic response under virtually any sea conditions. OceanTRx-4 brings the benefits of ACM and saves satellite bandwidth compared to smaller platforms, resulting in lower overall ownership cost. To enable superior system availability and connection uptime, OceanTRx-4 is designed and tested to meet the most stringent environmental standards including shocks, bumps, and vibrations.

OceanTRx-7 is the most compact and lightweight 2.2-m mobile maritime antenna system in the market, requiring about 88% less deck space and weighing at least 40% less than other solutions. OceanTRx-7 offers numerous configurations in multiband frequencies such as C,



Ku and Ka bands, and at different BUC power units. OceanTRx-7 is built for quick and easy installation, upgrade, and maintenance and combines exceptional RF performance and system availability. Small enough to be shipped as a fully assembled unit in a standard 20-ft container and already live tested over satellite on a sea simulator, OceanTRx-7 drastically lowers shipping costs.

Both platforms are Balance Free systems during installation and upgrades. Moreover, they do not require periodic balancing to reduce customers' overall cost of ownership.



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

Diamlemos Shipping picks new Cisco SmartBox-V

Cisco® has announced that the Diamlemos Shipping Corp. has decided to implement a unique telecommunications solution that is specifically designed for the shipping industry: SmartBox-V.

The SmartBox-V is an integrated bundle of software and quality services from Setel running on a Cisco® blade server that is hosted within a Cisco® modular 2900 series router. This solution will allow Diamlemos to reduce the complexity of on-vessel communications

equipment. SmartBox-V will simplify and optimize the vessel's communications, reduce the costs of managing the equipment, and offer a comprehensive set of crew welfare applications.

The project implementation is focused on consolidating the IT infrastructure. First, the network will be redesigned to replace the existing PBX with Cisco® Unified Communications Manager to interconnect offices in Piraeus, London, Arizona, and Monaco. Second, SmartBox-V, as the Cisco Cloud Connector, will be hosted on a Cisco 2900 Series Integrated Service Router (ISR) with the Cisco Unified Computing System™ (Cisco® UCS®) E-Series blade server.

Diamlemos Shipping chose an integrated solution for a manageable and highly secure gateway onboard commercial vessels by consolidating all the available communications devices (Inmarsat FBB, VSAT, 3G/4G, Wi-Fi), providing a high-performance and highly reliable platform to develop advanced and customized communication features for the access of private and public cloud services.

SmartBox-V, as the Cisco Cloud

Connector, is able to handle Ethernet ports in a versatile way by enabling WAN/LAN/VLAN architecture on demand. At the same time, the Cisco® ISR multiservice capabilities offer bandwidth management, optimized firewall, VPN, proxy and mail server, an Internet gateway, and embedded high-quality IP telephony through Cisco Unified Communications Manager Express with advanced crew welfare features — all on a single Cisco ISR platform.

The business benefits of the system include:

- Improved maritime communications and business transactions for highly reliable and consistent user experiences.
- TCO optimized as a result of vessels being part of the office network, which helps ensure interoperability, responsiveness and remote support.
- VoIP connections that practically eliminate vessel-to-office communication costs, thus providing free ship-to-shore phone communication and a measurable and significant ROI.
- Improved crew morale and a significant increase in crew retention rates.

For more information, visit www.cisco.com.

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AARNet massively boosts bandwidth for researchers

Australia's Academic and Research Network (AARNet) and Southern Cross Cable Network (SCCN) announced the completion of the 40 Gbps upgrade to the northern path of the SXTransPORT submarine fiber optic link connecting Sydney to North America. This upgrade boosts bandwidth from 10 Gbps to 40 Gbps, providing capacity for "big data" transport between Australia's scientific and research community and the rest of the world ahead of anticipated demand. The AARNet/SCCN partnership is also playing a critical role in projects related to the Square Kilometre Array (SKA), such as the Australian Square Kilometre Array Pathfinder (ASKAP) and the Murchison Widefield Array (MWA). AARNet upgraded the terrestrial section of its backbone to the SKA site in Western Australia to 100 Gbps to complement the massive international capacity upgrade and support the SKA, the world's biggest collaborative science project. The next phase of the project will see the southern path of the SXTransPORT link upgraded from 10 Gbps to 40 Gbps by the end of the year.

Warley Design helps develop next-generation optical repeater

Warley Design Solutions, one of the UK's leading independent providers of mechanical design and engineering services, has helped Xtera Communications Inc., a leading global supplier of optical networking solutions, to develop and launch a next-generation optical repeater for subsea cable systems. The new repeater enables service providers to build high-performance and highly reliable submarine cable solutions, for short regional systems and very long transoceanic applications, with significantly improved reach and capacity. As part of the Xtera team, Warley Design played a key role in designing what is now probably the world's smallest, lightest and most technically advanced optical repeater, including mechanical elements of the highly sophisticated internal opto-electronics and the external housing that enables it to be deployed in extremely hostile environments. The company provided the expertise to help overcome the many design and engineering challenges to ensure that the repeater could withstand immense pressures, enabling it to operate reliably within its design specification throughout its expected 25 year service life in water depths of up to 8 km.

NKT Cables completes long cable connection for wind farm

During April 2013, NKT Cables completed a submarine cable with a continuous length of 31 km for use on the West of Duddon Sands (WoDS) offshore wind farm project in the UK. The project is a joint venture between Dong Energy and Scottish Power Renewables. The new wind farm, located off the coast of Cumbria and Lancashire in northwest England, will have a capacity of 389 MW when completed, and the power will be exported to the shore via submarine export cables supplied by NKT Cables. The export cable manufactured and supplied by NKT Cables consists of a 3-core design with 1,000 sq. mm copper conductors and integrated fiber optics. Each cable is capable of transmitting more than 200 MVA. In total, NKT Cables are supplying in excess of 80 km of submarine export cable for the WoDS wind farm project. The benefit of supplying such long continuous lengths are the reduction in offshore installation time and risk during installation, thereby providing significant cost benefits to offshore wind farm developers.

VSMC signs two contracts for offshore wind farms

VSMC recently signed two separate contracts to lay and bury export cables for the Westermost Rough and Humber Gateway wind farms. With these latest projects, VSMC strengthens its strong position in laying and burying electricity cables in and to offshore wind farms. Under commission from the Danish company DONG Energy, VSMC will start laying and burying approximately 11 km of export cable along the east coast of England, near Hull, for the Westermost Rough Offshore Wind Farm. The cables will transport electricity generated at the 210 MW offshore wind farm to the onshore grid. Nearby, the Humber Gateway Offshore Wind Farm is being built 8 km out from shore. This park will eventually have 70 wind turbines, with a total capacity of 288 MW. VSMC was contracted by E.on to prepare the seabed along the route and transport and install two export cables. Project execution is scheduled to start in the 3rd quarter of 2013. VSMC will be partnering with Boskalis Offshore to perform these projects. Both E.on and DONG have ownership shares in the London Array, the largest offshore wind farm in Europe. VSMC performed a significant portion of the work on that project as well.

NIB allocates additional funding for Estlink-2



The Nordic Investment Bank (NIB) has signed a 20-year maturity loan agreement of EUR 10 million with Estonian state-owned transmission system operator Elering AS for the construction of Estlink-2, a new high-voltage power connection being built across the Gulf of Finland between the Baltic countries and the Nordic region.

The new loan will reduce Elering's own funding needs and comes in addition to a EUR 25 million loan signed with Elering for the same project in 2010.

Construction of the new 650-MW link is progressing according to plans and is expected to enter into operation in 2014. The capacity of the interconnection between Estonia and Finland will increase up to 1,000 MW and is estimated to cover more than two thirds of the annual average electricity consumption in Estonia.

The increase of the transmission capacity is one of the pre-conditions of the integration of the future power market between the Baltic countries and Nord Pool Spot. In 2005, NIB co-financed the construction of Estlink-1, the first ever connection between the Baltic countries and the EU.

For more information, visit www.nib.int.

AMETEK SCP introduces dry-mate connector, fiber optic feedthru

AMETEK SCP has introduced a new connector for subsea oil & gas applications. The new Elite Series Dry-Mate Connector from AMETEK SCP represents a technical leap forward and breakthrough in terms of design and performance. The connector is the first fully modular dry-mate connector that is ISO/API compliant. Its modular design permits the incorporation of interchangeable electrical or optical circuits with exceptional high performance.

SCP has taken the connector's modular design a step further, making it possible to use either a standard hard cable termination or a pressure-balanced, oil-filled configuration. Among the other improvements incorporated into the connector's design is an option for a fiber optic connection that incorporates angled polished contacts. These higher-performing contacts help satisfy an increased demand in the oil and gas industry for distributed sensing systems that are part of intelligent well system designs as well as other emerging distributed acoustic and temperature monitoring systems.

In addition, AMETEK SCP has developed the technology to



produce a glass-sealed fiber optic feedthru (FOFT) for extreme high-pressure, high-temperature applications. As oil and gas producers push their technology to ever greater ocean depths to find sources of supply, there has been an increased need for long-distance, high-temperature and high-pressure sensors and communications devices.

AMETEK developed the FOFT to meet the harsh downhole environments encountered in the drilling and completion of oil and gas wells, and customers have qualified it for 30,000 psi and 300°C. The FOFT is currently configured for one to eight fibers in a 0.375-in. housing that can be welded or coupled with a standard high-pressure fitting. The FOFT also has been miniaturized to fit a high-pressure, high-temperature connector.

This rugged, high-performance fiber optic feedthru is constructed of low outgassing materials and configurable with standard single-mode and multi-mode fibers. It conveniently interfaces with standard 3/8-in. high-pressure fittings and is available in a variety of optional end terminations, including bare, stripped, SMA, ST, FC, APC, and custom ferrules.

For more information, visit www.ametekscp.com.

Tender issued for TGA cable

Telecom New Zealand, Telstra, and Vodafone have invited tenders and will pick a supplier for its planned submarine fiber optic cable linking New Zealand and Australia.

The cable system, known as the Tasman Global Access (TGA) cable, has drawn the interest of several leading submarine cable suppliers. The carriers will pick a preferred supplier and award the contract by the end of 2013. Construction is expected to begin next year.

The TGA cable will stretch 2,300-km and will use the latest 100-G transmission technology. It is expected that the cable will enter service in early 2015.

Two landing options on the North Island's west coast are being evaluated for the New Zealand end of the cable: one south of Auckland and the other to the north. In Australia, a number of sites in northern and southern Sydney are being considered.

In February, Telecom, Vodafone, and Telstra announced they had signed a non-

binding memorandum of understanding (MoU) to co-invest in the TGA Cable, which will significantly improve New Zealand's international telecommunications connectivity as well as strengthen links into fast-growing Asian markets. It reflects the growing importance of trans-Tasman Internet traffic and demand from corporate customers for route diversity; around 40% of both Telecom and Vodafone's international Internet traffic is now Australia to New Zealand, versus just 10% in 2000.

The Tasman Global Access cable will also enable New Zealand to better leverage the international cable systems currently serving Australia (and several more proposed or in development), providing important redundancy for New Zealand. Australia also enjoys good connectivity with Asia, which is achieving strong Internet traffic growth in line with global economic shifts.

For more information, visit www.telecom.co.nz, www.telstra.com.au or www.vodafone.com.

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Philippines carrier Globe Telecom connects island to backbone

As part of its network modernization program, Philippines carrier Globe Telecom has interconnected Coron Island in the Palawan province through a submarine fiber optic cable, a move that will further strengthen network coverage in one of the country's premier tourist destinations.

The upgrade will allow subscribers vacationing in the area to share their Coron experiences through voice, text, and high-speed data with unparalleled ease as the leading telecommunications company linked up the island through a fiber connection, complementing the existing submarine fiber optic links to Boracay and Palawan.

The Coron submarine cable system is a 62-km fiber optic cable that branched off from the 270-km fiber optic network between Mindoro and the main island of Palawan to serve the communication services of one of the best tourist destinations in the country.

This is an upgrade from the existing microwave system to a more robust and reliable transmission system using fiber optic technology and a dense wave division multiplexing (DWDM) system,

designed to transmit 40 wavelengths at 40 Gbps capacity per fiber pair.

This will provide the required bandwidth for subscribers to have high-speed Internet surfing, seamless video streaming, fast uploads of photos and videos to social media sites, and a more reliable network for text and voice calls.

The company's network transformation program includes as a component the roll-out of about 12,000 km of optical fiber lines nationwide.

For more information, visit www.globe.com.ph.

Hudson Transmission Project goes online ahead of schedule

PowerBridge, LLC has announced that its affiliate, Hudson Transmission Partners, LLC (HTP), has completed testing of its underground and underwater, 660-MW electric transmission project between Ridgefield, New Jersey and Manhattan, and has begun delivering power to customers in New York City.

The Hudson transmission project route has a total length of about 7.5 mi, with a cable bundle buried under the Hudson River for about 3.5 mi and buried underground for approximately 4 mi, starting in Ridgefield, New Jersey.



The line connects to the Con Edison system at the West 49th Street substation in the heart of Manhattan and is capable of providing about 5% of New York City's peak demand. The project began construction in May 2011 at a cost of approximately \$850 million and was completed 6 weeks ahead of schedule, despite the two hurricanes that hit the area during the construction period.

The Hudson project is the second major underwater transmission project completed by PowerBridge, following the 660-MW Neptune undersea transmission project, completed in June of

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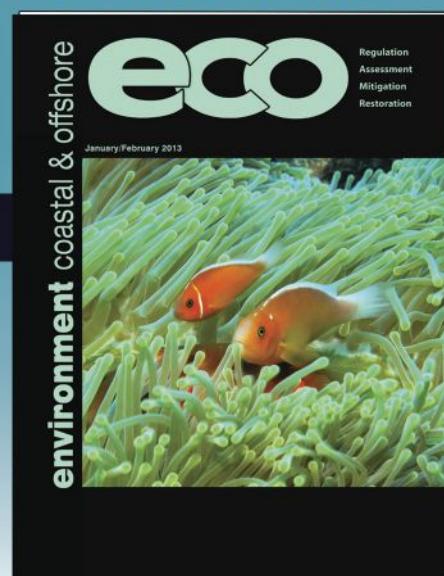
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2007, which extends 65 mi between New Jersey and Long Island. Neptune has supplied approximately 20% of Long Island's electricity needs since going into service. The Hudson and Neptune projects provide access to power from the PJM energy grid, one of the largest and most diverse power markets in the United States.

Using HVDC (High Voltage Direct Current) technology, the electricity drawn from the PJM grid is converted from AC to DC power and then back to AC power at a newly-built converter station in Ridgefield for the purpose of maximizing reliability and controllability in delivering power to Manhattan.

For more information, visit www.powerbridge.us or www.hudsonproject.com.

Alcatel-Lucent wins Indonesian contract

Alcatel-Lucent and Telkom Indonesia have signed a contract for the development of a fiber optic network infrastructure that will connect the islands of Sulawesi, Maluku, and Papua located in the eastern part of the Indonesian archipelago.

The system, spanning more than 3,000 km, will open new opportunities to

improve the competitiveness of the region for economic and social development.

Capable of supporting 100 Gbps speeds, the system will deliver an ultimate capacity of up to 16 Tbps, significantly boosting connectivity and substantially increasing the availability of broadband services throughout the islands. Additionally, it will pave the way for new applications such as e-tourism applications.

The system is part of Telkom Indonesia's Nusantara Super Highway, consisting in deploying a terrestrial and submarine infrastructure throughout the archipelago, to address the increased mobile penetration and Internet traffic growth. The terrestrial links and inland activities will be performed by Indonesia's PT Lintas, strengthening the cooperation between the companies.

The new submarine cable system will make a significant contribution to the deployment of the Nusantara Super Highway, which is contributing to bridging the digital divide and offering people a wider range of communications options and services. Expanding connectivity and increasing capacity for data services in areas that are not yet adequately served is vital to improve broadband

access for all. The system will help support Telkom Indonesia in accelerating the expansion of Internet connectivity to remote areas and overcoming the structural and geographic constraints that limit broadband penetration.

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

Ireland-France interconnector being considered

The two national transmission system operators, EirGrid in Ireland and its French counterpart, RTE (Réseau de Transport d'Électricité), have signed a Memorandum of Understanding to commission further preliminary studies on the feasibility of building a submarine electricity interconnector between Ireland and France.

An Ireland-France interconnector would, if developed, run between the south coast of Ireland and the northwest coast of France and comprise a cable length of approximately 600 km. Over recent months, EirGrid and RTE have conducted studies that indicated that an interconnector between the two countries could be beneficial for electricity customers in Ireland and France.

By this agreement, the two transmis-

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sion system operators will continue and deepen their cooperation and conduct further detailed feasibility studies. These studies will focus in 2013 on desktop analysis of the seabed to identify potential route corridors.

The capacity of the Ireland-France interconnector could be approximately 700 MW, or the equivalent of the power demand of about 450,000 households. Last year EirGrid completed construction on the 500-MW submarine East West Interconnector between Ireland and Wales.

For more information, visit www.eirgrid.com or www.rte-france.com.

France Telecom Marine becomes Orange Marine

France Telecom Marine, the fully-owned subsidiary of Orange specializing in submarine cable laying and maintenance for the telecommunications sector, is changing its name to Orange Marine.

The subsidiary has been using the Orange brand for all of its operations and interactions with customers all over the world since 1 July 2013. Three of its five cable ships are progressively being overhauled to reflect Orange's

visual identity. The other two vessels, which were acquired in 2010, will continue to operate under the brand Elettra for commercial reasons.

To reflect this name change, Orange Marine has opened a new website: www.orange.com/OrangeMarine. The site provides descriptions of the subsidiary's operations, fleet, and key services as well as details on its main areas of expertise.

The name change for France Telecom Marine fits in with the overall strategy of its parent company, Orange. The Group is building on its brand to construct its image as a leading telecommunications company that operates at the cutting edge of innovation and that listens to its customers.

The Group has gradually simplified its identity in France and abroad since 2006 for its various internal and external contacts to present itself under a single brand.

Orange Marine's activities play an important role in the achievement of Orange's goals, which include democratizing network access throughout the world, thereby opening the door to the digital services, particularly to the Internet, to as many people as possible. The subsidiary is one of the world's lead-

ing players in the installation and maintenance of submarine cables around the globe. Its ships are active primarily in the Mediterranean Sea, the Atlantic and Northern Europe area, the African coasts, and the Indian Ocean.

Since its establishment, Orange Marine has laid 170,000 kilometers of cable in every ocean, the equivalent of more than four times the earth's circumference. Its ships carry out an average of 50 operations a year, some of which are at depths of 8,500 m.

Recently, Orange Marine announced its intention to expand its operations to cover submarine energy cables. It aims to become a leading player in the installation and maintenance of submarine cables connecting offshore wind turbines or hydropower platforms to terrestrial distribution networks. Orange Marine recently ordered a new cable ship, the Pierre de Fermat, which will be commissioned in the summer of 2014. This new vessel will not only be able to conduct operations on telecommunications cables, but it will also be optimized for operations involving submarine energy cables.

For more information, visit www.orange.com.

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Pierce is a member of the Subsea Survey and Positioning team at Chevron, and currently serves as the project manager for their AUV Development Program. Pierce began his career with Chevron Energy Technology Company after graduating from the University of Texas with a B.S. in Mechanical Engineering.

R. Michael Haney founded Douglas-Westwood's Houston office in 2012 and has more than a dozen years' experience consulting for energy and chemicals clients with Accenture, Arthur D. Little and Booz Allen Hamilton. Mike has completed consulting projects for most of the IOC's, many NOC's, and several oilfield service clients, working on projects around the world.

As a Project Surveyor for Petrobras America, Don Ross is working on the Cascade and Chinook Project, and is a member of The Cascade and Chinook Integrity Management Team. Mr. Ross is a Texas Registered Professional Surveyor, is a Certified Hydrographer from the American Congress on Surveying and Mapping, and a Certified Project Management Professional from the Project Management Institute.

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SIDMAR delivers an AXYS WatchMate ODAS buoy to strengthen weather monitoring in Spain

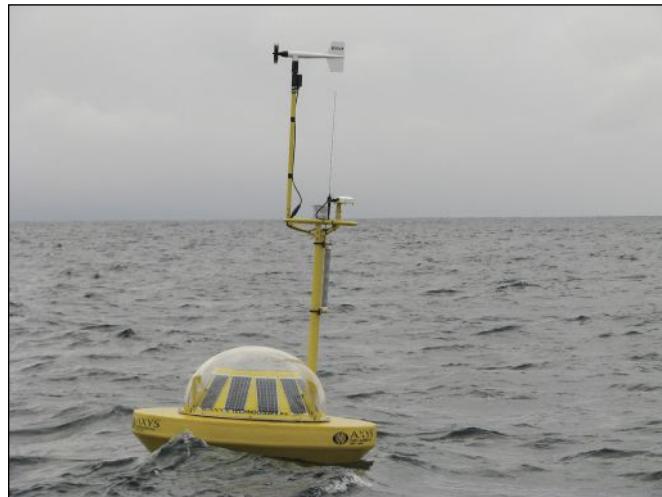
AXYS Technologies Inc. (AXYS) is pleased to announce that its exclusive Spanish agent, SIDMAR, has recently deployed an AXYS WatchMate™ 1.8 DM buoy in the external port of La Coruña. The WatchMate oceanographic buoy strengthens the weather monitoring program operated by Puertos del Estado (PdE) in the Galicia region. The WatchMate buoy system monitors additional strategic environmental parameters over the existing REDCOS TRIAXYS buoys for operation of the port and to improve the local marine weather forecasting models. The WatchMate buoy performs with a similar operational cost of maintenance when compared with the TRIAXYS™ buoys deployed in the REDCOS network.

The WatchMate™ transmits the following oceanographic and meteorological data: directional waves, marine currents, salinity, sea surface temperature, wind (speed and direction), atmospheric pressure, and temperature. Puertos del Estado can also expand these capabilities to add more sensors including water quality (chlorophyll, BGA, CDOM, turbidity, nitrates and hydrocarbons) and other instruments (current profilers, radiometers PAR and UV, etc.).

The WatchMate™ buoy features a redundant safety system unique to PdE, including AXYS' WatchCircle Alarm service (GPS position through Inmarsat satellite), Aid to

Navigation Automatic Identification System (AtoN AIS), dual radar reflectors and several full duplex communication systems (GPRS, Radio modem, and Inmarsat satellite), which ensures distribution of data via multiple telemetries and monitoring the position and status of all buoy systems.

For more information, visit www.axystechnologies.com.



New BIRNS Titan™ 4,000-W HMI floodlight

BIRNS, Inc. has been blazing new trails in marine illumination for the last six decades and is now pleased to introduce the newest lighting innovation in the sea: the BIRNS Titan™. This robust 4,000-W, intensely bright lighting system delivers 380,000 lumens with its hydrargyrum medium-arc iodide (HMI) lamp. The powerful lamp features a high Color Rendering Index (CRI) of Ra >90 and 6,000 K color temperature. It provides massive light output, mixing mercury vapor with metal halides in a quartz-glass envelope, and energizing the resulting mixture with two tungsten electrodes of medium arc separation.

The housing on this innovative new light system is especially rugged - crafted from tempered cast aluminum. The lens is powerfully constructed to withstand intensely rigorous salvage, security and offshore applications, made from tempered borosilicate 19 mm thick glass. The BIRNS Titan also comes with a sturdy stainless steel mounting yoke, so the light can be adjusted and set in a wide range of positions. It includes an exclusive power system that integrates BIRNS high performance metal shell subsea connectors, and a robust braided shielded cable. The light's output is controlled with an advanced dimmable electronic ballast.

ly rugged - crafted from tempered cast aluminum. The lens is powerfully constructed to withstand intensely rigorous salvage, security and offshore applications, made from tempered borosilicate 19 mm thick glass. The BIRNS Titan also comes with a sturdy stainless steel mounting yoke, so the light can be adjusted and set in a wide range of positions. It includes an exclusive power system that integrates BIRNS high performance metal shell subsea connectors, and a robust braided shielded cable. The light's output is controlled with an advanced dimmable electronic ballast.

For more information, visit www.birns.com.



Applied Acoustics' 300th USBL system sale

Another milestone has been reached at Applied Acoustics after the company announced the sale of its 300th USBL system through Toyo Corporation, its exclusive and long standing Japanese distributor. This landmark order will see a number of Alpha Portable USBL subsea tracking systems, integrated with peripheral equipment to provide complete diver monitoring packages.



Commenting on this development, Applied Acoustics' sales manager Gavin Willoughby stated, "We're delighted that Toyo continue to support and promote our equipment range throughout their territory. We're very proud to be associated with them and to be able to supply the quality products that they and their client base expect."

Highlighting the importance of close working relationships between the company and its distributors, he further commented, "To maintain and grow a global presence, it is vital that we not only select the right distributors to work with, but that we cooperate in long term partnerships that provide the best possible service to our end users."

During a visit and inspection of Applied Acoustics' UK headquarters in Great Yarmouth, Mr. Shin Takada, Toyo's senior sales engineer for the marine and ocean measurement department, accepted an award to celebrate the 300th system sale on behalf of the Tokyo-based firm.

For more information, visit www.appliedacoustics.com.

C-Nav C-Tides announced

C-Nav, the premier supplier of international GNSS Precise Point Positioning services, announced the launch of its latest GNSS real-time tide measurement package, C-Tides.

The C-Tides suite combines the exceptional vertical accuracy of C-Nav's GNSS Precise Point Positioning service with the latest advanced ocean

and coastal tides models.

C-Tides Online features real-time filters and vessel dynamics, choice of world-wide mean sea surface or regional reference frame models, and tidal prediction for mission planning.

C-Tides Offline utilities include data smoothing and outlier rejection, harmonic analysis, Doodson X0 filter, and a LAT option.

C-Nav's head of development, Russell Morton, announcing the launch commented, "It's been a privilege working with our academic partners to develop what is probably the world's most advanced real-time GNSS tide solution."

C-Tides is a fully supported C-Nav utility. The results are suitable for combining with other suitably calibrated vertical components to achieve IHO SP44 Order 1 or better.

For more information, visit www.cnav.com.

Unique Hydra joins hands with In Situ Site Investigations

Unique Hydra, a Unique Maritime Group (UMG) company and one of the world's leading integrated turnkey subsea and offshore solution providers, recently signed an agreement with In Situ Site Investigations (In Situ) based in Battle East Sussex, UK to offer rental Cone Penetration Testing (CPT) equipment and operators in the African subcontinent.

Based in Cape Town (South Africa), Unique Hydra is a leading provider of subsea rental equipment in Africa and a manufacturer of world class dive solutions. The product and service range includes design and manufacture of air, mixed gas & saturation diving equipment, marine winches, certified man-rider winches and specialized subsea rigging equipment among many others. Their experience has given UMG a leading edge in obtaining contracts involving the design, production, supply and maintenance of its specialized equipment.

In Situ Site Investigation is a specialist geotechnical and geo-environmental site investigation company that specializes in the use of CPT techniques and other related pushing technologies.

CPT is a commonly used In Situ testing method used to determine the geotechnical engineering properties of soils and assessing subsurface stratigraphy. Increased accuracy, speed of deployment, more continuous soil profile, and reduced cost over other soil testing methods make CPT testing an attractive option while undertaking

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geotechnical investigations.

CPT equipment available will include marine systems, both near shore (<40 m) and offshore (>40 m), as well as a fully fitted out land-based CPT truck.

For more information, visit www.hydra.co.za/www.uniquegroup.com.

Contactless power solution for simplified recharging underwater

WFS Technologies, global leader in the delivery of subsea wireless instrumentation and control solutions to the offshore oil and gas and renewables industries, has launched a subsea wireless power solution to complement its existing range of subsea wireless controllers, modems and dataloggers.

The WPT (Wireless Power Transfer) solution enables contactless recharging or powering of equipment in demanding offshore environments, avoiding wet mate/stab connections at depth and reducing electrical failure. As the power is delivered wirelessly, a vehicle such as an AUV can hover to be recharged without being raised to the surface. The solution can also incorporate high-speed wireless data communications if required.

With power transfer capability between 10 W and 3 kW and power transfer efficiency up to 90% at distances up to 30cm, WPT can deliver value in applications such as:

- Autonomous Vehicles: WPT can extend deployment length by providing power in situ rather than surfacing a vehicle to connect and recharge.
- Subsea Sensors: WPT can be used to recharge "sealed for life" sensors, reducing maintenance as no battery will ever need to be replaced.
- Subsea Equipment: WPT can provide an emergency power supply to a failed undersea system and, due to elimination of cables, can provide power to moving or rotating machinery such as a slip ring or subsea turbine.

WPT is tolerant to the harsh environment, and power transfer efficiency will



not be affected by turbidity or contaminants. WPT can be used both independently or to back up standard pin connectors underwater. Recharging underwater is simplified and battery maintenance removed, uptime is maximized and, without the need for wet mate connection, the risk of failure or damage to connectors is greatly reduced.

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

iXBlue DP-PHINS commissioned on board Subsea 7 vessel

iXBlue DP-PHINS Inertial navigation System has been proven in operation offshore West Africa for Subsea 7. The system delivers a robust and secure position reference in the case of corrupted positioning from satellite systems due to ionospheric interference.

The 4,500-ton DP2 Construction Support / Flex Lay vessel Simar Esperança has successfully completed FMEA (Failure Mode Effect Analysis) trials using the state-of-the-art DP-PHINS inertial navigation system. The iXBlue system was connected to the Kongsberg K-POS DP-22 and the Kongsberg HiPAP500 system. The advanced inertial navigation technology contained within the DP-PHINS system fuses the acoustic positioning data from the USBL (GAPS or equivalent) with



measurements of vessel rotation and acceleration to produce a blended position solution with smoother characteristics and a higher update rate than is possible from the acoustic system alone.

Operating in 1,364 m (4,475 ft) of water, GL Noble Denton oversaw FMEA proving trials that confirmed the ability of DP-PHINS to integrate tightly with the DP system. Both static and dynamic tests were conducted, with the vessel holding position under control of the DP-PHINS to satisfactory tolerances. As part of the test, the vessel took excursions from the holding position, 20 m north, south, east and west, followed by a 360° rotation of the vessel while maintaining auto position.

For more information, visit www.ixblue.com.

DNV software advances 3D simulation technology

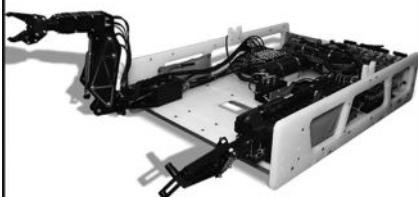
Marine operations—such as transportation, installation and lifting of fixed and floating structures and subsea equipment—are becoming increasingly challenging as operators move to harsher climates and deeper waters. DNV Software is now launching Sesam Marine, a groundbreaking software solution that keeps pace with the increasing complexity of marine operations with 3D simulation and visualization.

With Sesam Marine software it is possible to manage risk through calculation and visualisation of marine operations, taking into account environmental conditions and structural components. Realistic and rigorous testing and evaluation of operations is possible using environmental conditions and dynamic positioning as parameters. The simulations can be used during real-time execution of operations, including installation of subsea structure such as templates, flexible risers, umbilicals and pipelines. The coupled and multi-body analysis is performed in time domain.

Sesam Marine can be used in many facets of marine operations, including lifting and installation of topsides, modules and subsea structure, floatover installation and removal of topsides and offloading tankers in tandem or side-by-side. The ability to quickly visualize the operations in 3D and run multiple “what-if” scenarios immediately showing the results of all known factors reduces risk of offshore installations significantly.

For more information, visit www.dnv.com.

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PRODUCT NEWS

Seatrionics invests £1.7M in Teledyne TSS products

Seatrionics, an Acteon company, has recently placed orders totaling £1.7 million with Teledyne TSS. The purchases include 56 top-of-the-range Meridian Surveyor gyrocompasses, six highly-regarded TSS 440 pipe and cable tracking systems, and a number of DMS motion sensors.

The Meridian Surveyor is a high-precision gyrocompass capable of providing dynamic heading accuracies of $\pm 0.2^\circ$ even in extreme sea conditions. With a settle time of 40 min, the Meridian Surveyor is a British-built precision instrument capable of maintaining heading accuracies through turn rates as high as 200° per sec. By using state-of-the-art digital electronics and advanced manufacturing processes, exceptional reliability is built-in by Teledyne TSS so that users can benefit from a Mean Time Between Failures (MTBF) of more than 30,000 hrs.

The TSS 440s are also developed and manufactured at the Teledyne TSS factory near Watford, UK. The additional units reflect a steady increase in demand for rental equipment for the oil and gas sector plus the expanding requirements of the offshore wind farm industry.

"Seatrionics and Teledyne TSS have enjoyed a close working relationship for many years. As we are seeing growth in international activity, we are executing a drive to increase our rental fleet," said Seatronics managing director, David Currie. "The addition of these Teledyne TSS units is an integral step toward supporting Seatronics' growth in Singapore and Brazil. With the largest fleet of rental equipment in the industry, it is important to ensure that it is also up-to-date and in accordance with our expectations of high quality."

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

Observatory Operations Lead

Woods Hole Oceanographic Institution is the world's largest private institution dedicated to research and education at the frontiers of ocean sciences. We are driven to provide a unique total rewards package that supports these initiatives and complements WHOI's culture and values. That allows us to recruit, retain, and support the highest quality staff and provide an organization that nurtures creativity and innovation.

Responsible for all Shore-based Operations of deployed assets and instrumentation for the Coastal Global Scale Nodes (CGSN) Program. Lead the Ocean Glider and Autonomous Underwater Vehicle (AUV) piloting operations, monitor status and health of the deployed assets, and support the interface between the Program and the Science community.

Requires Ph.D. or Master's Degree and 3 years of experience, or Bachelor's Degree with minimum 6 years of experience. Science or Engineering Degree(s) preferred. Demonstrable experience in the planning and operation of Autonomous Underwater Vehicles (AUV) and/or Open Ocean Gliders. Due to the work on ITAR AUV's the Observatory Operations Lead must be a US Citizen.

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MacArtney upgrades CORMAC winch range

The MacArtney Group is pleased to reveal the implementation of several significant upgrades to its long established range of CORMAC electric stainless steel winches.

MacArtney CORMAC winches are constructed as modular and self-contained systems, housed in protective stainless steel frames. The modular outline of the CORMAC winch design entails that the winches can be easily modified to accommodate a variety of tasks. The winches are constructed from glass-blasted AISI 304 stainless steel and require minimal maintenance.

CORMAC winches are designed to be easy to control, using either a frame-mounted control panel or an appurtenant remote. The CORMAC winch range encompasses several models ranging from CORMAC 2 (cable length: 1,500 m, diameter: 8.2 mm) to CORMAC 6 (cable length: 3,200 m, diameter: 11.4 mm). Operators are allowed to choose between a broad range of specifications including speed, pull, motor size, system weight and cable capacity. Moreover, all CORMAC winches are available in a HS (High Speed) version and can be CE marked if supplied with cable and termination.

C O R M A C winches incorporate several intelligent features that, while allowing for accurate and high speed equipment handling,



makes for a very effective winch solution.

The standard "soft start" function makes the winch easy to handle, improves equipment maneuverability and protects the winch motor and gear. The electric motor and junction box are IP56 and, as an upgraded feature, all CORMAC winches are now fitted with an electric driven level wind, allowing for significantly improved spooling performance, while making it possible to easily change cable diameter. Finally, all CORMAC winches are prepared for a MOOG Focal model 180 electrical/electro-optical slip ring.

As a new feature, all CORMAC winches can be fitted with a speed and meter counter display mounted within the protective frame. As a frequently selected option, CORMAC winches are supplied with a wired or wireless remote control featuring high precision joystick control and an optional display indicating the deployed cable length and pay in/pay out speed.

For more information, visit www.macartney.com.

Shark Marine's Navigator selected by Swedish Defence Material Administration

The Swedish Defence Material administration (FMV) has selected Shark Marine's Navigator, diver-held sonar and navigation system, as its Diver Documentation and Sensor System (DDSS).

The modularity of the Navigator allows it to be configured to best meet the DDSS requirements of the Swedish Armed Forces, Navy EOD team. The Navigators will be used by the Navy Clearance Divers during search and clearance operations for underwater sea mines, ordnance or other objects, familiar or unfamiliar. The listed requirements also included the capability of the system to be operated by a single diver underwater, directly from shore, or from various small platforms such as RHIBs.

The use of the Navigators will greatly enhance the divers' situational awareness, their area coverage rate, and their personal safety by providing them with real-time information regarding position, depth, and heading as well as an extended visual range through the use of an imaging sonar. They will be able to traverse pre-programmed routes and way-points on a nautical chart, relying on guidance provided by the Navigator's positioning options, while recording sonar imagery along with video and digital photos to be used to verify and identify targets.

The FMV's decision adds Sweden to the growing list of now more than a dozen of the world's navies using the Shark Marine Navigator system for mine counter measures (MCM), very shallow water (VSW) applications and search and recovery operations (SAR).

For more information, visit www.sharkmarine.com.




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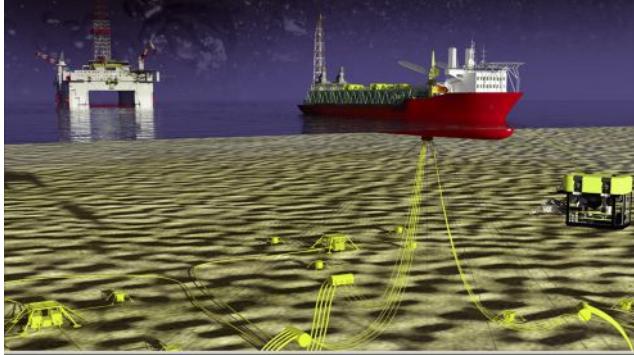

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CORPORATE SHOWCASE



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

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

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

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

Complete ROV Packages

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



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

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



vLBV

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

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



Crawler Skid

SeaBotix Containerized Delivery System (CDS)

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

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

CORPORATE SHOWCASE



See ad on pages 47 & 49

Founded in 1969, Geometrics is a world leader in the design, manufacture, sales and rental of rugged, portable, and easy-to-use geophysical instruments. These technologically-innovative systems are used for land, sea and air subsurface investigations. The company's main product line includes proton precession and cesium magnetometers, high-resolution seismographs, digital marine streamers, and electrical conductivity imaging and resistivity systems. Applications for our instruments include natural resource exploration, geotechnical and environmental assessments, ordnance detection, surveillance, and marine tectonic research. They are also used in locating archeological and treasure sites and for teaching and research. For over 40 years colleges, universities, research institutions, government agencies, and exploration firms have been depending on our experience and expertise to perform state of the art geophysical and environmental surveys.

Geophysical instruments are often subjected to extreme stress heat and cold, rain and dust, shock and vibration that would daunt the designers of conventional products. Geophysical instrumentation must also have the highest level of technology, incorporating user interfaces that are simultaneously easy to use and sufficiently powerful to give in field answers.

Geometrics products are highly computerized, with daylight visible graphical interfaces. Our land and marine seismographs offer 24-bit dynamic range; our cesium magnetometers operate on "atomic clock" technology for the highest resolution portable magnetometers; and our unique measurement systems for determining soil and rock conductivity provide deep soundings in a cost effective manner. Our rugged and durable designs are field proven to deliver consistent, reliable and accurate performance, enabling our customers to work faster and smarter.

In the area of marine applications, Geometrics has made significant innovations. Our model G-882 cesium vapor marine magnetometer is now routinely deployed in Transverse Gradiometer (TVG) mode which provides better target characterization allowing it to "see" in between survey lines. Using proprietary dual simultaneous inversion software (free with the system) it's able to detect and characterize targets by Lat/Long position, depth of burial and mass. This is especially important



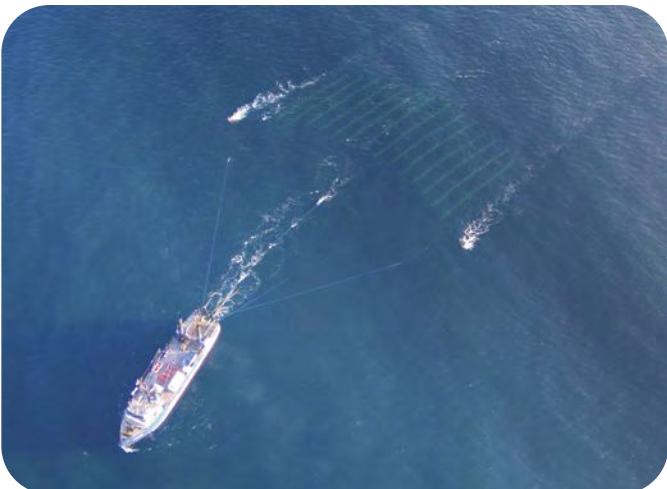
in offshore wind farm UXO surveys. This system along with our MagLogLite™ program provides excellent GPS positioned measurements for contour mapping.

To meet the growing demand for subsea investigations using Autonomous Underwater Vehicles (AUVs), Geometrics has been working on several projects to measure UXOs using a magnetometer deployed on an AUV. With partners Weston Solutions and University of Delaware, Geometrics installed a G-880AUV magnetometer (based on the G-882 technology) in a Teledyne Gavia AUV. Final results have been good and we successfully compensated the magnetic effects of the vehicle to easily detect the UXO targets using Geometrics' MagCompII software.

Geometrics has also been leading the way in marine streamer innovation. Geometrics' streamers include the GeoEel™ Digital Liquid, the GeoEel™ Digital Solid and the MicroEel™ Analog Solid. The GeoEel Liquid is suitable for shallow oil and gas, high-resolution engineering surveys and sub-bottom profiling for fast and efficient surveys. At only 41 mm, it is the smallest-diameter digital streamer available. Environmentally-friendly silicone oil is used for flotation. Some hand-deployed systems may be as long as 300 m. Smaller surveys requiring 24 channels or less are best addressed by the MicroEel™ coupled with our Geode seismograph. This is the smallest diameter marine streamer available, at only 31 mm.

The ultimate in marine seismic fidelity is Geometrics' GeoEel™ Solid digital streamer. The GeoEel™ Solid has superior electronics with a solid active section design that is largely immune to cable-borne noise. With the smallest-diameter solid design available (only 44.5 mm), it is easy to deploy, easy to transport and can be shipped by air.

Multiple GeoEel™ Solid seismic streamers may be com-



bined with our new P-Cable seismic streamer system for the finest in high-resolution 3D surveying. The P-Cable System provides ultra-high resolution 3D data that can be used in the search and production of energy resources as well as in minimizing associated risks. In 2011 and 2012, Fugro West, Inc. successfully used Geometrics' P-Cable system for a high resolution 3D survey off the Diablo Canyon Nuclear Power Plant near Avila Beach, California to map the Shoreline Fault. Similar work will be conducted off the San Onofre Nuclear Power Plant in Oceanside, California in fall 2013.

Geometrics is headquartered in San Jose, California in a 67,000 sq. ft facility. Representative offices and service centers are located in over 30 countries worldwide.

CORPORATE SHOWCASE



See ad on page 57

With a cumulative 1,000 years of experience supporting the oil and gas industry and the largest inventory of scientific field equipment in the world, CSA Ocean Sciences Inc. (CSA) is uniquely situated to support your desktop and field needs required to deal with potential environmental impacts throughout the world. Having worked in nearly 80 countries for numerous clients, CSA's specialty is providing these services with attention to logistical detail while maintaining superior technical quality.

For over 40 years, CSA has offered and successfully performed highly regarded consulting services that integrate environmental and social impact studies for domestic and international Energy Industry clients. The numerous environmental studies completed by CSA meeting recognized industry and international standards of practice include baseline surveys (i.e., habitat characterizations), monitoring studies, fate and effects modeling, impact assessments, and restoration/mitigation (e.g., coral relocation and artificial reef design and siting).

Services offered by CSA include the following:

- Environmental Impact Assessment
- Habitat Injury Assessment and Restoration
- Environmental Monitoring
- Biodiversity and Habitat Characterization
- Coastal Permitting
- NEPA-Compliant Documentation and Analysis
- Geophysical & Oceanographic Surveys
- Ocean Sound Solutions
- Marine Mammal Services
- Geospatial Service



Ocean Sound Services

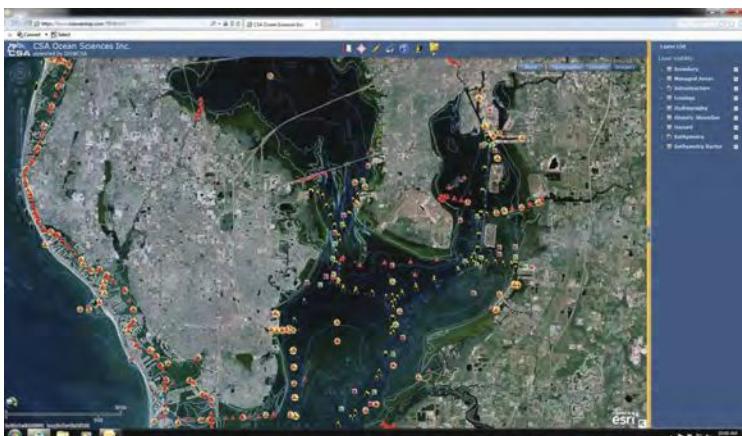
CSA's Ocean Sound group provides acoustic solutions to the marine environment by investigating sources of sound and their potential impacts. CSA provides a unique solution for acoustic monitoring using project-specific hardware deployments in conjunction with the SONS-DCL software, which can accommo-

date input from a variety of sources such as towed arrays, autonomous recorders, fixed buoys, autonomous vehicles, and free-floating, expendable buoys as well as provide real-time acoustic detection, classification, and localization of both marine species and anthropologic sound sources. Using SONS-DCL both nearshore and offshore, CSA is able to collect and archive data, conduct periodic data transfers, and, under certain conditions, transmit data in real time to a web server. Access to project data is continually available via a password-protected portion of CSA's website, www.oceansound.com. This website is designed for ease of operation (non-expert) and provides a monitoring and analysis system that operates 24 hours/day and without the need for post-processing.



Geospatial Services

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



CORPORATE SHOWCASE



See ad on page 9

Forum Energy Technologies, Inc. (FORUM), headquartered in Houston, Texas, is a leading global manufacturer of mission-critical, complex, stocked, and custom oilfield products and related after-market technical services for use onshore and offshore. We have assembled some of the most wellknown brands in our industry and bring innovative solutions to our worldwide customers. Our 3,600 experienced employees are dedicated to helping our customers improve safety and performance while lowering their operating costs.

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

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

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

Forum Subsea Technologies has recently introduced several new products.

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



The **Perry™ T1200**, made specifically for Canyon Offshore, is a heavy trenching system that can produce a trench to a depth of 3 m in all seabed conditions, from sand to stiff clays. Capable of deploying non-conducting water jetting tools with backwash and educator debris clearance systems, this cable and pipe burial ROV can carry an optional backfill and pipe following tool over long stretches.



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



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

CORPORATE SHOWCASE



TELEDYNE OIL & GAS

See ad on page 7

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

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

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

Reliability Partnerships

Building partnerships with customers...



...and sharing the benefits of reliability.

TELEDYNE OIL & GAS

Verification Testing (DVT), product qualification and Accelerated Life Testing, it verifies a product will be able to perform its required task, initially and throughout its intended life. The results of these and other tools such as Finite Element Analysis, Block Diagram Analysis, and Beta Testing is used to summarize and demonstrate reliability and its growth throughout product development, providing the customer with confidence that they are purchasing a highly reliable product.

Reliability work on a product does not end when the first product ships. With Reliability in Product Support, the product is constantly re-examined throughout its life, with an emphasis on finding areas for improvement. Performance data are tracked on all parts, failed and operational. These data are examined to understand potential failure modes under various conditions and to look for areas of improvement. Improvements focus on potential failure modes and customer usability to reduce operation related failures. TOG works with our customers and the end users of our products to validate our data and recommend design enhancements. Additionally, critical suppliers to TOG are identified and audited to ensure that the

highest quality components are used to provide for the highest reliability products to TOG's customers. Reliability is an important concept for everyone at TOG. As a result, Reliability Advancement is implemented at every possible opportunity. This includes advancing the knowledge of TOG employees through regular training, internally and at Reliability Engineering conferences. This supports TOG's goal of constantly being at the forefront of reliability. By actively working on the research and development of new reliability models and techniques, TOG's commitment to stay on the forefront of reliability and continue advancing reliability knowledge is evident.

One question remains: Does your supply chain have a robust Reliability model?

RELIABILITY: SCIENCE AND ENGINEERING

LEVELS OF RELIABILITY



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ENGINEERING

CUSTOMERS

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August 2013

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Ocean News & Technology

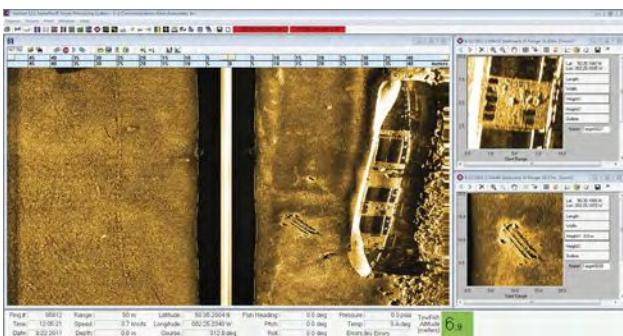
CORPORATE SHOWCASE



Klein Associates, Inc.

L-3 Klein Associates is the world's leading supplier of side-scan sonar equipment and waterside security and surveillance systems. Founded in 1968 and still headquartered in Salem, New Hampshire, L-3 Klein has developed a worldwide reputation of excellence by providing the highest quality products combined with outstanding customer service and support.

L-3 Klein's side-scan sonar systems are respected as the standard of excellence in the industry and are deployed by governments, navies, port authorities, surveyors, oil compa-



Wreck off the southern coast of England imaged with the L-3 Klein UUV-3500

See ad on page 43

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Ocean News & Technology



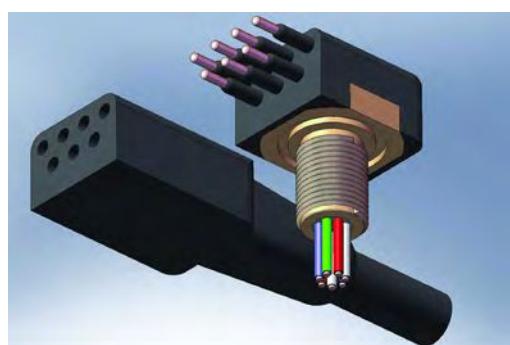
AK Industries is a small, agile, high-tech manufacturer of underwater electrical connectors. They have been in business since 1995 (18 years).

Major Product Announcements

In 2013, AK Industries is announcing two major new products: an extremely rugged low-profile line, and a rugged small diameter line. Both lines offer unique features not available elsewhere.

New Low Profile

The new Low Profile series is an extremely rugged rectangular form series. The receptacles have a stronger shell than is currently available in the industry. They have metal flats such that a wrench can be used for installation. They will be available in various sizes



nies, and universities worldwide. L-3 Klein's sonar systems have been used to locate the Titanic, wreckage of the Space Shuttle Challenger, TWA Flight 800 and John F. Kennedy Jr.'s plane, and countless shipwrecks, as well as performing the day-to-day work of hydrographic surveys. Further, many of our products protect navies from underwater threats in harbors and oceans around the globe. L-3 Klein employs a highly experienced technical staff who will help you get the most from your side scan systems. At L-3 Klein, we'll show you that The Difference is in the Image™.

L-3 Klein's HarborGuard® Integrated Waterside Surveillance & Security System is the choice for a growing number of maritime security solutions worldwide. HarborGuard® technology is currently in use by commercial customers and government agencies for port/harbor, offshore platform, dams, bridge security, and surveillance applications. Designed to detect, monitor and identify very small targets, the system has consistently demonstrated the ability to track small craft, surface swimmers, floating mines and water-borne improvised explosive devices (WBIED). The system automatically monitors all target activity in the coverage area and compares target's location and behavior against programmable sets of alarm rules, which then triggers response actions such as cueing pan/tilt cameras and activating external deterrent components such as searchlights and acoustic hoppers. HarborGuard® provides enhanced situational awareness for security stakeholders.



A typical L-3 Klein Harbor Guard installation

and contact patterns from 3 to 11 contacts, and 25 mm to 34 mm width. A power configuration and an Ethernet configuration will also be available.

New Small Diameter

The new Micro-HydroVolt line is a rugged, small diameter series. It is based upon a 12-mm diameter form factor. The bulkhead receptacle has a large diameter shank and thick walls usually only seen in larger connectors. The locking sleeve is robust and protects the inline from both tensile and off-axis forces.



Vertical Integration

AK Industries is a vertically integrated manufacturer. It has a modern machine shop and makes its own electrical contacts, metal shells, and tooling.

Quality Control

AK Industries has a complete quality control laboratory with virtually every type of electrical test equipment. It also has a large ID 10,000 psi pressure test tank (11.5-in. internal diameter) for large assemblies and a "Benthos Bullet" for smaller assemblies.

CORPORATE SHOWCASE



See ad on page 31

Marine Sonic Technology, Ltd.

Marine Sonic Technology, Ltd. (MSTL) was established as a Virginia corporation in 1990 to design, manufacture, and market underwater imaging and positioning systems using wideband, short-pulse technology that was originally developed by the company's founder for use in medical ultrasound imaging systems. This technology greatly improves across-track resolution and reduced power consumption for side-scan sonar systems.

MSTL sells its sonar products worldwide to military, the ocean technology industry, government agencies, the search and rescue community, universities, and private individuals.

MSTL is deeply committed to providing in-depth training and technical support to all of its customers, from engineers building sophisticated autonomous underwater vehicles to search and rescue workers locating drowning victims. By being available whenever it is needed, MSTL has established an enviable reputation for helping its customers succeed.

MSTL is located in southern tidewater Virginia close to the Chesapeake Bay, the many rivers, and several military bases in the Hampton Roads area. This area provides many diversified training areas and a supply of potential employees trained in sonar applications.



MSTL owns a 6,500 sq. ft facility situated on seven acres in Gloucester County. In addition, MSTL has a 36 ft twin-diesel workboat, the "Sonic Boom," which is used for product testing and customer training. All engineering, manufacturing, testing, marketing, and sales is done at this facility in White Marsh, Virginia. Currently, MSTL has 18 employees who bring nearly 80 years of experience in sonar imaging and ocean technology to the corporation.

Sales Manager: John DeMille: jdemille@marinesonic.com; www.marinesonic.com.



HYDROID A KONGSBERG COMPANY

See ad on page 32

Part of Kongsberg Maritime's AUV Group, Hydroid is the world's most trusted manufacturer of advanced Autonomous Underwater Vehicles (AUVs). REMUS AUVs, along with the HUGIN AUV, provide innovative and reliable systems for the marine research, defense, hydrographic, and commercial offshore/energy markets. REMUS and HUGIN vehicles are the most advanced, diversified, and field-proven AUVs in the world. REMUS AUVs are the only combat-proven AUVs in continuous operation with the U.S. Navy.

Historically, the sheer magnitude of the ocean has made comprehensive exploration unfeasible.

Hydroid's REMUS AUVs are changing that by offering a flexible alternative to surface vessels. They can glide along the surface, dive to deep depths, explore shallow waters, or hover in



hazardous areas where navigation is difficult. Use of REMUS AUVs has reduced the high costs of ocean exploration while increasing the quality of scientific marine data. Using Hydroid AUVs for undersea mine reconnaissance has helped save lives by eliminating human divers from mine fields, and these customizable undersea robots have helped solve many plane and ship disaster mysteries. REMUS AUVs also provide scientists with important data on pressing global issues, including climate change, the world's declining fish population, and environmental disasters.

As leader of the team that originally developed the REMUS AUV at Woods Hole Oceanographic Institution (WHOI), Christopher von Alt co-founded Hydroid in 2001, creating an independent company to commercially manufacture, support, and further develop the REMUS systems. In 2008, Hydroid was acquired by the Norwegian technology conglomerate Kongsberg Gruppen. Kongsberg had already developed the successful HUGIN line of AUVs that have been the industry leader in the offshore market for years. Now, with Hydroid as a subsidiary of Kongsberg Maritime, the Kongsberg AUV Group is the recognized industry leader, providing a full AUV product line to accommodate subsea applications up to 6,000 m.



CORPORATE SHOWCASE

RBR

See ad on page 17

At RBR, we are not simply a data logger manufacturer we are passionate about oceanography and water quality. With over 35 years of experience in the field, our innovative spirit drives us to understand the world around us. In this aim, RBR has released a new generation of loggers for use in the harshest environments; our products provide improved reliability, flawless measurements, and high-precision accuracy even in the most unpredictable conditions.



Our loggers are available in several standard configurations and are customizable with the sensors you require. They can operate in up to 740 m of water, provide up to 30 million readings, and deploy for over 5 years on one set of batteries. Some configurations are available in a deepwater version that can operate in up to 10,000 m of water (sensor dependent).

RBR's family of loggers include the single- and dual-channel RBRsolo, RBRvirtuoso, and RBRduo and the multi-channel RBRconcerto and RBRmaestro to measure various parameters, including temperature, pressure, and dissolved oxygen, conductivity, turbidity, tides, or waves to list a few.

The RBRduo C.T and RBRconcerto C.T.D loggers are the essential tools for any oceanographer charged with measuring salinity. As fluctuations in the ocean's global water cycle can impact ecological factors and climate change, monitoring the density and stability of salinity are of significant environmental concern. Our products accommodate specialized sensors for oceanographic, freshwater, cryospheric, estuarine, and coastal monitoring.

Located in Ottawa, Canada, RBR delivers superior submersible data recorders, controllers, and sensors to provide accurate and reliable measurements. (www.rbr-global.com).

August 2013

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See ad on page 41

ITT provides critical offshore and subsea application solutions

ITT is your single source for application solutions for offshore and subsea kinetic energy management and precision motion control applications. ITT Control Technologies delivers industry leading solutions to the global offshore energy community through its **ITT Enidine**, **Compact Automation**, **Turn-Act**, **Conoflow**, **Torque Systems** and **Neo-Dyn®** product brands.

As part of the ITT Corporation, (ITT), a \$2.1 billion USD company, ITT Control Technologies is well positioned to deliver unique and customized products to its customers for addressing critical offshore and subsea applications around the globe.

ITT's extensive menu of customized subsea solutions are a result of its "*Answer Engineering*" approach to its relationships with offshore energy customers. **ITT Torque Systems** complete line of custom servo motor part-sets provide superior subsea propulsion to ROVs and AUVs when installed in the thruster tubes. **ITT Enidine** provides "soft land-



Above the Waterline

ing" shock absorbers to prevent damage to expensive subsea equipment during critical delivery phases. Its **Compact Automation** and **Turn-Act** family of hydraulic subsea linear and rotary actuators provide best-in-class motion control for deep and ultra-deep subsea tooling, autonomous control-panel valve operation, and are used as pressure-loss signaling devices for ultra critical auto-shear shutdown systems. **Neo-Dyn®** subsea differential pressure switches continue to play an important roll inside subsea control modules (SCMs) for the most reliable safety monitoring of deep-water process valves for valve-open valve-closed orientation and triggering intervention activities if unsafe conditions are present. The **Conoflow** high-pressure regulators and low-pressure filter-regulators are constructed of marine-grade materials and provide precision flow control and clean-up of sampling gases before they reach sensitive analyzer equipment during drilling and production operations.

Reliable performance is critical to energy production, and even more critical at 10,000 ft below sea level. Look to ITT for innovation and reliability of its motion control and energy absorption solutions for all your sub-sea applications.



CORPORATE SHOWCASE



See ad on page 69

OceanServer Technology, Inc. is a leading provider of man-portable Autonomous Underwater Vehicles (AUVs), three-axis Digital Compasses, and high efficiency lithium Ion battery-based power solutions for embedded OEM application. The Iver AUV is an affordable, commercial vehicle used by customers around the globe for bathymetric and water quality surveys, sub-surface security, sensor development and general research.

IVER AUV

The Iver is a simple-to-operate AUV system that incorporates a Windows-based open software architecture and a well-defined hardware interface that enable researchers and OEMs to quickly

adapt the Iver for a variety of applications. The vehicle comes standard with OceanServer's VectorMap Mission Planning and Data Presentation tool to simplify survey operations. Common payloads included Side-scan sonar (SSS), Doppler velocity



log (DVL), acoustic Doppler current profiler (ADCP), conductivity, temperature and depth (CTD) sensor, and multi-beam imaging sonar. Researchers and developers can choose one of the three Iver Expandable Payload (EP) models that offer a dedicated second CPU and an intuitive API for customizing software, creating remote helm commands or sensor development.

The VectorMap program can input virtually any geo-referenced chart, map or photo image, allowing the operator to intuitively develop missions using simple point-and-click navigation. The base vehicle, with a starting price at just over US \$50,000, gives university, government and commercial users an affordable base-platform for survey applications in water quality, hydrography, security and general research. OceanServer Technology is a privately held company headquartered in Fall River, Massachusetts.



See ad on page 61

With over 190 man-years of acoustic Doppler experience, Rowe Technologies, Inc. (RTI), is developing the most advanced Doppler profilers in the industry. Our state-of-the-art electronics design is combined with advanced acoustic transducer technology to provide ADCPs that are powerful, compact, and extremely flexible. In addition, our new and innovative Doppler Array designs offer up to nine acoustic beams in a compact package that uses 50% less area than an ADCP using a traditional four-beam Janus configuration. These core technologies, combined with multiple frequency and packaging options, provide for a very cost-effective and capable platform to handle a variety of acoustic Doppler applications.

The *SeaWATCH* ADCP product line comprises self-contained (SC) units that operate on battery power and are meant to be deployed for extended durations, while the *SeaPROFILER* ADCPs are direct-reading (DR) units used for real-time, tethered applications. Both products come with a full compliment of waveform generation and broadband/narrowband signal processing functions that allow them to not only collect current profiling data, but also track the bottom to measure platform velocity. Both systems come in a range of frequencies from 75 to 1,200 KHz and are available in shallow-water and deepwater packages. RTI also offers dual-frequency variants of these products in combinations of 300,



600 and 1,200 KHz frequencies — effectively providing two instruments in one.

The *SeaTRAK* vessel-mount family of products consists of a low-frequency Doppler Array (150, 75 or 38 KHz) with integrated sonar electronics, interface cable, and rack-mount power interface unit. Installation of the system is relatively simple because the sonar electronics is integrated into the transducer assembly, requiring a small number of conductors in the cable assembly.

The *SeaPILOT* family of Doppler Velocity Logs (DVLs) uses the same core electronics and transducer technologies as described above to provide a versatile platform capable of producing precise bottom-referenced velocity measurements for ROVs, AUVs, and other manned/unmanned submersibles. The *SeaPILOT* family comes in 300, 600 and 1,200 KHz frequencies in shallow or deep packaging options. RTI also offers OEM packages for custom AUVs and ROVs.

For more information, please contact us at sales@rowetechinc.com or www.rowetechinc.com.

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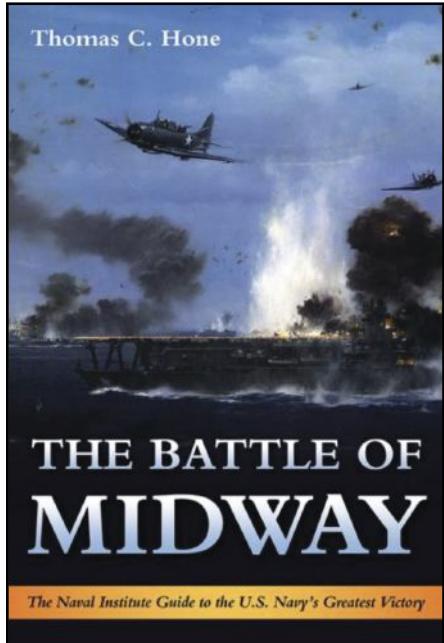


MEDIA SHOWCASE

The Battle of Midway

The Naval Institute Guide to the U.S. Navy's Greatest Victory

Edited by Thomas C. Hone



The best way for today's sailors to learn about a battle is from those who fought it. The Battle of Midway, commemorated annually in the U.S. Navy, warrants close attention. This Naval Institute guide includes some of the most vibrant and informed accounts by individuals who fought on both sides of the June 1942 battle. The anthology pulls together memoirs, articles, excerpts from other Naval Institute books, and relevant government documents to help readers understand what happened and explain why the battle was so significant to the naval service. The core of the book focuses on events leading up to the battle and the battle itself, with a separate section examining how others have interpreted the battle's often desperate engagements.

When the U.S. Navy stopped the Japanese steamroller off Midway Island, it not only turned the progress of the war but set the Navy's foundation for future counter offensives. The Navy's comeback spread to the Solomon Islands and on to the other key strategic areas in the Pacific. While many know that Midway was a crucial American victory, they often do not know the details of the battle. This book tells how, for example, the American PT boats contributed to the victory, how the carrier planes formed up for their attacks, and what role radar played in the battle. In addition to excerpts from books and articles, the guide includes selections from several important Naval Institute oral histories. From the enlisted man's perspective all the way to the admiral's, for both Americans and Japanese, readers see the U.S. Navy's greatest victory as the participants saw it.

Naval Institute Press; ISMN/SKU: 9781612511269
Hardcover, 384 pages, June 2013

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Lawrence Berry was named vice president of operations for Combustion Components Associates (CCA). He is responsible for contract execution, project management, spare parts sales, purchasing and the operations, including CCA's manufacturing subsidiary, Holmes Tool and Engineering. In addition, Berry is responsible for sales of CCA burners and TRIM-NOX SCR systems to package boiler OEMs. Prior to joining CCA, he was with Hamworthy Peabody Combustion (formerly Peabody Engineering) for 30 years where he held several progressively senior positions, including president from 2003 to 2011. Berry began his career at Foster Wheeler Energy Corp. in project management and has also held management positions at Preferred Utilities and Fives North American Combustion.

Devin International, a subsidiary of Greene's Energy Group, named **J.H. (Trey) Miller III** to the position of U.S. sales manager. Based in Houston, Texas, Miller will lead and manage a technical sales team covering seven U.S. domestic areas. Focusing on the main disciplines of Devin International, Miller will mentor the sales team in developing customer solutions for well intervention equipment

and services and specialty motion compensation packages. Prior to his promotion, Miller worked as a technical sales specialist for 3 years. His sales experience includes working with coiled tubing support structures, equipment skidding systems, motion compensation and deepwater surface support for subsea completion and intervention equipment packages.

Miller also has 2 years of experience as an offshore technician at Devin and more than 8 years of military service in the U.S. Navy.

Gulfstream Services, Inc. (GSI), an oilfield rental company providing high pressure equipment for the international oil and gas industry, named **Fred Bailey** as operations manager in the Sealy, Texas facility. Bailey is responsible for ensuring efficient production in terms of building revenue and maximizing the operational budget while effectively meeting customer standards. He is also accountable for strategic and tactful evaluations for special equipment designs. Bailey has been with GSI for more than 2 years, most recently as operations manager in



Miller

Williamsport, Pennsylvania. He previously worked with Baker Hughes for more than 30 years.

Chevron Corp. has appointed **Jeff Shellebarger** president of Chevron North America Exploration and Production Co. He succeeds **Gary Luquette**, who is retiring from Chevron after 35 years of service. Shellebarger, 56, is currently managing director of Chevron's IndoAsia business unit. Since joining Chevron in 1980, Shellebarger has held a variety of upstream positions in the United States, Angola and Indonesia. In his new capacity, he will be responsible for overseeing Chevron's exploration and production activities throughout North America, including the company's significant portfolio of assets in California, the Gulf of Mexico, Pennsylvania, the Mid-Continent region of the United States, and Canada. Shellebarger will report to George Kirkland, Chevron's vice chairman and executive vice president of upstream. Luquette has led Chevron's North America upstream business since 2006. He previously held key exploration and production positions in Louisiana, California, the United Kingdom, and Indonesia. He will stay with the company until 1 September 2013.



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SIDUS Solutions, LLC announces the promotion of **Rick Longabaugh**, currently business development manager, to operations manager. Mr. Longabaugh has been promoted because of his strong working knowledge of manufacturing operations and ability to work well in larger organizations while under pressure. By promoting Longabaugh, SIDUS Solutions hopes to reduce their delivery times, improve their current quality control program, and introduce a new range of products. Mr. Longabaugh has over 25 years of experience in the engineering field, starting as sales engineer and working his way up to general manager before joining the SIDUS team in November 2012.

BMT Scientific Marine Services has announced an expansion of its operations team with the appointment of **Phil Hart** as the new vice president of operations and **Jeffrey Lewis** as vice president - client support operations. Hart will be responsible for ensuring the operational efficiency of BMT projects, providing consistency between projects. He will manage the operations

Lewis group and will oversee project management, engineering, client support and technical services. In his new position, Lewis will lead a team to support the design and delivery of new maintenance and service products and customer-based application software. Lewis and his team will also support all three major business lines with equipment and systems testing activities and installation services.

DeepOcean Group Holding BV announced that **Dennis de Vreede** has joined DeepOcean as its Chief Financial Officer. He takes over from Frank Eggink who will leave DeepOcean on 30 June 2013. de Vreede joins from Prologis, a global market leader in the industrial real estate space, where he served as senior vice president, European finance director. Previously, Mr. de Vreede was at Redevco, where he held the position of chief financial officer. Prior, he worked as global finance director at Rockwell Automation Inc., served as vice president finance for telecommunications venture KPNQwest N.V., and gained mergers & acquisitions experience at Dresdner Kleinwort Benson in London. He started his career in 1993 with KPMG in the Netherlands.

Chet Morrison Contractors recently announced the hiring of industry veteran **Michael Brown** as general manager of marine construction. Brown has 35 years of experience in the commercial diving industry, most recently an 8-year tenure as vice president and general manager for EPIC, the commercial diving business unit of TETRA. Brown is an active member of several industry associations and committees, including the National Offshore Safety Advisory Committee (NOSAC) where he is serving a 3-year term as Offshore Diving Representative.

Acteon has completed the acquisition of **J2 Engineering Services Ltd**, which is based in Aberdeen, UK. J2 Engineering is involved in the rental, maintenance and repair of ROV manipulator arms and associated tooling and equipment. Over the past 5 years, the company has forged a reputation within the ROV and underwater survey industries for outstanding service quality, fast turnaround times and the ability to deliver highly reliable customized engineering solutions. The J2 Engineering team will continue to operate from its premises in Torry, Aberdeen, and will take advantage of Seatonics' established distribution and service network covering Europe, North America, Brazil, South East Asia, and the Middle East.



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

SUBSEA TOOLING

Seanic Ocean Systems

8860 Fallbrook Drive
Houston, TX 77064
Tel: 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.

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SEACON Advanced Products, LLC.

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P.O. Box 767
Bellville, Texas 77418, USA.
Tel: (979) 865-8846
Fax: (979) 865-8859
E-mail: sales@seacon-ap.com
Website: www.seacon-ap.com



SEACON Advanced Products, LLC., manufactures a wide variety of versatile and robust switches to suit a number of applications. These include Limit, Positive Action and Proximity switches in a range of materials including Titanium, Plastic and Stainless Steel which can be supplied in varying load capacities up to 7 amps and pressure rated to 10,000 psi. To further aid simplicity, our proven range of Modular Proximity Switches have been integrated with the Micro WET-CON electrical wet-mate connector making this switch a very modular component that is easily installed and replaced in the field, but without compromising reliability.

OCEAN INDUSTRY DIRECTORY

ON&T's Product & Service Directory

UNDERWATER VEHICLES/AUVs

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a subsidiary of Kongsberg Maritime

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MA 02559-4900, USA
Tel: 508-563-6565
Fax: 508-563-3445
E-mail: glester@hydroid.com
Website: www.hydroid.com
Contact: Graham Lester



Hydroid, a subsidiary of Kongsberg Maritime, is the world leader in manufacturing advanced Autonomous Underwater Vehicles (AUVs). REMUS AUVs provide innovative and reliable systems for the marine research, defense, hydrographic and offshore/energy markets. Hydroid vehicles represent the most advanced, diversified and field-proven family of AUVs and support systems in the world.

UNDERWATER VEHICLES/ROVs

Deep Ocean Engineering Inc.

2528 Qume Drive, Suite 11
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Fax: 408-436-1108
E-mail: sales@deepocean.com
Website: www.deepocean.com
Contact: Bill Charbonneau

Deep Ocean Engineering, Inc. provides remotely operated and unmanned surface vehicle (ROV / USV) solutions which are used by a broad range of industry applications - security, military, nuclear and hydroelectric power plants, inshore dams and lakes, oil and gas, scientific research, fisheries, salvage, search / recovery, and pipeline inspections.



Perry Slingsby

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Houston, TX 77041
Tel: 713-329-8230
Fax: 713-329-8299
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Tel: +1 530.753.6718
Fax: +1 530.753.8092
Contact: Peter MacInnes
E-mail: peter.macinnes@fmcti.com
Website: www.fmctechnologies.com



Schilling Robotics, a business unit of FMC Technologies, is a leading global producer of high-technology subsea systems, including remotely operated vehicles (ROVs), manipulators, and custom-engineered systems for subsea production. We bring nearly 30 years of technological expertise and innovation to the challenges facing customers in the subsea environments. www.fmctechnologies.com

SeaBotix Inc.

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San Diego, CA 92106 USA
Tel: +1 619 450-4000
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E-mail: Info@SeaBotix.com
Website: www.SeaBotix.com



SeaBotix Inc. is the world leading manufacturer of capable MiniROV systems. The Little Benthic Vehicle range of systems have become the benchmark in compact ROVs around the world. All systems perform a multitude of tasks including maritime security, body rescue, sensor deployment, object recovery, hazardous environment intervention, and hull inspection.

Sub-Atlantic

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Forum Energy Technologies' sub-Atlantic brand manufactures world class ROVs ranging from portable units to light work class systems. Sub-Atlantic also supplies thrusters, hydraulic power units, valve packs, compensators and pan and tilt systems to other ROV manufacturers. Sub-Atlantic is part of the FET subsea group and has facilities in the US and UK and sales offices and agents around the world.

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Fax: +44 (0)1224 226598
Email: km.camsales.uk@kongsberg.com
Website: www.km.kongsberg.com/cameras
Contact: Mark Esslemont



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Contact: Brian Abel

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- | | |
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CALENDAR & EVENTS

NortekUSA 2013 Technical Symposium

NortekUSA will be hosting its 2013 Technical Symposium 20-21 September in San Diego California, preceding the Oceans 13' MTS/IEEE conference. This conference will feature application studies from across the world including research, operational, and industrial projects. Scientists and engineers from academia, private industry, and government agencies will be sharing presentations and innovations related to their field. An overall theme of the evolution of applications and technologies of acoustic Doppler instrumentation in the marine environment will be discussed throughout the Symposium. Keynote presenters include: Tim Cowles, OOI VP and Director of Ocean Observing; Rob Pinkel, Associate Director Marine Physics Laboratory at SIO; and Glen Gawarkiewicz, Senior Scientist at WHOI.

The two day conference will kick off with a cocktail reception Thursday night, and end with fishing charter cruise on Sunday for those attending.

For more information, visit www.nortekusa.com/2013Symposium.

Teledyne RESON launches revamped World Tour 2013

Teledyne RESON has opened registration for World Tour 2013, our series of "Underwater Technology Seminars." This year, the theme is: "Discover new Opportunities with Multibeam Sonar," providing an interesting insight into the world of technical and business opportunities that arise from SeaBat multibeam sonar systems and software.

Each event is designed around three main components: paper presentations presented by industry experts, hands-on classroom training, and live demo workshops. At the classroom training and live demo workshops you will have an up-close experience with the recently launched SeaBat T20-P and the latest Feature Pack 4 release for SeaBat 7125. You will combine this with data acquisition and processing software from RESON, as well as other industry leading software suppliers. Last but not the least, Teledyne RESON has planned cozy hospitality arrangements, providing a favorable platform for social networking, which is important to keep you updated with the latest trends and technologies in the Industry.

"We are continually considering ways in which we can improve our seminars and have meticulously incorporated feedback from participants in 2012. This year,

we will offer two themes: one for hydrography and one for offshore with more in-depth and hands-on training sessions. Furthermore, we will provide intermediate and advanced training levels to optimize content for participants in the training sessions," says Danny Wake, Senior Product Manager at Teledyne RESON.

The World Tour 2013 follows the User Conferences held in 2012 in Turkey, Miami and Singapore, where Teledyne RESON brought together nearly 300 multibeam users and decision makers worldwide from more than 45 countries. In 2013 we expect to attract more than 400 attendees to our 3 Underwater Technology Seminars in Shanghai, Copenhagen and Austin, Texas.

For more information, visit www.teledyne-reson.com/worltdtour.

Oceans '13 MTS IEEE

The OCEANS '13 MTS/IEEE San Diego committee invites you to beautiful San Diego to participate in the world's most diverse and prestigious conference and exposition regarding our most critical resource—the oceans. This will be the 7th time the OCEANS conference has come to San Diego. The team that orchestrated the OCEANS '03 San Diego conference—the largest OCEANS conference to date—has returned to raise the bar even higher. The '03 conference, which was a cornerstone of the Scripps Institution of Oceanography's Centennial, had a total event attendance of 5,400, the exhibition included 301 booths and the technical program exceeded 800 excellent presentations. That international audience, from 46 countries, helped us establish the theme for the OCEANS '13 conference—An Ocean in Common.

The OCEANS conference is jointly sponsored by the IEEE Oceanic Engineering Society (IEEE/OES) and the Marine Technology Society (MTS). This international conference is a major forum for scientists, engineers and those with an interest in the oceans to gather and exchange their knowledge and ideas regarding the future of the world's oceans. In addition, a two night film festival and weekend golf tourney will kick-off the week's activities that will also include a day of tutorials and a banquet on the USS Midway aircraft carrier in San Diego Bay.

For more information, visit www.oceans13mtsieesandiego.org..

August 12-15, 2013
AUVSI's Unmanned Systems N.A.
Washington, D.C.
www.auvshipshow.org

September 3-6, 2013
Offshore Europe Oil & Gas
Aberdeen, UK
www.offshore-europe.co.uk

September 22-27, 2013
SEG Annual Meeting
Houston, TX
www.seg.org

September 23-27, 2013
Oceans '13 MTS IEEE
San Diego, CA
www.oceans13mtsieesandiego.org

September 29-October 2, 2013
ADCPS in Action
San Diego, CA.
www.rdinstruments.com/aia2013.aspx

September 30-October 2, 2013
SPE Annual Technical Conference/Expo
New Orleans, LA
www.spe.org

October 8-9, 2013
MTS Dynamic Positioning
Houston, TX
www.dynamic-positioning.com

October 9-13, 2013
International Workboat
New Orleans, LA
www.workboat.com

October 22-24, 2013
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www.deepoffshoretchnology.com

October 22-24, 2013
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www.lagcoe.com

October 22-24, 2013
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Providence, RI
www.offshorewindexpo.org

October 29-31, 2013
OTC Brasil 2013
Rio de Janeiro, Brasil
www.otcbrasil.org

November 5-7. 2013
Deepwater Operations
Galveston, TX
www.deepwateroperations.com

November 6-8, 2013
Oil Comm
Houston, TX
www.oilcomm.com

November 11-13, 2013
Subsea Survey IMMR
Galveston, TX
www.subseasurvey.com

2013 EDITORIAL CALENDAR

January/February 2013

Editorial: Decommissioning & Abandonment, Subsea Fiber Optic Networks
Distribution: Decommissioning & Abandonment Summit, NACE, Offshore Mediterranean, U.S. Hydro
Product Focus: Navigation, Mapping & Signal Processing

March

Editorial: Oceanology & Meteorology, Maritime Security
Distribution: Ocean Business, SubOptic 2013
Product Focus: Ocean Instrumentation, Diver Detection Systems

April

Editorial: Offshore Technology, Ocean Mapping & Survey
Distribution: GMREC, IDGA Maritime Homeland Security, OTC
Product Focus: Connectors, Cables & Umbilicals

May

Editorial: UW Imaging & Processing, Marine Salvage
Distribution: EnergyOcean, Oceans '13 Bergen, Sea Work Intl, UDT
Product Focus: Cameras, Lights & Imaging Sonars

June

Editorial: Workclass ROVs, Deepwater Pipeline & Repair & Maintenance
Distribution: TBA
Product Focus: Subsea Tools & Manipulators

July

Editorial: AUVs & Gliders, Marine Construction
Distribution: AUVSI
Product Focus: Tracking & Positioning Systems, Seismic Monitoring

August

Editorial: Defense & Naval Systems, Corporate Showcase
Distribution: TBA
Product Focus: Multibeam & Side Scan Sonars

September

Editorial: Ocean Observing Systems, Ocean Renewables
Distribution: Oceans MTS IEEE, SPE ATCE, MREC, MTS Dynamic Positioning,
Product Focus: Buoys & Monitoring Instrumentation

October

Editorial: Offshore Vessels, Offshore Communications
Distribution: International Workboat, LAGCOE, Oil Comm, OTC Brazil, North Sea Decommissioning, AWEA/Offshore Windpower
Product Focus: Acoustic Modems, Releases & Transponders, Marine Communications

November

Editorial: Subsea Inspection, Monitoring, Maintenance, Repair; Subsea Telecom
Distribution: SUBSEA Survey IMMR, Clean Gulf
Product Focus: Handling Equipment, Winches & Control Systems, Battery Technology

December

Editorial: Light Workclass ROVs, Commercial Diving
Distribution: Subsea UK, Underwater Intervention
Product Focus: Diving Equipment & Buoyancy Materials

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