

Ocean News

News for the Ocean Industry

www.ocean-news.com

& Technology

December 2012

2012 - The Year in Review

A yellow VideoRay mini ROV with two white lights is positioned near a large, dark metal structure, possibly an oil rig or pipeline, in an underwater environment. The ROV is connected by a cable to an off-camera control unit.

**VideoRay's "Click and Go" Nav
Autonomous mini ROV
control for Offshore Survey, Target
ID, and Reacquisition**

Feature Story – Page 10



REMOTELY OPERATED VEHICLES



A global leader in inspection-class underwater ROVs (Remotely Operated Vehicles), VideoRay makes it easy and affordable to inspect, observe, and explore underwater. The hydrodynamic and flexible design make VideoRay the ultimate platform for sensors and accessories to expand your operational window and capabilities. Explore at www.videoray.com.

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Sasha Mandic, Engineering Manager at Frigstad Engineering

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MANAGING RISK



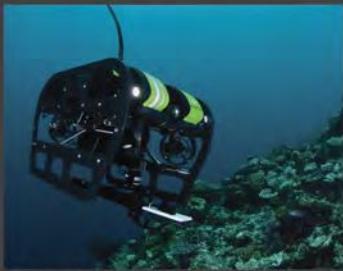
MINIROVS FOR PROFESSIONALS



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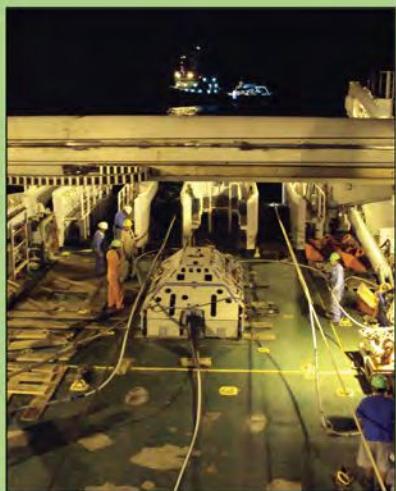
vLBC

Little Benthic Vehicles

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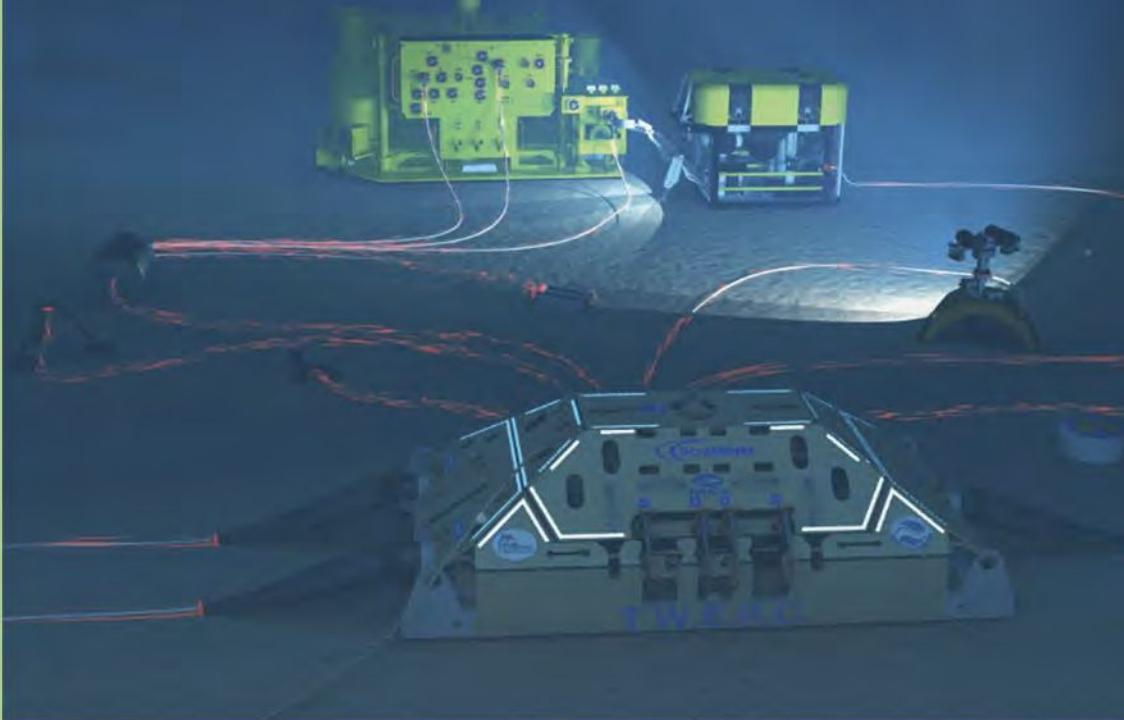
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Typical Projects Served

- Oil & Gas exploration and site assessment
- Equipment, pipeline, reservoir monitoring activities
- Scientific ocean observing systems
- Tsunami and seismic warning systems
- Pipeline and infrastructure security monitoring

in this issue

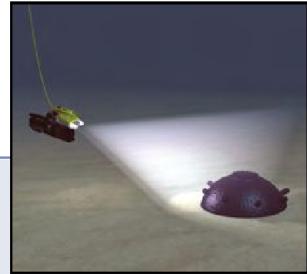
Ocean Industry



Offshore Industry



Feature Story



- 10 Autonomous mini ROV control for Offshore Survey, Target ID, and Reacquisition**

- | | |
|-----------------------------------|---------------------------------------|
| 13 Ocean Industry Briefs | 45 Offshore Industry Headlines |
| 18 Maritime Transportation | 48 Upstream Oil & Gas |
| 30 Ocean Science | 60 Underwater Intervention |
| 36 Ocean Energy | 64 Maritime Communications |
| 40 Defense | 68 Subsea Cables |

Departments

- | |
|------------------------------------|
| 8 Editorial |
| 76 Offshore at a Glance |
| 78 Stockwatch |
| 82 Product News |
| 87 Media Review |
| 88 People & Company News |
| 89 Calendar |
| 91 Ocean Industry Directory |

Cover Photo



VideoRay Pro 4 Remotely Operated Vehicle surveys the tsunami damage in Japan in 2011 for salvage estimates.
Photo Credit: Mr. Masanobu Shibuya, President SDI

Editorial Focus

- | |
|-------------------------------------------------------------------------------------------------------|
| 22 Year in Review 2012 |
| 34 Environmental Monitoring of Dredging Operations |
| 58 Deep Water Developments and Increased Confidence Driving Growth in Subsea Vessel Operations |



in the next issue

Editorial Focus

- Decommissioning & Abandonment
- Subsea Fiber Optic Networks

Product Focus

- Navigation
- Mapping & Signal Processing



Technology Systems Corp.

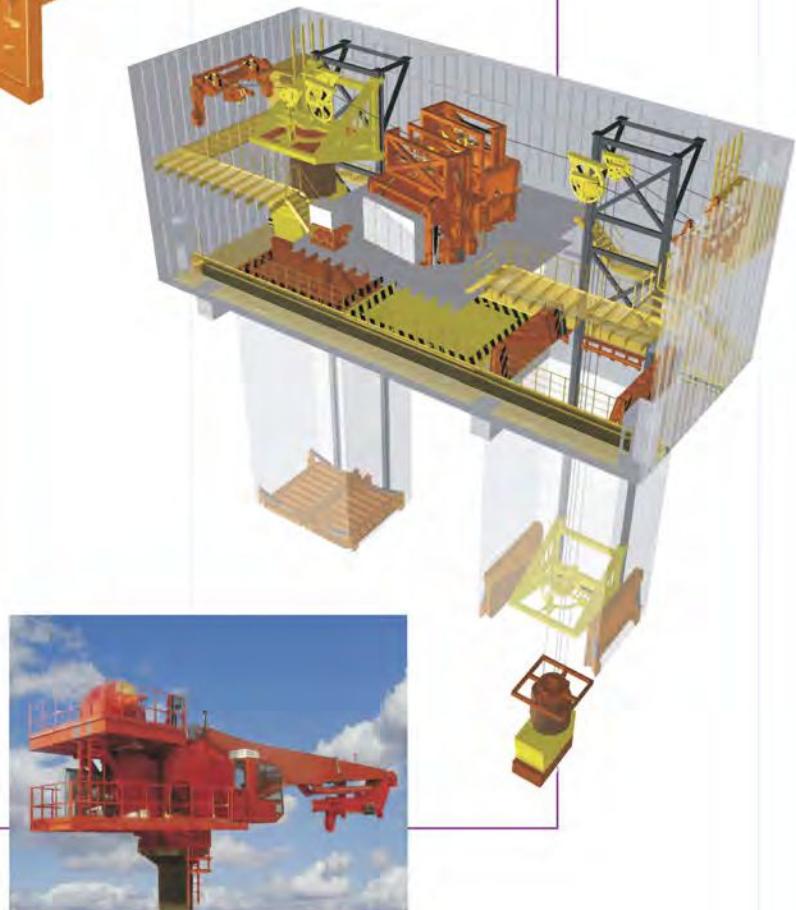
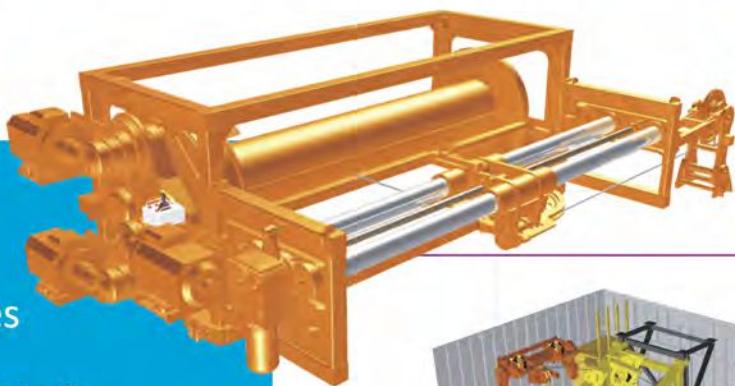
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RAPP HYDEMA

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The 2012 Subsea Survey IRM Panel AUVs for Oil & Gas Operations – a Game Changer

Subsea Survey IRM was held in Galveston, Texas 5-8 November 2012. The technical program was excellent and attracted many delegates, including numerous enthusiastic operators from the major oil companies. At the previous conferences in 2010 and 2011, a panel session was started to attempt to get a look at the future of the deepwater ROV and AUV.

Some of the questions posed to the panel experts during the last two conferences included “It’s the year 2020, what does the deepwater oil and gas UUV look like?” and “What critical technologies need to be improved or developed to support the oilfield of 2020?” For background information for this year’s panel discussion, I recommend you go back to the editorial published in the December 2010 issue (Vol. 16, Issue 9, pg. 8) and the Jan/Feb 2012 issue (Vol. 18, Issue 1, pg. 8) to revisit the outcomes of previous panel sessions.

The reason for the question is that ON&T has seen a move towards the use of AUVs for deepwater oil and gas operations.

The panel session was reconvened at the 2012 conference with some new panelists, along with some from the previous panels. Panelists this year included Omer Poroy (Bluefin Robotics); John Jacobson (Lockheed Martin); Jan Seisjo (Saab Seaeye); Dave Weaver (Oceaneering); and Jim Jamieson (Subsea 7). The panel session was moderated by Donna Kocak (Advanced Programs Engineer, Harris Corp.).

This year’s theme was “AUVs for Oil & Gas Applications.” The session began with a 10-min presentation from each AUV manufacturer on their technology as it relates to oil and gas.

• Lockheed Martin’s Marlin AUV, trialed by DeepStar, takes advantage of their vast knowledge in feature-based navigation and advanced sensor integration and is capable of change detection for inspection work from year to year.

• SAAB Seaeye is working with several companies looking at continuous long-term environmental and assessment integrity monitoring as well as with Chevron on data harvesting.

• Bluefin offers a strong AUV base, and although it is currently not on an oil and gas project, it has already demonstrated long survey operations.

• Oceaneering is working on offshore survey and inspection tasks, but is focused on the communications problem and advanced behavior.

• Subsea 7 stated that they never considered a hybrid vehicle and went directly to fully autonomous from the start.

Then, the floor was opened up for discussion. Questions were raised regarding accuracy of navigation and just how close an AUV can be allowed to work to oil and gas infrastructure. What are the risks? Approaches like feature-based navigation or CAD models allow the AUV to learn its way around things like platforms.

What needs to be demonstrated or overcome prior to performing IRM tasks fully autonomously? The manufacturers say they have reliably demonstrated autonomy, but demonstrating economy and reliability is critical for success. They also believe that technology is accelerating not just advancing and that new technology like processing, sensor, and communication are making new strides daily.

But in order for AUVs to be successful, operators must design their new fields to accommodate autonomous tasks.

What the manufacturers need is a commitment from the operators. One Chevron operator stated that the progress towards standard from committees is too slow and needs more progress, something DeepStar is looking at.

Is the AUV a “game changer” or just a tool? Most agreed it is a game changer. Using smaller support vessels to free up larger DP vessels for more difficult tasks will save a great deal of money. AUVs could perform more difficult light intervention such as flying leads and component replacement.

Finally, the point was made that machines can become trustworthy and perform repetitive operations—it is already being done in factories everyday. Even better, mistakes made by operator error could be eliminated. All the operators in attendance at the panel, including Chevron, Statoil, Total, and Petrobras, all believe this to be true.

I look forward to the 4th Annual Panel Session in 2013 that will look at this subject matter from, again, a new perspective.



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Autonomous mini ROV control for Offshore Survey, Target ID, and Reacquisition



As they become more powerful and versatile, VideoRay microROVs are taking over most survey, inspection, and search tasks previously performed by work class ROVs and Human divers in waters less than 300 meters of depth. Deployment of VideoRays is much easier and safer than work class ROVs or divers, and can be done in much higher sea states. Powerful thrusters combined with lower mass and hydrodynamic drag allow VideoRays to work in higher currents than other ROVs or divers. Very low power consumption, small size, and work area mean that VideoRays can be operated from smaller locations and can penetrate tight spaces. VideoRay is a tool that every serious underwater contractor needs in their toolbox.

One remaining challenge for microROV operators, however, is the talent required to navigate them. Work class ROV piloting has been assisted by SeeByte automation for some time. Now, this technology is available on the smallest ROV used offshore,

through collaboration with SeeByte Ltd, Teledyne RDI, and Teledyne BlueView.

CLICK AND GO

Sonar CoPilot for VideoRay Pro 4 ROVs is a simple software add-on for one of VideoRay's most popular accessories, BlueView multibeam imaging sonar. Using BlueView, the VideoRay ROV pilot can see and fly to targets in the water with very limited visibility. This task can be challenging for new operators, particularly in rapid and changing currents. Now, driving by sonar to reach a target is automated with the addition of Sonar CoPilot.

The sonar uses Auto Target Recognition (ATR) which allows an operator to define target parameters prior to operation. If you are looking for a meter-long object, you enter that parameter to filter out objects that are larger and smaller. Once you see a target simply click on its image, and the system automatically flies the ROV to visual range, and hovers near the object. With Sonar CoPilot, new operators can achieve search results in record time, and experienced operators can work longer with less stress.



PLAN AND GO

Conducting a grid-based survey with a microROV – even with one of the excellent navigation packages that are available, is often difficult and tedious. VideoRay, SeeByte, Teledyne RDI, and Teledyne BlueView have now released the first automated

waypoint based navigation on small inspection class ROVs. New software and hardware ensures data is geo-referenced, and that the latitude and longitude coordinates of each video frame are recorded. This means that observations and features can be readily revisited and easily compared in the future. Automatic controls allow the ROV to station-keep on a target as long as needed, allowing operators to relax or discuss options instead of focusing on controlling the ROV at all times. The system is a low logistic rapid deployment tool for salvage estimates, regulatory submerged asset inspection, target identification, local-area search, and ground truthing.



VideoRay Control Panel Operator Interface – VideoRay Cockpit ROV control software and SeeByte CoPilot autonomous vehicle control software, including the “Click to Go” target acquisition and navigation feature.

The system consists of new software and commercial off the shelf technology, including the VideoRay Pro 4 ROV system which fuses data from a GPS, and a state-of-the-art Phased Array Doppler Velocity Log (DVL) providing ROV Dynamic Positioning.

Autonomous mini ROV control dramatically shortens search, survey, and inspection time and increases the operator's confidence that areas have been fully and accurately assessed. The operator uses the CoPilot software to map out a flight path and the ROV follows it, with the click of a button. The computer controls the thrusters to maneuver the ROV along the planned route, unless the operator decides to alter the route, "pause" the ROV, or fly to a target for a closer look. Paths can be saved and repeated.

Survey CoPilot – for visual inspections of a planned waypoint survey

Survey CoPilot automates repetitive inspections of the same infrastructure. The system integrates the VideoRay Pro 4 ROV system using navigation and vehicle control merged into an autonomous system capable of going to a preset surface or subsurface target location. It can use coordinates, run a preset search route, or go automatically to "point and click" locations in route. Pilots can autonomously follow pre-defined missions or maintain a station in currents exceeding 1 knot and in rough sea conditions. With Survey CoPilot, operators can detect, acquire and classify, all during the same operation. With precise bottom track data provided by the Teledyne DVL, pilots can acquire

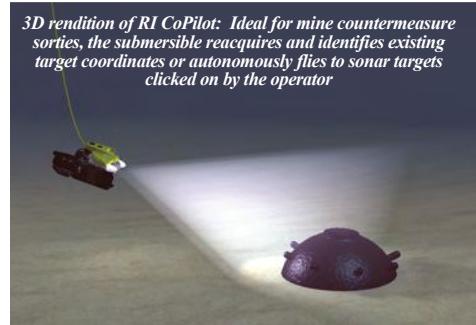
a GPS fix on the surface and once submerged continuously update the ROV's position in water altitudes ranging from 80 meters deep to as shallow as 31 centimeters. Survey CoPilot is ideal for submerged vessel surveys and submerged asset inspection, including rigs and where pre-known points of interest exist – operators can ensure full asset coverage during inspection.

RI CoPilot (Reacquire Identify) – for visual and sonar inspection of a planned waypoint survey

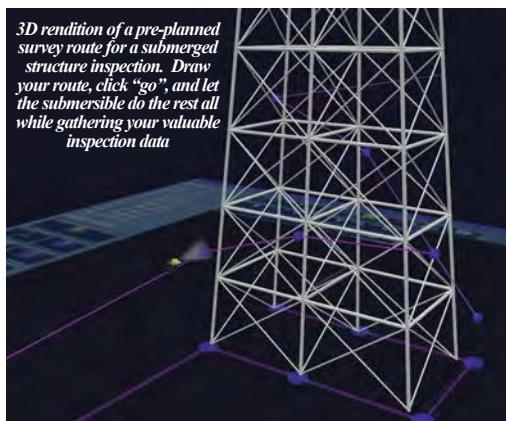
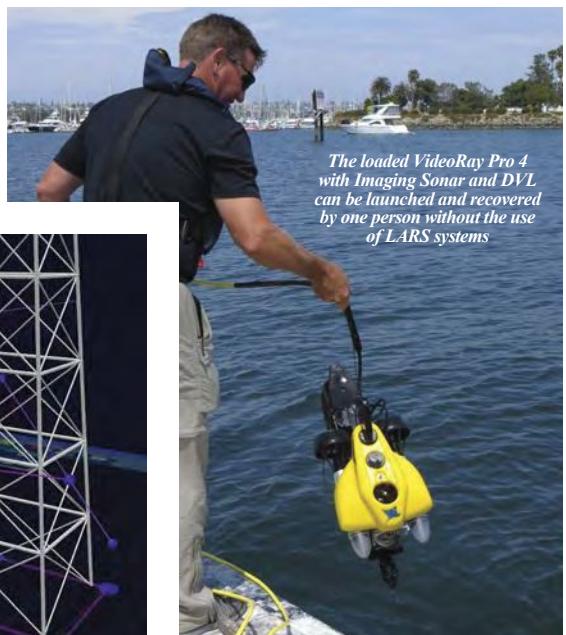
If you are searching a known area in low visibility and are unsure of what lies on the seafloor, RI CoPilot is the appropriate solution. RI CoPilot (Reacquire Identify) uses a VideoRay Pro 4 ROV system which fuses data from a GPS and a state-of-the-art Phased Array DVL, providing ROV Dynamic Positioning while overlaying real-time mutibeam sonar data on the survey map. Pilots can autonomously follow pre-defined waypoints or maintain a station relative to a target.

BlueView imaging sonar identifies underwater objects in a user-selectable operation and allows long range target detection in turbid or black waters and close-in target classification, all in real time. With precise bottom track data provided by the Teledyne DVL (Doppler Velocity Log), pilots can autonomously acquire a geolocation fix on underwater targets. RI CoPilot is ideal for law enforcement, port security, Naval MCM (Mine Countermeasure), rig inspection, survey, salvage, and many other subsea operations.

With VideoRay CoPilot, ROV operators can fully focus on the true task at hand; whether they are inspecting vessels, submerged infrastructure or tanks, searching for drowning victims, recovering objects, or detecting explosives. Operators no longer need to worry about missing sections of their search areas – CoPilot leaves no stone unturned, or in this case, uninspected.



3D rendition of RI CoPilot: Ideal for mine countermeasure sorties, the submersible reacquires and identifies existing target coordinates or autonomously flies to sonar targets clicked on by the operator



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OCEAN INDUSTRY

Australia creates world's largest marine park

Australia's precious marine environments have been permanently protected with the proclamation of the world's biggest network of marine reserves.

Environment Minister, Tony Burke, marked the proclamation, which will protect more than 2.3 million sq. km. of ocean environment.

"Australia is a world leader when it comes to protecting our oceans, and so we should be. We've got responsibility for more of the ocean than almost any other country on Earth," Mr. Burke said.

Australia is home to some incredible marine environments including the Perth Canyon in the southwest and the stunning reefs of the Coral Sea; this announcement cements Australia's position as a world leader on environmental protection.

Australia's oceans support many of the world's endangered marine animals, including the green turtle, the blue whale, the southern right whale, the Australian sea lion, and the whale shark.

Following consultation, the Director of National Parks prepared a report on the comments received and considered these in making the recommendation to the Governor General that the proposed reserves be declared.

Of the 80,000 submissions received, the vast majority of submissions were supportive of the Government's plan to create the world's largest network of marine parks.

The declaration of these new marine reserves delivers on an election commitment and represents a major achievement for the long-term conservation and sustainable use of Australia's oceans.

Existing management arrangements for former reserves, or areas subsumed into new reserves, will remain in place until the new management plans come into effect. New marine reserves have been proclaimed in five of Australia's six large marine regions. The reserves in the southeast region were proclaimed in 2007.

The reserves surround the entire continent of Australia including Tasmania and connect to existing reserves across the Great Barrier Reef.

The designation of these waters limits fishing and oil and gas exploration.

The reserves surround the entire continent of Australia, including the coral sea, coasts off South Australia, West Australia, New South Wales and the Northern Territory. It also includes areas around Tasmania and connect to existing reserves across the Great Barrier Reef.

In this Section

Ocean Industry Briefs	13
Maritime Transportation	18
Ocean Science	30
Ocean Energy	36
Defense	40

MTS elects three to board

The Marine Technology Society (MTS) is pleased to announce the results of its recent elections for positions on its Board of Directors. Richard (Rick) Spinrad was elected President-elect, Debbi Kill was re-elected Vice President of Finance, and Lisa Medeiros was re-elected Vice President of Sections.

Bluefin celebrates 15 years of subsea innovation

Bluefin Robotics, a leading provider of autonomous underwater vehicles (AUVs), is celebrating the company's 15th anniversary this month. Incorporated on 21 November 1997, Bluefin 'spun out' of the AUV Laboratory at the Massachusetts Institute of Technology (MIT). From a small group of engineers, Bluefin has grown to over 100 employees. Bluefin has experienced significant growth in recent years, winning major defense and commercial contracts including SMCM UUV (surface mine countermeasure unmanned underwater vehicle), HULS (hull unmanned underwater vehicle localization systems), and DSOP (deep sea operations) technology and system development program.

Southeast Asian ships caught illegally transferring fish in the Pacific Ocean

Greenpeace International has uncovered a large-scale illegal transfer of fish at sea between one ship from Cambodia, one from the Philippines, and two from Indonesia in the Pacific Commons. None of the boats are on the official record of vessels authorized to operate in the area, and they are, therefore, not allowed to fish or transfer fish at sea according to the rules of the Western and Central Pacific Fisheries Commission (WCPFC). Greenpeace International collected photo and video evidence showing MV Heng Xing 1, a reefer sailing under the Cambodian flag, transshipping fish catches with two Indonesian tuna purse seine vessels (KM Starcki 10 and KM Starcki 11) and one Filipino reefer (Sal 19). The Indonesian and Philippine vessels are bound by WCPFC rules, and their involvement in the transshipment is, therefore, illegal. Cambodia is not a member of the WCPFC, and the reefer is, therefore, considered unregulated. In addition, an oil slick stretching a mile long was also observed during the transshipment. Greenpeace will share this evidence with the relevant governments and the WCPFC.

BOEM announces availability of Environmental Assessment for Wind Energy Area offshore Massachusetts

The Bureau of Ocean Energy Management (BOEM) announced it is requesting public comment on an Environmental Assessment (EA) for the Wind Energy Area on the Outer Continental Shelf (OCS) offshore Massachusetts.

The EA considers potential environmental impacts and socioeconomic effects from issuing renewable energy leases and related site characterization activities within the Wind Energy Area. Site characterization activities include geophysical, geotechnical, archaeological, and biological surveys needed to develop specific project proposals on those leases.

The EA also considers environmental impacts associated with potential site assessment activities, including installation and operation of meteorological towers and buoys, in support of leases that may be issued.

"Responsible development of abun-

dant wind energy in places like offshore Massachusetts is a key part of the Obama Administration's "All of the Above" energy strategy," said BOEM Director Tommy P. Beaudreau. "At the same time, we must ensure that the potential effects of wind energy development on other resources, such as marine mammals and fishing, are closely analyzed and that appropriate protections are put in place."

BOEM is requesting public comments on the adequacy of the environmental analysis and of the measures designed to reduce or eliminate potential environmental impacts. BOEM will consider such comments before determining whether to issue a Finding of No Significant Impact or to conduct additional analyses under the National Environmental Policy Act.

For more information, visit www.boem.gov.

New management team announced by Hydro-Lek

Specialist remote and deep sea tooling manufacturers, Hydro-Lek Ltd, has

announced its new senior management team, following the passing last month of its founder and managing director, Chris Lokuciewski.

Charlotte Mott, Chris's daughter, takes up the position of Managing Director. A Chartered Accountant with a B.Sc. in Business and Technology, Charlotte brings a wealth of business experience and joins the company from telecoms company, Telefonica, where she has held senior management roles.

With over 15 years experience providing high level technical and engineering support for Hydro-Lek, Alan Green takes up the position of Technical Director. Alan, who has worked closely with Chris Lokuciewski since it was established in 1996, will be responsible for developing technical enhancements to existing products as well as providing engineering support for new products and applications planned for 2013.

Kenneth Cast joins Hydro-Lek in December with responsibility for sales. With a degree in Electrical Engineering, Ken started his career as a manned sub-

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mersible pilot before moving into ROV operations and engineering. He then spent the subsequent 35 years in various technical and sales roles within the under-water ROV industry including companies such as Deep Ocean Engineering, Oceanics plc and Seaway Marine.

For more information, visit www.hydro-lek.com.

ABS, CSBC Corp., Taiwan sign strategic cooperation agreement

ABS, the leading provider of classification services to the global marine and offshore industries, signed a strategic cooperation agreement with CSBC Corp., Taiwan (CSBC) on 16 October 2012.

Through this agreement, ABS agrees to support CSBC in vessel and offshore asset construction. The agreement creates an opportunity to form joint development projects in such areas as design optimization, energy efficiency management and design and fabrication of offshore support vessels, bulk carriers, oil tankers, ice-classed vessels and floating production units, and positions ABS as the preferred classification society for CSBC.

"Our organizations share the same commitment to the marine and offshore markets," says Rick Pride, ABS Greater China Division President and COO. "This cooperation agreement will bring together the core competencies of ABS and CSBC and allow us to work together on designs that are suitable for both target markets."

"Our long-term relationship will keep growing tighter and stronger through this multi-varient cooperation, and I believe it will make CSBC more competitive for the current challenging situation," says Lie-Lin Chen, CSBC President.

The two organizations will work together to develop a systematic training program for professionals involved in design, construction and operation of ships based on ABS training courses. And an exchange program will be developed for ABS and CSBC engineers to improve communication between the organizations and foster better understanding of the individual business models.

For more information, visit www.eagle.org.

BMT's Australian capabilities enhanced by Oceanica acquisition

BMT Group Ltd, the leading international maritime design, engineering and risk management consultancy, is pleased to announce the acquisition of Western Australian marine and coastal specialists, Oceanica Consulting Pty Ltd.

Oceanica will further strengthen

BMT's capacity and technical offering in Western Australia's buoyant market, while complementing the expertise and knowledge in the region of BMT's established Asia-Pacific subsidiaries, including BMT WBM and BMT JFA Consultants.

Established in 2000, Oceanica has provided specialist consultancy services for marine, coastal and estuarine environmental issues, working with corporate and government clients throughout Western Australia.

Dr Karen Hillman, Director at Oceanica, comments: "Our staff are genuinely excited by the prospect of joining the BMT group. BMT's management style means that we can maintain our systems and culture of excellence, while the Employee Benefit Trust ownership model provides our employees with direct and open engagement with the future success of a wonderful and unique enterprise."

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Highlights....

November 5-8, 2012

Galveston, Texas



Pre-Conference Workshops:

1. Offshore Surveying
2. Underwater Structure Visualization, Rig Moves, Directing Divers to Construction Support: Scanning Sonar does it All

3 Days of Keynotes:

- DeepStar: Greg Kusinski, Director
- Chevron: Olu Esan, Subsea Survey Engineer
- TOTAL: Herve de Naurois, Deep Offshore Manager
- Statoil: Kaj-Ove Skartun, Subsea Survey IRM Section Manager
- ADCI: Phil Newsum, Executive Director
- Quest Offshore: Sean Shafer, Consulting Manager

Panel Session:

- AUV's for Oil & Gas Operations
Moderated by Donna Kocak, Harris Corporation

More than 30 Technical Papers

Networking Events

Golf Tournament

Conference Notes

The 7th annual Subsea Survey IRM conference began November 5 with two well-attended pre-conference workshops and concluded with a lively interactive panel session addressing issues related to AUV's for Oil & Gas Operations.



Held in Galveston, Texas the 2-1/2 day conference attracted operators, installers and equipment providers who attended more than 30 presentations relevant to the challenges facing the industry, proven measures offering solutions, and new technology available today and forecast for the future.



Keynote speeches opened each day of the event with presentations from Chevron, Statoil, DeepStar, TOTAL, Quest Offshore and ADCI. Specialized Workshops and an AUV Panel provided additional opportunity for education and interaction, and attendees took full advantage of the many networking opportunities available to them.

Exhibitors lined up for the unique marketing opportunities of one-on-one product demonstrations in the exhibit hall -- punctuated by T&T Marine's survey vessel and Lockheed Martin's Marlin AUV.



Thank You!

Thanks to all who attended Subsea Survey IRM, with special thanks to our sponsors and supporters:

DeepStar, Chevron, Statoil, TOTAL, Quest Offshore, Lockheed Martin, Geospace Offshore, Oceaneering, SEACON, Ocean Sub Sea Services, UTEC, Seanic, CSA International, ADCI, THSOA, SUT

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About our New Name

Over the past year or so, a new acronym has emerged in the inspection, repair & maintenance (IRM) contracting world. This new term IMMR (Inspection, Monitoring, Maintenance, and Repair) is used to better describe the subsea work that is being accomplished in the industry today. Although monitoring has always been a focus of the conference, we have now added it officially to the conference logo.

SAVE THE DATE!

CALL FOR PAPERS

Contact:

Sponsorship and Exhibit Opportunities: Amy Dukes: 713-557-8057; amy@subseasurvey.com

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General Information: MJ McDuffee; 772-219-3027; mj@subseasurvey.com

Wärtsilä contracted to supply integrated power and automation systems for two Russian icebreakers

Wärtsilä, the marine industry's leading solutions and services provider, has been awarded a contract to supply integrated power and automation systems for two new icebreakers being built for a Russian State-owned enterprise by Vyborg Shipyard JSC, a long-time partner of Wärtsilä. The contract was signed in October 2012. The vessels, scheduled to be delivered in 2015, will operate mainly in the Baltic Sea and in Arctic waters. Wärtsilä's strong track record in supplying reliable and technically sound solutions for ice-breakers and other vessels operating in arctic conditions was cited as being a key factor in the award of this contract. There is an option pending to supply similar equipment for a third icebreaker within this same project.

Distinguished Naval shipbuilder to chair Austal USA

Rear Admiral USN (Retired) John "Dugan" Shipway has been elected to chair the Board of Austal's U.S. subsidiary Austal USA. The role extends a distinguished leadership career, including 35 years in the U.S. Navy and senior management roles in naval shipbuilding and support. Austal's chairman, Mr. John Rothwell, AO said Rear Admiral Shipway's technical and program management expertise would help Austal deliver its Navy contracts efficiently and effectively. "Dugan has exceptional skills and experience in naval acquisition and shipbuilding that will be instrumental in guiding the U.S. business, which is now a major U.S. Navy prime contractor," he said. "That experience includes managing similar US Navy programs at the highest levels for more than two decades." Austal is currently under contract with the U.S. Navy to build nine 103-m Joint High Speed Vessels (JHSV) under a 10-ship, US\$1.6 billion contract and five 127 m Independence-variant Littoral Combat Ships (LCS), four of which are a part of a 10-ship, US\$3.5 billion contract. Mr. Rothwell said he had known Rear Admiral Shipway for many years and regarded his achievements as President of U.S. shipbuilder General Dynamics Bath Iron Works (BIW) as particularly impressive.

OSG commences Chapter 11 process

Overseas Shipholding Group, Inc., a market leader providing global energy transportation services, filed voluntary Chapter 11 petitions for itself and certain operating subsidiaries in the U.S. Bankruptcy Court for the District of Delaware. The company intends to use the Chapter 11 process to significantly reduce its debt profile, reorganize other financial obligations, and create a strong financial foundation for the Company's future. Certain subsidiaries, including those that manage the Company's facilities in Manila, Singapore, Greece, London, and Newcastle, have not filed for Chapter 11 reorganization. A complete list of the OSG entities that filed and those that did not file Chapter 11 petitions, is available at www.kccllc.net/osg. OSG intends to work with its constituencies to emerge from bankruptcy as quickly as possible while maintaining the Company's market position, business model, and strategy. OSG will continue to serve customers without interruption while it reorganizes its debt. OSG has more than adequate cash to allow the company to continue operating as usual and does not require debtor-in-possession financing. In addition, the company expects to generate significant cash flow while in Chapter 11, further ensuring its ability to maintain safe, reliable, and high-quality operations throughout the process.

Damen launches its first hybrid tug



Damen Shipyards has launched its first ever hybrid tug—the ASD Tug 2810 Hybrid—and is proud to announce that Iskes Towage & Salvage will be the launching customer. The signing ceremony took place on 23 October at Offshore Energy in Amsterdam. The pioneering Dutch shipyard group is believed to be the only yard worldwide building hybrid tugs for stock. The second hybrid vessel will be available from stock at the end of 2013.

Depending on the operating profile of a tug, the ASD 2810 Hybrid, which has a combination of diesel-direct and diesel-electric propulsion, facilitates average fuel savings of between 10% and 30% and cuts local emissions by 20% to 60%. The vessel has a bollard pull of 60 tonnes.

The diesel electric propulsion system in the ASD Tug 2810 Hybrid delivers enough power to prevent the main engines of the diesel direct propulsion system from running idle frequently or at low loads.

During the E3 project, Damen's Research Department made a computer simulation model to analyze various propulsion trains. Damen can use this simulation model to calculate the exact savings that are possible from the Hybrid in each individual case based on the tug's operating profile and running hours.

Based on the findings and after looking at various battery, LNG, hydrogen, and compressed natural gas solutions, the Hybrid emerged. NOx, HC, CO, SOx, CO₂ and particles all decrease substantially, as does fuel consumption.

As an option, Damen is also offering a battery pack whereby it is possible to shut down all the engines during station keeping, maneuvering, and free sailing at low speeds, making the vessel even more environmentally friendly. Battery packs of 100 kWh each are likely to be provided, which allow the vessel to sail at speeds up to 5 kts.

Solar panels are added to the deckhouse on the Damen standard version, and these are used to charge the 24-V battery packs for starting the engines and emergency power for navigation lighting and radio equipment. Other green initiatives on the vessel include LED lighting and a special paint coating, making the vessel more environmentally friendly and clean for at least five years.

For more information, visit www.damen.com.

American Petroleum Tankers affiliate commits to building two new product tankers

An affiliate of American Petroleum Tankers Parent LLC (APT), a company majority-owned by funds managed by Blackstone on behalf of its investors, announced its commitment to build two new state-of-the-art tanker vessels at the National Steel and Shipbuilding Company (NASSCO) shipyard in San Diego. This commitment is contingent upon approval of a \$340 million Title XI loan guarantee from the U.S. Department of Transportation's Maritime Administration (MarAd) that would be used to refinance APT's existing five tankers. Should construction of the vessels proceed, they will be the first new product tankers to be ordered in the U.S. in 2 years.

The government-guaranteed loan program, Title XI, has historically provided between 80% to 87% of new build construction costs to support the U.S. shipbuilding industry. Construction of the new product tankers will help support the future of NASSCO as a key asset in the U.S. industrial base for military and commercial shipbuilding, sustain up to 500 jobs during construction, and create some 84 long-term seagoing jobs when the vessels become operational.

Rob Kurz, chief executive officer of APT, said, "This is a demonstration of our long-term commitment to the U.S. maritime industry and to bolstering job creation in the U.S. It is a win-win for the Maritime Administration and our Company, and we are committed to working with the Maritime Administration and the Department of Transportation to close this financing and support our nation's important maritime industry."

Sean Klimczak, managing director of Blackstone, said, "We have worked closely with MarAd over the past 2 years to present a loan application that would be the safest loan in Title XI history and that has met every MarAd program requirement. This loan is supported by five modern, state-of-the-art tankers, valued in excess of two times the amount of the loan requested by APT. We are looking forward to receiving MarAd's approval of the loan so that we may begin construction of these two new vessels without further delay."

For more information, visit www.blackstone.com.

UK's Royal Fleet of tankers to use GE drive technology for energy-efficient hybrid propulsion

With the global naval sector looking to deploy more energy efficient vessels, GE's Power Conversion business is supplying its electrical propulsion drive train technology for the U.K. Royal Fleet Auxiliary's (RFA's) new fleet of Military Afloat Reach and Sustainability (MARS) tankers.

When completed, the four 37,000-ton MARS tankers will be the U.K.'s next-generation class of large, fast-fleet tankers that will deliver fuel and fresh water to Royal Navy vessels around the world. GE's drive train will be installed as a key part of the ships' hybrid propulsion configuration that is inherently more fuel efficient than conventional propulsion. The next-generation MARS tankers are scheduled to enter



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service beginning in 2016.

The RFA is replacing its existing, single-hulled tankers to meet International Maritime Organization pollution regulations as well as more stringent European Commission environmental regulations. An amendment to MARPOL regulations (the International Convention for the Prevention of Pollution from Ships 1973 and together with the Protocol of 1978) requires tankers to be double-hulled.

Hybrid propulsion systems combine electrical and mechanical propulsion technology to turn the ship's propeller throughout its operating range of speeds. When the ship operates at moderate and low speeds, the propeller shaft is turned using GE's electric motor and variable speed drive controller system. Meanwhile, at high speeds, the diesel engine or gas turbine is connected directly to the propeller through a gearbox.

For more information, visit www.ge-energy.com.

BMT'S XSS design makes a splash

BMT Nigel Gee Ltd, a subsidiary of BMT Group, the leading international



maritime design and engineering consultancy, is pleased to announce that the first 26-m XSS Windfarm Support for Turbine Transfers has been launched at the Sepers B.V. shipyard in Holland. The XSS (Extreme Semi-SWATH) offers significant improvements in motion levels over conventional platforms and is on target for delivery to Turbine Transfers later this year in time to demonstrate its capabilities in the rougher autumn and winter weather. Its success will enable improved availability throughout the year, enabling O&M operations when they are most needed.

In a further development, it is announced that work has commenced on the second XSS for Turbine Transfers with a target delivery date of 2013.

For more information, visit www.bmt.org.

Aker Philadelphia Shipyard lays keel for first Aframax tanker for SeaRiver Maritime, Inc.

Aker Philadelphia Shipyard, Inc. (APSI), the sole operating subsidiary of Aker Philadelphia Shipyard ASA (Oslo: AKPS), held a ceremonial keel laying today for the first of two Aframax tankers that it is building for SeaRiver Maritime, Inc. (SeaRiver), Exxon Mobil Corporation's U.S. marine affiliate. The construction of the two tankers, valued at \$400 million, will create more than 1,000 jobs. When completed in 2014, the Liberty Class vessels will be 820 ft long and be capable of carrying 115,000 tons of crude oil. The tankers are intended to be used to transport Alaskan North Slope crude oil from Prince William Sound to the U.S. West Coast.

Keeping with long-held shipbuilding tradition, coins were placed on one of the keel blocks before the 230-ton unit was lowered into place in the dry dock. Representatives from SeaRiver and APSI placed the coins as a ceremonial sign of good fortune and safe travels. APSI's representatives included its Q3



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Safety Team of the Quarter, Team 650, which was recognized for safety greatness during the quarter.

Kristian Rokke, president and CEO of APSI said, "This is an important milestone, rich in tradition, that excites the shipbuilder in each of us. Together, we are part of something special—constructing another quality vessel born here in Philadelphia that will serve the needs of our customer and the U.S. Jones Act market for decades to come."

Since its inception in 1998, the shipyard has delivered 17 vessels for operation in the Jones Act market. In addition to this Aframax tanker, the shipyard has an additional Aframax tanker on order and is completing the second of two 46,000 dwt product tankers for Crowley.

For more information, visit www.phillyshipyard.com.

Dockwise heralds its two newest vessels

Dockwise subsidiary Fairstar Heavy Transport N.V. announces the commissioning of a new Type 1 Vessel to be named White Marlin and the christening



of its most recent new-build vessel, Finesse.

On acquiring Fairstar Heavy Transport N.V. in July 2012, Dockwise took charge of a set of vessel development plans and commitments. The status of the construction works on the third new-build vessel, following the Forte and Finesse, provided an opportunity to consider the optimal configuration for the new combined fleet. Following discussions with the fabrication yard, Guangzhou Shipyard International (GSI), the original contract for a Type 2 vessel to be named Fathom, has been renegotiated and a

commission placed for a Type 1 vessel to be named White Marlin.

White Marlin's specification will give it a capacity and vessel capabilities similar to Dockwise's existing Blue Marlin. Scheduled delivery will be in Q4 2014, for a total investment of USD \$150 million with instalments and expenses due in April 2013 (USD \$30 million), December 2013 (USD \$30 million), and on delivery in 2014 (USD \$55 million). Of the USD \$35 million instalments due in 2012, another USD \$10 million is yet to be paid.

The decision to build a Type 1 rather than a Type 2 vessel, for a cost increase of some USD \$40 million, removes the requirement Dockwise faced to withdraw its existing Type 2, Black Marlin from service in order to convert it to a Type 1 to satisfy growing demand for larger vessels. Such a conversion, at an estimated cost of USD \$60 million would have removed one of Dockwise's most commercially versatile ships for up to two quarters during a peak period of activity.

For more information, visit www.dockwise.com.

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Year in Review

JANUARY/FEBRUARY

Up to 20 million tons of debris from Japan's tsunami moving toward Hawaii

Some 5 to 20 million tons of debris, including furniture, fishing boats, refrigerators, and the like that were sucked into the Pacific Ocean in the wake of Japan's 11 March earthquake and tsunami are moving rapidly across the Pacific. Researchers from the University of Hawaii tracking the wreckage estimate it could approach the U.S. West Coast in the next 3 years.

China's largest global ocean expedition discovers 16 submarine hydrothermal deposits

Sixteen submarine hydrothermal deposits were discovered during China's largest global ocean expedition, researchers said. The expedition, the country's 22nd, launched from Guangzhou, capital of Guangdong province, on 8 December 2010. It spent 369 days in the Indian, Atlantic, and Pacific oceans, and was China's longest and most expansive ocean expedition. Over the course of the expedition, 218 experts from 32 institutions engaged in research. China has discovered 33 submarine hydrothermal deposits in the three oceans since the 19th expedition in 2007, comprising one tenth of the discovered submarine hydrothermal deposits in the last 3 decades.

Kongsberg to develop integrated environmental monitoring system

A consortium consisting of KONGSBERG, IBM, and DNV will develop a real-time environmental monitoring solution together with their client Statoil. The 150 MNOK project is led by KONGSBERG and will use integrated technology to create a step change for the operators' access and operational usage of environmental data. On behalf of the consortium, KONGSBERG has been awarded a contract by Statoil Research and Development Center in Trondheim for developing an Integrated Environmental Monitoring System.

Lockheed Martin achieves critical reliability testing milestone on U.S. Navy minehunting system

Lockheed Martin completed 500 hours of reliability testing on the U.S. Navy's Remote Multi-Mission Vehicle (RMMV), marking a critical testing milestone. The system will provide mine reconnaissance capabilities to the Littoral Combat Ship.



Douglas-Westwood forecast €51 billion offshore wind spend

Over €51 billion is expected to be spent on new offshore wind installations over the next 5 years, according to a report by international energy business advisors Douglas-Westwood. The World Offshore Wind Market Forecast 2012-2016 reveals that the world will see new installed capacity amounting to 15 GW over the period, averaging 3 GW per annum; up from 600 MW per annum in the 5 years to 2011.

MARCH

Hunley now fully visible for first time since 1864

Since the Hunley was recovered in 2000, she has been obscured by a steel truss mega-structure that was used to lift her from the ocean. Recently, that changed and the Hunley is completely visible for the first time since 1864.



U.S. Navy to build two new oceanographic research vessels

The U.S. Navy awarded \$70 million to Dakota Creek Industries Inc. of Anacortes, Washington to begin building the second of two modern oceanographic research vessels for the Office of Naval Research (ONR). The shipbuilder will begin detail design and construction on the Ocean-class Auxiliary General Oceanographic Research (AGOR) 28.

NEC demonstrates first T bps superchannel transmission over 10,000km

NEC Corporation completed the successful experimental demonstration of 1.15 Tbps ultra-long haul optical transmission over 10,000 km using optical superchannel technology. This is the first instance that a terabit/s channel generated from a single laser source has been transmitted over such a distance. Four superchannels were transmitted together by wavelength division multiplexing (WDM) to achieve a total capacity of 4 Tbps and a spectral efficiency of 3.6 b/s/Hz.

The world AUV market forecast 2012-2016

The 4th edition of Douglas-Westwood's World AUV Market Forecast 2012-2016 expects major market growth over the next five years. The size of the existing fleet of reportedly active vehicles, stands at 560 in 2012 (up from 390 in 2009) and Douglas-Westwood forecast this to rise to 930 by 2016.

APRIL

James Cameron makes first ever successful solo dive to Mariana Trench

Filmmaker and National Geographic Explorer-in-Residence James Cameron descended 35,756 ft (6.77 mi/10.89 km) to reach the "Challenger Deep," the ocean's deepest point located in the Mariana Trench, in his specially designed submersible Deepsea Challenger. The attempt was part of Deepsea Challenge, a joint scientific expedition by Cameron, National Geographic, and Rolex to conduct deep-ocean research and exploration. Cameron is the only individual ever to complete the dive in a solo vehicle and the first person since 1960 to reach the very bottom of the world in a manned submersible. During the dive, he conducted the first manned scientific exploration of the "Challenger Deep."

Filmmaker and National Geographic Explorer-in-Residence James Cameron emerges from the DEEPSEA CHALLENGER submersible after his successful solo dive to the Mariana Trench, the deepest part of the ocean. Photo by Mark Thiessen/National Geographic copyright National Geographic



Liquid Robotics gliders break world record

Liquid Robotics®, an ocean data services provider and developer of the first wave-powered Wave Glider® marine robot, announced that the PacX Challenge Wave Gliders® have broken the Guinness Book of World Records record for distance by an unmanned wave powered vehicle. Arriving in Hawaii on the first leg of their 9,000 nmi journey across the Pacific, they have traveled over 3,200 nmi breaking the previous world distance record of 2,500 nmi.

Fewer icebergs, more ships in the Arctic

As Arctic sea ice melts, Alaska's whales, walruses, and polar bears may face a new obstacle as they navigate local waters: traffic. According to an assemblage of Alaska Native groups and WCS, the rapid increase in shipping in these formerly frozen waterways poses a heightened risk to the region's marine mammals and the local communities that rely on them for food, security, and cultural identity.

Energy Department announces \$180 M for new initiative to deploy U.S. offshore wind projects

As part of President Obama's all-out, all-of-the-above approach to developing every domestic energy resource, Energy Secretary Steven Chu announced the start of an ambitious initiative to capture the potential of wind energy off American coasts. As part of a planned 6-year \$180 million initiative, an initial \$20 million will be available this

year as the first step in supporting up to four innovative offshore wind energy installations across the U.S. These offshore wind projects will accelerate the deployment of breakthrough wind power technologies that will help diversify our nation's energy portfolio, promote economic development, and launch a new industry in America.

Forum Subsea Technologies launches new Tomahawk™ ROV

Forum Subsea Technologies, a world-leading manufacturer and supplier of subsea equipment, has officially launched Tomahawk™, the latest addition to its class-leading range of multi-role ROVs.

Tomahawk™ has been built to be fast and agile, and it shares the same 35 kw power system and thrusters as Forum's largest electric, the Comanche. It is manufactured by Sub-Atlantic, a product line of Forum Subsea Technologies, at its facility in Aberdeenshire, Scotland.



U.S., Mexico sign deal for oil and gas exploration along maritime border

The U.S. and Mexico have reached an agreement to cooperate on oil and gas development in the Gulf of Mexico. The agreement would set a process that U.S. companies and Mexico's State-owned Pemex could use to jointly develop waters that straddle the nations' maritime border.

It also would provide for the U.S. and Mexican governments to jointly review applications and safety inspections in cases of drilling in the boundary-straddling waters, where oil spills could affect both nations.

The agreement would give companies easier access to areas—including 1.5 million acres on the U.S. outer continental shelf—considered attractive for oil and gas development, but long unexplored because of legal uncertainties over who has rights to the resources.



U.S. Gulf's first FPSO begins work at Cascade

Brazilian State-run energy giant Petrobras has started pumping oil from the first of two deepwater oil fields in the U.S. Gulf of Mexico. It is the first field development in the U.S. Gulf to use a floating production, storage, and offloading (FPSO) system to transport oil production ashore.

Year in Review

Output at the Cascade field started in late February, when the Cascade 4 well was connected to the BW Pioneer. Petrobras uses FPSOs extensively as production platforms at Brazilian offshore fields. At Cascade, oil will be shipped to the coast using shuttle tankers, while natural gas will be transported via a conventional pipeline system.



MAY

Jeff Bezos discovers F-1 rocket engine that sent Neil Armstrong to the moon

Amazon founder, chairman, and CEO, Jeff Bezos located the long lost submerged F-1 engines that powered the historic Apollo 11 astronauts to the moon. The five engines that were part of the first stage of the Saturn V rocket were found lying 14,000 ft below the surface where they came to rest over 42 years ago.



The U.S. Navy 30-year shipbuilding plan submitted to Congress

The U.S. Navy 30-year shipbuilding plan submitted to Congress assumes that shipbuilding funding will rise from fiscal 2018 and will continue through 2032, during which all major vessels will be retired, leaving the Navy able to prevent cost overruns. But the report warns that "if any of these assumptions prove to be faulty, future shipbuilding plans will include fewer ships and battle force inventory levels will change, inevitably falling below 300 ships."

Hawkes Ocean Technology designed sub Virgin Oceanic completes first free dive testing

Oceanic has entered the manned test phase with the first free, off-the-hook testing. For over 2 weeks, the Virgin Oceanic team tested and improved the launch and recovery and pulled together the details necessary for the first free dive. The first manned test by Chief Pilot Chris Welsh was brief; life support was good, and launch and recovery went well. In the water, he powered forward on the surface, but had small programming issues in the fly by wire program-

Sir Richard Branson (R) on top of the Virgin Oceanic submarine along with Chris Welsh. Each plan to pilot the just unveiled Virgin Oceanic submarine, sitting here atop its "mothership," the "Cheyenne" catamaran.



ming; this was to be expected as the system needs fine tuning that can only be fully tested under load. In parallel to new aircraft testing, this was the equivalent of high speed taxiing.

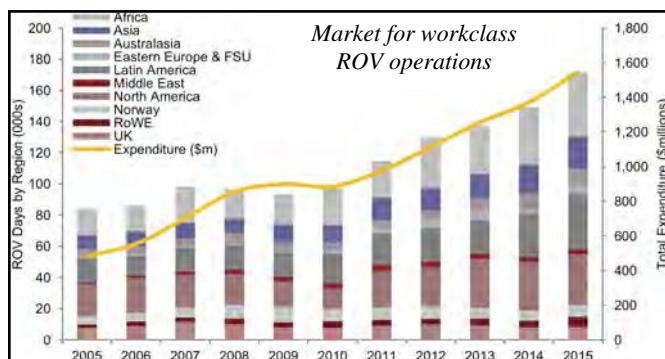
JUNE

Wood Group Mustang awarded topsides engineering for world's largest semi-submersible facility

Wood Group Mustang was awarded the topsides detailed engineering and procurement support for the semi-submersible central processing facility (CPF) in the Ichthys field development. The contract was awarded by Samsung Heavy Industries Co. Ltd., the EPC contractor for the CPF. The project, located off the northwest coast of Australia in 250 m of water, will be operated by INPEX and will weigh approximately 70,000 tonnes (60,000 dry) with a topside deck footprint of 156 m x 132 m (514 ft x 434 ft), making it the world's largest semi-submersible CPF.

Strong Growth Forecast for Workclass ROV Support

Globally, strong growth in demand for workclass ROV support is anticipated over the forecast period of 2011-2015. Despite continuing turmoil in financial markets, it seems that the offshore oil and gas industry is facing a future of significant growth. In addition, new, albeit much smaller, markets are developing in sectors such as offshore windpower. The next 5 years look good for ROV operators, and beyond that is the promise offered by development of the ultra deepwater "pre-salt" oil reserves of Brazil and perhaps West Africa.



U.S. Navy and General Dynamics unveil model of Knifefish UUV

Representatives from the U.S. Navy's Program Executive Office, Littoral Combat Ships Unmanned Maritime Systems Program Office and General Dynamics unveiled a quarter-scale model of the Surface Mine Countermeasure Unmanned Undersea Vehicle (SMCM UUV), known as "Knifefish," at the Navy League's Sea-Air-Space Exposition held at the Gaylord National Resort. Knifefish is a heavyweight-class, minehunting, unmanned undersea vehicle designed for deployment by forward operating forces and will be a part of the Littoral Combat Ship Mine Countermeasures Mission Package.

Exxon, Rosneft to pursue \$500B joint venture in Arctic, Black Sea

ExxonMobil and Russia's Rosneft unveiled an offshore exploration partnership in mid-April that could invest upward of \$500 billion in developing Russia's substantial energy reserves in the Arctic and Black Sea.

Under the deal, Exxon and state-controlled Rosneft will

seek to develop three fields in the Arctic with recoverable hydrocarbon reserves estimated at 85Bboe/d. A final investment decision on the projects in the Kara Sea, in the center of Russia's north coast, is expected in 2016-17, Rosneft said.

World outside U.S. holds 565 Bbbl of undiscovered, recoverable oil

Excluding the U.S., the world holds an estimated 565B bbl of undiscovered, technically recoverable conventional oil; 5,606 tcf of undiscovered, technically recoverable conventional natural gas; and 167B bbl of undiscovered, technically recoverable natural gas liquids (NGL), according to a recent assessment by the U.S. Geological Survey.

The report includes mean resource estimates in 171 geologic provinces of the world, including both onshore and offshore areas. The assessment does not include reserves that have been discovered, are well-defined, or are considered economically viable.

JULY

BOEM hears from scientific advisory committee

Bureau of Ocean Energy Management leaders concluded their briefings for members of the Outer Continental Shelf (OCS) Scientific Committee, the Federal advisory committee for BOEM, in Santa Barbara, California. The discussions focused on specific research plans for Fiscal Years 2013 and 2014 as part of the committee's mandate to advise the Secretary of the Interior, through the BOEM Director, on the feasibility, appropriateness, and scientific value of the OCS Environmental Studies Program.

China will become world's largest producer of shale gas by 2030

China has the potential to overtake North America and become the world's leading producer of shale gas by 2030, a poll conducted at the World Gas Conference in Kuala Lumpur has revealed. Roughly 81% of participants thought that China will become the largest shale gas producer in the next 18 years, while 19% thought that it will not.

Research shows humans are primary cause of global ocean warming over past 50 years

The oceans have warmed in the past 50 years, but not by natural events alone. Research by a team of Lawrence Livermore National Laboratory scientists and international collaborators shows that the observed ocean warming over the last 50 years is consistent with climate models only if the models include the impacts of observed increases in greenhouse gas during the 20th century. Though the new research is not the first study to identify a human influence on observed ocean warming, it is the first to provide an in-depth examination of how observational and modeling uncertainties impact the conclusion that humans are primarily responsible.

World's largest offshore windfarm fully operational

Walney Offshore Windfarms, the world's largest wind farm, became fully operational. The Walney wind farm, off the coast of Cumbria, entered full commissioning, with all 102 turbines delivering clean electricity into the UK's grid.

Former Presidents George H.W. Bush and George W. Bush Visit CVN 77

USS George H.W. Bush (CVN 77) hosted the ship's namesake, former President George H.W. Bush, and his son, former President George W. Bush, for a promotion and reenlistment ceremony off the coast of Kennebunkport, Maine, 10 June. The ship's sponsor, Doro Bush Koch, former Florida Gov. Jeb Bush, and other members of the Bush family accompanied the Navy's newest aircraft carrier during a regularly scheduled training evolution to encourage the crew and raise morale.

Tonsberg – world's largest RO/RO ship awarded "ship of the year"

Tonsberg, the world's largest roll-on/roll-off (RO/RO) ship, built by Mitsubishi Heavy Industries, Ltd. (MHI), has been awarded the "Ship of the Year 2011" by the Japan Society of Naval Architects and Ocean Engineers (JASNAOE). Every year JASNAOE selects what it considers to be the most technologically, artistically, and socially superior ships and marine structures built that year, and the Tonsberg was chosen for its highly evaluated transport efficiency and environmental compatibility.



Prysmian inaugurates new cable plant

Prysmian Group has inaugurated its new submarine power cable plant in Finland, having invested approximately €40 million to increase its production capacity at the Pikkala facility, already one of the Group's centers of excellence for high-voltage cable production. In particular, the Pikkala plant has started production of transmission cables that use HVDC (High Voltage Direct Current) technology allowing large amounts of energy to be transmitted over long distances.

AUGUST

New human-powered submarine world speed record

During the inaugural European International Submarine Races (eISR) that took place in the UK at QinetiQ's Haslar base at Gosport in Hampshire in June, a Canadian team set a new human-powered submarine world speed record. École de Technologie Supérieure of Quebec team's submarine Omer 8 travelled at 3.6 m/s (7.03 kts) over a 13 m section of the course, barely inching ahead of Florida Atlantic Universities submersible Talon 1.



Year in Review

Calvin Andrew Gongwer, 25 June 1915 – 20 March 2012

The ROV industry lost an esteemed pioneer and the scientific community a true genius upon the death of Cal Gongwer in March. The inventor, entrepreneur, athlete, designer, and president and chief engineer of Innerspace Corporation passed away quietly at home at 96 years of age.

Funding for NURP axed, including Aquarius Reef Base and Pisces subs

National Oceanic and Atmospheric Administration (NOAA) budget cuts have effectively ended any future missions to the underwater Aquarius Reef Base. The Federal budget crunch and cost overruns in NOAA's satellite program have caused the axe to fall on the reported \$5 million annual funding for the National Undersea Research Program (NURP), which includes the Aquarius lab and two Pisces submersibles.



*Aquarius Reef Base, Florida Keys
(Photo Stephen Frink)*

NKT develops world's largest submarine power cable

NKT Cables has engineered, developed, manufactured, installed, and commissioned a 245-kV three-core high-voltage submarine cable. With a diameter of 270 mm, it is the largest submarine cable in the world. The cable route is approximately 24.5 km, connecting the GIS station at Grenaa with the offshore transformer platform at the Anholt offshore wind farm.

Venezuela ends shark finning, creates protected area

Venezuela set forth a series of measures to protect sharks within its waters. Most significantly, commercial shark fishing is now prohibited throughout the 3,730 sq. km (1,440 sq. mi) of the Caribbean Sea that make up the popular Los Roques and Las Aves archipelagos, whose pristine beaches and coral reefs make it a diving and fishing attraction. The new regulation also prohibits the practice of shark finning (cutting off the fins and dumping the body overboard at sea) and mandates that all of these animals caught in Venezuelan waters must be brought to port with their fins naturally attached.

OPT and Lockheed Martin to develop wave energy project in Australia

Ocean Power Technologies, Inc. (OPT) and Lockheed Martin have entered into a teaming agreement with the goal of developing a 19-MW wave-energy project in Portland, in the state of Victoria, Australia. This is one of

the largest wave-energy projects announced to date and leverages a grant from the Commonwealth of Australia. For the project, Lockheed Martin will assist with the design of OPT's PowerBuoy® technology, lead the production and system integration of the wave-energy converters, and support overall program management.

Cape Wind begins major offshore operations

Cape Wind commenced a major geotechnical and geophysical survey operation as part of its construction design and engineering process and initial mobilization of the project on Horseshoe Shoal in Nantucket Sound.

The multi-million dollar offshore program involves up to 50 scientists, engineers, archeologists, and geologists using specialized vessels.

Fugro is the lead Cape Wind contractor undertaking this effort. Fugro is a leading global, geotechnical survey firm that has performed similar work for a majority of the offshore wind farms built in European waters. Fugro's U.S. east coast operations are based in Norfolk, Virginia.

NOAA collects 50 metric tons of debris off Hawaii

A team of 17 scientists collected nearly 50 metric tons of marine debris, which threatens monk seals, sea turtles and other marine life in the coral reef ecosystem, in the Northwestern Hawaiian Islands (NWHI). NOAA has conducted annual removal missions of marine debris in the NWHI since 1996 as part of a coral restoration effort.

As part of this year's mission, the NOAA team did look for debris from the 2011 tsunami in Japan, however, no debris with an explicit connection to the tsunami was found.

CSA completes sea trials of its new USV

The Unmanned Surface Vessel (USV) is the latest tool in CSA's scientific equipment pool, providing the company with a unique capability for performing a wide variety of surveys in hazardous, remote, sensitive, and shallow water areas. The USV can be pre programmed or controlled remotely to perform survey transects, while recording and/or streaming data back to its command center. The vehicle has the payload, power, and data bandwidth to carry a variety of sensors—supporting both scientific and geophysical surveys.



SEPTEMBER

HMS Hood's bell to be recovered

An operation to recover the bell of the battle-cruiser HMS Hood, sunk in 1941, has been agreed upon by the UK Government. If recovered successfully, the bell will form a tangible and fitting memorial to the ship and the 1,415 men who were lost in her when she was sunk by the Bismarck in the North Atlantic. Hood is the largest Royal Navy vessel to have been sunk, causing the greatest loss of life suffered by any single British warship.

The Ministry of Defence (MOD) and the Royal Navy are grateful for the very generous offer by the U.S. philanthropist Paul G. Allen to recover the bell at no cost to the MOD. Mr Allen's yacht, Octopus, is equipped with a remotely operated vehicle (ROV) and will be used for the operation and be supported by Blue Water Recoveries Ltd., which specializes in the search and investigation of shipwrecks.

Austal officially opens module manufacturing facility in Mobile

A little more than a year after a memorable groundbreaking ceremony was held for new construction at Austal's Mobile, Alabama shipbuilding facility, over 120 distinguished guests joined Austal in celebrating the official opening of not one but three new buildings—Module Manufacturing Facility (MMF) Phase 2, Assembly Bay 5, and the Office Complex—with a ribbon cutting ceremony. The ceremony was led by Austal USA's interim president and chief financial officer, Brian Leathers.

Joint BOEM, NOAA, USGS mission discovers record depth for *Lophelia* coral on GoM platforms

On a 10-day expedition in the Gulf of Mexico, a team of Federal and university scientists has discovered *Lophelia* coral growing deeper than previously seen anywhere in the Gulf. Newly available information on *Lophelia* growth rate and conditions will inform future environmental review and decision-making for the protection of deep-water coral habitats.

The overall goal of the mission was to examine coral ecosystems and related habitats that developed over several decades on or near actively producing deep-ocean oil and gas production platforms. Undersea structures supporting energy production platforms provide some of the scarce hard surfaces in the Gulf where *Lophelia pertusa*, a deep cold-water coral that lives where there is no sunlight, can grow.



Massive seafloor photograph taken by Autosub6000

The most detailed photographic survey of the abyssal ocean floor has been taken by the National Oceanography Centre's robot submarine, Autosub6000—some half a million photos that will be stitched together to form a "street view" map of the North Atlantic's Porcupine Abyssal Plain and its inhabitants.

Forward and down-facing cameras mounted on the unmanned robot submarine have provided continuous images of an area some 12 mi long by 4 mi wide (20 km by 7 km), covering an area about the size of city such as Southampton, but 3 mi underwater (around 4,850 m).



Credit: National Oceanography Centre

New version of NMEA 0183 standard released

The National Marine Electronics Association (NMEA) has released a significantly updated version of NMEA 0183, its well-known standard that enables the interfacing of marine electronics. Version 4.10 will improve boating safety and navigation through updates and expansions of various electronic communications "sentences" pertaining to a number of navigation and communications devices, including Galileo satellite receivers and Automatic Identification Systems (AIS).

NMEA 0183 defines electrical requirements, data transmission protocol and timing, and specific sentence formats for a 4800-baud serial data bus. Version 4.10 impacts shipboard, non-shipboard, and land-based equipment as well as networks for maritime and other industry use. The standard has been expanded to include the new Galileo Global Navigation Satellite System (GNSS). Many of the existing GNSS sentences have been extended to accommodate Galileo and future GNSS improvements.

Cable ship Chamarel catches fire, abandoned off Namibia



A fire broke out on the ship late afternoon on 8 August while returning from a repair operation on the SAT-3-SAFE cable off the coast of Namibia in the Atlantic Ocean. Despite the crew's efforts to control the fire, the

Year in Review

decision was made to abandon the ship at around 8 pm local time. All 56 crew members were safely recovered by a Namibian fishing vessel without injury or incident.

OCTOBER

Phoenix participates in search for Amelia Earhart's plane

On the 75th anniversary of the disappearance of Amelia Earhart and her navigator Fred Noonan, members of Phoenix International Holdings, Inc. (Phoenix) set sail from Hawaii in support of a search effort led by The International Group for Historic Aircraft Recovery (TIGHAR). The target of the search was Amelia Earhart's Lockheed Electra 10E aircraft. After years of research, TIGHAR theorized that the plane went down near the island of Nikumaroro, an atoll roughly 1,900 mi southwest of Hawaii. Phoenix's role was to search 1 sq. mi. of the seabed from 50 to 4,000 ft off the northwest side of the island.



Dr. Raymond F. McAllister, Ph.D. dies

Respected and admired as an educator, Dr. Raymond F. McAllister, Ph.D., 89, died of natural causes September 17th at his home in Lighthouse Point, Florida. A pioneering professor emeritus of Ocean Engineering at Florida Atlantic University, he also fought to protect the region's coral reefs more than 40 years ago, long before anyone realized they were in danger. Dr. McAllister was best known by this community for the book he co-authored "Handbook of Ocean and Underwater Engineering."

America's first ocean energy delivered to the grid

Bangor Hydro Electric Company verified that electricity is being delivered to their power grid from Ocean Renewable Power Company's (ORPC's) Cobscook Bay Tidal Energy Project. This is the first power from any ocean energy project, including offshore wind, wave, and tidal, to be delivered to an electric utility grid in the U.S. Also, it is the only ocean energy project, other than one using a dam, that delivers power to a utility grid anywhere in North, Central, and South America.

This first TidGen™ device has a peak output of 180 kW and will generate electricity annually to power 25 to 30 homes. Two additional TidGen™ devices will be installed at ORPC's Cobscook Bay Project site in the fall of 2013 and, together, the three-device power system will generate enough energy to power 75 to 100 homes.

Oil and gas capital expenditures break \$1 trillion barrier: GlobalData

Increased activity in the exploration and production sector will be the primary driver in pushing oil and gas capital expenditure to an enormous \$1.039 trillion for 2012, according to a recent GlobalData report.

The new report predicts that the total oil and gas spending will increase by 13.4% this year over the 2011 total of \$916 billion as oil companies intensify upstream operations across locations as diverse as offshore Brazil, the Gulf of Mexico, and the Arctic Circle.



NOVEMBER

Rear Adm. Jonathon White appointed Oceanographer of the Navy

Rear Adm. Jonathon White has assumed the title of Oceanographer of the U.S. Navy, replacing Rear Adm. David Titley who retired in July. Assigned to the staff of the chief of naval operations, White is now head of the Oceanography, Space and Maritime Domain Awareness directorate (OPNAV N2N6E). He also serves as head of the Navy's Positioning, Navigation and Timing Directorate and he holds the title Navigator of the Navy. In addition, White serves as director of the Navy's Task Force on Climate Change, the naval deputy to the National Oceanic and Space Administration, and director of the Office of the DoD Executive Agent for Maritime Domain Awareness.

Remembering Chris Lokuciewski

Sadly Chris Lokuciewski passed away on 28 September, aged 59. Many would have known Chris as not only the MD and founder of specialist subsea tooling company, Hydro-Lek Ltd, but also as a leading figurehead in the deep sea submersibles industry.

CSA launches real-time ocean sound website

CSA International, Inc. (CSA) is pleased to introduce an Internet-based, global, real-time software solution for the detection, classification, mitigation, monitoring, and archiving of natural, biological, and artificial sounds.

The www.oceansound.com website, developed through a partnership with SONSETC, is the latest addition to the rapidly expanding CSA Marine Sound business line. The website provides real-time monitoring and interpretation of sounds from a variety of ocean observatories around the world; it is designed to provide ocean users with an automated and user-friendly tool, applying the latest in acoustic technology with a wide variety of applications.

Norway's Crown Prince opens Sheringham Shoal offshore wind farm

His Royal Highness, Crown Prince Haakon of Norway, officially opened the Sheringham Shoal offshore wind farm built off the coast of Norfolk, UK by the owners Statoil and Statkraft. The Crown Prince opened the wind farm at an official ceremony at historic Holkham Hall in North Norfolk, with support from UK secretary of state for

energy and climate change Edward Davey, Norwegian petroleum and energy minister Ola Borten Moe, Norwegian trade and industry minister Trond Giske, and the owners' presidents and CEOs Helge Lund (Statoil) and Christian Rynning-Tønnesen (Statkraft). Sheringham Shoal is owned equally by Statoil and Statkraft through the joint-venture company Scira Offshore Energy Limited. The opening took place 4 years after Scira was granted consent by the UK government and 3 years after the initial construction works began.

Global floating production capital spending expected to double

Douglas-Westwood projects that between 2013 and 2017 \$91 billion will be spent on floating production systems (FPS), an increase of 100% over the preceding 5-year period. This growth is driven by factors such as a larger proportion of newbuilds and conversions compared to redeployments, a greater degree of local content resulting in increased costs, and general offshore cost inflation.

FPSOs represent by far the largest segment of the market both in numbers (94 installations) and forecasted capital expenditures (80%) over the 2013-2017 period. FPSSs account for the second largest segment of capex (10%), followed by TLPs, then spars.

Gulf of Mexico production to rise 43% by 2019: Wood Mackenzie

An exploration and production resurgence in the U.S. Gulf of Mexico 2 years after a 6-month drilling shutdown because of the BP Plc oil spill is expected to increase output nearly 43% by 2019, energy consultancy Wood Mackenzie said.

Excluding new discoveries between now and then, the forecast sees current output of 1.4 mmboe/d jumping to a new peak of 2 mmboe/d.

Statoil and Statkraft acquire Dudgeon Offshore wind power project

Following a successful partnership in developing the Sheringham Shoal Offshore Wind Farm off the coast of North Norfolk, Statoil and Statkraft will now work together to develop the Dudgeon Offshore Wind Farm. The project could deliver many hundreds of jobs during the construction phase and, once in operation, will provide renewable energy to the UK market. Dudgeon has recently received an offshore consent that allows for up to 560 MW of installed generation capacity. The North Sea project site is located 32 km offshore, north of the town of Cromer in North Norfolk, and is 20 km northeast of the Sheringham Shoal Offshore Wind Farm.

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NOAA, University of New Hampshire fund projects to investigate effects of chemical dispersants in oil spills

NOAA and the Coastal Response Research Center (CRRC) at the University of New Hampshire announced research funding for three projects aimed at better understanding the impact of dispersed oil and chemical dispersants used during oil spills. NOAA is awarding these grants using supplemental research funding provided by Congress as a result of the Deepwater Horizon oil spill. The grants, collectively totaling nearly \$500,000, were awarded on a competitive basis through a peer-review process that attracted 36 proposals from U.S. and international research teams.

NOAA, NASA: Antarctic ozone hole second smallest in 20 years

Warmer air temperatures high above the Antarctic led to the second smallest seasonal ozone hole in 20 years, according to NOAA and NASA satellite measurements. This year, the average size of the ozone hole was 6.9 million sq. mi (17.9 million sq. km). The ozone layer helps shield life on Earth from potentially harmful ultraviolet (UV) radiation that can cause skin cancer and damage plants. The Antarctic ozone hole forms in September and October. This year, the hole reached its maximum size for the season on 22 September, stretching to 8.2 million sq. mi (21.2 million sq. km), roughly the area of the United States, Canada, and Mexico combined. In comparison, the largest ozone hole recorded to date was in 2000 at 11.5 million sq. mi (29.9 million sq. km). The Antarctic ozone hole began making a yearly appearance in the early 1980s, caused by chlorine released by manmade chemicals called chlorofluorocarbons (CFCs). The chlorine can rapidly break apart ozone molecules in certain conditions, and the temperature of the lower stratosphere plays an important role.

Ocean salinity trends show human fingerprint

Changes in ocean salinity over the second half of the 20th Century are consistent with the influence of human activities and inconsistent with natural climate variations, according to a new study led by researchers at Scripps Institution of Oceanography, UC San Diego. Observed changes agree with computer model suggestions about salinity trends in a steadily warming world, said Scripps climate researcher David Pierce, the study's lead author. Ocean salinity changes are driven by the world's patterns of evaporation and rainfall, which themselves are changing. Observations over recent decades have found a general intensification of salinity differences in which salty ocean regions experience even more evaporation of surface waters and relatively fresh regions are becoming more diluted with precipitation. These patterns are part of global changes in precipitation and evaporation that influence rainfall, or the lack of it, over land. Pierce said the significance of the study is that it provides an independent check of the effects of climate change on the water cycle using different instruments and techniques than weather station rainfall measurements. Studies of rainfall over land are harder to measure and place in context because of changes to weather stations over the years and the episodic nature of storms. The paper, "The fingerprint of human-induced changes in the ocean's salinity and temperature fields", appeared 2 November in the American Geophysical Union journal, Geophysical Research Letters. Co-authors include Peter J. Gleckler, Benjamin Santer, and Paul Durack of the Lawrence Livermore National Laboratory in Livermore, California. and Tim Barnett of Scripps Oceanography.

NASA study examines Antarctic sea ice increase



View of Sheldon Glacier with Mount Barre in the background, seen from Ryder Bay near Rothera Research Station, Adelaide Island, Antarctica. A new NASA/British Antarctic Survey study examines why Antarctic sea ice cover has increased under the effects of climate change over the past two decades. Image credit: British Antarctic Survey

NASA and British Antarctic survey scientists have reported the first direct evidence that marked changes to Antarctic sea ice drift caused by changing winds are responsible for observed increases in Antarctic sea ice cover in the past two decades. The results help explain why, unlike the dramatic sea ice losses being reported in the Arctic, Antarctic sea ice cover has increased under the effects of climate change.

Research scientists Ron Kwok of NASA's Jet Propulsion Laboratory, Pasadena, California, and Paul Holland of the Natural Environment Research Council's British Antarctic Survey, Cambridge, United Kingdom, used maps created by JPL from more than five million individual daily ice-motion measurements. The data, captured over a period of 19 years by four U.S. Defense Meteorological satellites, show, for the first time, long-term changes in sea ice drift around Antarctica.

"Until now, these changes in ice drift were only speculated upon, using computer models of Antarctic winds," said Holland, lead author of the study published this week in the journal *Nature Geosciences*. "This study of direct satellite observations shows the complexity of climate change. The total Antarctic sea ice cover is increasing slowly, but individual regions are actually experiencing much larger gains and losses that are almost offsetting each other overall."

"We now know that these regional changes are caused by changes in the winds, which, in turn, affect the ice cover through changes in both ice drift and air temperature," he continued. "The changes in ice drift also suggest large changes in the ocean surrounding Antarctica, which is very sensitive to the cold and salty water produced by sea ice growth."

Holland said sea ice around Antarctica is constantly being blown away from the continent by strong northward winds. "Since 1992, this ice drift has changed," he said. "In some areas, the export of ice away from Antarctica has doubled, while in others it has decreased significantly."

Sea ice plays a key role in Earth's environment, reflecting heat from the sun and providing a habitat for marine

life. At both poles, sea ice cover is at its minimum during late summer. However, during the winter freeze in Antarctica, this ice cover expands to an area roughly twice the size of Europe. Ranging in thickness from less than 3 ft (1 m) to several meters, the ice insulates the warm ocean from the frigid atmosphere above.

This new research also helps explain why observed changes in the amount of sea ice cover are so different in the two polar regions. The Arctic has experienced dramatic ice losses in recent decades, while the overall ice extent in the Antarctic has increased slightly. However, this small Antarctic increase is actually the result of much larger regional increases and decreases, which are now shown to be caused by wind-driven changes. In places, increased northward winds have caused the sea ice cover to expand outwards from Antarctica. In contrast, the Arctic Ocean is surrounded by land, so changed winds cannot cause Arctic ice to expand in the same way.

For more information, visit www.jpl.nasa.gov.

Why seas are rising ahead of predictions

Sea levels are rising faster than expected from global warming, and University of Colorado geologist Bill Hay has a good idea why. The last official IPCC report in 2007 projected a global sea level rise between 0.2 and 0.5 m by the year 2100. But current sea-level rise measurements meet or exceed the high end of that range and suggest a rise of 1 m or more by the end of the century.

"What's missing from the models used to forecast sea-level rise are critical feedbacks that speed everything up," says Hay. He will be presenting some of these feedbacks in a talk at the meeting of The Geological Society of America in Charlotte, North Carolina, USA.

Some of those feedbacks involves Arctic sea ice, the Greenland ice cap, and soil moisture and groundwater mining.

"There is an Arctic sea ice connection," says Hay, despite the fact that melting sea ice—which is already in the ocean—does not itself raise sea level. Instead, it plays a role in the overall warming of the Arctic, which leads to ice losses in nearby Greenland and



northern Canada. When sea ice melts, Hay explains, there is an oceanographic effect of releasing more fresh water from the Arctic, which is then replaced by inflows of brinier, warmer water from the south.

"So it's a big heat pump that brings heat to the Arctic," says Hay. "That's not in any of the models." That warmer water pushes the Arctic toward more ice-free waters, which absorb sunlight rather than reflect it back into space like sea ice does. The more open water there is, the more heat is trapped in the Arctic waters, and the warmer things can get.

Then there are those gigantic stores of ice in Greenland and Antarctica.

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During the last interglacial period, sea level rose 10 m due to the melting of all that ice—without any help from humans. New data suggest that the sea-level rise in the oceans took place over a few centuries, according to Hay.

For more information, visit www.geosociety.org.

New tagging research reveals remarkable mako shark round-trip journey in high resolution

A satellite reporting tagging device known as a SPOT tag, attached to a shortfin mako shark dubbed “Carol” in New Zealand 5 months ago, is providing scientists with remarkable and previously unknown details of the timing and long-distance migratory movements of this species.

The Guy Harvey Research Institute (GHRI) at Nova Southeastern University is collaborating with the New Zealand National Institute of Water and Atmospheric Research (NIWA) on the tagging experiment with Carol, the shortfin mako shark.

The SPOT tag is revealing that Carol



is spending a lot of time at the ocean’s surface, reporting her location to the satellite several times daily.

“The unexpectedly frequent daily detections are providing us with a really high-resolution view of the migration of this animal,” said GHRI director, Dr. Mahmood Shivji. “We’ve found that Carol has traveled over 5,700 mi in five months, averaging 60 mi/day during some parts of her migration—and this is just a juvenile shark!”

“Conventional identification tags tell us little about the timing of mako shark movements, the route that they take, or distance traveled,” said Dr. Malcolm

Francis, who is leading the NIWA effort on this study. “The SPOT tag, revealing Carol’s detailed travels from New Zealand to Fiji and back, shows these sharks have an amazing internal navigation system that keeps them on course over long journeys.”

Given the high fishing pressure on makos for their fins and meat, this species is showing declining population trends in parts of its range, which has resulted in the species being listed as “Vulnerable” on the IUCN Red List of threatened species.

Based on the amazing results from this initial trial, the GHRI and NIWA are expanding their mako migration study off New Zealand starting in January 2013, according to Dr. Shivji. The GHRI and Dr. Guy Harvey are also working with Captain Anthony Mendillo of Keen M International to compare the migratory patterns of mako sharks in the Atlantic by tagging them off the coast of Isla Mujeres, Mexico.

To follow Carol’s travels, visit <http://www.nova.edu/~johnmatt/makosharks.htm>.

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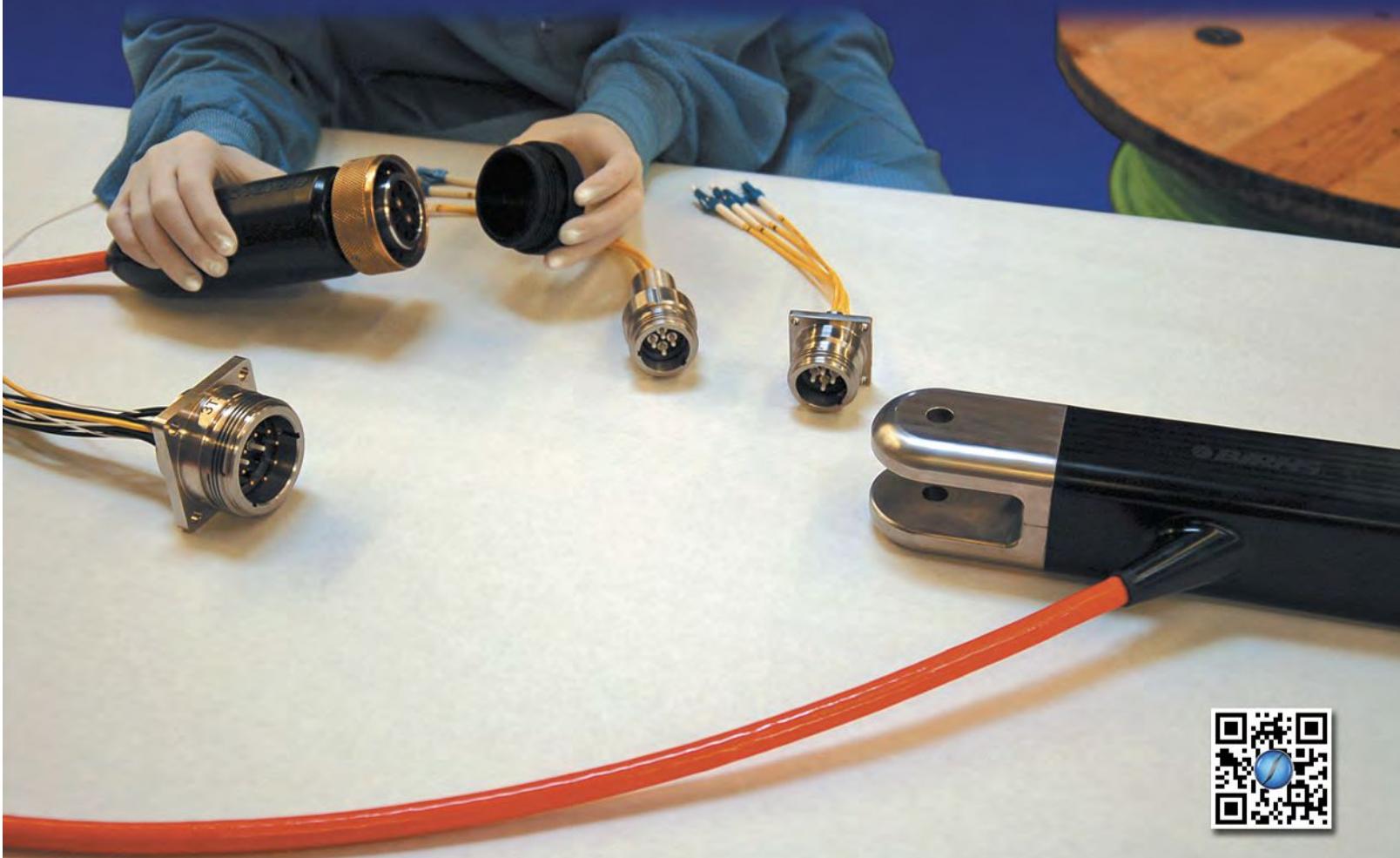
32 Volume 18 • Issue 11

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Environmental Monitoring of Dredging Operations

By: Thomas O. Mitchell, Ph.D., Sea-Bird Electronics, and Ian Walsh, Ph.D., WET Labs

The global trends of increasing awareness of environmental impacts from human endeavors and resource operations in remote locations are colliding in dredge activities. This collision is driving innovation in dredge-monitoring technology, resulting in higher quality data arriving at decision makers' desktops in near real time. Going forward, high-quality data sets from dredge-monitoring operations will be important enhancements to ocean and coastal observing systems.

Dredging along coastlines is increasingly key to sustaining economic activity. Comprising roughly 4% of the world's surface and supporting over 30% of the world's population, coastlines have an economic importance disproportionate to their geographic extent. Commercial improvement and maintenance of coastal waterways through dredging and port construction is vital to support local economies; at the same time, care must be taken to preserve the local ecosystem, which holds intrinsic as well as significant economic value. This is especially true when dredging operations occur where tourism-based economies rely on pristine water quality to sustain their reputations.

Dredging is typically conducted in waters less than 25 m deep, which means the entire water column is in the photic zone where biological activity is concentrated. Monitoring this environment can be difficult from a sensor standpoint because although gradients are often very small, these changes can lead to large changes in biological communities. Bio-fouling prevention, careful consideration of deployment systems, and regular, routine maintenance of sensors all help to assure the highest quality data over the longest time, which is necessary to effectively monitor stress to the environment.

Dredging near coral is a difficult and potentially ecologically harmful activity. When mechanically disturbed, corals release micron and sub-micron sediment, creating highly turbid waters with suspended solids that can stay in suspension for days. The creation of particulate and suspended solids is also seen in dredging of non-coral material, including both hard and soft material in access channels and harbors. Because the material is in some cases suspended for long periods of time, the turbid plumes are carried by current and wave action to nearby areas, shadowing corals and settling on and sometimes smothering coral polyps. In addition, there may be increased release of nutrients that can result in decreased oxygen levels.

A number of water quality parameters can be monitored to determine the impact of dredging near a site. High-accuracy measurements of conductivity and temperature as a function of depth are key to providing a baseline reference of the local ocean density and temperature. Monitoring of turbidity, typically in NTU units, is a first step in quantifying the impact of sediment plumes on coral reefs. Monitoring of photosynthetically active radiation (PAR) is thought to be a better measure of true impact on a coral colony as it is a physical measure of the inci-



WET Labs WOM as it is being deployed on DHI buoy, Fehmarn Belt Fixed Link Project (photo by DHI)

dent light over a broad spectrum, more accurately reflecting the light utilized by the coral ecosystem to sustain life. Dredging and the subsequent dumping of material can lead to an increase in nutrient concentrations, potentially resulting in anoxia/hypoxia indicated by a reduction in dissolved oxygen levels. Thus monitoring of dissolved oxygen in an impacted area provides an indication of the stress level in the photic zone.

Field Experience

Environmental monitoring takes place within the dredge area as well as in nearby reference sites, with data collected at 15-minute intervals and transmitted to a central data center on an hourly or daily basis. Monitoring often starts a year or more before construction, providing a seasonally accurate baseline for future reference.

Sea-Bird Electronics and WET Labs have both adapted their instruments to the needs of the dredge-monitoring community. Anders Jensen, business area manager for survey and monitoring for DHI, has worked closely with WET Labs and Sea-Bird. "We built our buoy systems for the Fehmarn Belt Fixed Link project with WET Labs WQMs and Sea-Bird

Environmental Monitoring



Sea-Bird SBE 16plus-IM V2 SeaCAT CTD with SBE 63 Optical Dissolved Oxygen Sensor, integrated with WET Labs ECO-NTU and ECO-PAR sensors with Bio-wipers™

Bird instruments have been remarkably good; they provide high-quality data under demanding conditions. With their instruments, we are confident that our buoy system can provide up to 6 months of data. In fact, battery power is our main limitation, not the instruments. We are also very impressed with the quality of the data from the sensors. DHI performed our own laboratory calibration of the WET Labs ECO NTU against suspended sediment and confirmed that the sensors are very sensitive instruments that can measure small concentrations of suspended solids very accurately. This is very important in remote areas where the water is clear and discriminating dredging plumes can be difficult."



Jensen also states, "As a full-service provider of marine environmental-monitoring systems, DHI expects, and our clients demand, reliability. We build our buoys to provide this with near real-time delivery of data to the web and data redundancy in the instruments on the buoy as back-up. DHI's Aquaguard controller communicates with the instruments using Sea-Bird's Inductive Modem technology, which has been the key to providing robust communication capability." Live data from a DHI monitoring buoy at Storestrømmen in Denmark is available at <http://datacenter.dhi.dk/storstrom/>. (select Measurements/demo).

Dredging and dredge-spoils monitoring increasingly occurs within fragile ecosystems and at remote locations. In some areas such as Western Australia, simply getting to the monitoring sites is time consuming and expensive. Martin Hills of Imbros, an Australian supplier of integrated water quality instrumentation, has worked with many of the consulting groups performing dredge monitoring in Western Australia. Hills stated, "The systems that we provide based on Sea-Bird Electronics' SBE 16plus CTDs and WET Labs' optical instruments have been the only ones that will operate and provide good data over a workable length of time. In Western Australia, it takes at least a week to move an instrument package in and out of the sites or for a

site visit by a technician. The need to monitor continuously means that longer deployments reduce the cost of replacing or swapping instruments, resulting in immediate savings for the contractors and better data overall."

Where hard bottom communities, corals, and sub-aquatic vegetation (SAVs) are potentially impacted by dredging, the underwater light field is a key indicator of stress on the communities. The underwater light field is most effectively measured directly with a PAR sensor. WET Labs' PAR sensor is equipped with Bio-wiper™ technology to keep the optics clean and reduce sensor drift over long deployments. Imbros' Martin Hills states, "The WET Labs ECO PAR sensor is the only PAR sensor that can stay in the field for as long as the CTD and turbidity sensor and still provide good data. Our clients have had great success with this sensor in the water. We have also provided the ECO PAR for use as an above water sensor; the Bio-wiper™ keeps birds from fouling the optics."



Conclusion

Environmental monitoring of dredging and port construction sites will become more extensive over time, as greater economic development takes place in and near ecologically sensitive areas. Currently, best practices for monitoring dredge sites include gathering accurate and drift-free conductivity, temperature, and depth data as well as monitoring turbidity, PAR, and dissolved oxygen. For more information on sensors and systems used in environmental dredge monitoring, please visit www.sea-birdscientific.com.

Interior announces commercial lease for renewable energy offshore Delaware

Secretary of the Interior Ken Salazar and Bureau of Ocean Energy Management (BOEM) director Tommy P. Beaudreau today announced that BOEM has reached agreement on a lease for commercial wind energy development in federal waters that covers 96,430 acres approximately 11 nmi off the coast of Delaware. This is the first lease completed under Interior's "Smart from the Start" approach to facilitate environmentally responsible offshore wind development along the Atlantic Outer Continental Shelf (OCS) by identifying wind energy areas in a coordinated, focused approach with extensive environmental analysis, public review and large-scale planning. The lease grants NRG Bluewater Wind Delaware LLC the exclusive right to submit one or more plans to BOEM to conduct activities in support of wind energy development in the lease area. The company may submit a Site Assessment Plan (SAP) with a proposal to conduct site assessment activities, such as the installation of a meteorological tower or meteorological buoy, and/or submit a Construction and Operations Plan (COP) to propose construction of the actual wind facility and cabling to shore.

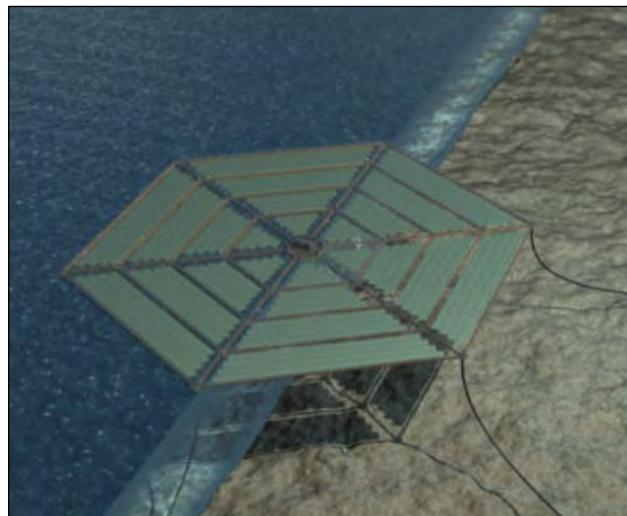
Offshore Wind to Cut Bigger Share of Rotor Blade Market

The growing proliferation of offshore wind farms will see a decreasing share of the global wind turbine rotor blade market allotted to onshore installations, says the latest report from international business analysts GlobalData. The firm's new research* estimates that in 2020 offshore wind farms will account for 11% of all installed rotor blades, whereas last year this share did not reach even 1%. Wind rotor blades used for onshore and offshore wind turbines are not significantly different in terms of design, structure or composition; however, larger blades are used for offshore applications due to the larger turbine size and rated power output. Offshore wind farms are currently a small portion of total wind power capacity, but the number of planned projects across the world's major wind markets indicates the level of confidence in this renewable energy source. The largest wind rotor blade market in 2011 (by a substantial margin) was China, who held a massive 59% share with 37,385 installations. The US came a relatively distant second, with an installed total of 11,085 rotor blades accounting for 18% of the global market, while India were third with an 11% share. GlobalData predicts the global cumulative wind power installed capacity to show steady growth until the end of the decade, increasing from 238,600 MW last year to 658,449 MW by the end of 2020.

EnBW postpones 500 MW Hohe See offshore project

Germany's third-largest power utility has announced the postponement of its investment decision on the 500 MW Hohe See offshore wind farm. EnBW has already invested tens of millions of euros in the project. Citing regulatory uncertainty and the lack of a firm grid-connection date, EnBW's decision comes at a time when Germany's government is struggling to pass legislation to help alleviate investor fears due to ongoing grid-connection delays. EnBW and others have been critical of the new draft law for not doing enough for projects not yet under construction. This announcement follows last month's decision by Dong to put on hold its 300 MW Borkum Riffgrund 2 project due to a firm grid-connection date.

DNV unveils its SUNdy floating solar field concept



Researchers at DNV have developed a dynamic floating offshore solar field concept. Dubbed SUNdy, the core feature of the concept is a hexagonal array that floats on the sea surface. A collection of these arrays, totaling 4,200 solar panels, forms a solar island the size of a large football stadium, capable of generating 2 MW of power. Multiple islands connected together make up a solar field of 50 MW or more, producing enough electricity for 30,000 people.

"The renewable energy market is rapidly changing due in main part to climate change, soaring global demand for electricity, and scarcity of fossil fuels. For DNV, technological innovation is a key element in our strategy to help address these concerns, and SUNdy, as an example of our research work, can help illustrate future applications for solar as a truly sustainable resource," says Bjørn Tore Markussen, chief operational officer for DNV KEMA Energy & Sustainability Asia. "Indeed, renewable energy is becoming increasingly important in nations across the globe, including Asia, and with such a readily available and abundant source that is rapidly approaching grid parity levels, it's solar power that's attracting a lot of interest in this part of the world."

The SUNdy concept is made possible using thin-film, 560 W solar panels that are flexible and lighter than the traditional rigid glass-based modules, allowing them to undulate with the ocean's surface, explains Sanjay Kuttan, managing director of the DNV Clean Technology Centre in Singapore. "The key to creating an ocean-based structure of this size is the use of a tension-only design. Rather like a spider's web, this dynamic, compliant structure yields to the waves, yet is capable of withstanding considerable external loads acting upon it."

According to Dr. Kuttan, separating the solar arrays into prefabricated sections allows for large-scale manufacturing and streamlined assembly offshore. The cable grid provides for maintenance access in the form of floating gangways. Below the surface, the shape of the island is maintained by the tensile forces from the lengthy spread mooring.

For more information, visit www.dnv.com.

America makes waves as marine power gains popularity

Collaborations between the U.S. power industry and academia to develop new technologies for marine power generation are closer than ever before, states a new report by energy experts GlobalData.

The new report shows that the U.S. is working to conduct extensive testing of wave and tidal power devices in open waters, while various universities are working to develop marine technologies.

All ocean energy research in the U.S. is consolidated under the Naval Facilities Command (NAVFAC) and the U.S. Navy has continued its support. The Water Power Program by the US Department of Energy (US DOE) has invested more than \$87 million in marine and hydrokinetic development projects and aims to collaborate with universities, laboratories, industry, and other agencies working on marine technology in the US to commercially develop and deploy marine technology for power generation.

Electric Power Research Institute (EPRI) estimates the total annual average wave energy off the U.S. coast, calculated at a depth of 60 m, at 2,610 TWh/yr, with Alaska and the western coast contributing for more than 80% of this. Several projects are planned to capture the energy potential in U.S. waters, and over 80 marine energy projects are in various stages of development, though no tidal power plants are currently commercially active—the U.S. has only one commercially active wave power plant, with 1 MW capacity.

Approximately 50 tidal projects are in various stages of development throughout the U.S., with many based in Alaska and California. Oregon is the leading generator of hydroelectric power in the U.S., with close to 300 MW of planned projects lined up for development by Finavera Renewables, Oceanlinx Limited, and Ocean Power Technologies. The neighboring coast of California is also a potential site for wave energy.

For more information, visit www.globaldata.com.

Ocean Power Technologies awarded contract by Mitsui Engineering & Shipbuilding in Japan

Ocean Power Technologies, Inc. (OPT) announced that it has received a ¥70 million (approximately US \$900,000) contract from Mitsui Engineering & Shipbuilding (MES) for further work towards development of the Company's PowerBuoy technology for application in Japanese sea conditions.

Under this contract, OPT will continue to analyze methods to maximize buoy power capture using advanced optimization methodologies as well as modeling and wave tank testing. OPT will team with MES staff to develop PowerBuoy enhancements that, under normal Japanese wave conditions, would provide for improved power capture. This analysis and design work is expected to be completed by the end of OPT's fiscal year ending 30 April 2013 after which a decision will be made on the next steps toward ocean trials of a demonstration PowerBuoy system. This would provide the basis for a prospective build-out of a commercial-scale OPT wave power station in Japan.

For more information, visit www.oceanpowertechnologies.com.

Tocardo manufactures commercial free-flow turbines for Nepal and Japan

Tocardo International, the leading producer of free-flow turbines, has commenced the manufacture of six free-flow water turbines for installation in Nepal and Japan.

This follows the partnership agreements announced in March to supply 8 MW of bi-directional turbine power over a 3-year period to Japan and, in June, to supply 2.5 MW of uni-



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Japan and Nepal have been identified by Tocardo as regions where sustainable, low-cost renewable energy is becoming increasingly important, with particular potential for tidal and in-stream technology. As manufacturing of

Tocardo's hydro turbines commences, the opportunity presented by these two markets is starting to be realized.

The Tocardo free-flow in-stream hydro turbines can be compared to underwater wind turbines: free-standing underwater units, generating energy from sea currents, tidal, and river flows. They are easy to install and are low-cost to maintain.

For more information, visit www.tocardo.com.

Eco Wave Power signs MOU with Ocean University of China

The MOU between Eco Wave Power (EWP) and the Ocean University of China (OUC) is meant to lead to the implementation of EWP's unique technology across a wide range of wave-prone regions in China.

According to the terms of the agreement, OUC will secure full funding for EWP's first commercial-scale project and conduct the related R&D works with its state-of-the-art facilities.

This is a great opportunity for EWP and OUC, as both organizations are known to be leaders in their fields of expertise.



OUC is under the direct administration of the State Ministry of Education and was defined by the Central Government as one of the 13 national key comprehensive universities in China. During the 10th "Five Year Plan," OUC was ranked first among the marine-related institutions in terms of number of projects undertaken, including the national project 973 and 863 with funds granted by the National Natural Science Foundation of China. Moreover, OUC has been awarded a prize in natural science, two prizes for science progress, and 54 prizes at provincial and ministerial levels.

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Raytheon awarded \$45 million MK 54 torpedo contract

The Raytheon Company has been awarded a \$45.3 million U.S. Navy contract to provide MK 54 light-weight torpedo hardware, test equipment, spares and related engineering and repair services for U.S. fleet inventory and in support of foreign military sales to the Royal Australian Navy and the Indian Navy. The award represents an exercised option of a current Navy contract for MK 54 torpedo kits. Raytheon is the U.S. Navy's sole production supplier for MK 54 lightweight torpedo hardware, in production since 1999. With an established infrastructure and experienced workforce co-located with the Naval Undersea Warfare Center, Keyport, Washington, the company works directly with the Navy to meet the lightweight torpedo requirements of U.S. and allied fleets. The MK 54 is the Navy's next-generation anti-submarine warfare (ASW) weapon deployed from surface ships, helicopters, and fixed-wing aircraft to detect and attack underwater targets. Sophisticated processing algorithms allow the MK 54 to analyze the information, edit out false targets or countermeasures, and pursue identified threats. The MK 54 is designed for both deepwater and littoral environments, making it the only lightweight torpedo capable of striking any underwater target in the world's oceans, regardless of water depth.

General Dynamics awarded \$89 M by U.S. Navy for Virginia-class submarine work

General Dynamics Electric Boat has been awarded an \$88.8 million contract modification by the U.S. Navy to provide research and development and lead-yard services for Virginia-class nuclear-powered attack submarines. Under the contract, Electric Boat will undertake development studies and other work related to Virginia-class submarine design improvements. Additionally, Electric Boat will perform research and development work required to evaluate new technology to be inserted in newly built Virginia-class ships. The contract has a potential cumulative value of \$881 million through 2014 if all options are exercised and funded. This work will engage Electric Boat™'s engineering and design organization, which comprises more than 4,000 employees. Possessing proven technical capabilities, these employees work on all facets of the submarine life cycle from concept formulation and design through construction, maintenance and modernization, and eventually to inactivation and disposal.

Alion awarded contract for evaluation and development of unmanned and automated weapon systems

Alion Science and Technology, a global engineering, R&D, IT, and operational solutions company, will provide the Naval Surface Warfare Center, Panama City Division (NSWC PCD), with technology development, integration, and evaluation expertise under a \$24 million contract. Alion's NSWC PCD work includes technical engineering to increase unmanned and automated weapon systems capabilities for such tasks as the implementation of unmanned systems payloads on "commercial off-the-shelf" or existing non-developmental unmanned underwater vehicles (UUVs) with limited modifications. Under the contract, this work can include UUVs, unmanned surface vehicles (USVs), unmanned ground vehicles (UGVs), and unmanned aerial vehicles (UAVs). The NSWC PCD supports research development test and evaluation for weapon systems development associated with mine warfare, naval special warfare, and amphibious/expeditionary maneuver warfare systems, and other littoral missions. The work was awarded under the Defense Technical Information Center's Weapon Systems Technology Information Analysis Center contract with the period of performance through September 2015.

Virginia-Class submarine Minnesota (SSN 783) launched

The 7,800-ton submarine Minnesota was moved out of a construction facility into a floating dry dock using a transfer car system.

Huntington Ingalls Industries announced that the Virginia-class submarine Minnesota (SSN 783) was launched into the James River at the Company's Newport News Shipbuilding (NNS) division.

"Launch is a significant accomplishment in the life of a submarine," said Jim Hughes, NNS' vice president of submarines and fleet support. "It's an opportunity for our incredible shipbuilders to stand back and take pride in their work. Thanks to their tremendous efforts and steadfast determination, Minnesota's progress is nearly 1 year ahead of schedule and has been built using about 600,000 fewer man-hours than the previous boat."

As many as 1,000 shipbuilders have worked on Minnesota, the 10th Virginia-class submarine. At about 92% complete, Minnesota is on track to be completed in 63 months. Construction began in February 2008, and Minnesota was christened on 27 October.

To achieve her latest milestone, the 7,800-ton Minnesota was moved out of a construction facility into a floating dry dock using a transfer car system. The floating dry dock was submerged, and Minnesota was launched into the James River. Once in the water, tugboats moved the submarine to NNS' submarine pier, where final outfitting and testing will take place.

"It is truly awe-inspiring having been able to watch the submarine go from pieces and now launching for the final stretch of construction prior to sea trials," said Cmdr. John Fancher, Minnesota's commanding officer. "When I think of all the energy and craftsmanship of the shipbuilders that has gotten us to this point, I am humbled. The crew is excited to get their boat into the water, and I couldn't be more proud of them and all of their hard work and training."

Huntington Ingalls Industries designs, builds, and maintains nuclear and non-nuclear ships for the U.S. Navy and Coast Guard and provides after-market services for military ships around the globe. For more than a century, it has built more ships in more ship classes than any other U.S. naval shipbuilder. Employing more than 37,000 in Virginia, Mississippi, Louisiana and California, its primary business divisions are Newport News Shipbuilding and Ingalls Shipbuilding.

For more information, visit www.huntingtoningalls.com.

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Defense

SAIC awarded prime contract by Defense Advanced Research Projects Agency

Science Applications International Corporation (SAIC) announced it was awarded a prime contract by the Defense Advanced Research Projects Agency (DARPA) for the Anti-Submarine Warfare (ASW) Continuous Trail Unmanned Vessel (ACTUV) program phases two through four to design, build, and test a new prototype unmanned autonomous surface vessel.

The single-award, cost-plus fixed-fee (CPFF) contract has a 3-year period of performance for phases two and three with a total contract value of approximately \$58 million, and a \$1 million 18-month option for phase four. Work will be performed primarily in Virginia, Florida, Pennsylvania, Maryland, Mississippi, California, Washington, Rhode Island, and Oregon.

The DARPA ACTUV program aims to develop an unmanned autonomous surface vessel with the ability to track a quiet diesel-electric submarine overtly for months over thousands of kilometers, with minimal human input. SAIC provided conceptual design services in phase 1 of the program, creating an innovative wave-piercing trimaran solution.

Under the contract, SAIC will provide a final design and production plan for the ACTUV prototype in phase two, construction of the prototype is scheduled to be completed in phase three, and government testing in phase four. Leveraging the company's phase one concept design as the point of departure, SAIC will work with DARPA to design, build, and demonstrate an experimental vessel capable of independently deploying under sparse remote supervisory control to achieve a game-changing ASW operational capability, with the ultimate objective to facilitate rapid transition of that capability to the Navy in response to critical operational demand.

Key teammates are Oregon Iron Works and Christensen Shipyards for ship design, construction and propulsion; NASA's Jet Propulsion Lab; and Carnegie Mellon University for autonomy.

For more information, visit www.saic.com

Drop in Somoli piracy reported

The number of ships signalling attacks by Somali pirates has fallen this year to its lowest since 2009, a report from the International Chamber of Commerce International Maritime Bureau (IMB) revealed, but IMB warns seafarers to remain vigilant in the high-risk waters around Somalia, the Gulf of Aden, and the Red Sea. Meanwhile, violent attacks and hijackings are spreading in the Gulf of Guinea.

Worldwide this year, pirates have killed at least six crew and taken 448 seafarers hostage. The IMB Piracy Reporting Centre recorded that 125 vessels were boarded, 24 hijacked, and 26 fired upon. In addition, 58 attempted attacks were reported.

The drop in Somali piracy has brought global figures for piracy and armed robbery at sea down to 233 incidents this year—the lowest third quarter total since 2008. In the first 9 months of 2012, there were 70 Somali attacks compared with 199 for the corresponding period in 2011. And from July to September, just one ship reported an attempted attack by Somali pirates, compared with 36 incidents in the same 3 months last year.

IMB says policing and interventions by international navies are deterring pirates along with ships' employment of Best Management Practice, including the use of armed guards and other onboard security measures.

As of 30 September 2012, suspected Somali pirates were holding 11 vessels for ransom with 167 crew members as hostages onboard. In addition, 21 kidnapped crew members are being held on land. IMB says more than 20 hostages have now been held for over 30 months.

For more information, visit www.icc-ccs.org.

USNS Montford Point floated from General Dynamics NASSCO building dock



General Dynamics NASSCO completed the complex float out operation for the first Mobile Landing Platform (MLP) ship, the USNS Montford Point.

Construction of the USNS Montford Point is progressing ahead of schedule, with the ship currently at 91% complete. The ship will now undergo final outfitting and testing pier side before completing sea trials. USNS Montford Point is scheduled to be christened in March 2013 and delivered to the U.S. Navy in May 2013. Fabrication of the second MLP, the USNS John Glenn, began in April 2012. Following a keel laying ceremony in December, this second MLP ship will be erected in the same building dock as the USNS Montford Point.

The MLP is a new class and type of auxiliary support ship, as part of the U.S. Navy's Maritime Prepositioning Force of the Future (MPF-F) program. The ship will serve as a transfer station or floating pier at sea, improving the U.S. military's ability to deliver equipment and cargo from ship to shore when land bases do not exist. It will provide capability for large-scale logistics movements such as the transfer of vehicles and equipment from sea to shore.

For more information, visit www.nassco.com.

Alion to support weapon systems development for US Navy

For the Navy, the development of unmanned and automated weapon systems ranks as a top priority to sustain the country's littoral missions. To support this need, Alion Science and Technology, a global engineering, R&D, IT and operational solutions company, will provide the Naval Surface Warfare Center, Panama City Division (NSWC PCD), with technology development, integration and evaluation expertise under a \$24 million contract.

Alion's NSWC PCD work includes technical engineering to increase unmanned and automated weapon systems capabilities for such tasks as the implementation of unmanned systems payloads on "commercial off the shelf" or existing non-developmental unmanned underwater vehicles (UUVs) with limited modifications. Under the contract, this work can include UUVs, unmanned surface vehicles (USVs), unmanned ground

vehicles (UGVs) and unmanned aerial vehicles (UAVs).

The NSWC PCD supports research development test and evaluation for weapon systems development associated with mine warfare, naval special warfare and amphibious/expeditionary maneuver warfare systems, and other littoral missions.

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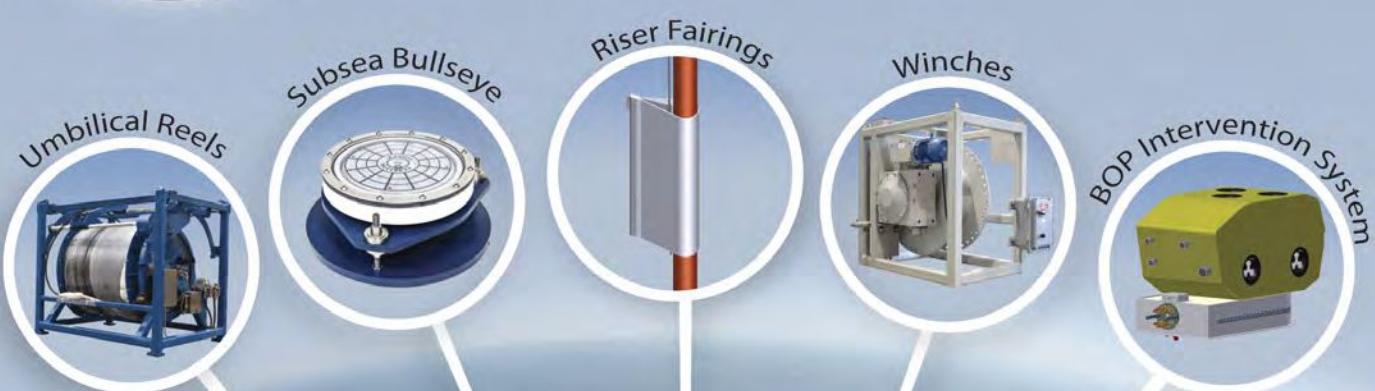


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OFFSHORE INDUSTRY

Emergence of floating liquefaction to drive growth in FLNG sector

The emergence of floating liquefaction will drive a significant increase in total global capital expenditures from 2013 to 2019, according to a study authored by Douglas-Westwood.

While expenditure is expected to increase in the existing regasification market, the liquefaction sector is forecast to dwarf this, as capex associated with a floating liquefaction terminal is more than triple that of a typical floating import terminal.

Douglas-Westwood forecast that expenditure is set to total \$47.4 billion over the 7-year period, with over \$28 billion spent on FLNG liquefaction and \$19.1 billion on import terminals.

Economic growth is driving electricity demand occurring in the developing world, and Asia will be a focus region for both liquefaction and regasification terminals between 2013 and 2019, accounting for 35% of global capex.

Australasia will account for 22% of the market, largely due to a number of liquefaction projects. Latin America will represent 17% of global FLNG expenditure over the period, with projects involving both offshore liquefaction and regasification vessels, the report says.

BP to share technology, expertise with Pemex for deepwater well cap

Pemex E&P and BP have announced an agreement for BP to share the technical information it used to build its global deepwater well-capping equipment.

Under the technology license agreement, BP will make available technical information that Mexico's Pemex E&P, one of four subsidiaries of Pemex, can use, in addition to Pemex E&P initiatives already in place, if it decides to build and maintain its own well-capping system for use in Mexican territorial waters of the Gulf of Mexico.

In addition, BP has agreed to conduct workshops in Houston to brief Pemex E&P on the technical information and operational aspects of the system as well as to introduce Pemex E&P specialists to key vendors and fabricators that BP used to develop its global deepwater well cap and tooling package.

"The agreement marks another step



Capping stack: BP has constructed own equipment after joint effort by Marine Well Containment Committee.

forward in Pemex E&P's ongoing efforts to help protect the rich Gulf of Mexico environment in which we operate as well as to apply state-of-the-art technology as we develop Mexico's deepwater oil and natural gas resources," said Carlos Morales, president of Pemex E&P.

Pemex has previously expressed its interest in the Marine Well Containment Committee, a joint capping stack effort between Gulf of Mexico operators formed in the wake of the Macondo disaster. BP has since built its own capping stack.

U.S. to become the world's largest oil producer by 2020, report says

The U.S. will become the world's top producer of oil by 2020, a net exporter of oil around 2030 and nearly self-sufficient in energy by 2035, according to a new report from the International Energy Agency. The U.S. currently imports some 20% of its energy needs.

An "energy renaissance" has begun in the U.S., marked by a boost in oil, shale gas, and bioenergy production made possible by new technologies such as hydraulic fracturing, or fracking, and horizontal drilling, said the report by the Paris agency, which acts as an energy watchdog for industrialized nations.

"North America is at the forefront of a sweeping transformation in oil and gas production that will affect all regions of the world," IEA executive director Maria van der Hoeven said.

U.S. oil production peaked in 1970 at slightly more than 9.63 million barrels a day. Except for a modest recovery to fewer than 9 million barrels a day in 1985, U.S. crude production had been on a precipitous decline until 2008, when it bottomed out at 5 million barrels a day.

In this Section

Offshore Industry Headlines	45
Upstream Oil & Gas	48
Underwater Intervention	60
Maritime Communications	64
Subsea Cables	68
Offshore at a Glance	76
Stockwatch	78

BP to pay U.S. \$4.5B in spill fines, penalties; faces more challenges

BP reached a settlement with the U.S. government in November to pay \$4.5 billion in criminal fines and penalties for the 2010 oil spill in the Gulf of Mexico. That's a record amount.

However, while the settlement resolves BP's criminal liability with the Federal government, it's not the end of civil suits against the oil giant. BP faces additional civil claims from the United States as well as State governments, that could easily run into the billions of dollars. Fines under the Clean Water Act alone could add up to \$21 billion.

BP already has spent about \$14 billion on spill response and cleanup and paid out more than \$9 billion in claims to affected businesses and individuals.

As of the end of September 2012, BP's financial statements recorded a \$38.1 billion charge taken against pre-tax income in relation to the accident and oil spill, according to the company.

Still, BP said the \$4.5 billion settlement, which must be approved by the court, was a positive step.

"We believe this resolution is in the best interest of BP and its shareholders," chairman Carl-Henric Svanberg said in a statement. "It removes two significant legal risks and allows us to vigorously defend the company against the remaining civil claims."

Summing up at the end of the day, Judge Carl Barbier said the settlement had been reached after "extensive and contentious negotiations over a long period of time."

BP agreed to plead guilty to 14 criminal charges and pay the \$4.5 billion in criminal fines and penalties. Eleven lives were lost in an explosion on the Deepwater Horizon rig, which caused 4.9 million barrels of oil to pour into the U.S. Gulf from a leaky well, contaminating 150 miles of shoreline, in the world's largest offshore oil spill.

Winners awarded 167 licenses in UK government's 27th offshore round

The UK government has selected the winners of 167 new production licenses in its 27th offshore oil and gas licensing round. The notable winners include Apache Corp., BG Group, Maersk, Nexen, Premier Oil, Royal Dutch Shell, and Total.

The licences, offered by the Department of Energy and Climate Change (DECC), cover 330 North Sea blocks, with an additional 61 blocks under environmental assessment.

In May 2012, the government announced a record 224 applications for licenses on 418 UK Continental Shelf blocks were to be submitted for the 27th round. In this latest round, Apache has been offered 14 blocks in the northern part of the North Sea, where it will be required to acquire 3D seismic data.

Most offers have been made in the central North Sea, where BG Group has been offered 7 blocks and Shell 5 blocks. In the central North Sea, Maersk has been offered 4 blocks while Nexen has been offered 17 blocks, which includes a commitment to drill at least four wells on 2 of these blocks.

Premier Oil has been offered 8 blocks in the central zone and Total has been offered 16 blocks in the west of the Shetland Islands. Total has also been offered 4 blocks in the northern North Sea and 2 blocks in the central North Sea. Other companies that have been made license offers include BP, Centrica, ConocoPhilips, E.ON, GDF Suez, OMV, Statoil, and Tullow Oil.

Chevron, NASA's JPL team up for high-tech exploration, production

Chevron has teamed up with NASA's Jet Propulsion Laboratory to bring space-age techniques to down-to-Earth energy exploration and production involving increasingly harsh environments, according to AOL Gov newsletter.

Just as NASA has learned to work in the super-hot and fluctuating pressure environments in space and other planets, Chevron wants and needs to work in similar environments as energy exploration becomes more complicated.

"At JPL, we do unmanned exploration of space, using robotics and communications in very difficult environments," said Dean Wiberg, program manager in the commercial program office of the Jet Propulsion Laboratory. "All of those techniques for very harsh environments have applications for the equally harsh environments of oil and gas exploration."

He added: "If you go down 20,000 ft,



NASA Mars rover Curiosity at JPL

there is a lot of temperature variation and high pressure. This is very analogous to things we deal with in space."

The JPL technologies of interest to Chevron include valves to control oil and gas flow from different geological formations in a well; single-phase pumping motors for continuous operation at the bottom of deep wells; sensors and electronics to deploy in exploration holes; and integrated management systems for monitoring temperature, pressure, and flow rates in deep wells and assessing the health of drilling operations.

JPL will be looking at applications for its technology at Chevron in the upstream, midstream, and downstream sectors.

Deloitte says drilling confidence returning to UK offshore sector

Drilling activity is reviving offshore the UK, according to the latest North West Europe Review by Deloitte's Petroleum Services Group. The number of wells drilled in the UK sector during the first 9 months of this year is only 6% below the total for all of 2011.

Additionally, the number of transactions involving UK offshore oil and gas fields is already 5% up on last year's count. And the number of fields granted development approval in the UK this year has surpassed the total in 2011.

Although there was a decrease in the number of exploration and appraisal wells drilled in Q3 2012 compared to Q2 2012 the underlying trend is of greater stability, according to Graham Sadler, managing director of Deloitte's Petroleum Services Group.

"We're still not seeing pre-recession levels of activity," he said, "but there's a definite feeling of some confidence coming back to businesses operating in the UK continental shelf."

New field allowances introduced by the government this year, including the shallow water gas allowance, are starting to deliver benefits, and the government's plans to create more certainty around decommissioning tax relief should stimulate further interest in the sector.

Seven new UK fields are online this year so far, compared to five in 2011.

Offshore Norway, drilling activity fell by 44% in the Q3 compared to the same period last year, although activity has largely focused on appraising existing discoveries and exploiting major fields as opposed to new well exploration and appraisal.

Shell ends its 2012 Arctic drilling season in Beaufort, Chukchi seas

Shell has ended its troubled 2012 drilling season in Alaska's Beaufort and Chukchi seas. Under the terms of the company's Federally approved exploration plans, drilling had to finish by 31 October.

The company said it drilled the top sections of the Burger-A well in the Chukchi Sea and the Sivulliq well in the Beaufort Sea, and that these top holes will position Shell for a drilling program in 2013.

Shell's Kulluk drilling unit was in the final stages of demobilizing from its location in the Beaufort Sea, while the drillship Noble Discoverer had begun sailing south from its Chukchi Sea well roughly 70 mi from the coast.



The drillship Noble Discoverer

Shell had originally planned to complete several wells in the Chukchi and Beaufort seas this year. However, delays in the deployment of an oil containment barge that forms part of the company's oil spill response fleet caused the company to trim back its plans to the drilling of top hole sections of wells above any hydrocarbon bearing zones.

Shell said limited operations off Alaska this year proved that the company can "drill safely and responsibly in the Arctic."

Although oil companies have drilled nearly three dozen wells in the Beaufort and Chukchi seas between 1982 and 1997, Shell's latest Arctic venture is the first bid to find crude underneath these waters in decades and the first since the Gulf of Mexico oil spill focused new government scrutiny on the safety of offshore drilling.

Safety at Sea delivers first port project for Melones Oil Terminal

Glasgow-based marine safety consultancy, Safety at Sea Ltd. has completed its first port project for the Melones Oil Terminal, (MOT) in Panama. MOT is a 2.1 mmbbl capacity tank farm facility due to open before the end of 2012 on the Islas Melones, a greenfield development around 8 nmi from the Pacific end of the Panama Canal.

Safety at Sea provided a marine safety assessment covering marine procedures and operational limits around the newly constructed terminal. The project encompassed the modeling of vessel maneuverability in the waters approaching the transfer and storage terminal and devising the initial stages of a vessel traffic management system. Safety at Sea also prepared a plan to ensure MOT's International ship and port facility security code compliance.

Dr. Luis Guarin, Safety at Sea director of safety engineering, said, "This is the first time we have been able to make our marine safety and navigation expertise available directly to a port customer. The merger of Safety at Sea and Brookes Bell last year brought considerable master mariner and port experience to our offering. Being called in to verify the marine-related aspects of this major development confirms the way cross-fertilizing in-house expertise has significantly broadened our scope."

He added, "We combined the modeling, simulation, design, and consultancy capabilities, evolved over a number of years, with in-house expertise at Brookes Bell to offer an innovative package of services that signals our ability to address port development issues at an early stage."

The MOT, which will mainly cater to local bunkering requirements, is situated on an island within the approaches to the Panama Canal. As part of its traffic management review, Safety at Sea assessed how tanker and barge operations would interact with both through-canal traffic and around anchorage sites in the area, where up to 100 vessels can be waiting at any time.

Safety at Sea established traffic management rules and drafted an outline specification of navigational aid equipment that the terminal might require. The company also used its proprietary software to undertake simulations to better understand maneuvering for berthing and un-berthing tankers in a range of weather conditions in both laden and ballast conditions as well as requirements for tug and pilot boats. It used three models from its extensive library to cover a variety of ship types and operational conditions.



The new Melones Offshore Terminal

Fram one of Shell's biggest projects in Scottish North Sea in a decade

Shell said it will undertake one of its biggest Scottish North Sea energy projects in the past decade, which will pump 5% of Britain's gas needs at peak production. The company noted that it would develop the Fram oil and gas field about 135 mi east of Aberdeen following the green light from the Department of Energy and Climate Change.

"The durability of oil production in the North Sea constantly confounds expectation," Energy Minister John Hayes said.

Shell, which shares the field with ExxonMobil, said Fram will come on

stream in 3 years and produce 35,000 boepd at its peak.

Two-thirds of production from Fram will be gas, and it will be developed using cutting-edge technology. This will include a floating, production, storage and offloading (FPSO) vessel and a pipeline spur that will go to St. Fergus, near Peterhead.

The field is about 30 mi west of the line dividing the UK North Sea from Norway's marine territory in waters roughly 100 m deep. The development plan contains eight production wells, one production water re-injection well, and two subsea drill centers—all producing to an FPSO vessel.

UK oil and gas professionals feel under appreciated: CRG study

Almost half (48%) of UK oil and gas professionals have not received inflationary pay rises within the last 2 years, according to research released in early November by oil and gas recruitment specialists Change Recruitment Group.

One in 10 (10%) said there were structures in place within their organizations to ensure that pay keeps pace with inflation. A fifth (20%) said they had received nothing at all.

Over two thirds of respondents (73%) subsequently felt that they would be paid better if they worked for a different organization. Over half (54%) also thought benefits would be better if they jumped ship.

Over a quarter (26%) of oil and gas workers felt they were not appreciated by their organization.

The figures highlighted that frustrations are starting to show as three quarters (75%) confess to job hunting, with almost half (44%) of those looking for a move in order to take a step up.

"The failure of pay rises to keep pace with inflation ultimately amounts to a backwards step in earnings for employees. It is really disappointing to see that only one in 10 organizations have the appropriate structures in place to assess pay," said Laura Drysdale, Change Recruitment's international managing director.

Research for this report was conducted in September, with 800 responses across the UK.

Two dead, one missing, nine hurt in U.S. Gulf platform explosion

An explosion and fire aboard a Black Elk Energy production platform offshore Louisiana in mid-November left two workers dead, another missing and presumed dead, and eight others injured and treated at local hospitals in the New Orleans area. Eleven others were safely evacuated, the company said.

The platform, located at West Delta Block 32 about 17 mi southeast of Grand Isle in the Gulf of Mexico, had been shut-in since mid-August.

The National Response Center, U.S. Coast Guard, and the Bureau of Safety and Environmental Enforcement (BSEE) were promptly notified of the incident. The fire was extinguished within an hour.

The cause of the explosion and fire were under investigation. Authorities said the blaze erupted the morning of November 16 while workers were using a torch to cut an oil line on the platform.

Black Elk said no oil was leaking from the charred platform.

GE gets subsea contract for Chevron project
 Chevron Overseas Congo Ltd. has signed a \$165 million contract for GE Oil & Gas to supply subsea production equipment to the offshore Lianzi project between Angola and the Republic of Congo. GE will supply seven trees, nine subsea control modules, topside and subsea controls distribution equipment, and vertical connection systems. Completion of the first tree is scheduled for Q4 of 2013, with GE's Aberdeen, Nailsea, and Sandvika (Norway) sites collaborating on project delivery. The \$2 billion Lianzi development will include a subsea production system and a 27-mi electrically heated flowline, the first of its kind at this water depth. The flowline will transport oil from the field to the BBLT (Benguela-Belize, Lobito-Tomboco) platform.

Eri contracts subsea umbilicals from Aker

Eri has contracted Aker Solutions to provide umbilicals for the offshore Angola block 15/06 West Hub development for \$50 million. Aker Solutions' scope of work includes engineering, procurement, fabrication, and supply of static and dynamic steel tube umbilicals, totaling 21 mi, in addition to associated equipment and hardware. Delivery is scheduled for Q1 2014. The West Hub development project is approximately 218 mi northwest of Luanda and 81 mi west of Soyo in Angola. West Hub consists of the main field Sangos and two additional satellite fields, Cinguvu and Ngoma.

Total installs downhole valves offshore Gabon

Red Spider has won a 3-year contract to supply downhole devices on Total's Anguille field offshore Gabon. As part of the 3-year agreement, Red Spider will supply and service eREDs for the Anguille field in Gabon. The company will deploy 12 of its 3.25-in. remotely operated eREDs, two in each of the six wells. These will be positioned as barriers within injector wells, with one eRED used as a shallow-set barrier and the second as a deep-set barrier. The technology allows opening and closing of the valve numerous times, which, according to Red Spider, potentially saves many additional hours of rig time.

Aquaterra to engineer centralizers for platform

BP Azerbaijan has contracted Aquaterra Energy to design and install 260 centralizers for the West Chirag platform in the Azeri-Chirag-Gunesli (ACG) oil fields in the Caspian Sea. Aquaterra Energy's scope includes pre-engineering casing requirements and devising a centralizer package for the tieback operations. The West Chirag platform has 48 drilling slots, 20 of which are tieback slots. A maximum of 17 wells will be tied back to the platform during the pre-drilling program and will require centralization. Aquaterra Energy has developed the centralizer package in conjunction with the riser analysis to verify that conductor connections, centralizers, and joint positions comply with the analysis requirements. The centralizers will provide an interface between the platform jacket structure and the well system.

Gulf of Mexico: On the mend to a bright future

The worldwide financial crisis and subsequent economic recession, shale gas' implications on U.S. natural gas prices, and the aftermath of the Deepwater Horizon disaster have led to significant changes in the outlook for the Gulf of Mexico.

Despite these overwhelming obstacles, the region's future is bright with a pronounced recovery expected in all major market segments from drilling to subsea, floating production, and marine construction, Quest Offshore concludes in its latest market report, "Quest Deepwater Review: Gulf of Mexico 2013 and Beyond."

Overall spending in the region is expected to increase significantly starting in 2013, up nearly 30% to \$40 billion, with total expenditures expected to reach a significant \$167 billion in the 2013-2016 period. For the first time, the report says, 2012 is expected to represent an investment shift with deepwater capital and operating spending surpassing that in shallow water.

In the under-developed ultra-deepwater frontier areas of the region, challenging technical and reservoir conditions will result in increased spending across the board, a trend expected to continue through the foreseeable future, according to Quest's report.

Five years ago, the region was a mix of major and independent oil companies executing both oil and gas standalone and subsea tieback projects. In 2013 and beyond, Quest sees more oil dominance with offshore gas waning. Large international oil companies will play a larger role with the execution of standalone (hub) projects, with niche-focused independents looking to infrastructure-led drilling around existing hubs and mega-independents continuing to grow their strategic portfolios in select basins.

With one-third of active deepwater leases, oil majors, national oil companies, and some large independents are expected to continue to be the driving force for pushing the boundaries of the Gulf of Mexico's development. Drilling permit approvals are showing noticeable increases over the past 6 months, with total counts back to pre-Macondo levels. As of the end of September, there have been 78 new exploration drilling permits and 36 new development drilling permits approved over the year.

Notable discoveries of ultra-deepwater fields in the Lower Tertiary continue to increase the reserve and production expectations for the region. The shift in the Gulf is most apparent in the floating rig market, with four operators now possessing 50% of the contracted rig fleet. Approximately 90% of rigs operating are high-spec and rated for ultra-deepwater.

A shift toward fewer, larger subsea tiebacks as well as increased FPS units will have profound effects on the future of the subsea sector as the hardware installed evolves as a direct result of fewer gas developments and deeper, more challenging fields, according to Quest. This next wave of FPS developments is, for the most part, in ultra-deepwater and in more remote areas not currently connected to shallow water or onshore infrastructure. These developments will materially impact the pipeline and marine construction markets (SURF) as these production hubs are connected to existing export infrastructure through 2016 and beyond. The subsea tieback potential for these hubs is most likely to be seen in the latter half of this decade, Quest says.



Installation of Shell's Perdido platform in deepwater GoM

Gulf of Mexico

LLOG, Blackstone form \$1.2B strategic partnership in U.S. Gulf

LLOG Exploration Co. LLC and Blackstone have formed a long-term, strategic partnership, committing to invest more than \$1.2 billion to expand and accelerate LLOG's offshore operations in the Gulf of Mexico. The partnership is said to be the largest private equity financing executed in the U.S. Gulf to date.

The partnership will leverage the combined operational and financial resources of LLOG and the private equity funds managed by Blackstone to expedite development of LLOG's four recent deepwater discoveries as well as the exploration and appraisal of its extensive prospect inventory, which includes over 110 offshore leases.

In addition, the partnership will expand LLOG's asset base in the U.S. Gulf through Federal lease sale participation, farm-ins, and merger and acquisition activities, further building upon its position as one of the largest private companies in the basin.

Blackstone is one of the largest alternative asset managers in the world, with more than \$205 billion in assets under management.

Mexico's deepwater oil discovery may hold 75 to 125 mmbbl

Petróleos Mexicanos (Pemex) has discovered a potential new oil field in deep-water Gulf of Mexico, said Mexico's President Felipe Calderón. The Supremus 1 well, 155 mi offshore Tamaulipas in 9,5134 ft water depth, was drilled to 3,609 ft below the seafloor.

The well is less than 25 mi from the international maritime boundary between Mexico and the United States. Calderón said Pemex hopes to confirm new 3P reserves between 75 and 125 mmbbl of oil. If confirmed, Pemex will have doubled its current proven reserves when coupled with the recent Trion 1 discovery.

Technip awarded subsea contract for the Cardamom field in GoM

Technip was awarded a lump sum contract for the development of subsea infrastructure for the Cardamom field located in the Gulf of Mexico, Garden Banks block 427. The field is at a water depth of approximately 830 m. The project consists of a subsea tie-back to the Auger tension leg platform, wholly owned by Shell Offshore Inc.

The contract covers the project management, engineering, fabrication, and installation of the East and West Loop 12.8 km pipe-in-pipe flowlines with associated PLETs and steel catenary risers.

Technip's operating center in Houston, Texas will perform the overall project management. The flowlines and risers will be welded at Technip's spoolbase in Mobile, Alabama.

The offshore installation is expected to be performed in the second half of 2013 by the Deep Blue, Technip's deepwater pipelay vessel, and the Pioneer, which was recently added to the Technip fleet with the acquisition of Global Industries.

Exxon adding to U.S. Gulf position with stakes in Phobos, Thorn

ExxonMobil Corp. said recently it acquired interest in several blocks in the Gulf of Mexico, where it already has an active drilling program. Exxon acquired a 20% interest in the Phobos prospect and a 35% interest in the Thorn prospect in the third quarter, Exxon investor relations executive David Rosenthal told analysts on a conference call.

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Pipelay vessel *Intrepid* goes to Stabbert

Helix Energy Solutions agrees to sell three pipelay vessels

Helix Energy Solutions Group Inc. has agreed to sell its three pipelay vessels, the Caesar, Express, Intrepid, and related equipment in separate transactions for \$252.75 million.

Helix has agreed to sell the Caesar, Express, and related equipment to Coastal Trade Ltd. for \$238.25 million. The sale is expected to close in two

stages as each vessel completes existing contractual backlog. The Express closing is expected to occur in February 2013 and the Caesar closing is expected in July 2013. In a separate transaction, Helix sold its pipelay vessel, Intrepid, to Stabbert Maritime Holdings, LLC for \$14.50 million. Helix retains its Ingleside, Texas, spoolbase.

Seadrill commits to further Samsung drillship for \$600 M

Seadrill has entered a turnkey contract with Samsung to build a new ultra-deepwater drillship in South Korea. The estimated price is about \$600 million, including project management, drilling and handling tools, spares, capitalized interest, and operation preparations. Delivery is scheduled for Q4 2014.

Additionally, Seadrill has agreed to a fixed-price option for construction of a further drillship at the yard, due to be delivered in the 2015 first quarter. The company believes that continuing drilling demand will lead to limited rig availability in 2014 and is currently discussing details of upgrades for that unit.

The new drillship will be of the same

design as six existing vessels Samsung is building, with a hook load capability of 1,250 t and a water depth capability of 12,000 ft. The main target areas are the Gulf of Mexico, Brazil, and West and East Africa. As before, the new units will be outfitted with a seven-ram BOP stack configuration and with storing and handling capacity for a second BOP. Seadrill currently has 19 newbuild rigs on order, including seven drillships, two harsh environment semi-submersibles, five tender rigs, and five jack-ups.

PGS orders two Ramform Titan seismic vessels from Mitsubishi

Petroleum Geo-Services ASA has ordered two additional Ramform Titan-class seismic vessels from Mitsubishi Heavy Industries Ltd. Two vessels were ordered in 2011 with an option for two more, and PGS says it has exercised that option. The first two of the four vessels are planned for delivery in 2013 with the second set in 2015. The Titan-class vessels are 342 ft long, 230 ft wide, and have a 21 ft draft. Transit speed is 16 kts with diesel electric power totaling 18 mwt holds two 30-ft workboats.

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Rigs & Vessels

Keppel FELS delivers refurbished Paradise 400 jack-up to Safin Gulf

Keppel FELS has delivered the Paradise 400 jack-up drilling rig to Safin Gulf FZCO (Safin) ahead of schedule. This was a refurbishment and upgrade of a KFELS B Class jack-up that Keppel FELS acquired last year.

The group's offshore technology development division designed the KFELS B Class rig to operate in water depths of 400 ft with a drilling depth of 30,000 ft. It is equipped with a 15,000-psi BOP system, 70-ft cantilever outreach, upgraded mud pit storage capacity of 4,000 bbl, and accommodation for up to 150 personnel.

Other upgrades include two additional knuckle boom cranes, one installed on the port and one on the starboard sides of the cantilever platform to improve efficiency of material handling; and new mud treatment technology systems such as balanced elliptical motion and cascade shakers to provide better throughput capacity.

A compact, derrick-mounted bridge crane has also been installed to improve safety and efficiency of offline stand building, pipe racking, and drill pipe handling. Raimonds Namikis, executive vice

president of Safin, said, "We continue to see strong demand for such high-specification jack-ups from the Middle East to the Gulf of Mexico."

Rolls-Royce to design, power new Brazilian offshore supply vessels

Rolls-Royce, a global power systems company, has won a \$38.2 million order to design and equip four platform supply vessels (PSVs) for Brazilian ship owner Bravante Group, former Navegação São Miguel Ltda, the company said.

The UT 775 SE PSVs are designed to carry deck cargo, pipes, and diesel oil to and from offshore oil and gas platforms. They will be chartered by Petrobras. Bravante Group will build the vessels at its ship yard in Niteroi, Brazil, as it has done for previous orders.

In addition to the design, Rolls-Royce will supply a wide range of onboard equipment, including Azipull and bow thrusters, deck machinery, a bulk handling system, Active Front End (AFE) frequency converters, automation and control systems, and a dynamic positioning system.

Bravante Group now has eight Rolls-Royce vessels under construction.

Atwood Oceanics orders third ultra-deepwater newbuild rig

Atwood Oceanics Inc. has executed an option with Daewoo Shipbuilding and Marine Engineering Co. Ltd. for construction of a third ultra-deepwater drillship. The Atwood Admiral is expected for delivery by 31 March 2015.

It is the same design as the previously ordered Atwood Advantage and Atwood Achiever. All are DP-3, dual derrick vessels rated to water depths to 12,000 ft and drill to 40,000 ft.

Each will offer two seven-ram BOPS, three 100-t knuckle boom cranes, one 165-t active heave "tree running" knuckle boom crane, and accommodations for 200, according to the company.

Atwood also has secured an option for construction of a fourth similar drillship for delivery in December 2015. The option must be exercised by 30 June 2013, the company added.





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GeoGlobal Resources pulls plug on exploration well offshore Israel

GeoGlobal Resources said it will terminate its Sara-1 exploration well offshore Israel. The well, drilled by the semi-submersible Noble Homer Ferrington, has reached a final TVD subsea of 12,887 ft. Based on cutting samples and logging while drilling, the well intersected about 321 ft of good quality reservoir sands in the lower Miocene-upper Oligocene, with good porosity and permeability.

There were indications from the wireline logs that gas has migrated through the system, but the sands are wet with no commercial hydrocarbons present.

Paul B. Miller, president and CEO of GeoGlobal, said, "The result from the well did not meet our expectations, but we believe there are additional prospects in the Myra and Sara licenses and the basin. The company will use the information it has acquired through these drilling operations to further refine the geological model and evaluate the other potential targets in Myra and Sara in conjunction with its partners."

Having completed the work programs in Myra and Sara, the company is now qualified as a deepwater operator in Israel. It intends to use this qualification to open up new opportunities in the basin and abroad.

Anadarko to drill back-to-back wells offshore Kenya for \$140M

Anadarko Petroleum was scheduled to begin exploring for oil and gas in Kenya this month, with plans to drill two wells. The two wells, known as the Kiboko prospect in block L11B and the Kubwa prospect in block L7, will be drilled back-to-back and cost about \$140 million each.

Anadarko is the operator of blocks L7 and L11B and holds 45% of the licenses in each. French oil major Total has a 40% stake, and Cove Energy holds the remainder. The Kiboko and Kubwa prospects will be Anadarko's first wells in Kenya, though it made significant gas discoveries offshore Mozambique earlier this year. The U.S. company has three other blocks offshore but has not yet determined when it will drill wells within that acreage.

Alaska's Beaufort Sea lease sale draws \$1.78 M in apparent high bids

Alaska's areawide Beaufort Sea sale on 7 November attracted 26 bids from five bidders or bidding groups on 26 tracts, a total of 99,200 acres with \$1,781,307.20 in apparent high bids. Last year's Beaufort Sea sale drew 89 bids on 78 tracts with 281,095 acres sold and



Fairfield chief operating officer Ian Sharp on Dunlin platform in North Sea

Fairfield spuds first of three wells in North Sea Darwin area

E&P independent Fairfield Energy has launched the first well of a three-well campaign in the Darwin area of the North Sea. The well, spud 23 October, is being drilled from the Ocean Nomad and is operated by Fairfield.

The Darwin area includes the southern end of Block 211/27a, previously known as the NW Hutton field, together with an extension into Block 211/27e and lies about 130 km northeast of the Shetland Islands in the northern portion of the North Sea.

The drilling campaign follows a multi-year program of subsurface work comprising new 3D seismic and static-dynamic modeling that has resulted in the identification of significant in-place volumes.

Fairfield holds a 50% interest in both blocks following a 50% farm-out to TAQA Bratani earlier this year.

"This exploration and appraisal program is a very exciting event in the history of our company. The multi-well program is testing a significant opportunity, which has the potential to be a material North Sea field," said Chris Wright, Fairfield's chief executive officer.

\$6,874,656.80 in high bonus bids.

NordAq Energy was the major bidder in this year's sale, with bids on 15 tracts, 69,760 acres, for a total of \$1,185,384. NordAq's bids included three at the higher acre bid for this sale, \$29.89 an acre. The tracts surround NordAq's existing acreage in state waters in Harrison Bay north of NPR-A.

A bidding partnership of 25% Dan Donkel and 75% Samuel Cade took 12,800 acres for \$295,936, paying \$26.12 an acre for most tracts. Samuel Cade bidding by himself took three tracts, 7,680 acres, for \$200,601.60, paying \$26.12 an acre for those tracts. A bidding partnership of 25% Donkel and 75% Wiley Lowe took one 640-acre tract for \$10 an acre. The Donkel and Cade acreage ranges from the Badami area to the east

to the Endicott area on the central North Slope. Repsol E&P USA picked up a single tract adjacent to a large block of their holdings north of the Colville River unit and Realeza del Spear Ltd. Partnership out of Midland, Texas, picked up a single tract near Kaktovik.

The State of Alaska and the Federal government actually opened bids for four oil and gas lease sales, including the Beaufort Sea, with preliminary results from the sales showing apparent high bids totaling some \$15.1 million. The majority of that, more than \$14.2 million, came from three state areawide lease sales—Beaufort Sea, North Slope, and North Slope Foothills. The U.S. Bureau of Land Management brought in \$898,901 from its National Petroleum Reserve-Alaska lease sale.

Exploration

CGG Veritas conducts first BroadSeis surveys offshore China

CGGVeritas said it has successfully conducted the first 3D BroadSeis™ marine surveys to be recorded offshore China. The deepwater surveys of two areas offshore Shenzhen in the east of the South China Sea were awarded to CGGVeritas by Chinese seismic services company, COSL (China Oilfield Services Ltd.) on behalf of its parent company, the Chinese National Oil Co. (CNOOC). Data processing was already underway in the CGGVeritas Singapore center and is expected to be delivered by the end of 2012.

The BroadSeis™ surveys were contracted to CGGVeritas under a framework agreement for technical collaboration between CGGVeritas and COSL with respect to BroadSeis™, the CGGVeritas proprietary marine broadband solution. CNOOC is said to have specifically identified BroadSeis™ for the project in order to overcome the challenge of complex imaging of both shallow and deep targets in the area.

The Viking II vessel, operating with eight x 8,100 m Sercel Sentinel streamers equipped with Sercel Nautilus® streamer control devices, acquired the approximately 1,000 sq. km full-fold data over the two survey areas, which included the heavily congested HuiZhou production area.

Political, economic uncertainties in Africa threaten E&P activities

Among the key emerging oil and gas exploration markets in Africa, Kenya has the largest number of active exploration blocks, followed by the Republic of Tanzania, Mozambique, Cameroon, Republic of Congo, Chad, and Uganda. Kenya, Tanzania, Chad, Mozambique, and Uganda also have a large number of planned exploration blocks, according to a recent report by GlobalData.

Increasing oil and gas discoveries in Africa are promoting exploration and production (E&P) companies to explore the region. So far, 64 oil and gas discoveries have been made in the emerging exploration markets of Africa during the 2007-2012 period. Uganda, Mozambique, and the Republic of Tanzania are the regions that have encountered most of the hydrocarbon discoveries.

However, the uncertain political and economic situation in the region is one of the key challenges faced by oil and gas companies operating in emerging exploration markets in Africa, GlobalData reports, adding that such circumstances have led to withdrawal from the region by several international companies in the past.

Political uncertainties have forced some of the oil and gas companies to farm out exploration blocks to other companies. The political and economical uncertainties not only include attacks by rebels or the risk of war, but also include changes in oil and gas taxation, pricing policies, change in customs, and duties. These are some of the issues that threaten operations of oil and gas companies in the region, according to the report, "Emerging Oil & Gas Exploration Markets in Africa."

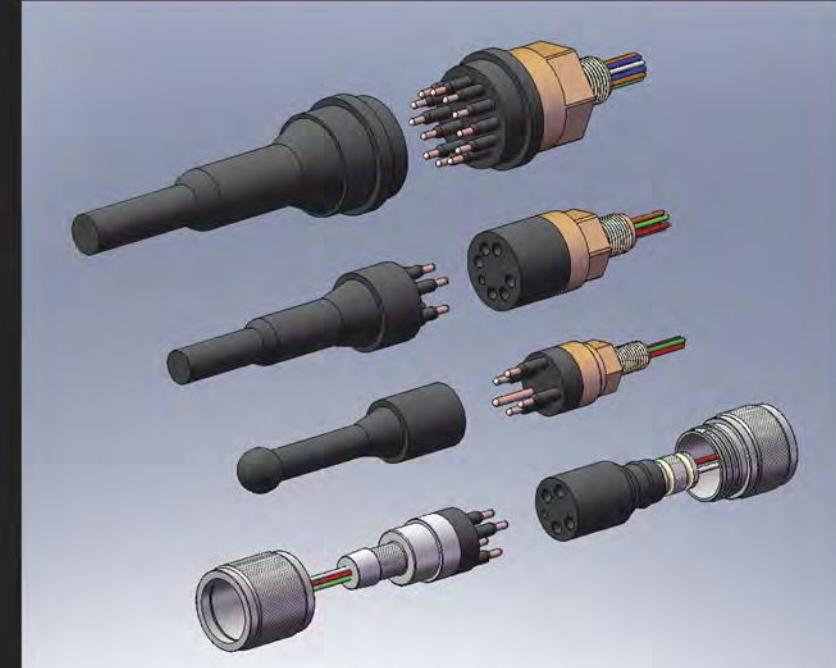


Apache secured the Deepsea Metro 1 to drill Mbawa prospect offshore Kenya



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Expedited isolations pave way for tie-in offshore Malaysia

TDW Offshore Services (TDW) has completed an offshore pipeline pressure isolation operation ahead of schedule in just 18 hours, resulting in minimum downtime, reduced costs, and no impact on the environment, the company said.

TDW conducted the operation on behalf of a Malaysian company. The isolation was carried out in order to prepare for the tie-in of a new gas pipeline to an existing gas export pipeline attached to a platform offshore the east coast of peninsular Malaysia.

To formulate a solution that would make it possible to safely and efficiently perform the eventual tie-in, the Malaysian company worked closely with TDW, which specializes not only in pipeline pressure isolation services, but in assessment and repair, inline cleaning and inspection, and related offshore services.

Following extensive consultation and several visits to the site of the tie-in, TDW and the client decided to carry out double-block isolations against the gas pressure in two connecting pipelines so that work on the tie-in point could take

place safely. One of the primary challenges faced by TDW was the narrow operating window of 26 hours.

Because the platform is a producing platform owned by another major operator, the Malaysian company was required to complete the installation of the tie-in tee as quickly as possible, so as not to disrupt production through the platform



The two double-block pressure isolations were achieved with SmartPlug® isolation technology in just 18 hours

for an extended period.

TDW completed the two double-block pressure isolations with its SmartPlug® isolation technology in just 18 hours. From mobilization to demobilization, the entire offshore operation took only 7 days.

As a result of the double-block pipeline pressure isolation operations, the Malaysian company saved the cost of bleeding down the affected pipelines or flaring off gas into the atmosphere, both of which are costly and environmentally intrusive.

"This operation was like a synchronized pit stop tire change on a Formula 1 race car during a Grand Prix," said Rolf Gunnar Lie, regional business development manager-Asia Pacific for TDW. "Our goal was to keep downtime to a minimum while maintaining the highest possible safety standards, so we planned every isolation down to the smallest detail. It's extremely satisfying that our joint efforts produced such an impressive result, without a single safety incident," he added.

Rochelle drilling suspended for subsea hookup in UK North Sea

The Diamond Ocean Nomad has completed drilling of the first of two planned development wells on the Rochelle field in the UK North Sea to final casing point. According to Rochelle operator Endeavour International, the rig has since moved off location to allow for hookup of the pipelines and flowlines to the subsea manifolds.

The Transocean Prospect will handle final drilling and completion of the first development well after its scheduled arrival in December. Due to the change in the timing of completion of the first well, first production from Rochelle, a tieback to Nexen's Scott platform, is now expected in January. The Rochelle subsea infrastructure installation reportedly has been substantially completed.

Latest South Pars jacket heads to installation site offshore Iran

One of the platform jackets for the South Pars phases 22-24 project has been loaded out from SADRA Co.'s construction complex in southern Iran. The 2,425-t structure and its accessories, which weigh 2,205 t, were due to undergo a 2-day journey to the South Pars gas field offshore Iran, followed by a 2-day program for the installation.

It was designed and built entirely by Iranian engineers in 6 months using local facilities, according to a SADRA official. The company is also building the platform's bridges and flare.

Full development of phases 22-24 involves construction of four new jacks, each weighing 2,000 mt, four well-head platforms and accessories with a total weight of 2,535 t, four connecting bridges each weighing 264 t, and four flares each weighing 121 t. Remaining components of the project, with a total weight of 33,620 t, are under construction at the Bushehr Farasahel Factory.

More horizontal wells planned by Lukoil in north Caspian field

Lukoil has drilled four new complex development wells this year at the Yu Korchagin field in the Russian sector of the northern Caspian Sea. Horizontal borehole length varied from 6,562 to 16,405 ft, with initial flow rates between 4,000 and 10,000 b/d.

Next year, the company plans to drill four more horizontal wells, with a horizontal displacement potentially more than 19,685 ft.

Following a geological survey this year, the field's recoverable oil reserves have been upgraded by about 50% to 360 mmbbl.

Chevron, BG Group proceed at Starfish gas field in Trinidad

Chevron Corp. and BG Group Plc have approved the Starfish natural gas field development project in Trinidad and Tobago, Chevron said. The field off the east coast of Trinidad is operated by BG Group subsidiaries. Both companies have a 50% stake in the project, according to a statement. First gas is planned to come on stream in Q4 2014.

Natural gas produced at the field will be mixed with output from the Dolphin project and delivered through existing pipelines to supply contractual commitments with the National Gas Co. of Trinidad and Tobago and Atlantic LNG, Chevron said.

Appraisal well to secure 'optimal' development solution for field

Statoil and its partner Sinochem have completed the drilling of appraisal well 3-STAT-8-RJS at the Peregrino field, 85 km offshore Brazil. The field is located in the Campos basin at about 100-m water depth in licenses BM-C-7 and BM-C-47. The main objectives of drilling the well were to confirm the previous volume estimate for the Peregrino South discovery and secure an optimal development solution for the Peregrino Phase II development.

Proserv wins Cygnus topside controls contract

Proserv, a leading global provider of production technology services, has secured a \$1.9 million contract to supply topside control equipment at a major southern North Sea development.

The company was awarded the deal on the Cygnus field by operator GDF SUEZ through its design contractor AMEC. As part of the agreement, Proserv will supply the design, engineering, and build of well-head control panels and accompanying topside umbilical termination units for the Alpha and Bravo platforms.

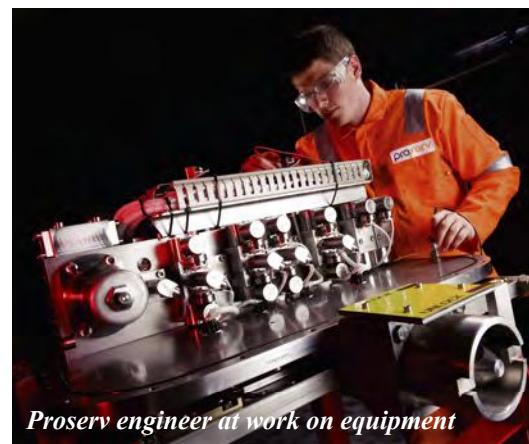
Six of the 10 development wells for both platforms will be controlled by the initial panel design and include the commissioning of spares and specialist tools. Proserv's team of control experts based at the company's dedicated engineering and manufacturing facility in Great Yarmouth will play a key role in carrying out the work.

The production platform will use an umbilical to provide fiber optic communication and utilities to the Bravo well-head platform, and Proserv will also sup-

ply the topside termination panels for the utilities. The subsea export pipeline has a subsea isolation valve (SSIV) fitted, which is controlled from the production platform, with Proserv providing the topside umbilical termination unit.

Design and engineering work is currently underway, with equipment due for delivery in 2013-14. This latest deal follows the announcement in August of two contracts worth a combined \$9.5 million. The first project involves the provision of electro-hydraulic multiplex subsea control systems at the Maersk Oil-operated Talisman Clyde-platform over 12 months. Topsides and subsea manifold control systems support is being provided on a development in the Southern North Sea for the second.

Commenting on the project win, David Lamont, Proserv's chief executive officer, said, "The award of this contract is further evidence of the great reputation the team in Great Yarmouth, and indeed Proserv, has built and continues to build with our customers globally."



Proserv engineer at work on equipment

"Our values combined with market-leading technologies and great people allows us to deliver world-class products and services from our Great Yarmouth facility on time and within budget consistently. These elements have been crucial in supporting our expansion to date and will stay at our core as our reputation and business continues to grow."

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Wärtsilä wins contract to supply ballast water management systems

Wärtsilä has won a contract to supply ballast water management systems (BWMS) to four platform supply vessels (PSVs) for Tidewater Marine, LLC, a provider of offshore service vessels to the global energy industry.

The scope of supply for the vessels, due for delivery from the COSCO (Guangdong) Shipyard in 2014, includes four 250 m³/hr-capacity Wärtsilä AQUARIUS® UV BWMS, which will be assembled and shipped from Wärtsilä's manufacturing facility in the UK. The contract was signed with COSCO shipyard in August.

Wärtsilä AQUARIUS® UV is a modular ballast water management system involving filtration and medium pressure UV disinfection technology, designed to provide a safe, flexible, and economical process.

The 3,800-dwt PSVs will transport pipes, equipment, and cargo to and from pipe laying barges, oil drilling, and production platforms. Recognizing the associated operational profile, AQUARIUS® UV was favored over the alternative AQUARIUS® EC system due to owner technology preferences and more favorable space, power, and cost constraints on this ship application. The first of the AQUARIUS® UV systems will be delivered to the shipyard in January 2013 and then at 2-month intervals.

Ballast water treatment with the AQUARIUS® UV system is achieved

through a two-stage process. Upon uptake, the sea water is first passed through a back washing filter. The filtered sea water then passes through a UV chamber where ultraviolet light is used to disinfect the water prior to entering the ballast tank. Upon discharge, water from the ballast tanks passes through the UV chamber only for a second time.

For more information, contact Karina McCormack at kmccormack@hamworthy.com, or phone +44 (0)1202 662636.

Plustek's new OpticFilm 8200i Ai for 35-mm film and slide scanning

Plustek Technology Inc., a manufacturer of consumer, prosumer, and professional imaging devices, has released the latest addition to its award-winning OpticFilm line of scanners with the OpticFilm 8200i Ai, delivering professional grade 35-mm negative and slide scanning with 7200 dpi resolution.

With its state-of-the-art optical system, the new OpticFilm 8200i Ai is an exceptional scanner for professional photographers. It is also a great solution for amateur photographers, graphic designers, photo enthusiasts, and any others who demand high-quality digital reproductions of their 35-mm film and slides. The OpticFilm 8200i Ai's LED light source, CCD imaging sensor, and IT8 calibration bring photographers a sharper image and brighter colors, resulting in image quality that is a step above the rest.



Bundled with the purchase of the OpticFilm 8200i Ai scanner is LaserSoft Imaging SilverFast Ai Studio 8, which includes Multi-Exposure and iSRD—two essential technologies for scanning 35-mm negatives and slides. Multi-Exposure enhances dynamic range, diminishes noise, and enriches image detail. SilverFast iSRD electronically removes dust and scratches from film using the scanners' built-in infrared channel.

For more information, please visit www.plustek.com/usa.

MacArtney introduces the 21 pin SubConn® connector series

MacArtney recently launched the micro 21 pin connector, which marks the latest addition to the series of wet mateable connectors in the SubConn® range. This latest addition has been designed for underwater technology projects requiring multiple sensor, signal, and data connections—along with power connections. In particular, the 21-pin SubConn® connector is ideal for applications that require a large number of connections within a limited space.



This new SubConn® connector—with 21 pins for data and signal—is based on the existing B size connector range, offering the assured quality and reliability already proven through decades of offshore use.

Moreover, using the same dimensions as the standard B size connector, the 21-pin connector is compatible with the same range of locking sleeves, nuts and other accessories.

For more information on this product, visit the MacArtney website at www.macartney.com or the SubConn website at www.subconn.com.

Emerson, Statoil to enhance reservoir management tools

Emerson Process Management has teamed with Statoil to develop and test technologies that will enable more accurate and realistic production planning and field management for oil and gas reservoirs.

The 3-year project will lead to enhancements in Emerson's Roxar reservoir management software tools, especially the ability to improve reservoir simulations by incorporating actual production history into mathematically based reservoir models. The results will help geologists, production planners, and reservoir engineers to better manage the uncertainties inherent in such models and improve oil and gas recovery.

"The staggering complexity of offshore production—especially thousands of meters underwater and hundreds of miles from shore—demands better intelligence and real-time data about reservoirs," said Steve Sonnenberg, president of Emerson Process Management. "We welcome this opportunity to work with Statoil to develop solutions that better estimate future production and help maximize recovery from its reservoirs."

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JANUARY 2013

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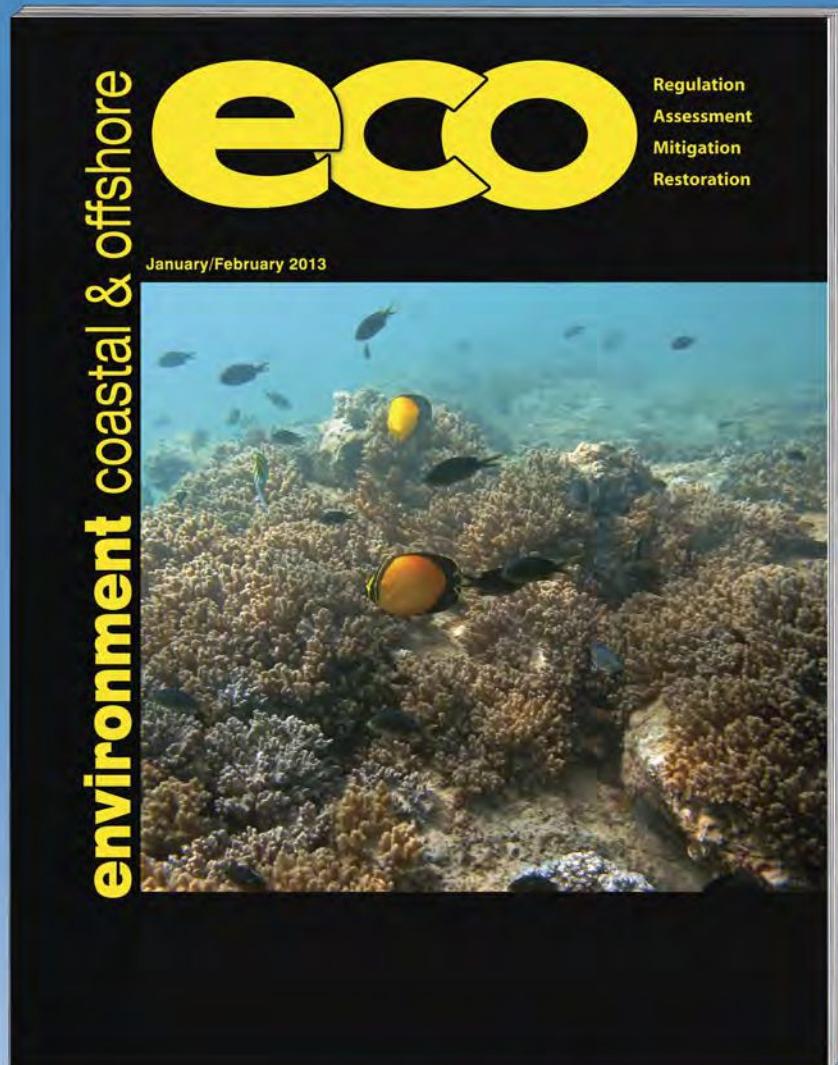
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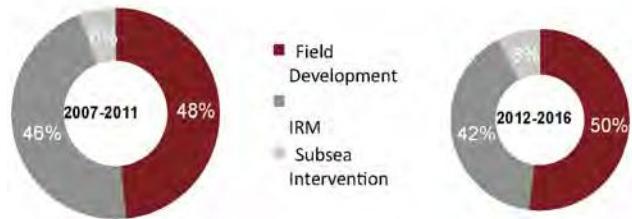


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Deep Water Developments and Increased Confidence Driving Growth in Subsea Vessel Operations

The new second edition of *The World Subsea Vessel Operations Market Forecast 2012-2016* analyzes the main factors that are driving demand for ROVSV, DSV, Flexlay, LWV, and pipelay vessels and provides supporting information analyzing each key sector. The report builds on the success of the first edition to include a comprehensive supply-side competitive landscape with major players and their fleets, segmented by vessel type, day-rate analysis, and geographic focus.

By Joseph Corrigan, Douglas-Westwood



Market Summary

DW forecast that approximately \$77 billion will be spent on subsea vessel operations in field development, inspection, repair & maintenance (IRM), and subsea well intervention between 2012 and 2016,. This is an increase of 63% over the preceding 5-year period. Global vessel demand for these markets is expected to increase 33% on the previous 5 years.

Global vessel expenditure grew from \$8.7 billion in 2007 to over \$10 billion in 2009 before dipping in 2010. During this period, vessel contractors were largely insulated from the financial crisis that strongly impacted some other sectors and were able to work off their backlog.

Subsea Vessel Operations

The report considers three main areas of activity: Field Development, IRM, and Subsea Well Intervention.

Subsea infrastructure and equipment are installed by vessels with specialist capabilities. Subsea wells and infrastructure require regular IRM and intervention services to ensure production rates remain high. Subsea tasks and services often involve complex and challenging engineering in difficult conditions, which is why the costs associated with subsea developments can be far higher than platform-based developments.

Field Development: Tasks carried out by vessels that can lift and install offshore and subsea infrastructure for new developments or connect additional subsea equipment to an existing production facility.

The field development market is expected to see strong growth from 2012 onwards, with vessel day demand totalling an estimated 149,413 days with \$4.2 billion of expenditure over the forecast period.

The sector suffered a 5% decrease in activity of 5% between 2008 and 2010, a drop in 2,586 vessel days, as operators stalled projects due to the economic crisis. 2012 will mark the first year of growth after this period as confidence returns to the market and operators drive delayed projects into the installation phase.

Africa and Latin America will exhibit strong demand for field development and construction vessels and will become the most significant regions, requiring approximately 10,000 and 7,000 vessel days, respectively, by 2016. The develop-

ment of Brazil's pre-salt basins will be the dominant driver for this.

Future demand will be driven by developments in deeper waters. Oil majors have an urgent requirement to renew reserves to keep up with growing global demand for oil and gas, and the largest prospects lie in deep water.

Between 2012 and 2016, the number of vessel days associated with deepwater developments is set to more than double, with an estimated 26,223 required by 2016.

IRM: Tasks carried out on offshore infrastructure below the water line in order to maintain production and ensure suitable HSE standards are met.

Total demand for IRM vessel activity grew by 19% between 2007 and 2011, and expenditure reached \$4.5 billion in 2011 which represents nearly 27,929 vessel days. This continuing upward trend is being driven by the growing installed infrastructure base and is forecast to be worth \$7.5 billion by 2016, a 53% growth on 2012.

North America is the most dominant region for IRM activity due to the mature nature of the region and the sheer volume of infrastructure in place. Over the forecast period the region will require 25% of all IRM activity and have estimated expenditure of \$7.5 billion. This is impacted by the Deepwater Horizon accident, which has placed greater focus on regulators to ensure infrastructure is inspected at more frequent intervals.

Subsea well intervention: An umbrella term for a number of distinct tasks designed to maintain structural integrity of wells or increase production.

The use of intervention vessels will grow due to substantial cost savings over using rigs. From 2012 onwards, the demand for riserless and rigless intervention vessels will increase dramatically by 77% to 5,443 days by 2016.

The vessel demand forecast over the period 2012-2016 is expected to total an estimated 23,046 days—an increase of 132% compared to the previous 5-year period. This demand growth is driven by the realization by the major market players of the large cost savings possible through the use of intervention vessels and the subsequent increased adoption of this reasonably new technology.

Market Forecast

Subsea Vessel Supply

The last 5 years have seen an unprecedented increase in the number of newbuilds entering the subsea vessel market. Between 2006 and 2012, 169 vessels joined the fleet, increasing capacity by 60% from 277 to 446.

Cyclical has always been an inherent characteristic of this market (similar to most offshore oil and gas sectors). The recent cycle has dwarfed all historic newbuild booms and as a result of the slackening of demand due to the economic downturn and saturation of the market we are now in a period of oversupply.

Vessel Contractor Competition

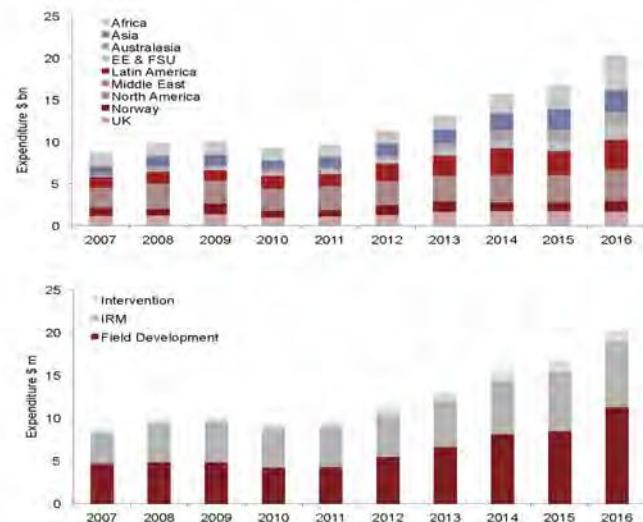
The market for vessel contractors operating in field development, IRM, and subsea intervention is highly fragmented. DW has identified 446 vessels from 83 contractors. While there has been some consolidation in the industry with the Subsea7/Acergy merger, the vessel market is composed of a significant number of international vessel contractors and smaller regional players.

The industry possesses high barriers to entry. New competitors face the challenges of the complex nature of project execution involved in offshore developments, the requirement for highly skilled employees, and limited access to cheap newbuild financing options. Additionally, operators tend to favor companies that have a proven track record and the experience of completing high cost projects.

Market Forecast

DW forecast strong growth over the next 5 years with annual subsea vessel: operations expenditure set to rise from \$11.3 billion in 2012 to \$20.3 billion by 2016. This growth is a result of confidence returning to the subsea industry, a move towards deepwater in underdeveloped regions and ultra deep in some already developed, and the subsequent increased demand for higher specification vessels over increased operational timescales.

By 2016, there will be a move towards more complex deepwater projects being sanctioned, and this should benefit the vessel contractors with deepwater capability and engineering experience. Deepwater awards will suit contractors with modern vessel fleets, strong project execution skills, and a strong track record in delivering such projects.



Total Expenditure by region

\$bn	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Africa	1.61	1.51	1.56	1.49	1.48	1.51	1.69	2.34	2.83	4.14
Asia	1.00	1.25	1.30	1.00	1.26	1.48	1.66	2.03	2.45	2.65
Australasia	0.23	0.53	0.32	0.44	0.29	0.46	0.72	1.35	1.44	1.38
Eastern Europe & FSU	0.06	0.08	0.24	0.37	0.50	0.49	0.73	0.82	1.14	1.83
Latin America	1.27	1.42	1.23	1.50	1.40	2.08	2.37	3.13	2.87	3.61
Middle East	0.47	0.69	0.72	0.81	0.77	0.77	0.80	0.75	0.63	0.65
North America	1.93	2.36	2.01	1.83	2.13	2.09	2.29	2.57	2.66	3.05
Norway	0.95	0.76	1.27	0.81	0.75	1.20	1.26	1.02	0.98	1.30
UK	0.91	0.87	0.95	0.69	0.76	0.93	1.25	1.36	1.09	1.16
RoWE	0.26	0.35	0.43	0.29	0.33	0.32	0.36	0.38	0.68	0.50
Total	8.7	9.8	10.0	9.2	9.7	11.3	13.1	15.7	16.7	20.3

Total Expenditure by Sector

\$bn	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Field Development	4.67	4.88	4.87	4.25	4.30	5.50	6.63	8.18	8.53	11.33
IRM	3.56	4.43	4.67	4.45	4.65	4.93	5.47	6.27	6.83	7.53
Subsea Intervention	0.45	0.51	0.49	0.53	0.72	0.88	1.04	1.31	1.38	1.42
Total	8.7	9.8	10.0	9.2	9.7	11.3	13.1	15.7	16.7	20.3

Forum announces sale to Cummings Consulting, Inc.

Forum Energy Technologies, Inc. (FET) is pleased to announce the signing of a contract with Cummings Consulting, Inc. (Cummings). Under the contract, FET will supply two complete Sub-Atlantic™ Mojave ROV systems. Both of the Mojave ROVs will be equipped with job-specific tooling systems such as electric winches, touch screen control monitors, Sub-can Control Systems, sonar, and color and monochrome cameras. Also included are two three-function manipulators and VisualSoft™ data capture capabilities.

The Mojave systems are capable of reaching depths of 300 m and will be deployed for assessment analysis immediately off the coast of Florida.

"The Mojave was the perfect observation vehicle for us because of its high thrust, low cost, and easy deployment. Our relationship with Forum played an important role in our purchase as well. Over the years, we have always received wonderful support throughout the transaction and beyond," says Joe Cummings, President of Cummings Consulting, Inc.

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



Saab SeaEye Tiger ROV going to Egypt



Egypt's National Institute of Oceanology and Fisheries (NIOF) has chosen a Tiger ROV from Saab Seaeye as their preferred vehicle to undertake a range of studies in the Mediterranean.

The NIOF chose the Tiger over other makes of ROV as it can handle the strong currents of the Mediterranean and dive to 1,000 m.

They like its small, easily handled size that needs little deck space on a small vessel.

Yet despite its compact size, a range of sonars, cameras, and tools can be added as needed to undertake the wide scope of tasks planned by the Institute.

For instance, a four-function manipulator has been included that will manoeuvre a specially designed Saab Seaeye scoop for collecting seabed samples.

For detailed, observation work, the Tiger also comes equipped with a wide-angle, low-light B&W camera and a color zoom camera.

The overall mission of the NIOF is to seek accurate information on the different Egyptian aquatic environments, including typographical features, to improve knowledge of the economic resources in seas, lagoons, and freshwater bodies, along with gaining an understanding of their interactions and influencing factors. This will include studying and monitoring the physical, chemical, and biological changes in Egyptian waters.

For more information, visit www.seaeye.com.

OceanWorks International to perform Deep submergence Systems Scope of Certification work

OceanWorks International has been authorized by the U.S. Navy's Naval Sea Systems Command (NAVSEA) Note 5000 to perform Deep Submergence Systems Scope of Certification (DSS SOC) work in support of designated submarine rescue and intervention systems. The authorization is a renewal of the existing Note 5000 authorization, which has been held by OceanWorks International since 8 September 2011.

OceanWorks International has been work-

ing with NAVSEA and the U.S. Navy for many years. As the OEM designer and manufacturer of both the Pressurized Rescue Module System (PRMS) submarine rescue system and associated systems as well as the ADS2000 Atmospheric Diving Systems, OceanWorks International has played a key role in enabling the submarine rescue capabilities of the world's largest submarine fleet.

For more information, visit www.oceanworks.com.



Lockheed Martin's AUV completes first commercial offshore platform inspections

The Marlin™ Autonomous Underwater Vehicle (AUV) recently conducted the oil and gas industry's first commercial autonomous offshore platform and site inspections in the U.S. Gulf of Mexico.

During its 2 weeks at sea, the Marlin™ AUV successfully completed inspections of fixed platforms, the surrounding seabed, and partially decommissioned work sites undergoing the final stages of clearance activities.

Operating from a small utility class vessel, the 10-ft unmanned submersible logged more than 62 hrs of submerged operations covering 72 mi of seabed. While at sea, the Marlin™ generated 3D geo-referenced models of the platforms and surrounding seabed, creating an accurate bird's eye view of the area.

The 3D models generated by the Marlin™ provide operating companies with a full view of the scene surrounding a structure and the ability to perform metrology of the structures and seabed. This output allowed the operating com-



pany to make accurate operating plans for an upcoming subsea recovery operation within days of deploying the salvage vessel, as opposed to days or weeks using traditional ROV and/or diver inspection methods.

The inspections in the Gulf of Mexico validated the ability of the Marlin™ to provide faster, smarter, and more frequent subsea infrastructure inspections for the oil and gas industry.

For more information, visit www.lmco.com.

SMD trenching ROV #23 delivered to Fugro

Fugro has recently taken delivery of the first of two SMD QT1400 trenching systems for burial of cables, umbilicals,

and flowlines up to a maximum diameter of nearly 36 in.

The vehicle is equipped with a 3-m jetting tool for soils of 100 KPA, a mechanical chain cutter for soils of up to 250 KPA, and an optional track propulsion. The jetting tool is maintained at a constant angle, regardless of burial depth, using a double scissor linkage. The vehicle is able to free-fly (in jetting mode) and operate in water depths of up to 3,000 msw.

The vehicle consists of a common upper power/control/propulsion module, with interchangeable lower modules, depending on its jetter or chain cutter modes. The modules are changed safely at sea using a unique deck transfer system. The turnkey package is completed with a customized launch and recovery system (LARS) rated to Lloyds Sea State 6, employing a snatch load limiter and submersible cursor.

Further module options include cable burial in rock up to 20 MPa, pipeline burial in soft rock, and wire-line core drilling and cutter dredging.

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

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The Cable Tracker 1 system consists of the Signal Injector and the Cable Tracker Probe all for one low price.”



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Kongsberg unveils advanced operations monitoring solution for wide and multi azimuth seismic surveys

Kongsberg is introducing a new concept designed to enhance safety and efficiency for multi vessel seismic surveys. By utilizing the SIMOPS technology developed for complex marine operations involving offshore oil and gas platforms and vessels, SIMOPS for Seismic™ is a great tool and aid in planning, monitoring, and managing complex seismic operations such as wide or multi azimuth surveys. The integral, highly reliable wireless broadband network enables exchange of live HD video and provides critical information between the different vessels.

SIMOPS gives a clear and consistent operational overview onboard the vessels involved and also integrates with AIS (Automatic Identification System) to include third-party vessels in the operational overview. SIMOPS exchanges data between the participating vessels in a seismic operation (seismic vessels, gun boat, workboat, chase boat). As an

example, – a stabilized camera on a work boat can provide live pictures onboard the mother vessel by utilizing the SIMOPS integral wireless “highway.”

Further, the optimized user interface and display areas have overlays that, in addition to navigation charts, objects and vessels can display updated ice charts and specialized information such as seabed maps relevant to the survey area.

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

Bibby Offshore makes multi-million pound investment in ROV fleet

Aberdeen-based subsea installation contractor Bibby Offshore has announced investment of around £11 million in ROV systems for its latest division, Bibby Remote Intervention Limited (BRIL).

Initial investment of close to £4 million has been made in ROV systems for Bibby Offshore's fleet of diving support vessels (DSVs) to bring the service provision in-house, while 46 jobs have been created on and offshore within the divi-

sion already this year.

BRIL has installed Sub Atlantic Comanche ROVs on all three of Bibby Offshore's North Sea fleet of DSVs, including the Bibby Topaz, Bibby Sapphire, and Toisa Polaris. It also supplies BRIL survey and position services on board the DSVs in conjunction with NCS Survey.

BRIL has awarded Soil Machine Dynamics (SMD), based in Newcastle, a 5-year frame contract worth £25 million for SMD to provide a wide range of hydraulic work-class ROVs to BRIL. Under the terms of the agreement, BRIL took delivery of its first new work-class ROV, the 100-horsepower (hp) Atom, from SMD in September and will receive a new 3,000-m rated, 150-hp Quasar in November. BRIL will then immediately expand its onshore staff by eight, and the offshore workforce will more than double from 30 to around 65. Further recruitment of staff will continue throughout 2013.

For more information, visit www.bibbyoffshore.com.

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Christy Lee platform fender repair

In early March of 2012, the north fender on the Christy Lee oil platform, owned and operated by Hilcorp, experienced mechanical failure which caused it to plunge into approximately 80' of water in the Cook Inlet. The fender structure mechanically raised and lowered with the tide to keep visiting tankers properly fended during calls. The timeline for a prompt solution was critical, as delaying the arrival of tankers to the Christy Lee would subsequently result in substantial monetary loss.

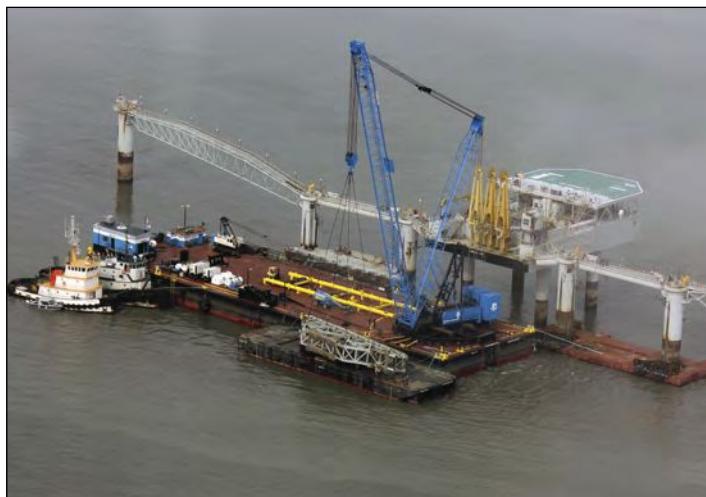
Global used sonar equipment to determine the exact location of the damaged fender and its orientation on the sea floor. It was concluded that there was sufficient water depth above the fender to allow vessels to continue to call at the berth; however, a temporary system would need to be devised in order to keep the platform operational.

Global developed a plan to install a temporary fender, which consisted of assembling a Flexi-float barge system that would encompass both of the north legs of the platform and span the gap left by the missing fender. It was evaluated by our internal engineering staff and was verified by a third party engineering firm. Global successfully mobilized, fabricated, and installed the temporary fender system in just over two weeks, three days prior to the arrival of the next scheduled tanker.

In July, Global remobilized to the platform to recover the sunken fender. Constructed by a steel framework with a timber face and concrete counterweights, the fender is trapezoidal in shape and measures approximately 96' long, 30' wide, and 8' tall, and weigh 175 tons. Divers rigged the fender for removal, taking advantage of the short slack tide intervals between 3.5 knot flood and ebb currents. Global subcontracted Pacific Pile & Marine to provide a 500 ton crane, mounted on the barge "Salvation". The 175.5 ton fender was lifted from the seafloor and loaded onto the deck barge "Mr. Ed". It was then transported to the ASRC dock in Nikiski, AK where it was offloaded onto the pier, flipped over, and set down for repairs.

Upon completion of repairs, the fender was transported back to the site for reinstallation. Once onsite, the "Salvation" lifted the fender and set it into a 'stored' position on the platform, allowing the temporary fender system to be dismantled and removed. The repaired fender, already secured to the platform, was then lowered into its permanent place and the concrete counterweights reattached. The repaired system has been fully operational since mid-October.

For more information, visit www.gdiving.com.



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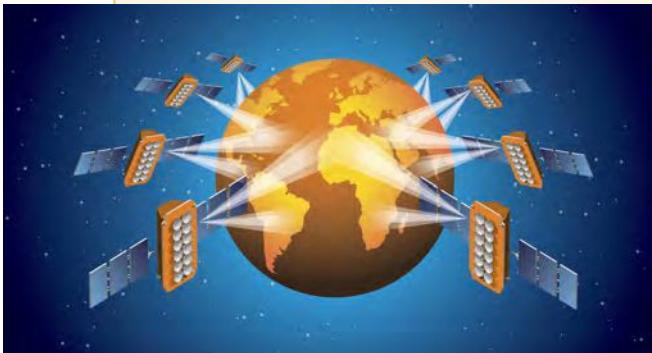
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SingTel signs Inmarsat Global Xpress® VAR agreement

Singapore Telecommunications (Singtel) has signed to be a value added reseller of Inmarsat's Global Xpress® service. The deal makes Singtel the first telco in Asia to be appointed a Global Xpress Value Added Reseller and is the latest endorsement from the market for Inmarsat's service innovation and roadmap toward Global Xpress®. Scheduled for service introduction in 2014, Global Xpress® will offer the shipping industry the first global superfast broadband. Based on Ka-band technology, it will consistently deliver the fastest speeds through more compact terminals at a lower cost than existing VSAT services, making it accessible to many more vessels. It will offer the global coverage and reliability that Inmarsat is renowned for, with back-up from FleetBroadband for extra resilience in the most challenging environments.

O3b Networks launches O3bEnergy

O3b Networks unveiled O3bEnergy—a new offshore communications solution that delivers high-speed, fiber-like connectivity to offshore installations and seismic survey vessels without the big upfront CAPEX investments, outage concerns, lack of mobility, lengthy ramp up times, or other fiber shortfalls. Oil and gas companies and systems integrators can leverage O3b's unique high-capacity, low-latency satellite offering to get far more from their existing enterprise systems and operational budgets. O3b's Medium Earth Orbit fleet will enable oil and gas companies to deliver the same level of sophisticated communications capabilities they count on at headquarters aboard their remote offshore platforms. With sub 150-msec latency and fiber-like speeds, O3bEnergy is designed to improve and elevate the full spectrum of offshore communications from mission critical applications to greatly enhanced crew morale. In addition to offshore communications, O3bEnergy is also tailored to provide near real-time transmission of seismic vessel survey data with a unique store and forward application that can transfer up to 2 Terabytes of data per day from ship to shore. O3b Networks is in the final stages of constructing a global network supporting an initial constellation of eight MEO satellites, which are scheduled for service availability in Q3 2013.

**KVH opens office in Japan**

KVH Industries, Inc. has opened an office in Tokyo to further strengthen KVH's position in the market and to provide additional support to its Japanese partners. The opening of the KVH Industries Japan Co., Ltd. office reflects the growing market in Japan for KVH's maritime satellite communications solutions, which include the mini-VSAT Broadband™ service - the world's leading maritime VSAT choice - and the award-winning TracPhone® satellite communications systems.

KVH Industries' Japanese partners include SKY Perfect JSAT Corporation, which provides the mini-VSAT Broadband™ service under the OceanBB brand name, as well as Furuno Electric Co., Ltd. and Japan Radio Co. Ltd., which provide and install KVH TracPhone® communications systems.

The company named Mr. Yoshito Yamane as the Country Manager and Representative Director for KVH Industries Japan Co., Ltd. Mr. Yamane has collaborated with KVH Industries for the past 3 years as a sales consultant, developing relationships with KVH Industries' Japanese partners. Mr. Yamane's prior work experience includes directing Stratech Inc., a communications technology firm specializing in improving vessel operational efficiencies, performing IT planning and management for Tsuneishi Shipbuilding, and doing computer software product management for Microsoft Corporation. He holds a Ph.D. in Computer Science from the University of Washington.

KVH Industries' business interests in the region have grown steadily in recent years. Since 2009, KVH Industries has provided mini-VSAT Broadband™ service coverage in Asia Pacific waters and in the Indian Ocean through a satellite-capacity leasing arrangement with SKY Perfect JSAT.

In 2011, MOL LNG Transport Co., Ltd., a subsidiary of Mitsui O.S.K. Lines, one of Japan's leading shipping companies, signed a contract to add KVH's award-winning TracPhone® V7 satellite communications systems to select-

ed LNG tankers. The systems use KVH's global mini-VSAT Broadband service under the OceanBB brand name.

In 2012, following extensive onboard tests of maritime communications systems, Tokyo-based Nippon Yusen Kaisha (NYK Line), the largest shipping company in Japan, chose KVH's TracPhone® V7 satellite communications systems and mini-VSAT Broadband™ service, under the OceanBB brand name, for selected containerships. NYK's fleet includes containerships, Pure Car Truck Carriers (PCTCs), dry bulk carriers, crude oil tankers, and LNG tankers, more than 100 of which will be equipped with broadband service to support NYK's IBIS (Innovative Bunker and Idle-time Saving) project with real-time communications between ships and staff on shore.

Japan's maritime shipping industry has experienced a boom in recent years due to improved shipping rates and increased demand for goods throughout Asia. Japan ranks second in the world in the amount of deadweight tonnage it controls as a percentage of the world's fleet, according to the United Nations Conference on Trade and Development's "Review of Maritime Transport 2011." In addition, Tokyo is one of the world's busiest ports for container traffic. KVH Industries also has offices in other centers of the global commercial maritime industry, including Singapore, Denmark, and Norway.

For more information, visit www.kvh.com.

MTN opens Seattle Product Innovation Office

MTN Satellite Communications plans to open a new Product Innovation Office in Seattle, Washington. The firm said the office is dedicated to creating new cutting-edge products, solutions, and services. The goal of this enhanced product innovation effort is to supplement the connectivity and value global MTN customers have realized for more than 30 years. MTN said it is hiring software developers and engineers with exceptional technology skills to build its next-generation communications infrastructure and network as well as the products it will enable.

Social networking sites and mobile devices, such as tablets and smartphones, are fueling more high-data consumption. This has generated farther-reaching customer requirements, whether delivered through satellite, Wi-Fi, cloud computing, or other technologies. The MTN Product Innovation Team is dedicated to anticipating needs with new options that optimize both current and next-generation platforms. MTN intends to continue leading delivery of Internet, content, and social media at sea in ways never before imagined.

MTN offers services and solutions to cruise lines, commercial ships, mobile and fixed oil and gas vessels, mega yachts, government entities, and aviation customers. MTN delivers and supports a broad array of integrated turnkey services, including remote access for Internet, VoIP, voice services, remote IT management, global vessel tracking, bandwidth optimization, real-time video capabilities, crew calling solutions, and other enterprise solutions.

For more information, visit www.mtnsat.com.

Mitsubishi's maritime satellite product passes GVF's muster

A new maritime broadband satellite communications product developed by Mitsubishi Electric Corporation has been awarded Type Approvals following extensive testing conducted by the Global VSAT Forum (GVF), the non-profit association of the satellite communications industry. The Type Approvals were provided through the GVF Product Quality Assurance Framework, which was established by the international satellite

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industry to improve earth station technology design and performance.

Mitsubishi Electric's Type Approvals award represents a major achievement because the technology demonstrated its ability to consistently provide high-quality Ku-band transmissions via a 1.2-m Very Small Aperture Terminal (VSAT) designed for use onboard maritime vessels (the model name is the MVA120 series). The tests were based on the Eutelsat and Intelsat

satellite-operator specifications, which are among the most rigorous in the world.

As part of the GVF Product Quality Assurance Framework, the association provided outsourced Earth station type-approvals testing services for Mitsubishi Electric through a mutually-recognized test framework and an industry-authorized network of testing entities. Major global and regional satellite operators rely the service, which

is provided by GVF, through its Mutual Recognition Arrangement Working Group (MRA-WG).

The procedures used are similar to the time-tested and well-understood procedures employed by the major satellite system operators over the past two decades. Successful completion of the process results in a Type Approval issued by one or more satellite system operators from whom type approval is being sought. In this regard, the process is transparent to the antenna manufacturer or system integrator seeking type approval for their product.

The GVF MRA maintains procedure GVF-101, which defines a set of standard tests that an antenna or earth station manufacturer must perform in order to apply for type approval from any satellite operator who is a member of GVF. Use of this procedure assures the quality of the ground communication equipment and provides the Earth station operator with a complete set of measured and verified test data. This helps reduce the time and cost required to bring new ground-segment technology to the market, and provides credible measured performance data for use in developing link budgets, thereby advancing the competitiveness of satellite communications services.

A key aspect of the procedure is the approval by the GVF membership of "Test Entities." Authorized Test Entities (ATEs) are those individuals or organizations that the members believe are competent, impartial, and experienced enough to certify that test data taken by a manufacturer may be used with confidence by any satellite operator member, without requiring any re-testing. Under the GVF-101 procedure and GVF Board decisions, only those members of the GVF who are satellite operators may vote on approving Test Entities, and the vote must be unanimous.

For more information, visit www.gvf.org.

RigNet wins contract with major drilling contractor in Brazil

RigNet, Inc. announced that its Brazil subsidiary, RigNet Serviços de Telecomunicações Brasil, has signed a 6-year contract with a major drilling contractor and its oil and gas customer to deliver managed network communications solutions for an ultra deep-water drilling rig.

The company will provide world-class reliable communications services via satellite with auto-stabilized

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Through VSAT technology solutions, RigNet is able to meet two priorities for the oil and gas community: high-performance and security. The demands on reliable offshore and onshore communication systems require dependable and efficient support around the clock. RigNet's Network Operation Center provides 24/7 network monitoring and can dispatch local field technicians when required. RigNet delivers innovative products while upholding industry standards with fully-managed, end-to-end IP network solutions to ensure each rig derives the greatest value from its communications services.

For more information, visit www.rignet.com.

O3b, CapRock announce alliance to provide solutions to oil and gas

O3b Networks and Harris CapRock Communications announced plans to develop a strategic marketing alliance focused on ultra high-speed, low-latency exploration and production communications capabilities. As part of the initiative, Harris CapRock plans to add O3b Network's O3bEnergy solution to its portfolio for customers in the energy market. O3bEnergy is a satellite-delivered solution that will empower oil and gas companies with latencies under 150 msec unlimited, affordable bandwidth and unrivaled operational savings.

O3bEnergy will deliver speedy data transfers, up to 2 Terabytes per day, fully capable of significantly reducing time to production by enabling real-time seismic surveys of oil reserves beneath the ocean floor. O3bEnergy will provide fiber-like connectivity to oil and gas platforms and search vessels without the major upfront CAPEX investments, outage concerns, lack of mobility, or lengthy ramp up times of fiber. Oil and gas companies and systems integrators will be able to easily integrate the high-capacity, low-latency satellite offering

to get far more from their existing enterprise systems and operational budgets.

The alliance extends an innovative partnership between Harris CapRock and O3b Networks to dramatically improve the Internet experience aboard the largest cruise ship in the world, Royal Caribbean Cruises Ltd's Oasis of the Seas. The maritime service leverages O3b's unique Medium Earth Orbit (MEO) satellite fleet

and Harris CapRock's extensive integration expertise.

Initiating service in Q3 2013, O3bEnergy will enable oil and gas companies and systems integrators to provide fiber-like connectivity to oil and gas rigs and seismic survey ships throughout the Gulf of Mexico, Brazil, Angola, Asia, and other key markets around the world.

For more information, visit www.o3bnetworks.com.

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McDermott awarded cable installation project

McDermott International, Inc. announced that one of its subsidiaries has been awarded a cable procurement and installation project for Saudi Aramco in the Safaniya, Abu Safah, and Marjan fields. The contract, issued under the existing long-term agreement, will include the procurement, transportation, installation, hookup, and testing of seven composite cables and corresponding anode sleds. The McDermott engineering office in Al-Khobar will undertake design and installation engineering and procurement, while fabrication will be carried out at the Jebel Ali facility, with cable installation by North Ocean 102. A 15-kV composite cable covering 26.9 km will be installed in six segments in the Safaniya, Abu Safa, and Marjan fields, and a 35-kV composite cable covering 28.4 km will be installed in one segment in the Marjan field. The offshore campaign is scheduled to commence during Q2 2013.

Cost of Western Isles HVDC link to reach £700 million

Scottish Hydro Electric (SHE) Transmission plc has been developing a link to the Western Isles to meet the requirements of large and small renewable generation on the islands. The company has released an open letter to update the current status of the project. SHE Transmission advanced detailed contractual negotiation with the preferred supplier of the Western Isles HVDC Link. The first stage of this negotiation concluded in late summer, and it became clear that the cost and delivery program agreed upon in October 2010 would be substantially altered. The total cost of the HVDC Link (excluding associated infrastructure on Lewis) is now estimated to be no less than £700 million. The current program estimates a delay in the planned completion date of October 2015 for the HVDC Link of at least 12 months, with a real potential it could be later. Further negotiations with the supplier are ongoing. In parallel with these contractual negotiations, SHE Transmission made the first stage of a funding request to Ofgem in April 2012. Work with Ofgem on the assessment of the requirement for the Western Isles and Lewis infrastructure project progressed well over the summer; however, the increased cost and delayed delivery date is likely to have a material impact on this assessment. Given this, SHE Transmission is in the process of reviewing and updating the analysis. SHE Transmission said that it remains committed to working with all stakeholders to achieve timely, cost-effective investment in the transmission system in the north of Scotland and will provide a further update on the progress of the Western Isles transmission project, including supply chain discussions regarding the cost and delivery date, by the end of the year.

JDR wins umbilical contract from Swiber Offshore

JDR has won a umbilical contract with Swiber Offshore Construction Pte Ltd for deployment in the Brunei Shell Petroleum Champion Field. Brunei Shell Petroleum, one of Asia's biggest energy companies, will use JDR's umbilicals to redevelop the Champion field as part of its Waterflood Project to increase oil recovery. The agreement will see JDR provide 10 custom designed umbilicals totaling 13 km that will be used at water depths of up to 32 m. The contract is JDR's latest in a long-term relationship with Brunei Shell Petroleum, following two previous umbilical contracts for the Champion field complex. It strengthens JDR's position as the preferred umbilical vendor for the Asia Pacific region and is testament to the investment the company has made over the last 2 years in our state-of-the art umbilical plant in Hartlepool, UK.

Cyta deploys Infinera DTN-X Platform

Infinera and Cyprus Telecommunications Authority (Cyta) announced the deployment of Infinera's DTN-X platform, featuring 500-Gbps long-haul super-channels, across the TE-North Cable System, interconnecting Asia and Africa to Europe. Cyta selected the DTN-X platform to deliver commercial services to its customers for the scalability, efficiency, simplicity, and reliability the solution delivers to its network.

Cyta is the leading telecommunications provider in Cyprus, providing the full spectrum of electronic communications services, ranging from fixed and mobile telephony to Internet service provision and broadband applications. Cyta operates and maintains the ALEXANDROS subsystem, part of Telecom Egypt's TE-North Cable System, which stretches 3,600 km connecting Abu Talat, Egypt to Marseilles, France, with a branch to Pentaskhinos, Cyprus. The deployment of Infinera's DTN-X platform will allow Cyta to add additional capacity to the ALEXANDROS subsystem, with the ability to upgrade TE-North's terrestrial network in the future in order to serve global operators who rely on Cyta to offer services in the Middle East, Asia, and Africa region.

Infinera is the first to deliver 500-Gbps long-haul super-channels based on Photonic Integrated Circuits (PICs) and FlexCoherent™ Processor, scaling transport capacity without scaling operational complexity. Infinera's PICs combine multiple optical subsystems on a single IC and result in fewer fiber connections, less space, and less power when compared to conventional systems based discrete components. The Infinera DTN-X increases network efficiency with 5 Terabits of integrated OTN switching per bay, resulting in much more efficient utilization when compared to conventional WDM architectures that do not allow sub-lambda grooming and switching. Infinera's Bandwidth Virtualization™ simplifies service deployment, enabling operators to deploy networks in days and services in minutes, thereby lowering operational costs.

For more information, visit www.infinera.com or www.cyta.com.cy.

Mitsubishi Electric upgrades IMEWE

Mitsubishi Electric Corporation has completed work on the India-Middle East-Western Europe (IMEWE) Cable Network to upgrade the submarine cable network with 40 Gbps dense wavelength division multiplexing (DWDM) technology.

The upgrade involved the installation of submarine line terminal equipment in eight countries. The IMEWE Cable

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System, which was commissioned in 2010 as a 10-Gbps DWDM system, is an ultra high-capacity fiber optic submarine cable system that links India to Europe via the Middle East. This cable network system, with a total length of approximately 12,091 km, is complemented with 10 terminal stations owned by a consortium of nine leading telecom carriers in eight countries: India, Pakistan, UAE, Saudi Arabia, Egypt, Lebanon, Italy, and France. The cable system comprises three optical fiber cable pairs with two fiber pairs on an express path as well as a terrestrial link connecting the cities of Alexandria and Suez in Egypt.

Network demand in these areas is expected to grow rapidly in line with economic development in India and the Middle East. To meet this demand, the IMEWE Consortium had decided to upgrade the cable system by deploying 40-Gbps/wave technology; Mitsubishi Electric was awarded the contract for this upgrade. Mitsubishi Electric has incorporated cutting-edge forward error correction and high-speed coherent technologies to terminal equipment,

boosting transmission capacity. The technology will result in enhancing the network capacity to a maximum of 3.2 Tbps or more per fiber by adding more 40 Gbps submarine line terminal equipment.

Mitsubishi Electric has been a leader in submarine cable systems since supplying the world's first 5-Gbps optically amplified repeaters for a transpacific cable in 1994. In 1999, the company supplied the world's first 10-Gbps transmission technology for a transoceanic network, an order comprising 10-Gbps optically amplified repeaters and submarine line terminal equipment. Since 2004, the company has performed upgrades for numerous undersea cable systems.

For more information, visit www.mitsubishielectric.com.



Arctic Fibre to add cable coverage in Canada

Arctic Fibre Inc., which is planning to install a submarine fiber optic cable to connect London, New York, and Tokyo through the waters of the Canadian Arctic, has amended its plan to include a backbone connection that would extend along the eastern side of Hudson Bay from Cape Dorset to Kuujjuaq and Chisasibi, Canada. From there, it would run through James Bay Cree territory down to Montreal and New York City, cutting many hundreds of kilometers off the cable system's link between Tokyo and New York.

The company hopes that the new route would make the network even more attractive to traders working in financial center like Tokyo and New York because it would offer nearly instantaneous turn-arounds on large-volume buy and sell orders, the company said in a statement.

To that end, Arctic Fibre has amended its landing license application to Industry Canada to enable cable landing sites near Chisasibi and Moosonee to

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facilitate the shorter route through Montreal to New York.

The company also proposes a series of spur links that could benefit Nunavik, Nunavut, and the James Bay Cree. These include spur lines to Ivujivik, Akulivik, Puvirnituq, Inukjuak, Umiuaq, and Kuujjuarapik-Whapmagoostui.

Douglas Cunningham, Arctic Fibre's chief executive officer, announced the amended plans 30 October at a Northern Communications and Information Systems Working Group meeting in Iqaluit.

The company proposes that governments spend about \$161 million on a system of spur lines to link communities that are not adjacent to the backbone. Of that, \$111 million in spending would pay for the Nunavut-based spur lines.

For more information, visit www.arcticfibre.com.

PLDT to build cable to Bohol Island

Philippine Long Distance Telephone Co. (PLDT), along with its mobile unit

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Smart, intends to construct a P856-million fiber-optic cable system linking Cebu, Bohol, and Mindanao. The project involves laying down a total of about 450 km of fiber-optic cables from Cebu to Cagayan de Oro City. A little over 300 km of that cable are terrestrial, while another 150 km are submarine links in the sea between Cebu and Bohol and between Bohol and Misamis Oriental.

The new fiber-optic link to Bohol will provide 20 Gbps of capacity to the island. The link to Mindanao will carry 190 Gbps of capacity. The cable, which will be completed in September 2013, will significantly boost the resiliency of PLDT transmission links to Bohol and the entire island of Mindanao. It will be initially equipped with 210 Gbps of capacity.

With communications services in Bohol vastly improved, the provincial government will be able to more aggressively pursue its efforts to attract investments from business-process outsourcing companies.

The project will also add a third leg to the two fiber optic highways already

connecting Mindanao to the rest of the country via PLDT's domestic fiber optic network. One existing link runs from Cebu to Negros Oriental and then on to Ozamis City, Misamis Occidental, while the other starts in Cebu and then connects Leyte and then Butuan, Caraga region.

Improved communications will also benefit Bohol's successful tourism program, which has been growing steadily over the past few years. Tourist arrivals at the island hit the 550,000 mark last year, up from about 460,000 in 2009. The number is expected to rise further as more visitors take to the province's famous beach resorts and eco-tourism attractions.

For more information, visit www.pldt.com.

Forum announces sale trenching ROV system

Forum Energy Technologies, Inc. has announced the signing of a contract with Global Marine Systems Limited, Ltd. (GMSL). Under the contract, Forum will supply a PerryTM XT 600 Trenching System, complete with

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LARS and special tooling. The trencher provides 3-m ROV burial capability on the ocean floor. Also included in the scope of supply is operation and maintenance training for GMSL personnel and support during the first mobilization onboard their vessel and during the sea trials.

The XT 600 Trenching System is scheduled for delivery in 2013. It will be installed in the GMSL vessel, the Cable Retriever, based in the Philippines, and will replace the T205 trencher that was previously supplied by Forum/Perry in 2000. The XT 600 Trenching System will be used to support GMSL subsea cable maintenance contracts in Southeast Asia and the Indian Ocean.

Forum Subsea Technologies is a product line of Forum Energy Technologies, Inc. Its ROV product line ranges from electric observation class ROVs to large hydraulic work-class vehicles used for inspection, survey, and deep-water construction as well as other remote intervention technologies and services. Forum Subsea Technologies is positioned to support its customers through a global sales team and a worldwide network of distributors and service centers.

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

Telkom South Africa maintains uptime during SAT-3 maintenance

Telkom South Africa announced the successful completion of planned maintenance work on its SAT-3 submarine fiber optic cable during several weekends in October.

Telkom's customers experienced no downtime during the maintenance period, which can be attributed to the various contingency plans the company undertook to minimize any impact to its international connectivity.

Telkom said that its innovative network design automatically rerouted traffic, resulting in little to no impact to its customers, and that the network's self-healing capabilities and automatic traffic rerouting ability kept any impact to a minimum.

For more information, visit www.telkom.co.za.

U.S. Navy selects L-3 for cable installation at training range

L-3 Communications announced that its MariPro division has been

awarded a multi-year contract with a potential value of \$127 million, if all options are exercised, to install an Undersea Warfare Training Range off the coast of Jacksonville, Florida for the U.S. Navy. The scope of this contract includes design, manufacturing, and installation of a state-of-the-art undersea warfare training system that will ultimately span 500 sq. nmi.

Phase I of the program will provide

the initial infrastructure, including shore facilities and equipment, as well as nearshore cable and seabed sensors to instrument an area of approximately 200 sq. nmi. The second phase of the program will instrument the remaining 300 sq. nmi. The installed system will provide the U.S. Navy with the latest technology to maximize training and testing, particularly in shallow water. The system has a 20-year design life.

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For more information, visit www.L-3com.com/MariPro.

Globe Telecom strengthens connections in the Philippines

Globe Telecom has successfully interconnected Boracay Island to the Philippines carrier's fiber optic backbone through a new submarine fiber optic cable, effectively boosting the connections and strengthening the network coverage of the internationally renowned tourist destination.

The connection was accomplished through the Boracay Submarine Cable

Subsea Telecom

System, a 2-km submarine fiber optic cable that is able to transmit 80 DWDM wavelengths at 40 Gbps per wavelength and is expandable to 100 Gbps.

The new cable further bolsters the progress of the company's network modernization, which has already breached the 60% milestone in record time.

The building of the Globe Telecom network will involve blanketing the whole Philippine geography with the steady progression of the network transformation, which includes far-flung locations, creating seamless coverage for the entire country. The entire infrastructure change-out is accelerating toward the homestretch earmarked for Q1 2013.

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

Australia's Leighton exploring sale of telecom assets

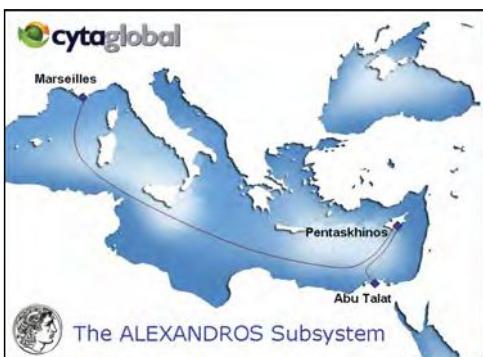
Leighton Holdings Limited announced that, following the completion of a detailed strategic review of its telecommunications infrastructure

assets, the Board intends to explore a potential divestment of Nextgen Networks, Metronode, and Infoplex. The decision is part of the company's previously announced strategy of recycling capital as these assets are considered non-core.

The potential deal may impact a major submarine fiber optic cable project under development by Nextgen. The ASSC-1 project is a cable currently under development that would link the west coast of Australia with Singapore.

The company said that construction, maintenance, and field services opportunities in the telecommunications sector remain strong and do not depend on the ownership of telecommunications assets. It also noted that it had received a number of unsolicited inquiries that and Macquarie Capital has been retained with respect to the potential sale process, but that it will not sell these assets unless there is a compelling value-creating proposition for its shareholders.

For more information, visit www.leighton.com.au.



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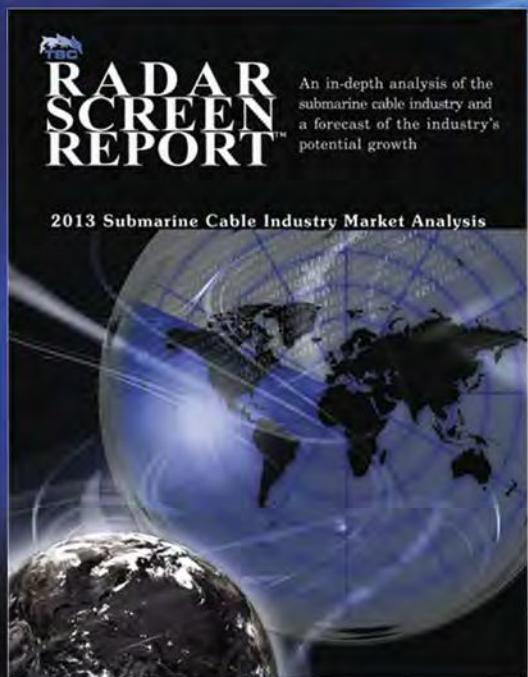
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- Forecast of demand for new systems from 2013-2018
- Analysis of the major factors impacting the submarine cable market, including Internet demand, availability of financing and implications of the financial crisis
- A listing of 250 submarine cable projects under contract during 2012 or planned for the future



Published and distributed by Technology Systems Corporation



Cable laying begins for the EstLink 2 cable

The laying of the EstLink 2 submarine power cable between Finland and Estonia has begun with marine cable pull-in operations in Aseri, Estonia. The submarine cable will be laid in the Gulf of Finland in two stages. The new high-voltage direct current (HVDC) connection is expected to come into operation in early 2014, and it will play an important role in the development of the electricity market in the Baltic Sea region.

The EstLink 2 HVDC connection between Finland and Estonia will have a transmission capacity of 650 mw, which increases the total transmission capacity between the countries to 1,000 mw. The total length of the link is approximately 170 km, some 14 km of which is overhead line in Finland, about 145 km submarine cable laid on the bottom of the Gulf of Finland, and about 12 km underground cable in Estonia.

The total budget of the project is approximately 320 million euros, which will be divided in equal proportions between Fingrid and Elering, the transmission system operators in the two

countries. EstLink 2 will receive 100 million euros in investment subsidy from the EU as part of the EU's extensive economy recovery package.

There will be converter stations at both ends of the link used for converting direct current to alternating current and vice versa. The interconnection will be connected to the Finnish transmission grid at the Anttila substation. In Estonia, the cable will be connected to the Estonian grid at the Püssi substation in Northeastern Estonia.

Following the manufacturing of the submarine cable in Norway, the cable is laid on the seabed in two campaigns of approximately 75 km each. A single cable campaign weighs about 5,800 tons. The carrying capacity of the cable installation vessel cable ship Nexans Skagerrak is 7,000 tons.

The installation began off the Estonian coast last week, and the cable laying work in Finland outside Porvoo is scheduled to commence by December 2012. The schedule depends on the weather conditions. The final jointing, testing, and commissioning of the submarine cable will be done in 2013.

The laying of the cable from the



Estonian coast takes about a week, as will the laying of the cable in the sea area of Finland later on. The cables will be connected at the middle of the Gulf of Finland. After the laying of the cable, it will be submerged and protected in the seabed by means of the water jetting method.

For more information, visit www.fingrid.fi.

Ocean Yield acquires cable lay vessel

AMC Connector AS, a joint venture between Aker Solutions and Emas Offshore Limited, has agreed to sell subsea construction and cable-lay vessel Lewek Connector (previously called AMC Connector) to Ocean Yield AS.

In October 2010, Aker Solutions announced that it would sell its offshore construction and installation subsidiary Aker Marine Contractors to Ezra Holdings Limited, which operates in the offshore construction market under the EMAS AMC brand name. As part of this transaction, Ezra agreed to acquire 50% of the shares in Lewek Connector's vessel owning company, AMC Connector AS. The transaction will be completed in Q4 2012.

The divestment of Aker Marine Contractors marked the start of a restructuring of Aker Solutions, which has since streamlined the company into becoming a fully-fledged provider of oilfield products, systems, and services.

Lewek Connector is being sold for a total consideration of US\$315 million, which will give a small positive result effect for Aker Solutions. The sale also provides Aker Solutions with a net cash release of approximately NOK 345 million. Aker Solutions owns approximately 7.4% of Ezra, which is listed on the Singapore stock exchange.

For more information, visit www.akersolutions.com.

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Power Cables

Prysmian wins second Italy-Montenegro contract

Prysmian Group has been awarded a new contract worth approximately €400 million for the MON.ITA. project—a new submarine power link between Montenegro and Italy, following the public tender issued by Terna Rete Italia S.p.A. (a company entirely owned by Terna S.p.A.).

The project involves supply and installation of one of the two poles of the interconnection (about 415 km of submarine route at depths of up to 1,200 m) made of an extra (HVDC)(500 kV) subsea cable system with a rated power of 1,000 MW as well as specialist civil works both in Italy and in Montenegro. Prysmian will also supply and install the marine electrodes to enable the system's emergency operation.

In the Mediterranean, Prysmian has carried out (or is currently carrying out) projects like the Italy-Greece interconnection, SA.PE.I. (Sardinia to Italy mainland) and Sorgente-Rizziconi (Sicily to Calabria) in Italy, Spain-Morocco and the Iberian Peninsula-Majorca in Spain. Worldwide submarine cable links to highlight are the record Western HVDC Link project in Britain; Basslink in Australia; Neptune and Hudson in New York; Transbay in San Francisco; and eventually GCCIA and Doha Bay in the Middle East and the interconnection across the Dardanelles in Turkey. In addition, the Group is also strongly involved in the grid connection of an offshore wind farm in the North Sea.

The cables for the MON.ITA link will be manufactured in the Arco Felice plant (Naples), the Group's center of technological and manufacturing excellence, development of which has seen the investment of €40 million in

2012 alone. Submarine cable laying will be performed by the Giulio Verne cable-laying vessel. The MON.ITA project will also enhance Prysmian's unique track record in the field of deepwater cable systems, which already includes SA.PE.I. (with a record maximum depth of 1,650 m), the link between Majorca and the Iberian Peninsula (with a maximum depth of 1,400 m), and the Italy-Greece link (with a maximum depth of 1,000 m).



The new MON.ITA will link the Balkans and Italy across the Adriatic, thus contributing to increase the integration with the other European countries. In Europe, Prysmian is actively engaged in initiatives for the future development of power grids, such as "Friends of the Supergrid" to promote a new concept pan-European power supergrid and Medgrid to develop a

subsea transmission grid that will transport renewable energy from North Africa to Europe. The Group has recently co-founded Norstec, an association of the key players in the global energy sector, whose aim is to support the production of renewable energy by offshore wind farms in the North Sea.

For more information, visit www.prysmian.com.

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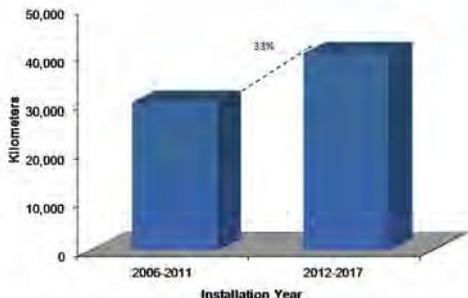
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Offshore At-A-Glance

Quest Offshore Activity Report

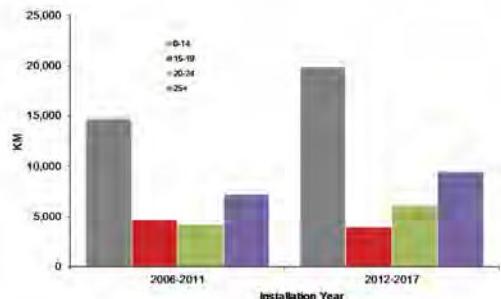
Worldwide Pipeline Demand Growth

2006 – 2011 vs. 2012 – 2017



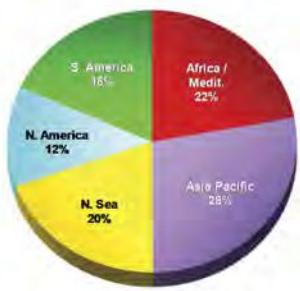
Worldwide Pipeline Demand Growth

2006 – 2011 vs. 2012 – 2017



Worldwide Pipeline Demand by Region

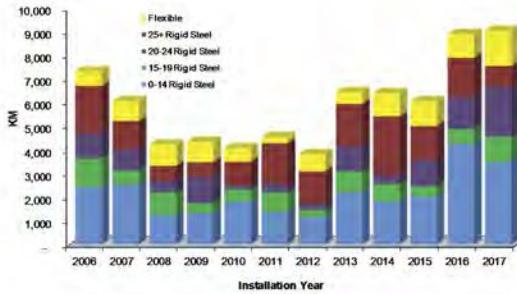
2012 – 2017 Installations (40,674 km)



The growth of long-offset offshore projects in Australia enable the installation of long-distance trunk lines that bolster the Asia Pacific region's forecast.

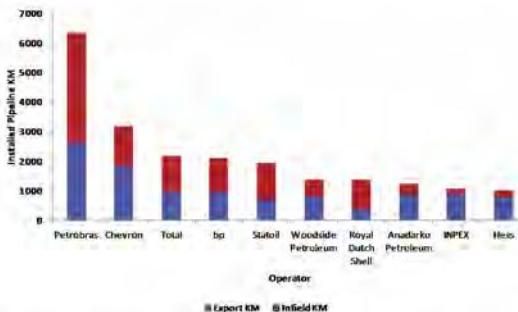
Worldwide Pipeline Demand

2006 – 2017



2012e-2017e Top Operators by Pipeline Installation (KM)

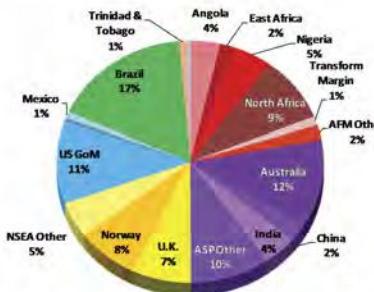
Infield v. Exports



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

Worldwide Pipeline Demand

2012 – 2017 by Province (40,674 km)



FOR MORE DETAILED INFORMATION

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Gulf of Mexico Data

Current Deepwater Activity

Operator	Area	Block	OCS Lease	Rig Name	Prospect Name	Water Depth (ft)
Shell Offshore, Inc.	WR	508	G18730	NOBLE DANNY ADKINS	Stones	9,553
Petrobras America, Inc.	WR	206	G16965	PRIDE DEEP OCEAN MENDOCINO	Cascade	8,143
Shell Offshore, Inc.	AC	857	G17565	H&P 205	Great White	7,815
Noble Energy, Inc.	MC	698	G28022	ENSCO 8501	Big Bend	7,232
Shell Gulf of Mexico, Inc.	MC	391	G26252	T.O. DEEPWATER NAUTILUS	Appomattox #3	7,157
Chevron USA Inc.	WR	758	G17015	T.O. DISCOVERER INSPIRATION	Jack	6,959
Anadarko Petroleum Corp.	KC	875	G26771	ENSCO 8500	Lucius	6,822
ExxonMobil Corp.	WR	674	G32699	T.O. DEEPWATER CHAMPION	Hummer	6,812
Union Oil Co. of California	WR	634	G18745	T.O. DISCOVERER CLEAR LEADER	Saint Malo	6,805
BP Exploration & Production, Inc.	MC	607	G09837	SEADRILL WEST CAPRICORN	East Anstey	6,590
Chevron USA Inc.	KC	736	G22367	T.O. DISCOVERER INDIA	Moccasin	6,537
BP Exploration & Production, Inc.	GC	744	G15605	T.O. DEVELOPMENT DRILLER II	Atlantis	6,523
Marathon Oil Co.	MC	993	G24134	MAERSK DEVELOPER	Innsbruck	6,266
Union Oil Co. of California	WR	98	G21841	PACIFIC SANTA ANA	Coronado	6,127
BP Exploration & Production Inc.	MC	429	G07944	ENSCO DS-3	Ariel	6,106
BP Exploration & Production, Inc.	KC	292	G25792	SEADRILL WEST SIRIUS	Kaskida	6,031
Shell Offshore Inc.	WR	95	G31943	NOBLE GLOBETROTTER	Yucatan North	5,847
Anadarko Petroleum Corp.	WR	51	G31938	ENSCO 8505	Shenandoah	5,837
BP Exploration & Production Inc.	MC	777	G09867	T.O. DISCOVERER ENTERPRISE	Thunder Horse South	5,610
BP Exploration & Production, Inc.	GC	743	G15607	T.O. DEVELOPMENT DRILLER III	Atlantis	5,413
ConocoPhillips Co.	GB	783	G11573	NABORS MODS 201	Magnolia	4,675
Anadarko Petroleum Corp.	GC	683	G16783	T.O. DISCOVERER SPIRIT	Caesar	4,485
Hess Corp.	MC	725	G22898	STENA FORTH	Tubular Bells	4,334
BHP Billiton Petroleum (GOM) Inc.	GC	654	G20085	GSF C.R. LUIGS	Shenzi development	4,300
Cobalt International Energy LP	GB	959	G30876	ENSCO 8503	North Platte	4,297
Chevron USA, Inc.	GC	640	G20082	T.O. DISCOVERER DEEP SEAS	Tahiti 2	4,292
BHP Billiton Petroleum (GOM) Inc.	GC	507	G22970	T.O. DEVELOPMENT DRILLER I	Ness	4,028
Shell Offshore Inc.	GB	602	G11553	NOBLE DRILLER	Macaroni	3,693
Murphy E&P Co.	GC	338	G21790	NABORS MODS 200	Front runner	3,325
Shell Offshore, Inc.	MC	807	G07962	NOBLE BULLY 1	Mars (Ursa/Princess)	3,040
LLOG Exploration Offshore LLC	MC	761	G28025	ENSCO 8502	Crawfish	3,031
Shell Offshore, Inc.	GC	158	G07995	H&P 202	Brutus	2,985
Shell Offshore Inc.	MC	807	G07963	H&P 201	Mars (Ursa/Princess)	2,945
W&T Energy VI, LLCC	MC	243	G19931	COIL TUBING UNIT (N.O. #3)	Matterhorn	2,816
LLOG Exploration Offshore, LLC	MC	503	G32334	NOBLE AMOS RUNNER	WhoDat	2,732
Shell Offshore Inc.	GB	427	G07493	NOBLE JIM THOMPSON	Cardamom	2,719
Eni US Operating Co. Inc.	MC	460	G18245	T.O. DEEPWATER PATHFINDER	Appaloosa	2,654
Hess Corp.	GB	386	G10350	ATWOOD CONDOR	Liano	2,627
Energy Resource Technology GOM, Inc.	GC	237	G15563	NOBLE JIM DAY	Phoenix	2,405
Energy Resource Technology GOM, Inc.	GC	237	G15563	CAL DIVE Q-4000	Phoenix	1,982
Statoil USA E&P Inc.	GC	36	G26287	T.O. DISCOVERER AMERICAS	Candy Bars	1,938
Anadarko Petroleum Corp.	VK	826	G06888	NABORS P-10	Neptune	1,935
Chevron USA Inc.	VK	786	G10944	NABORS 87	Petronius	1,754
Hess Corp.	GB	260	G07462	NABORS S.D. XVI	Baldpate	1,648
Dynamic Offshore Resources, LLC	GC	65	G05889	H&P 206	Bullwinkle	1,353

Deepwater prospects with drilling and workover activity: 45

Current Deepwater Activity as of Tuesday, 13 November 2012

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,838	34,628	2,805
201 to 400	120	1,113	20
401 to 800	295	848	10
801 to 1,000	395	562	9
1,000 & above	3,417	1,785	25

Rig Activity Report 21 November 2012

Location	Week of 11/21	Week +/- Ago	Week +/- Ago	Year Ago
Land	1745	5	1740	-196
Inland Waters	19	0	19	-1
Offshore	53	3	50	14
U.S. Total	1817	8	1809	-183
Gulf of Mexico	50	2	48	12
Canada	387	3	384	-97
N. America	2204	11	2193	-280
				2484Z

Activity by Water Depth Information current as of Monday, 19 November 2012

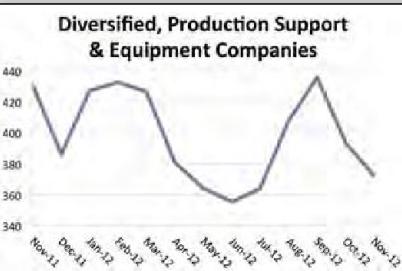
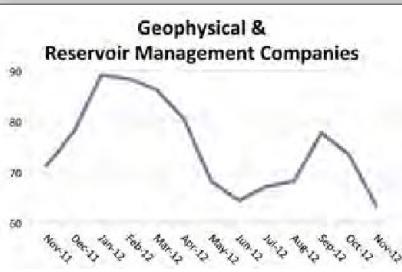
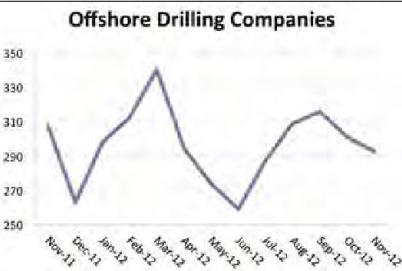
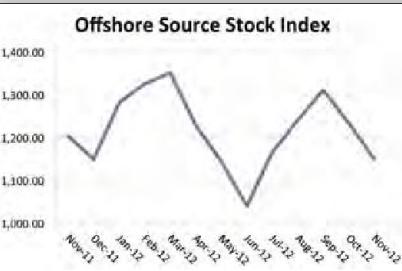
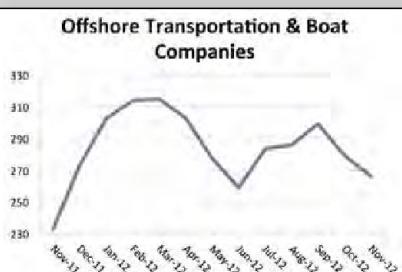
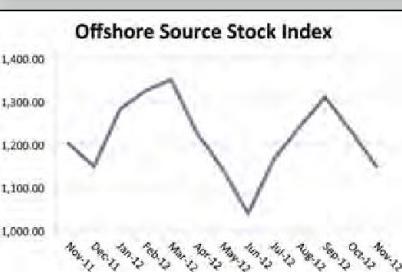
Maximum number of rigs operating in the deepwater Gulf of Mexico. The rig unit includes platform rigs operating on deepwater production facilities in addition to the MODU's. The numbers do not distinguish between rigs drilling and those in service for completion and workover operations.

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

Monthly Stock Figures & Composite Index

Industry Company Name	Symbol	Close Mid-November	Close Mid-October	Change	Change %	High 52 week	Low
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	39.92	44.77	-4.85	-10.8%	57.97	37.08
Cameron Intl. Corp.	CAM	52.73	52.92	-0.19	-0.4%	60.00	38.38
Drill-Quip, Inc.	DRQ	67.76	67.96	-0.20	-0.3%	77.12	57.27
Halliburton Company	HAL	30.32	33.44	-3.12	-9.3%	39.19	26.28
Tenaris SA	TS	36.79	39.41	-2.62	-6.6%	44.48	29.79
Newpark Resources, Inc.	NR	6.91	6.83	0.08	1.2%	10.62	5.19
Schlumberger Ltd.	SLB	68.95	71.83	-2.88	-4.0%	80.78	59.12
Superior Energy Services, Inc.	SPN	18.50	19.69	-1.19	-6.0%	31.88	17.54
Weatherford International, Inc.	WFT	9.07	12.09	-3.02	-25.0%	18.33	9.02
Deep Down, Inc.	DPDW	1.36	1.27	0.09	7.1%	1.80	0.80
FMC Technologies	FTI	40.07	43.55	(3.48)	-8.0%	55.19	36.89
Total Diversified, Production, Support and Equipment.....	372.38	393.76	-21.38	-5.4%	477.36	317.36	
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	22.64	24.77	-2.13	-8.6%	40.76	20.20
Mitcham Industries, Inc.	MIND	12.77	14.82	-2.05	-13.8%	26.76	12.55
Compagnie Gnrale de Gophysique-Veritas	CGV	27.99	34.03	-6.04	-17.7%	34.84	18.77
Total Geophysical / Reservoir Management.....	63.40	73.62	-10.22	-13.9%	102.36	51.52	
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	46.21	45.96	0.25	0.5%	50.18	34.93
Diamond Offshore Drilling, Inc.	DO	64.90	66.82	-1.92	-2.9%	73.50	52.98
ENSCO International, Inc.	ESV	54.64	55.41	-0.77	-1.4%	61.48	41.63
Nabors Industries, Inc.	NBR	13.26	14.23	-0.97	-6.8%	22.73	12.40
Noble Drilling Corp.	NE	33.96	36.14	-2.18	-6.0%	41.71	28.73
Parker Drilling Company	PKD	3.62	4.25	-0.63	-14.8%	7.62	3.69
Rowan Companies, Inc.	RDC	31.29	32.29	-1.00	-3.1%	39.40	28.62
Transocean Offshore, Inc.	RIG	44.79	45.73	-0.94	-2.1%	59.03	38.21
Total Offshore Drilling.....	292.67	300.83	-8.16	-2.7%	355.65	241.19	
Offshore Contractors, Services, and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	16.08	18.27	-2.19	-12.0%	21.09	14.61
Gulf Island Fabrication	GIFI	21.22	26.82	-5.60	-20.9%	35.48	20.05
McDermott International, Inc.	MDR	9.88	11.18	-1.30	-11.6%	15.35	9.04
Oceaneering International	OII	51.93	50.99	0.94	1.8%	58.53	42.27
Subsea 7 SA	SUBCY.PK	21.35	22.83	-1.48	-6.5%	27.21	16.87
Technip ADS	TKPPY.PK	26.49	28.73	-2.24	-7.8%	30.21	20.25
Tetra Technologies, Inc.	TTI	5.98	5.90	0.08	1.4%	10.66	5.35
Cal Dive International, Inc.	DVR	1.36	1.37	(0.01)	-0.7%	4.00	1.00
Total Offshore Contractors, Service, and Support.....	154.29	166.09	-11.80	-7.1%	202.53	129.44	
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	85.61	85.75	-0.14	-0.2%	100.00	79.19
Gulfmark Offshore, Inc.	GLF	28.50	32.45	-3.95	-12.2%	56.41	29.29
Bristow Group	BRS	48.96	48.98	-0.02	0.0%	52.54	37.92
PHI, Inc.	PHII	27.25	31.29	-4.04	-12.9%	33.14	19.09
Tidewater, Inc.	TDW	42.90	46.03	-3.13	-6.8%	63.27	43.06
Trico Marine Services, Inc.	TRMAQ.PK	0.04	0.04	0.00	0.0%	0.11	0.01
Hornbeck Offshore	HOS	32.71	34.66	-1.95	-5.6%	43.83	28.88
Total Offshore Transportation and Boat	265.97	279.20	-13.23	-4.7%	349.30	237.44	

Monthly Stock Figures & Composite Index

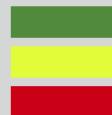
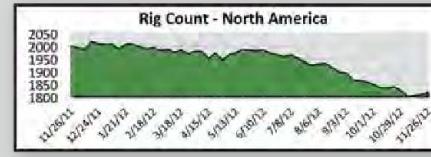
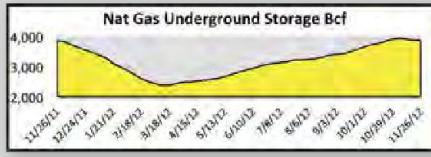
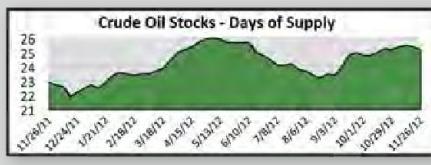
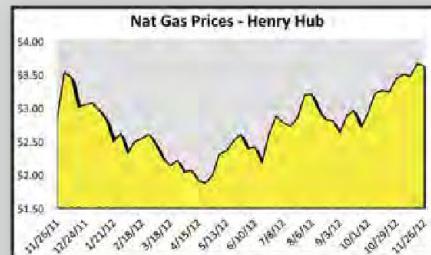
Industry	Close Mid-November	Close Mid-October	Change -21.38	Change -5.4%	High 477.36	Low 317.36	
Diversified, Production Support & Equipment Companies							
	Total Diversified, Production, Support and Equipment	372.38	393.76	-21.38	-5.4%	477.36	317.36
Geophysical & Reservoir Management Companies							
	Total Geophysical / Reservoir Management	63.40	73.62	-10.22	-13.9%	102.36	51.52
Offshore Drilling Companies							
	Total Offshore Drilling	292.67	300.83	-8.16	-2.7%	355.65	241.19
Offshore Source Stock Index							
	Total Offshore Contractors, Service and Support	154.29	166.09	-11.80	-7.1%	202.53	129.44
Offshore Transportation & Boat Companies							
	Total Offshore Transportation and Boat	265.97	279.20	-13.23	-4.7%	349.30	237.44
Offshore Source Stock Index							
	Total Offshore Source Index	1,148.71	1,213.50	-64.79	-5.3%	1,487.20	976.95

DISCLAIMER

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

Oil & Gas Industry Trends

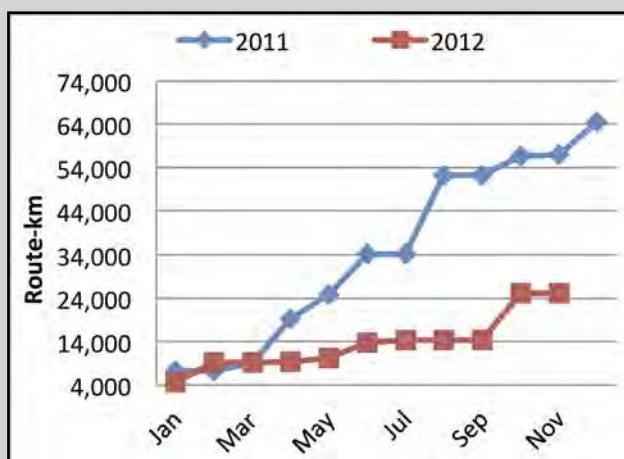
Monitoring the Pulse of the U.S. Offshore Oil & Gas Industry



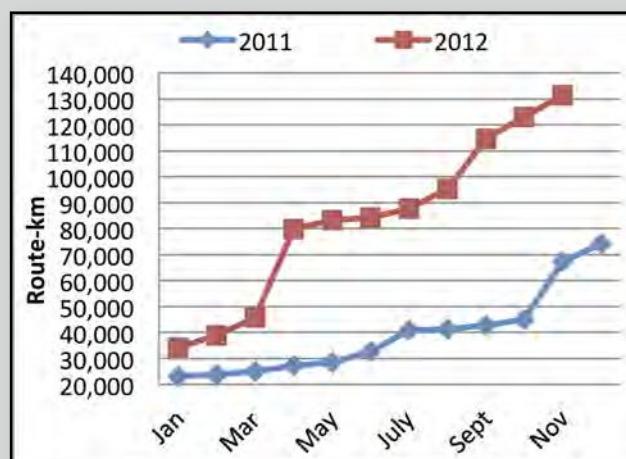
- Positive trend, at least 3 weeks
- Changing trend, less than 3 weeks
- Negative trend, at least 3 weeks

Subsea Telecom & Power Cable Data

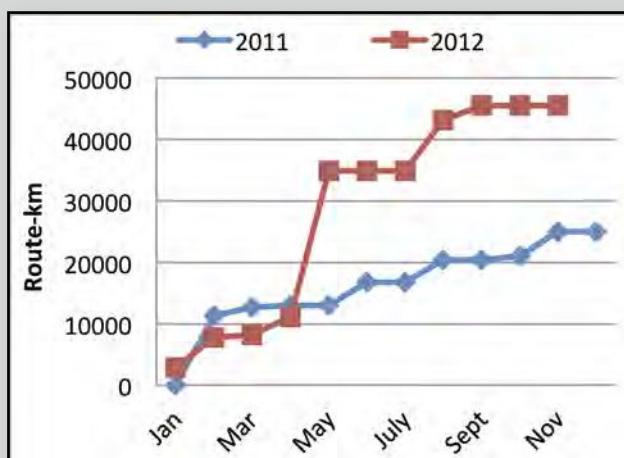
FO Cable Awards by Month



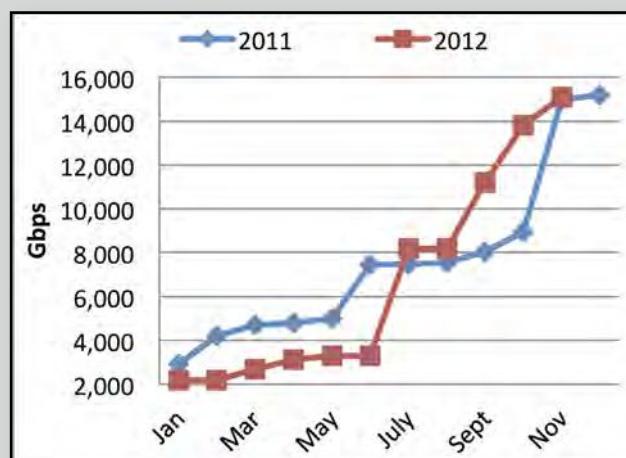
FO Cable Announcements 2012



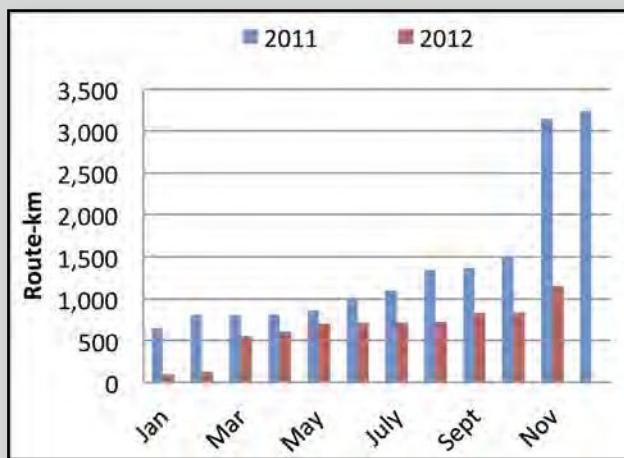
Submarine FO Cables Entering Service 2012 in Route-km



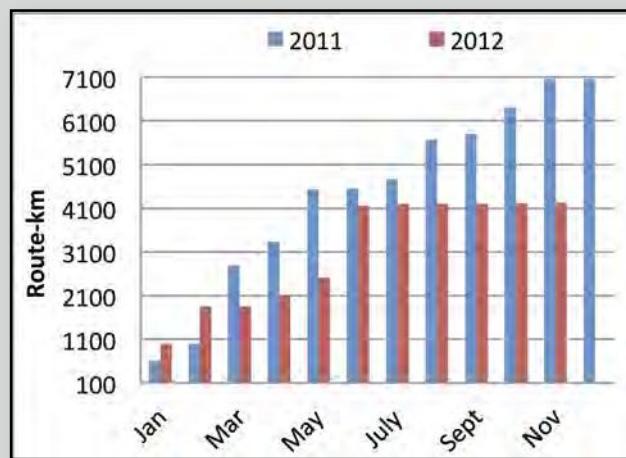
Upgrades of Existing Cable Systems in Gbps



Submarine Power Cable Awards 2012 in Route-km



Submarine Power Cable Announcements 2012 in Route-km



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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Teledyne BlueView ships new “Mini” 2D multibeam imaging sonar

Teledyne BlueView, the world leader in compact acoustic imaging and measurement technology, made its initial shipments of the smallest, full-featured 2D multibeam imaging sonar systems, the M Series. Shipments of the all-new M Series sonar included Global Diving & Salvage of Seattle, Washington and Oceanographic & Geophysical Instruments of Sandwich, Massachusetts.

The new M Series is 30% smaller than Teledyne BlueView's P900 Series and includes the same features and functionality that made the P900 Series so popular. It is engineered to fit where other sonar systems can't to deliver crisp, real-time, high-resolution sonar imagery for underwater navigation, monitoring, target tracking, and more. Available with 45°, 90°, or 130° field-of-view options, it is a lightweight model with near neutral buoyancy, and a built-in 10° down angle for ROV applications.

“Teledyne BlueView constantly pushes the size envelope. Our customers needed minimally intrusive sensors to fit onto smaller and smaller platforms, and the new M Series is engineered to fit this need,” said Scott Bachelor, BlueView vice president of engineering.

Teledyne BlueView is a leader in 2D imaging and 3D scanning sonar technology with more than 500



installed systems worldwide. Teledyne BlueView's advanced sonar systems are currently deployed on AUVs, ROVs, surface vessels, fixed positions, and portable tripods and have been adopted by leading manufacturers and service providers to support mission critical operations. Teledyne BlueView customers enjoy a low cost of ownership with reliable operation, exceptional service, in-person training, extensive online information, and worldwide after-sale support.

For more information, visit www.blueview.com.

HB Rentals designs custom sleeper for offshore Brazil Modu

Offshore accommodation specialist, HB Rentals, a Superior Energy Services company, has built an ABS-approved eight-man sleeper for use offshore Brazil, announced Glenn Aguilar, HB Rentals vice president – corporate sales and marketing.

A custom design, the sleeper will be installed as permanent quarters on a mobile offshore drilling unit (MODU) in Brazil. The sleeper is A60 fire-rated and designed to comply with the Ministry of Health's NR-30 requirement for Brazilian standards as well as ABS rules and regulations for MODUs.

The building is currently under construction in Broussard, Louisiana, and will be shipped to Rio de Janeiro upon completion.

For more information, visit www.hbrental.com.



Pulse Technology® keeps lead-acid batteries in peak condition

Additional U.S. Patent approvals continue to distance PulseTech® Product Corporation's innovative battery maintainers, smart chargers, and other battery desulfation and maintenance products from competitive brands in the marketplace.

“The evidence is overwhelming that our patented, high-frequency Pulse Technology® system is unique in its ability to reduce the buildup of sulfation on battery plates resulting in the battery working at peak efficiency,” said PulseTech president Pete Smith.

Smith said the interaction of sulfuric acid with the surface area of the lead plates is at the heart of a batteries' ability to create, store, and release energy. Basically, a battery is able to store and supply energy if enough of the active plate material is available to allow an energy transfer to occur naturally.

For more information, visit www.pulsetech.net.



BuTech ½ in. double block and bleed valves

BuTech has released a new version of its popular Double Block and Bleed Valve (DBB Valve). The DBB Valves are space-saving valves that remove the need for large and complicated multi-valve systems. These valves allow sections of a piping system to be isolated for maintenance, with a drain valve between them, ensuring that unwanted pressure doesn't get into the section being serviced. The new version of the DBB Valve is rated to 15,000 psig, with two trunnion isolation ball valves, each with a ½ in. orifice and a needle valve to bleed pressure. The valve can be configured to connect up to most sizes of tubing with all connection styles. These DBB Valves are primarily made from 316 stainless steel; however, they can be machined from other machinable alloys to meet clients specific needs.



BuTech also continues to offer the largest variety of valves designed for top-side and land-based applications, including sour gas. These valves can also be machined from any machinable alloy, with pressure capabilities up to 150,000 psig. BuTech offers a variety of connections, including coned and threaded, NPT, and single ferrule compression connections to support all pressures and sizes 1 in. and below.

For more information, visit www.haskel.com.

SonaSoft 2.6 software released

The FarSounder team is shipping its new SonaSoft 2.6 software, showcased at the Monaco Yacht Show, to customers. All systems are eligible for a free software upgrade, enabling the new capabilities.

Systems purchased prior to 2012 may require firmware, computer, and/or electronics upgrade to take advantage of all the new features. For customers looking to receive their upgrade, consider contacting the FarSounder team this month.

For more information, visit www.farsounder.com.

Cyclops fluorometers integrated into AUVs, gliders, and floats

Turner Designs' new Cyclops Integrator enables easy system integration of its popular Cyclops submersible fluorometers and turbidimeter into AUVs, gliders, floats, and other platforms.



One, two, or three optical sensors with configurations ranging from deep UV to IR along with the Cyclops Integrator electronics can be fastened to an optical head defined by the customer and ready for integration. Alternately, customers can purchase the Cyclops Integrator with sensors in one of the pre-defined Turner Designs optical head configurations.

Data integration is simple with ASCII data automatically delivered at 1-sec second intervals only 3 sec after power is applied. Standard optical kits are available for detecting: in vivo chlorophyll, crude oil, refined fuels, CDOM/FDOM (dissolved organic material), blue/green algae, fluorescein dye, rhodamine dye, PTSa dye, optical brighteners, tryptophan, and turbidity.

Cyclops Integrator packages can also be configured with custom optics for specialized applications per customer request. Sensors are pressure-rated to meet 600 m, 1,000 m, or 6,000 m depths. Typical current draw is minimal, 100 mA operational for three installed sensors powered with a 12-V supply. An optional wiper motor can be added to minimize biofouling of sensors when deploying long-term.

For more information, visit www.turnerdesigns.com.

OceanServer qualifies Marine Magnetics explorer magnetometer

OceanServer Technology has partnered with Marine Magnetics to bring a new magnetometer option to the Iver2 family of AUVs. This new AUV-towed device, coupled to enhanced data-logging software features, enables existing or new Iver2 AUVs to collect high-quality geo-referenced magnetometer data.

The Marine Magnetics Explorer is the world's smallest, lightest, and most efficient high-sensitivity total-field magnetometer with high-resolution output at 0.02nT RMS/rt-Hz. Pairing this powerful sensor with the Iver2 AUV provides users with a powerful new survey approach for collecting magnetic data. AUVs can accurately sweep large areas at a defined height off the seabed.

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Product News

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In addition, the recent development of very high-resolution sonars from Klein (UUV-3500) and Edgetech (2205) will allow users to collect photo-like images of targets along with high-accuracy magnetometer data. This ability to simultaneously collect and fuse both datasets adds a new capability for shallow waters and resolution-intensive applications such as mine countermeasures (MCMs), UXO identification, and debris mapping. The Explorer option also extends the Iver platform into traditional magnetometer markets such as inshore geophysical surveys, archaeology/wreck detection, magnetic mapping of harbours, and ferrous target detection.

For more information, visit www.ocean-server.com.

CARIS Bathy DataBASE 4.0 provides speed and scalability

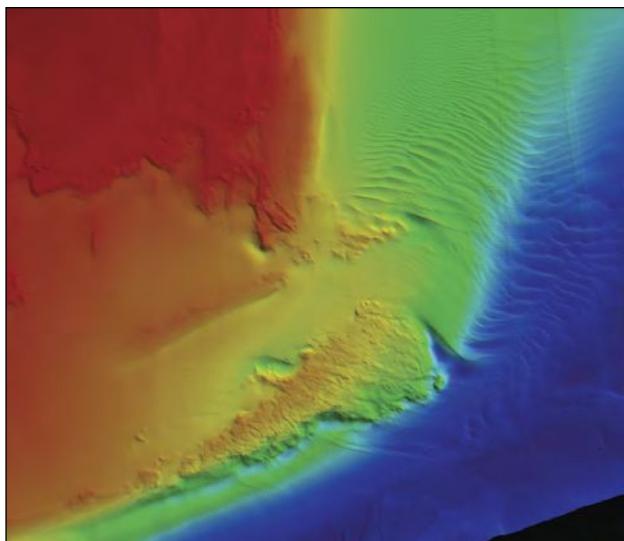
CARIS is pleased to announce the release of Bathy DataBASE 4.0, the leading solution for managing and analyzing bathymetry data. Powered by the CSAR engine and backed by proven RDBMS technology, Bathy DataBASE delivers a robust and scalable solution for the storage and analysis of ever-expanding volumes of Sonar and LiDAR data.

Significant enhancements have been made to the latest version of Bathy DataBASE, including the launch of a 64-bit version. A new dataset grouping tool makes the display and analysis of multiple grids and point cloud datasets fast and simple. The surface combine tool has been re-factored to use memory more efficiently, making the process dramatically faster and more scalable. New database connection and query capabilities create quicker and more effective means of working with large databases.

In addition to these enhancements, the latest version of Bathy DataBASE includes access to database operations using the Python scripting language. Through the use of scripting, users can automate portions of the workflow and run batch processes on large numbers of sources in the database.

The Bathy DataBASE 4.0 release will introduce version control licensing. License strings will be available via the Online Customer Service website, but clients can also request that the new license files be sent via e-mail. Each license will be unique and work with Bathy DataBASE 4.0 as well as earlier versions. Those clients without a current subscription will not receive a new license string for Bathy DataBASE 4.0 but will continue to be able to use older versions of the software.

For more information, visit www.caris.com.



ARROW, tsunami detection system

Mooring Systems, Inc. and Down East Instrumentation, LLC announce the release of a jointly developed Tsunami Detection System following nearly 2 years of development work.

The ARROW (Autonomous Real-time Reporting of Waves) system was conceived based on the need to address specific concerns with existing buoy-based technologies now used for tsunami detection.

The ARROW system differs from conventional systems as it is fully submerged 100 m below the ocean surface while in its "ready" state and throughout its 2-year deployment cycle. If a tsunami threat is detected, a hydrodynamic-shaped pop-up buoy outfitted with an Iridium transmitter is released to the surface at a high speed ascent rate. Once at the surface, the tsunami threat data are transmitted via satellite to the warning centers.

The advantage of remaining fully submerged is the elimination of exposure to harsh environmental conditions on the ocean surface. Buoy and mooring damage caused by repetitive wave action and extreme weather is eliminated along with vandalism, which has proven to be a serious problem in many regions around the world.

The ARROW system employs a proven technique of hydrostatically measuring the height of the water column using a high-resolution pressure sensor and processing the data to determine if a tsunami wave passes above the sensor. The ARROW system uniquely sends the pressure data from the seabed located sensor to the processing electronics in the sub-surface buoy using a hardwired link. This link is also the sub-surface buoy's mooring cable configured using jacketed wire rope. The signal is carried inductively through the wire rope providing a robust and direct connection to the processing electronics located 100 m below the ocean surface. The fast ascent rate of the expendable pop-up buoy allows a quick response time between tsunami detection and satellite transmission.

Another unique aspect of this system is how the message is delivered from the satellite ground station. It is transmitted in e-mail form, allowing the immediate alert message to be forwarded to all warning centers and any addresses designated by the government owning the system.

For more information, visit www.mooringsystems.com.

RESON provides underwater sonars to new breakwater system

RESON is pleased to provide its advanced multibeam sonar system, the SeaBat 7125, to a new breakwater mapping system called GEOSUB 3DTM developed by the company MESURIS in France. The system is a high-resolution, 3D real-time bathymetric and topographic system designed to provide marine engineering data both above and below water surface deployable either from a land or barge crane.

MESURIS decided to use RESON's SeaBat 7125 as the sonar for the GEOSUB 3DTM system because it combines beam density, high ping rates, and extremely high-resolution data, which is required to optimize underwater work. Also, it reduces work duration with cost effectiveness and quality. The unique aspect about the GEOSUB 3DTM system is that it does not require a dedicated survey vessel. The instrumented frame is suspended at crane hook and deployed into the water for a few minutes every time it is necessary to evaluate the work progress.

For more information, visit www.reson.com.

Terresolve Technologies biodegradable fluids gain Rolls-Royce approval

Terresolve, an industry leader in producing environmentally safe lubricants and functional fluids, announced Rolls-Royce Deck Machinery (Brattvaag Group) has approved its EnviroLogic 3000 line of high-performance, readily biodegradable hydraulic fluids for use in its products.

Terresolve's EnviroLogic 3000 hydraulic fluids are readily biodegradable, non-toxic, and a direct replacement for their petroleum analogues. The fluids are safe to use in environmentally sensitive applications, and there are no long-term negative environmental effects in the event of a leak or spill. The EnviroLogic 3000 hydraulic fluids break down into natural parts within 28 days in accordance with the Organization for Economic Co-operation and Development's (OECD) ultimate biodegradation test.

Rolls-Royce provides deck machinery solutions that are suitable for all vessels in the offshore supply and service fleet. The offshore industry has seen a multitude of environmental fluids that have failed due harsh conditions, such as extreme temperatures and moisture.

For more information, visit www.terresolve.com.

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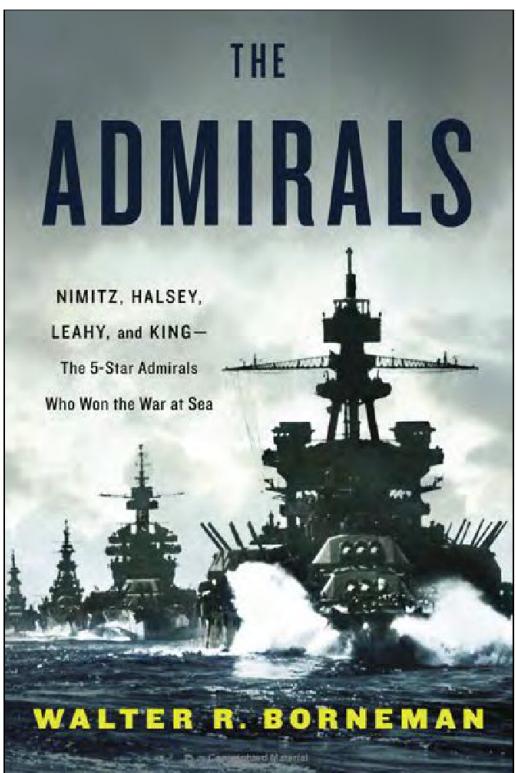
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The Admirals:

How history's only five-star admirals triumphed in World War II and made the United States the world's dominant sea power

Walter R. Borneman

Only four men in American history have been promoted to the five-star rank of Admiral of the Fleet: William Leahy, Ernest King, Chester Nimitz, and William Halsey. These four men were the best and the brightest the Navy produced, and together they led the U.S. Navy to victory in World War II, establishing the United States as the world's greatest fleet.

In **THE ADMIRALS**, award-winning historian Walter R. Borneman tells their story in full detail for the first time. Drawing upon journals, ship logs, and other primary sources, he brings an incredible historical moment to life, showing readers how the four admirals revolutionized naval warfare forever with submarines and aircraft carriers and how these men—who were both friends and rivals—worked together to ensure that the Axis fleets lay destroyed on the ocean floor at the end of World War II.

Walter Borneman is the author of seven works of non-fiction, including *1812*, *The French and Indian War*, and *Polk*. He holds both a master's degree in history and a law degree. He lives in Colorado.

Little, Brown and Company; ISBN-13: 9780316097840
Hardcover - 576 pages (June 2012), \$29.99

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People & Company News

Richard Kaelin was named executive director of Washington operations at Gas Technology Institute (GTI). In this role, he will lead GTI's government R&D activities and work with various State and Federal elected officials and agencies to secure funding of strategic R&D projects and programs. He will also educate key stakeholders about GTI and its initiatives and keep them informed about current energy industry trends and issues. Most recently, he was president of Rich Kaelin Consulting, a business development and legislative affairs firm assisting technology clients with strategic advocacy planning, messaging, partnering, and business development. Prior to that, he was a partner and equity owner in Federal Business Group, a government relations firm focused on business development and legislative affairs in the defense and energy marketplace. From 2004 to 2009, he spearheaded energy and water segments as an associate at the PMA Group.

DNV, a multinational provider of risk management and sustainability services, appointed **Peter Boyle** as UK regional director to drive forward its offshore aging and life extension business. Based in

Aberdeen, Scotland, Boyle is also responsible for the coordination and business growth of DNV's marine and offshore advisory services across the UK through its 100 consultants based in London, Manchester, Glasgow, and Aberdeen. Boyle has worked for DNV for 18 years, most recently leading the risk and technical solutions teams in Aberdeen since 2004. A chemical engineer, he has specialized in safety engineering, providing consultancy services for many oil and gas facilities globally and managing significant asset integrity projects in Kuwait, Dubai, and Algeria.

Alexandra Bech Gjørv was appointed a member of the board of directors of Technip, replacing Daniel Lebègue. **M. Pascal Colombani** was appointed chairman of the audit committee. Bech Gjørv is also a member of the audit committee. In addition, following the ethics and governance committee's proposal, the board appointed **Gérard Hauser** as the company's senior independent director for a 2-year term. Bech Gjørv is a partner in the



Boyle

law firm Hjort (Norway) and also chaired the public 22 July Commission on the terrorist attacks. She began her career in law firms before joining Norsk Hydro ASA from 1993 to 2007 where she held a number of positions, including executive vice president HR and HSE and senior vice president, New Energy. She then moved to Statoil ASA as senior vice president, New Energy from 2007 until 2010 before joining Hjort in 2010.

Bluefin Robotics, a provider of AUVs, said that **Eric Levitt** joined the company as sales director for commercial and international markets. His primary focus is to expand Bluefin's worldwide footprint. Levitt has over 20 years of sales and marketing experience in both domestic and international markets for subsea technology. Before joining Bluefin, he was business development and sales manager at General Dynamics C4S Systems for Underwater ISR (Sonar) Solutions. In this role, he developed export markets for mine countermeasure and anti-submarine warfare applications. He has held business development roles at Sonardyne International and Kongsberg Defense and Aerospace.

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Crowley Maritime Corp. said that **Steve Demeroutis** will now assume the role of vice president, marine operations, for the company's petroleum and chemical transportation group. **Rudy Leming** will assume Demeroutis' former position of vice president, labor relations. In their new positions, both will remain domiciled in Jacksonville, Florida.

Demeroutis will report to Crowley's Rob Grune, senior vice president and general manager, petroleum services, while Leming now reports to Bill Pennella, vice chairman and executive vice president. In his new position, Demeroutis will be responsible for the safe and reliable operation of Crowley's marine petroleum assets, including U.S. Coastwise, Jones Act product tankers, ranging from 240,000 to 300,000 barrels, as well as the company's 17 articulated tug-barges. Leming began his career with Crowley in 1984 when the company purchased Delta Lines. In his new position, Leming will be responsible for the development and implementation of Crowley's overall labor strategy. He will oversee contract negotiations, union relationships, and the day-to-day administration of collective bargaining agreements throughout the entire Crowley organization.

Liquid Robotics® announces **Gary Gysin** has joined the Company as executive vice president of global sales and services. In this position, Gary will build upon the worldwide momentum for Wave Glider® data services to scale the business for the next phase of expansion and growth. Gary brings to Liquid Robotics over two decades of extensive experience leading public and start-up companies in IT communications, network and infrastructure systems involving complex hardware, software, and data services solutions.

Ocean Power Technologies, Inc., announced the appointment of **Dr. Mike M. Mekhiche** to the position of Vice President, Engineering. Dr. Mekhiche joins OPT from BAE Systems, where he most recently held the position of Director of Programs.

Craig International Supplies, a division of global shipping and energy services firm Craig Group, appointed **Steve McHardy** and **Jill MacDonald** as joint managing director. Formerly CIS

directors prior to the appointment, they have a combined experience of 29 years with the oilfield procurement company. McHardy, who previously worked with National Oilwell and Aker Kvaerner, has been with CIS for over 15 years. MacDonald has been with CIS for 17 years. They have been in charge of overseeing the management and subsequent growth of the Aberdeen head office along with the startup and success of their international locations in Houston and Cape Town.

Channel Technologies Group (CTG), a supplier of piezoceramics, transducers, and sonar and navigation systems, appointed **Paul Downey** to the position of chief financial officer. Downey brings more than 30 years of experience, primarily in the aerospace and defense sectors. Prior to joining CTG, Downey served as chief financial officer at several mid-sized, high-growth technology companies, including Ensign-Bickford Aerospace & Defense Co., in Hartford, Connecticut, and Primus International, Inc. in Bellevue, Washington. In his new position at CTG, Downey will oversee the finance and accounting operations of CTG and serve on the executive leadership team.



Demeroutis



Leming

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North Sea Decommissioning Conference
Aberdeen
www.decomworld.com

December 3-5, 2012
OTC Arctic Technology Conference
Houston, TX
www.otcnet.org

December 5-7, 2012
International Workboat
New Orleans, LA
www.workboat.com

January 15-17, 2013
Underwater Intervention
New Orleans, LA
www.underwaterintervention.com

January 21-23, 2013
GoM Oil Spill & Ecosystem Science
New Orleans, LA
www.gulfofmexicoconference.org

March 19-21, 2013
Decommissioning and Abandonment Summit
Houston, TX
www.decomworld.com

March 19-21, 2013
Nace Corrosion 2013
Orlando, FL
www.nacecorrosion.org

March 20-22, 2013
Offshore Mediterranean Conference
Ravenna, Italy
www.omc.it

April 9-13, 2013
Ocean Business 2013
South Hampton, UK
www.oceanbusiness.com

April 10-11, 2013
Global Marine Renewable Energy Conference
Washington, D.C.
www.globalmarinerenewable.com

April 22-25
SubOptic 2013
Paris, France
www.suboptic.org

May 6-9, 2013
Offshore Technology Conference
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June 10-13, 2013
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Website: www.appliedacoustics.com
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E-mail: tssales@teledyne.com
Website: http://www.teledyne-tss.com
Contact: Carolyn Jones

USA Office: 10801 Hammetry Blvd, Suite 128,
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E-mail: info@ceramcoceramics.com
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PIEZOELECTRIC

**Channel Industries**

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Tel: (805) 967-0171; Fax (805) 683-3420
E-mail: cisales@channeltech.com;
Website: www.channeltechgroup.com
Contact: K.Ruelas, pres.; K.Aties, Director of Business Development; E.Bickel, technical sales

Piezoelectric ceramics - Channel Industries, A Division of Channel Technologies Group (CTG) is a custom manufacturer of piezoelectric ceramics in lead-zirconate and barium titanate compositions. Since 1959 Channel Industries ceramics have been at the heart of thousands of underwater acoustic applications and systems. Hydrophones, towed arrays, modems, side-scan sonar, etc. Military and commercial applications worldwide for over 50 years.

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Website: www.ak-ind.com
Contact: Allan Kidd

AK Industries is an agile high tech manufacturer of rugged low cost underwater electrical connectors. The HydroVolt line of connectors is the most rugged and reliable low cost connector available. AK Industries is also ideally suited to provide unique solutions engineered to customer requirements.

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Website: www.birns.com
Contact: Eric Birns

BIRNS, Inc. is a fully-integrated ISO:9001:2008-certified designer and manufacturer of high-performance underwater solutions—LED and tungsten-halogen chamber and commercial diving lights, MPI-NDT equipment; electrical, coaxial, optical, electro-opto-mechanical connectors, penetrators and custom cable assemblies. Specializing in high-end connector products—BIRNS Millennium™, miniature metal shell (high-density, high-voltage, coaxial, fiber-optic, hybrid); Metal Shell: rugged, high power use; Penetrators: ABS/DNV-approved pressure boundary penetration; along with Aquamate, Rubber and Polymeric lines.

**BIRNS Aquamate LLC**

122 Waltham St.
Pawtucket, RI 02860 USA
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E-mail: sales@birnsaquamate.com
Website: www.birnsaquamate.com
Contact: Eli Bar-Hai

Birns Aquamate design and manufacture underwater electrical connectors, cable assemblies, and cable terminations. The company produces a wide range of standard industry connectors such as the 5500 Series, SC, MC, LP, FAWL/FAWM, Rubber Molded, and NANO. BIRNS Aquamate is the only underwater connector producer that guarantees compatibility with other manufacturers. Birns also excels in fast turn-around for custom design of special connector solutions. Stocking dealers in the UK (Scorpion Oceanics) South Africa (Marine Solutions) Holland (Nautikaris and Seascapes) as well as dealers in Italy, Russia, China, Brazil and across the USA.

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E-mail: larry.bobbit@oegoffshore.com
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Website: www.uniquegroup.com

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Contact: Beto Campos - Director, Global Com. Sales

BlueView delivers state of the art, compact acoustic imaging, measurement, and automation solutions for defense, energy, civil engineering, transportation, and port security applications worldwide. BlueView's advanced acoustic systems support underwater operations from a wide variety of platforms, including ROVs, AUVs, surface vessels, fixed mounts, portable tripods, and diver handheld systems.

Imagenex Technology Corp.

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E-mail: imagenex@shaw.ca
Website: www.imagenex.com
Contact: Steve Currie

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Sonatech

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E-mail: marketing@sonatech.com
Website: www.channeltechgroup.com
Contact: K.Ruelas, pres.; R. Franklin, v.p., nav & range sys; M. Shaw, v.p., sonar & transducer sys; B. Febo, Director of Business Development



Sound Engineering Solutions – Sonatech, A Division of Channel Technologies Group (CTG) develops innovative solutions for underwater acoustic applications. Existing technologies span a wide variety of acoustic systems, including sonar systems, navigation systems, and custom acoustic solutions. Our solutions are based on a 36-year career of developing high-performance, high-reliability undersea systems that are continually improved through research and development.



Sound Metrics Corp.
15029 Bothell Way NE, Suite 100
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E-mail: sales@soundsmetrics.com
Website: www.soundmetrics.com
Contact: Jeanne Dorsey

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E-mail: info@saivas.no
Website: www.saivas.no
Contact: Gunnar Sagstad

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SUBSEA FABRICATION



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E-mail: contact@seanicusa.com
Website: www.seanicusa.com
Contact: Karen North

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TRANSDUCERS



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Tel: (805) 683-2575, Fax (805) 967-8199
E-mail: sales@itc-transducers.com
Website: www.channeltechgroup.com
Contact: K.Ruelas, pres.; B.Dolán, Director of Business Development; E.Kunstal, eng. mgr.

The Science of Sound Performance – ITC, a Division of Channel Technologies Group (CTG), designs and manufactures both custom and off-the-shelf underwater, air, and ultrasonic acoustic transducers, projectors, hydrophones, hydrophone/preamp, side-scan arrays, OEM and end-item products for commercial and military applications.

UNDERWATER THICKNESS GAUGES



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Annapolis, MD 21401 USA
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E-mail: sales@cygnusinstruments.com
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Contact: Rod Sanders

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Tel: 858-864-7775, Fax: 907-569-0268
E-mail: sales@exocetus.com
Website: www.exocetus.com
Contact: Ray Mahr, VP Sales & Marketing

The new Exocetus Coastal Glider is specifically designed for use in coastal waters where high currents and large variations in water densities occur. A larger buoyancy engine than legacy gliders designed for open-ocean operation enables the Exocetus Coastal Glider to easily operate in up to 2 knots of current, handle densities from 7 ppt to 37 ppt, operate up to 60 days with a lithium battery pack and easily integrate additional sensors.

ROVs



SUBSEA TECHNOLOGIES
everything remotely possible™
Perry Slingsby
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Houston, TX 77041
Tel: 713-329-8230, Fax: 713-329-8299
E-mail: perry.sales@f-e-t.com
Website: www.f-e-t.com/Subsea

Forum Energy Technologies' Perry Slingsby brand supplies deepwater work class ROVs, tooling solutions, burial systems, and control-system-based products to the oil, gas, and telecommunications industries. Providing the most advanced, robust and dependable ROVs and subsea products in the world, Forum's Subsea group has facilities in the US and UK and sales offices and agents around the world.



SeaBotix Inc.
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Tel: +1 619 450-4000
Fax: +1 619 450-4001
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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Tel: +44(0)1224 798660, Fax: +44(0)1224 798661
10642 West Little York, Suite 100
Houston, Tx, 77041-4014, USA
Tel: +1 713 329 8730, Fax: +1 713 329 8299
E-mail: sub-atlantic.slaes@f-e-t.com
Website: www.f-e-t.com/Subsea

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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ON&T's Product & Service Directory

UNDERWATER VEHICLES

ROVs



VideoRay

580 Wall Street, Phoenixville, PA 19460
Tel: (610) 458 3000, Fax: (610) 458 3010
E-mail: info@videoray.com
Website: www.videoray.com
Contact: Brian Luzzi

With more than 1,900 Remotely Operated Vehicles (ROVs) in service around the world, VideoRay has clearly become the global leader in Observation ROV technology. VideoRay is an extremely versatile, portable, affordable, and reliable solution for underwater operations including surveys, offshore inspections, search & recovery, homeland & port security, science & research, fish farming, and other unique applications in underwater environments. VideoRay is available on the General Services Administration.

UVVs



iRobot Corporation | Maritime Systems

4625 Industry Lane, Durham, NC 27713
Tel: 919-405-3993, Fax: 919-495-3994
E-mail: frochleder@irobot.com
Website: www.irobot.com
Contact: Friedrich Rochleder, Sales Account Manager

iRobot designs and builds robots that make a difference. iRobot's family of unmanned underwater vehicles (UVVs), including the iRobot IKA Seaglider and iRobot 15A Ranger, perform a variety of missions for researchers, oceanographers and military planners including physical, chemical and biological oceanography, persistent surveillance, marine environmental monitoring and other missions.

UNDERWATER VIDEO EQUIPMENT



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Kongsberg Maritime Ltd.

Camera Division
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Tel: +44(0)1224 226500
Fax: +44 (0)1224 226598
E-mail: km.camsales.uk@kongsberg.com
Website: www.kongsbergmaritime.com
Contact: Bill Stuart

Shark Marine

23 Nihon Dr., Unit 4
St. Catharines, Ontario L3N 1L2
Tel: 905-687-6672, Fax: 905-687-9742
E-mail: sales@sharkmarine.com
Website: www.sharkmarine.com
Contact: Jim Honey

Since 1984 Shark Marine Technologies, has been manufacturing Remotely Operated Vehicles and accessories, Winches, Handling & Control Systems, Underwater Cameras and Diver Held Sonar Systems, for operations including surveying, oil and gas, security and defence, search and recovery and archaeological investigations. We also provide on-site operations and consultation, software development and custom manufacturing.



SIDUS Solutions, Inc.

San Diego, CA Office:
Tel: (619) 275 5533
Fax: (619) 275 5544
Houston, TX Office:
Tel: (281) 658-2555
E-mail: info@sidus-solutions.com
Website: www.sidus-solutions.com

SIDUS Solutions LLC is an integrated systems provider for security and video surveillance systems specializing in customization. Our products are operational to subsea depths of 6,500m, serving industries worldwide. We are a full service provider, offering end-to-end solutions from concept design, product selection, engineering, manufacturing, technical and customer support. Industries we serve are Oil and Gas, Scientific, Military and Academic.

Continued ■

Continued ■

WINCHES, HANDLING & CONTROL SYSTEMS



Hawboldt Industries

220 Windsor Road
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Tel: 902 275 3591
Fax: 902 275 5014
E-mail: paul.phillips@hawboldt.ca
Website: www.hawboldt.ca
Contact: Paul Phillips

Hawboldt Industries has built robust commercial and scientific deck machinery for over a century, focusing on custom winch solutions and satisfying project requirements from engineering to commissioning. ROV winches, A frames, and electro-hydraulic power packs are available to satisfy the offshore and subsea markets. Our scientific winches, preferred by universities and governments worldwide, are renowned for their durability and performance particularly in harsh environments.



Markey Machinery Company

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Fax: +1 206 623 9839
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WINCHES - UNDERWATER

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E-mail: admin@alloceans.co.uk
Website: www.alloceans.co.uk
Contact: Brian Abel

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3 Which category best describes your business?

(Indicate the primary activity of your organization by placing a 1 next to the category. Place 2, 3 and 4 next to other markets served.)

- | | |
|---------------------------------------------------------------|-------------------------------------------------------------|
| A. <input type="checkbox"/> SHIPS, CONSTRUCTION, SALVAGE | O. <input type="checkbox"/> DIVING EQUIPMENT / SERVICES |
| B. <input type="checkbox"/> U/W VEHICLES / COMPONENTS | P. <input type="checkbox"/> CONSULTING, DATA SERVICES |
| C. <input type="checkbox"/> NAVIGATION / POSITIONING | Q. <input type="checkbox"/> MARINE ELECTRICAL / ELECTRONICS |
| D. <input type="checkbox"/> RESEARCH & DEVELOPMENT | R. <input type="checkbox"/> COMPUTER SERVICES / SOFTWARE |
| E. <input type="checkbox"/> OCEAN INSTRUMENTATION | S. <input type="checkbox"/> OCEAN RENEWABLES |
| F. <input type="checkbox"/> OFFSHORE OIL & GAS | T. <input type="checkbox"/> SUBSEA IRM |
| G. <input type="checkbox"/> COMMUNICATIONS / UTILITIES | U. <input type="checkbox"/> OCEAN OBSERVING |
| H. <input type="checkbox"/> SCIENCE, ENVIRONMENTAL | V. <input type="checkbox"/> SHIPPING/ TRANSPORTATION |
| I. <input type="checkbox"/> EDUCATIONAL INSTITUTION / LIBRARY | W. <input type="checkbox"/> SUBMARINE TELECOM |
| J. <input type="checkbox"/> GOVERNMENT MILITARY | X. <input type="checkbox"/> EQUIPMENT RENTAL |
| K. <input type="checkbox"/> GOVERNMENT CIVILIAN | Y. <input type="checkbox"/> MANUFACTURERS' REPRESENTATIVE |
| L. <input type="checkbox"/> MARINE HARDWARE / DECK EQUIP. | Z. <input type="checkbox"/> OTHER (Please specify below) |
| M. <input type="checkbox"/> FISHING INDUSTRY, AQUACULTURE | <hr/> |
| N. <input type="checkbox"/> SURVEY, MAPPING, EXPLORATION | <hr/> |

4 Which category best describes your job function? (check only one)

- | | |
|----------------------------------------------------|----------------------------------------------------------|
| 1. <input type="checkbox"/> OWNER / EXECUTIVE | 5. <input type="checkbox"/> BUYER |
| 2. <input type="checkbox"/> MANAGEMENT / PROFESSOR | 6. <input type="checkbox"/> SALES |
| 3. <input type="checkbox"/> ENGINEER / SCIENTIST | 7. <input type="checkbox"/> OTHER (Please specify below) |
| 4. <input type="checkbox"/> TECHNICIAN / OPERATOR | <hr/> |

**5 How many other people will
read your issue of Ocean News
& Technology at this location?**



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AK Industries www.ak-ind.com	53	Deep Ocean Engineering (DOE) www.deepocean.com	72	Outland Technology www.outlandtech.com	89
ARC Controls www.arccontrols.com	42	DeepSea Power & Light www.deepsea.com	62	Quality Positioning Services BV www.qps.nl	29
BIRNS, Inc. www.birns.com	33	Det Norske Veritas AS www.dnv.com/software	3	Quest Offshore Resources, Inc. www.questoffshore.com	88
C&C Technologies www.cnavgnss.com	69	ECO Magazine www.eco-tsc.com	57	Radar Screen Report www.subcableworld.com	73
Ceramco www.ceramcoceramics.com	83	EvoLogics GmbH www.evologics.de	99	Radoil, Inc. www.radoil.com	44
Channel Technologies Group www.channeltechgroup.com	39	FORUM Energy Technologies, Inc. www.f-e-t.com	9	Rapp Hydema AS www.rappmarine.com	7
CSA International, Inc. www.csaintl.com	19	Geofac Systems, Inc. www.geofac.com	71	RBR Ltd www.rbr-global.com	43
Csnet International, Inc. www.csnetintl.com	5	Geometrics, Inc. www.geometrics.com	50	Sea-Bird Electronics, Inc. www.seabird.com	100
Cygnus Instruments www.cygnusinstruments.com	75	GJ Land & Marine Food Dist., Inc. www.gjfood.com	55	SeaBotix www.seabotix.com	4
Senior Manager for Oil & Gas Business Line					
CSA International, Inc. (CSA) is an established and dynamic worldwide leader in marine environmental science consulting, with an emphasis on oil and gas, coastal permitting/monitoring, and habitat restoration. CSA is seeking a Houston-based senior manager for its oil & gas business line.		JW Fishers Manufacturing, Inc. www.jwfishers.com	61	Seacon www.seaconworldwide.com	38
The successful candidate will be responsible for building a key worldwide business line, including the development of resources, the expansion of the customer base, the development of sales and the management of the business line's operational tactics and strategies in line with the parent organization. In addition, the Business Line Manager will be responsible for the quality, validity and accuracy of the science component of projects; planning of and participation in field surveys; oversight of analysis and reporting phases; strong supervision of project managers; and communication with clients, among other duties.		LinkQuest, Inc. www.link-quest.com	12	Seanic Ocean Systems/ Ashtead Technology www.seanicusa.com	49
Preferred qualifications are 1) Ph.D. in marine environmental science, oceanography, marine biology, or related science (degree requiring written thesis/dissertation); 2) a minimum of 10 years consulting experience with focus on the oil and gas industry; 3) a minimum of 5 years project management experience; 4) a minimum of 5 years experience managing technical and professional personnel; 5) the motivation to develop environmental business in the offshore oil and gas industry; 6) proficiency in public speaking; and 7) a willingness to travel.		MacArtney AS www.macartney.com	20	SeaRobotics www.searobotics.com	15
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Senior Manager for Oil & Gas Business Line

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The successful candidate will be responsible for building a key worldwide business line, including the development of resources, the expansion of the customer base, the development of sales and the management of the business line's operational tactics and strategies in line with the parent organization. In addition, the Business Line Manager will be responsible for the quality, validity and accuracy of the science component of projects; planning of and participation in field surveys; oversight of analysis and reporting phases; strong supervision of project managers; and communication with clients, among other duties.

Preferred qualifications are 1) Ph.D. in marine environmental science, oceanography, marine biology, or related science (degree requiring written thesis/dissertation); 2) a minimum of 10 years consulting experience with focus on the oil and gas industry; 3) a minimum of 5 years project management experience; 4) a minimum of 5 years experience managing technical and professional personnel; 5) the motivation to develop environmental business in the offshore oil and gas industry; 6) proficiency in public speaking; and 7) a willingness to travel.

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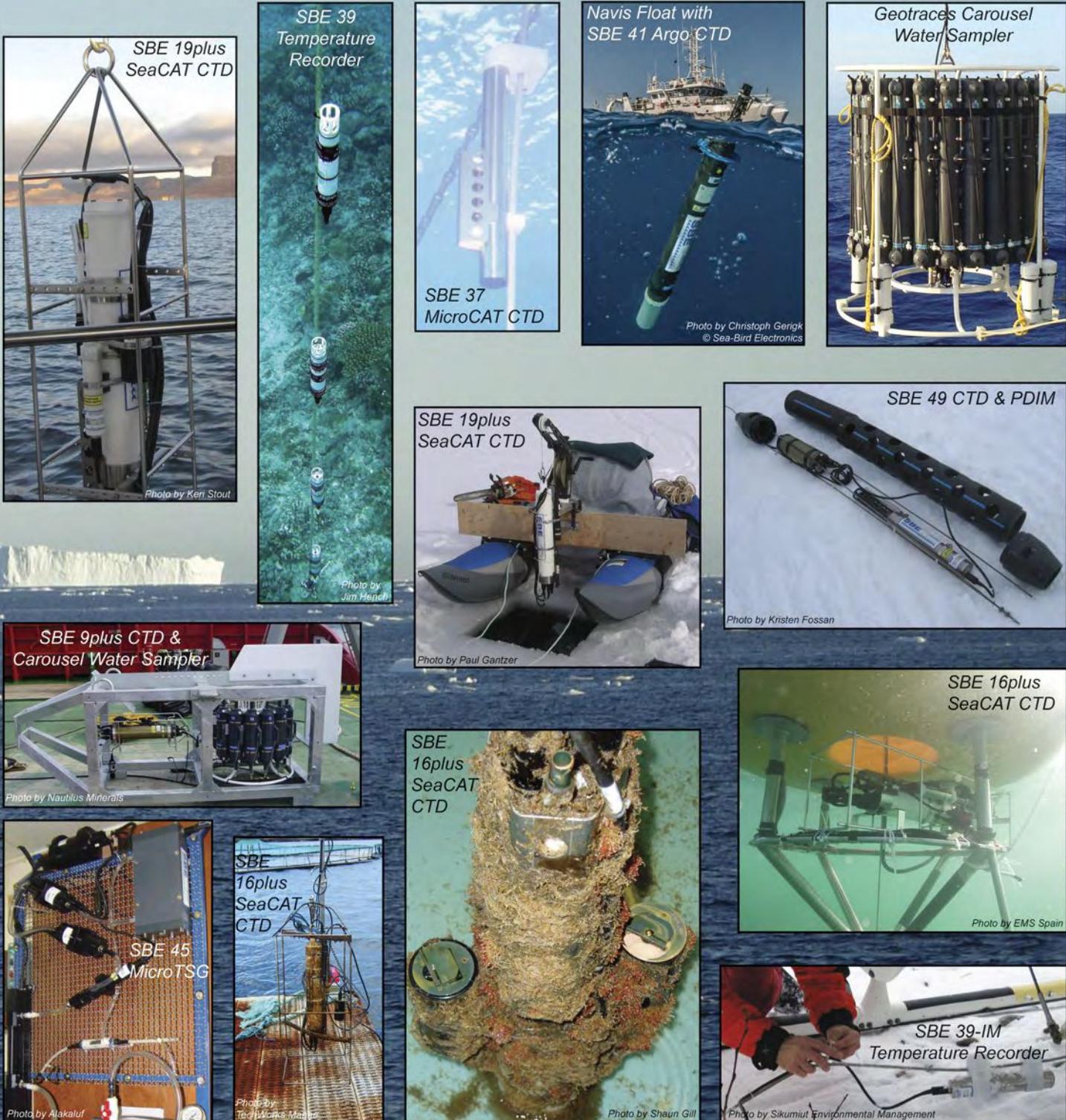
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